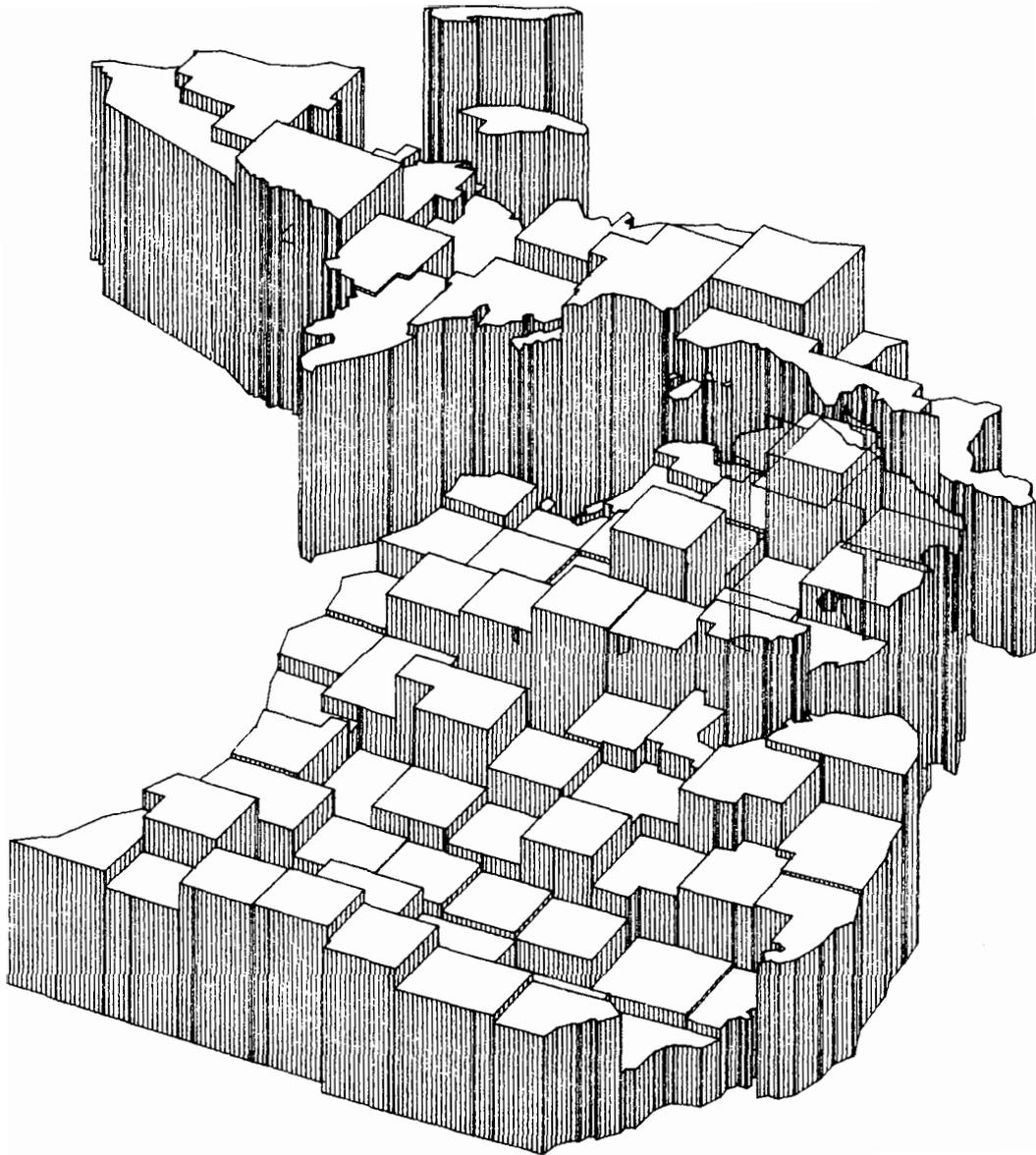


PROGRAMS AND ORGANIZATION

MARCH 1988

Angling Participation By Residence County



Department of Natural Resources
Fisheries Division



Fisheries Management Report No. 12

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A DESCRIPTION OF THE ORGANIZATION AND
PROGRAMS OF THE FISHERIES DIVISION,
MICHIGAN DEPARTMENT OF NATURAL RESOURCES

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A DESCRIPTION OF THE ORGANIZATION
AND PROGRAMS OF THE FISHERIES DIVISION,
MICHIGAN DEPARTMENT OF NATURAL RESOURCES

Preface

This Fish Management Report provides a comprehensive description of the mission and goals, constituencies, programs and organization of the Fisheries Division. It has been developed to inform our shareholders of how the Division discharges its responsibilities to protect and propagate the fishery resources of the State. And it is intended to identify important fishery issues and stimulate progress toward further enhancement of the State's recreational and commercial fisheries.

John A. Scott
Chief, Fisheries Division
March 1, 1988

INTRODUCTION

The State of Michigan contains 11,000 lakes, 36,000 miles of rivers and streams, and 43 percent of the Laurentian Great Lakes which contain more than 20 percent of the world's fresh water. These waters contain a variety of fish communities representing most of the types found in North America. These extensive resources in proximity to the large human population of Michigan and nearby states provide fishing opportunities which are unmatched anywhere in the world.

Recreational fishing is the largest and highest-valued use of the state's fishery resources. Approximately two million Michigan residents and 334,000 non-resident tourists fish in Michigan each year. These anglers fish over 35 million angler days per year. Net value of fishing to these fishermen has been estimated at \$950 million. In fishing, anglers spend \$850 million per year with a resulting impact on tourism and fishing equipment sectors of Michigan's economy of \$1.4 billion per year. This produces value-added of \$900 million annually with associated employment of 18,000 persons. Since some of these expenditures would have gone toward other uses in Michigan if not spent on fishing, net contribution to Michigan's economy is \$210 million of economic activity, \$140 million value-added annually, and 2,700 jobs. Much of the activity in excess of this net contribution, however, is in different economic sectors and geographical areas than would otherwise occur. Net contribution to tourism- and fishing-related businesses in rural areas and coastal towns is over \$500 million per year and 12,000 jobs. In many northern Michigan communities, fishing and related tourism support as much as half of the local economy.

Commercial fishing in Michigan waters of the Great Lakes produces approximately 16 million pounds of whitefish, chubs, perch, lake trout, catfish, and other species with a dockside value of approximately \$10 million each year. Wholesaling, processing, and retail sales after landing produce another \$9 million in economic activity annually. These activities provide employment for about 1000 Michigan residents. Approximately 40% of the landed value is taken by treaty fishermen; the remainder is landed by state-licensed fishermen.

However, Michigan's fisheries resources are also fragile in many respects and are subject to heavy fishing and many other human impacts; thus they require fairly intensive protection and management. In the absence of management beyond statutory fishing regulations and habitat protection, the state's fisheries would quickly degenerate and would support no more than 40 percent of present fishing. Management of Michigan's fisheries began with establishment of the Michigan Fish Commission in 1873. The Fisheries Division of the Department of Natural Resources which evolved from that commission is now the second oldest administrative agency in the state's government.

MISSION AND GOALS

Michigan's fishery resources are held in trust by the state for the benefit of its citizens. As trustee, the state has special, more demanding, obligations beyond its general responsibility to act for the public benefit. Indeed, the state's constitution declares "The conservation and development of the natural resources...to be of paramount public concern..." and enjoins the government to act in this interest. Act 17, P.A. 1929 charges the Department of Natural Resources to "provide for the protection and propagation of game and fish. . .". The state's responsibilities as trustee of the people's fishery resources are largely discharged through the Fisheries Division. Thus the doctrine of the public trust in natural resources is fundamental to the division's mission and goals.

Five guiding principles have been established through statutory and judicial application of the public trust doctrine:

- (1) Public trust resources are a special form of public property. If they have any value under public ownership, they may not be transferred to private ownership unless such transfer will serve a significant public purpose. They particularly should not be disposed of at less than market value unless there are obvious public reasons for such a subsidy.
- (2) The interests of future citizens of the state are as important in resource management as those of present citizens. Present citizens have only the right of use and must pass the trust on to the future without diminishing its value. If trust resources are degraded, as were the Great Lakes fisheries, then the state has an obligation to rehabilitate them if it is possible.
- (3) The state has an obligation to provide for the broadest possible benefits from use of public trust resources. Thus, the state must favor recreational over commercial fishing and should provide for public access to the state's waters where these can produce significant public fisheries.
- (4) Government must act to develop natural resources and promote their use in the interest of the general welfare. It is not sufficient to conserve resources and provide for their use; rather, where possible, new resources, new uses, and new values should be created so as to increase the common wealth.
- (5) Resource managers must seek to define and serve the broad public interest as against narrower, more focused interests. They must actively identify and respond to public needs and concerns rather than simply providing for public participation in management decisions.

In light of this understanding of the public trust doctrine, the following mission and goals have been adopted by the Department of Natural Resources for the Fisheries Division to address the interests of the major stakeholders in the state's fishery resources and management programs.

The mission of the Fisheries Division, Michigan Department of Natural Resources, is to protect and enhance the public trust in populations and habitat of fishes and other forms of aquatic life, and promote optimum use of these resources for benefit of the people of Michigan. In particular, the division seeks to:

Protect and maintain healthy aquatic environments and fish communities and rehabilitate those now degraded;

Provide diverse public fishing opportunities to maximize the value to fishermen of recreational fishing;

Permit and encourage economically efficient and stable commercial fisheries which do not conflict with recreational fisheries;

Insure a significant role in Michigan's fisheries for those Indian tribes with legally established fishing rights; and

Foster and contribute to public and scientific understanding and stewardship of fish, fishing, and fishery management.

CONSTITUENCIES AND PUBLICS

The Fisheries Division's mission and goals reflect the broad interests of the people of Michigan in a healthy environment, ample opportunity for outdoor recreation, the creation of wealth, and just treatment of the state's citizens. However, the division must consider and balance a variety of more concrete interests expressed by a variety of constituencies and interested publics. Thus an understanding of these constituencies and publics is valuable for a deeper understanding of the division's mission and goals.

In addition to the general public, the division's principal publics include anglers, angling-related businesses, boating interests, riparians and near-shore residents, water users and managers, commercial fishing interests including Indian tribes with fishing rights, Great Lakes resource agencies, various general agencies of state government, local and regional agencies, various communications agents, and fisheries and related professionals.

The largest of the division's constituencies encompasses those Michigan citizens who fish for recreation. Recreational fishermen usually have intense interest in those fishing opportunities they use and a general interest in the conservation and sound management of all of the state's fisheries. Most recreational fishermen do not belong to any formal organizations but the structure of their interests is often reflected in the organized groups.

Anglers' interests are often focussed on fisheries near their residences or second homes. These interests may be expressed through lake or stream associations or local conservation clubs. Some local governments or local businesses may also actively reflect fishing interests although these views may be tinted by commercial interests.

Some anglers also have specific interests in kinds of fish or fishing. These interests are reflected by organizations such as the Michigan-Ontario Musky Club, the Lake St. Clair Walleye Association, various bass fishing clubs, Trout Unlimited, Michigan Steelhead and Salmon Fishermen's Association, and the Federation of Fly Fishermen. Such groups often are as interested in "program balance" and special fishing opportunities as they are in local fisheries. Special interest groups of this type often highlight issues or concerns which are more diffuse among the general population of anglers, but they do not represent the whole of the angling constituency.

Many anglers and groups support regional and statewide organizations whose aims include influencing government policies and programs. Such groups as the Michigan United Conservation Clubs, Michigan Steelhead and Salmon Fishermen's Association, Michigan Bass Federation, Michigan Council of Trout Unlimited, and Northern Michigan Sportsman's Society serve to distill and filter local opinion.

Many groups of anglers also become stewards of particular resources or management projects. They make substantial donations of labor, materials, and funds to aid division efforts in return for the division's continued attention to their projects.

Businesses which serve anglers usually have interests which are closely related to, if not consistent with, anglers' interests. Tackle and bait retailers, fishing license agents, equipment and tackle manufacturers, charter boat operators and fishing guides, and fish cleaning station operators all have a direct interest in angling activity. Many resorts, motels, campgrounds, marinas, boat rental services, restaurants, gas stations, and other travel-related businesses in areas with substantial fishing activity have great interest in the fishing which attracts tourists. These interests are expressed through state and local chambers of commerce, local governments, community service clubs, regional tourist councils, the Great Lakes Charter Boat Association, Michigan Retail Hardware Dealers Association, the American Fishing Tackle Manufacturers Association, the Michigan Marine Dealers Association and the Michigan Travel Bureau.

Since much fishing is done from boats and much boating is done to engage in fishing, there is considerable correlation between the interests of anglers and boaters. Both anglers and boaters need access to the water and prefer clear, clean water and pleasant settings. However, there are also significant conflicts between boaters and anglers. Intense boat traffic on lakes and rivers and canoe traffic on streams disrupts fishing. High speed boating is particularly incompatible with fishing. Boaters often view anglers as obstructions to boat traffic. Angling and non-angling boaters compete for limited facilities in some areas. Boating interests are also biased toward larger boats than are used by many anglers. Boating views are expressed to the Fisheries Division through the State Waterways Commission, the DNR Recreation Division and the Michigan Boating Industries Association.

Riparian landowners and managers and near-shore residents often have a direct interest in fishing but also have many correlative interests. Many private riparians and near-shore residents live near water in part because of their interests in fishing. Public riparian agencies including the U. S. Forest Service, various DNR divisions, and local governments make specific efforts to accommodate fishing. Private riparians, however, also find intense public use disrupts their interests and may oppose public access and be concerned about trespass, congestion, and noise. Such concerns may extend to near-shore residents and communities. Many riparian activities such as weed control, water level management, beach maintenance, dredging, seawall construction, and dockage can completely dominate shoreline and eliminate critical fish habitat. Erosion, nutrient loading, and water use by riparians can profoundly affect fish habitat in lakes and streams. Riparian activities are primarily managed by the DNR Land and Water Management Division.

Industrial and agricultural users of surface water and agencies which manage water and its use have important effects on fisheries interests and may be significantly constrained by protection of fish and fishing. Water withdrawal especially by steam electric and hydroelectric plans often kills fish by impinging them on screens or mechanical or thermal effects as they pass through the facility. Water withdrawal from streams also has a profound effect on their capacity to support fish in affected reaches. Drainage management can have similar effects. Dams affect water flow, temperatures, and fish movement and hence fish populations. Discharge of wastewater from municipalities, industry, and agriculture can also significantly affect water quality. Users of water are numerous but are regulated by a few key agencies with whom Fisheries Division works. These agencies include the DNR Land and Water Management and Surface Water Quality divisions, U. S. Environmental Protection Agency, U. S. Army Corps of Engineers, Federal Energy Regulatory Commission, and county drain commissioners.

Commercial fishing is an important use of fisheries resources which can be of economic benefit to the state and of particular value to traditional fishermen, especially Indians. Commercial fishing interests are expressed directly to the division through the Michigan Fish Producers' Association, Michigan Bait Dealers' Association and independent salmon and salmon egg processors. Tribal commercial fishing interests are represented by the Bay Mills, Grand Traverse, Keweenaw Bay, and Sault Ste. Marie Tribes, the Chippewa-Ottawa Tribal Management Authority and the U. S. Department of Interior. The tribes have a specific interest in self-governance of their fishing. In those few areas of the state where commercial fishing dominates recreational fishing, local communities and businesses are supportive of the commercial fishery. There is no organized expression of the interests of consumers of commercially caught fish.

The Great Lakes fall within the jurisdiction of Canada and the United States, further subdivided among the province of Ontario and eight states. Each of these jurisdictions has several agencies concerned with Great Lakes resources. The Fisheries Division works cooperatively with these agencies to protect fish habitat and manage fish stocks of common concern. The Great Lakes Fishery Commission, established by convention between the

United States and Canada, provides the principal forum for such cooperation. The International Joint Commission, established by treaty between the United States and Canada, is responsible for water level, use, and quality management in the Great Lakes.

As an agency of state government, the Fisheries Division must work within guidance and management systems defined by various general agencies of state government. Considerable policy direction is given by the Legislature, Governor, Attorney General, Natural Resources Commission, and DNR Executive Office. DNR executives, the Department of Management and Budget, the Governor, and the Legislature determine the division's budget. Personnel policies and management systems are established by the Department of Civil Service and Civil Service Commission, the Office of the State Employer, and the Michigan Equal Employment and Business Opportunity Council, as well as DNR executives and personnel office. Administrative management systems, particularly purchasing and accounting, are controlled by the Department of Management and Budget. These agencies have a large influence on the magnitude of the division's efforts and the efficiency of its performance.

The Fisheries Division has substantial influence on many of Michigan's citizens. Many local governments, regional planning commissions, economic development councils, local business organizations, and state legislators recognize this influence. They have thus emerged in recent years as a major public for the division. Great Lakes port communities and small communities near major inland fisheries have concentrated on the economic impact of the fisheries. Larger cities have shown particular interest in increasing recreational opportunities for residents. Local interest in fisheries can be a boon to anglers when channeled into improved facilities and services. However, the division must also deal with competition between localities.

Several institutions of society are devoted to communicating a variety of information to interested people. Among these are the press and broadcast media, schools, and extension service which have specific interests in communications about fish, fishing, and fisheries management. The outdoor press and extension service also work to communicate opinions back to the division. These communications agents can be an important public for the division.

The remaining group of the division's major publics is made up of fisheries and related professionals. These professionals and the division mutually contribute to scientific understanding of fish, fishing, and fisheries management through professional journals, conferences, and society activities. Naturally, those professionals who work in Michigan and nearby jurisdictions have closest association with the division, but major agencies and universities around the world are also significant cooperators. The division's primary emphasis is on work with the American Fisheries Society, International Association of Fish and Wildlife Agencies, Midwest Association of Fish and Wildlife Agencies, Michigan State University and University of Michigan, scientists and managers working on the Great Lakes, and scientists and managers working in the Pacific northwest. The division's close institutional relationships with Michigan State University and the University of Michigan are critical to the attainment of excellence in the division's research efforts and hence in fishery management.

DIVISION PROGRAMS

The Fisheries Division pursues its mission and goals through five programs-- Recreational Fisheries, Commercial and Indian Fisheries, Great Lakes Fishery Resources, Inland Fishery Resources, and Fish Production--guided by Division Management. These programs are defined by the principal decisions and services they produce and are not necessarily simple organizational entities. They do have characteristic goals, decision criteria, processes, and theories. Certain personnel and units in the division have lead roles in each program. Certain key cooperators are also involved in each program.

In formulating this program structure and the division's organization, the division has sought to satisfy four broad concepts. First, the division must be responsive to the public interest, especially in the management of resource use. Thus the principal users are the focus of separate programs and most decisions are based in management districts whose supervisors are charged to assure that the division involves and is responsive to the public. Second, the division must have a sound empirical basis for its decisions. Thus the major decisions in the various programs are based on research and evaluation carried out jointly by district personnel, specialists in the division's research and evaluation section, and the state's major universities. Third, basic ecological principles require management of ecosystems and not just fish species. Thus the management of fishery resources is broadly organized by Great Lakes and inland ecosystems with the focus of each program being on whole water bodies and their watersheds. Fourth, the division can be most effective in pursuing its mission by entraining the efforts of others. Thus the division seeks active cooperation of certain agencies and institutions in each program.

Recreational Fisheries Program

Through the Recreational Fisheries Program, the division seeks to provide diverse public fishing opportunities to maximize the value of recreational fishing by:

Maintaining a current inventory of fishing opportunities, including their use and attributes;

Analyzing the recreational fishing market to determine angler preferences, obtain a continuous record of angler participation, activity, catch, satisfaction, values derived and economic impact, and develop means of projecting these quantities under various fishery management policies;

Determining the inland lakes, streams and Great Lakes ports which should be managed to serve each variety of angler and directing Great Lakes and Inland Fishery Resources program activities in each district to maximize fishery value contributed by management;

Securing, through appropriate technical and financial assistance, public access and local services to accommodate fishing on waters which can sustain significant public fisheries;

Promoting Michigan's recreational fishing and informing Michigan anglers of the fishing opportunities which best satisfy their preferences and the division's role in providing these opportunities; and

Interpreting fish, fishing, and fisheries management to educate Michigan citizens and visitors about the values of fishing and their role in stewardship of Michigan's fisheries resources.

The conceptual and empirical bases for decisions in this program are being developed from marketing theory and other social sciences. Personnel who are principally involved in this program are the program manager, district fisheries managers, and angler surveys unit. Major cooperators for this program include the Michigan State University extension service and its recreation specialists; the DNR Recreation, Parks and Forest Management divisions, the U. S. Forest Service, the Huron-Clinton Metropolitan Authority, and various local governments; the DNR Law Enforcement division; the Michigan Travel Bureau and the DNR Office of Publication Services and DNR License Control Section.

Commercial and Indian Fisheries Program

The Commercial and Indian Fisheries Program seeks to permit and encourage economically efficient and stable commercial fisheries which do not conflict with recreational fisheries, while insuring a significant role for those Indian tribes with legally established fishing rights by:

Partitioning fishing areas administered by Indian tribes with established fishing rights from those administered by the state and maintaining a voluntary market in fishing rights which will efficiently allocate allowable harvest to individual fishing enterprises;

Assuring through general regulations, licenses, permits, and contracts that commercial harvest of fish is appropriately selective, that allowable harvest is not exceeded, and that the user-pay principle is satisfied;

Obtaining a continuous record of catch, fishing effort and practices, market structure, capital and employment structure, and cash flows in the commercial and Indian fisheries; and

Promoting development and adoption of more effective fishing, processing, and enterprise management practices in the commercial and Indian fisheries and vertical integration of fishing enterprises into related businesses.

The bases for program decisions are found in administrative law, court decisions about Indian fishing, and economic principles. This program is carried out largely by the program manager with advice from district and Great Lakes assessment personnel. Major cooperators for this program are Michigan Indian tribes, the DNR Law Enforcement division, and Michigan State University Sea Grant Extension agents and researchers.

Great Lakes Fishery Resources Program

The Great Lakes Fishery Resources program protects and maintains healthy Great Lakes environments and fish communities and rehabilitates those now degraded by:

Obtaining a continuous record of catch rates, species and stock composition, and biological features of fish caught in the Great Lakes and anadromous fisheries;

Identifying Great Lakes and anadromous fish stocks and determining their spatial distributions and movements, contributions to the fisheries, vital statistics, current status and optimum fishing rates;

Developing, testing, and improving decision models which reflect current understanding and uncertainties about the history, dynamics, structure and management of Great Lakes fish communities and fisheries;

Developing harvest rates, stocking schedules, and lamprey control levels to produce an optimal combination of recreational fishing, commercial fishing, and progress in rehabilitating Great Lakes fish communities and negotiating compatible management by the other Great Lakes fishery jurisdictions; and

Assessing the extent and significance of any pollution, impairment, or destruction of Great Lakes fishery resources, or the public trust therein, which has occurred or is likely to occur and securing appropriate action to prevent or mitigate such effects.

These decisions are being made by optimization using mathematical models of fishery dynamics where possible and by integration of judgments of district and research personnel otherwise. This program is carried out by the program manager; research and evaluation personnel at the Marquette, Alpena, Charlevoix, and Mt. Clemens fisheries stations; technicians in the districts; and biologists in the districts as necessary. Major cooperators for this program are the Great Lakes Fishery Commission, the U.S. Fish and Wildlife Service, and the fishery agencies of the other Great Lakes jurisdictions through the Great Lakes Fishery Commission's lake committees; the tribal fisheries management authorities; faculty and graduate students of the University of Michigan and Michigan State University; and the DNR Land and Water Management and Surface Water Quality divisions and Office of the Great Lakes.

Inland Fishery Resources Program

The Inland Fishery Resources program protects and maintains healthy inland waters and fish communities and rehabilitates those now degraded by:

Maintaining a current inventory and history of fish communities and habitat, fishery management problems, and performance of management prescriptions in each of Michigan's major river basins and individual public waters;

Developing fish community and habitat models to support statewide policy decisions and management evaluation of individual waters;

Developing and documenting cost-effective, environmentally and socially acceptable prescriptions for resolution of fishery problems in Michigan's major river basins and individual public waters which can support significant fisheries;

Assessing the extent and significance of any pollution, impairment, or destruction of inland fishery resources, or the public trust therein, which has occurred or is likely to occur and securing appropriate action to prevent or mitigate such effects;

Safely and efficiently performing those fish community or habitat management actions prescribed in management plans; and

Providing technical and financial assistance to local governments and citizens groups in implementing habitat management actions on waters of special interest to them.

This program operates largely through problem-oriented management of community structure and habitat, by water body and river basin. Operating decisions concerning anadromous fish runs are included in the program because of their interrelationships with river basin planning and riverine fish communities. The inland program is carried out by the program manager; lake, stream and habitat protection specialists; field biologists and technicians in the districts; and research and evaluation personnel at the Marquette, Hunt Creek, and Ann Arbor fisheries stations. Major cooperators for this program include anglers and other citizens involved in various projects; faculty and graduate students of Michigan State University, including its Water Resources Institute, and the University of Michigan; the U.S. Forest Service and Soil Conservation Service; the DNR Land and Water Management and Surface Water Quality divisions; and the sea lamprey control agents of the Great Lakes Fishery Commission and U.S. Fish and Wildlife Service.

Fish Production Program

The Fish Production program hatches, rears, and transports fish required for management of both Great Lakes and inland fisheries, including:

Developing and maintaining hatchery facilities which can reliably produce at low cost the fish needed for fishery management;

Maintaining genetically diverse broodstock or wild spawn sources for the species and strains of fish needed for fishery management;

Efficiently rearing fish in the varieties, sizes, and numbers which best meet fishery management needs within hatchery capacity;

Assuring that fish produced and stocked are free of debilitating and lethal diseases, in good physical condition, and do not show symptoms of chronic stress;

Tagging or marking a portion of fish produced to permit evaluation of fish performance and fishery management plans; and

Stocking available hatchery fish according to fishery management plans and priorities in the manner and times which will produce optimal results at the lowest possible cost.

These efforts are guided by principles of fish culture and optimal process control. Hatchery personnel and the fish health and quality unit are primarily responsible for this program. Considerable assistance from district personnel is also required during seasons of high workload. Major cooperators for the fish production program are the Great Lakes Fish Disease Control Committee, the U.S. Fish and Wildlife Service fish culture laboratories, and other state agencies with which the division exchanges fish and eggs.

Division Management Program

Division Management directs and integrates the division's programs by:

Defining the division's goals, strategy and management systems, objectives, and resource requirements and evaluating the performance and results of these plans;

Managing communications with the division's publics to assure that the division responds to their needs and concerns and secures informed consent to the division's programs;

Developing and maintaining information systems which provide the division ready access to all available information which is relevant to fishery management decisions;

Securing capable staff for the division who are representative of Michigan's population and providing good working conditions, fostering commitment, and focussing efforts so that each employee may work productively toward achievement of the division's goals; and

Planning, efficiently implementing, and reporting on the division's program accomplishments, activities, and costs.

Its decision processes are critical and prescriptive and its theoretical basis is found in modern management science and concepts of public choice. The program is carried out by the Division Management Team and program services staff with significant involvement by program managers and all unit supervisors. Major cooperators for division management include the general government agencies of the State of Michigan, the executive and administrative offices of the DNR, and the grants-in-aid office of the U.S. Fish and Wildlife Service.

DIVISION ORGANIZATION

The Fisheries Division has three basic types of operating units: fishery management districts, fish hatcheries, and fisheries research and assessment stations.

The thirteen districts are defined as shown on Figure 1. These districts are the primary fishery management units of the division and are responsible for carrying out fishery investigations and public involvement to support local and statewide management planning, analyzing local fishing demand and opportunities, developing water-by-water and river basin management plans, carrying out most aspects of such plans other than stocking and fishery regulation, evaluating management results, providing services to recreational fishermen, and managing local public issues about fisheries. The staffing of each district consists of a district fisheries biologist who supervises the district, carries out local market analyses, sets management objectives and priorities, and manages local issues; two field biologists who plan fishery investigations and analyze results, prepare management plans, evaluate management results, and provide assistance to the district biologist in serving local information and consultation needs; and two or more technicians who carry out fishery investigations and management work and assist in data handling and analysis. When there are more than two technicians, one of them is the field foreman to supervise the other technicians and handle logistical support for district operations. Broad measures of district workload are summarized in Table 1.

The division's six fish hatcheries are located at Wolf Lake west of Kalamazoo, on the Platte River near Honor, and near Marquette, Harrietta, Thompson, and Oden. These hatcheries are responsible for rearing and stocking fish throughout the state according to centrally developed production and stocking plans. Each hatchery is supervised by a hatchery superintendent who is responsible for supervising the hatchery crew, planning hatchery operations, controlling fish stress and quality, and controlling costs. The hatchery crew consists of fish cultural staff and facility maintenance staff. The fish cultural staff under supervision of a fish culture foreman cares for fish, collects and records operating data and maintains records, makes basic operating calculations, and brings problems to the attention of the superintendent. The maintenance staff carries out preventive and emergency maintenance and repair work to assure safe, reliable, and efficient operation of the hatchery. When more than two maintenance personnel are required, one is designated as the maintenance foreman to supervise other maintenance personnel and handle logistics of hatchery maintenance.

The fisheries stations, located at Marquette, Charlevoix, Alpena, Hunt Creek, Mt. Clemens, and Ann Arbor, are less uniform in function and staffing than the other units. Each is responsible for planning research projects and performing or coordinating district performance of project activities. The Marquette Station is responsible for projects on Lake Superior, Green Bay of Lake Michigan, and the inland waters of Michigan's Upper Peninsula. The Charlevoix and Alpena stations are responsible for research and evaluation projects on Lake Michigan and Lake Huron, respectively. In addition, the Charlevoix station plans and coordinates statewide sampling of Great Lakes and anadromous fishery catches and serves as the statewide center for fishery modeling and formal decision analysis in support of Great Lakes fishery management. The Hunt Creek station is responsible for research on inland waters of the northern Lower Peninsula. The Mt. Clemens station is responsible for research and evaluation studies on the St. Clair River, Lake St. Clair, Detroit River,

Figure 1. Michigan's fisheries management districts, hatcheries, and fisheries stations.



Table 1. 'Workload measures for Michigan's fisheries management districts

<u>District</u>	<u>Projected 1990 Population in 1,000's</u>	<u>Angling Days in 1,000's</u>	<u>Inland Water Acres</u>	<u>Great Lakes Shoreline in Miles</u>	<u>Fisheries District Staffing</u>
Baraga	72.4	642.8	84,899	299	5
Crystal Falls	70.0	407.6	38,990	41	5
Escanaba	138.9	779.8	42,286	289	5
Newberry	55.2	891.6	81,871	424	6
Gaylord	201.8	1,734.8	145,854	278	8
Cadillac	304.8	3,287.5	93,170	233	9
West Branch	234.5	2,980.1	90,413	111	8
Bay City	637.9	927.3	10,164	183	6
Grand Rapids	1,164.8	3,136.5	61,156	79	9
Plainwell	775.9	2,807.9	59,538	78	8
Rose Lake	1,285.7	942.0	43,626	0	5
Jackson	797.9	1,249.6	27,258	0	5
Pontiac	4,304.2	3,592.6	30,704	161	10
TOTAL	10,044.0	23,380.1	809,930	2,176	89

and Lake Erie. The Ann Arbor station works on research and evaluation studies in inland waters of southern Michigan and serves as the statewide center for analysis and evaluation of inland management policies, fishing regulations, and standard investigational and management procedures.

Management of the division's programs and operations is done through six sections and a small program management staff. The six sections include three regions, a hatchery operations section, a research and evaluation section, and a program services section. Each region consists of a Regional Fisheries Manager supervising four or five districts and a regional warehouse staffed by an equipment operator and maintenance mechanic. The hatchery operations section consists of a Hatchery Operations Manager who supervises the six hatcheries, a Fish Health Laboratory, and a Fish Marking and Stocking Unit. The research and evaluation section consists of a Research and Evaluation Manager who supervises the six fisheries stations and maintains liaison with universities performing joint research projects. The program services section consists of a Program Services Manager who supervises a Personnel Officer, Administrative Officer, and Information Manager, directs the work of the Fisheries Information Systems Unit of the DNR Management Information Division, and maintains liaison with support units in other DNR divisions.

The program management staff consists of the Assistant Division Chief and subordinate program managers for the Recreational Fisheries, Commercial and Indian Fisheries, and Great Lakes Fishery Resources. Because new staff and increased budgets have been developed to expand the inland fishery resources program, the program manager reports directly to the Division Chief until the program becomes fully functional. These program managers are responsible for program planning, project selection, program accomplishment reporting, and program evaluation but do not exercise direct supervision of the field organization.