

**GUIDELINES FOR FISH HABITAT MANAGEMENT AND PLANNING  
IN THE GREAT LAKES**

Report of the Habitat Planning and Management Task Force  
and  
Habitat Advisory Board  
of the Great Lakes Fishery Commission

SPECIAL PUBLICATION 87-1



**Great Lakes Fishery Commission**

1451 Green Road  
Ann Arbor, Michigan 48105

March 1987

The Great Lakes Fishery Commission was established by the Convention on Great Lakes Fisheries between Canada and the United States, which was ratified on October 11, 1955. It was organized in April 1956 and assumed its duties as set forth in the Convention on July 1, 1956. The Commission has two major responsibilities: first, develop coordinated programs of research in the Great Lakes and, on the basis of the findings, recommend measures which will permit the maximum sustained productivity of stocks of fish of common concern; second, formulate and implement a program to eradicate or minimize sea lamprey populations in the Great Lakes.

The Commission is also required to publish or authorize the publication of scientific or other information obtained in the performance of its duties. In fulfillment of this requirement the Commission publishes the Technical Report Series, intended for peer-reviewed scientific literature, and Special Publications, designed primarily for dissemination of reports produced by working committees of the Commission. Technical Reports are most suitable for either interdisciplinary review and synthesis papers of general interest to Great Lakes fisheries researchers, managers, and administrators or more narrowly focused material with special relevance to a single but important aspect of the Commission's program. Special Publications, being working documents, may evolve with the findings of and charges to a particular committee. Sponsorship of Technical Reports or Special Publications does not necessarily imply that the findings or conclusions contained therein are endorsed by the Commission.

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## FOREWORD

One of the charges from Canada and the United States to the Great Lakes Fishery Commission (GLFC) is to determine which measures will make possible the maximum sustained productivity of Great Lakes fish. The Commission has long recognized that habitat quality and quantity relate directly to this charge. The Commission has repeatedly confronted a wide range of habitat issues and concluded that its role in these matters is as an advocate for fishery resources and to act as a catalyst for the development of improved habitat assessment and management capabilities among the agencies with mandates and programs involving the welfare of the Great Lakes ecosystem.

The fishery management agencies reached the same conclusion, for in their 1981 Joint Strategic Plan for Management of Great Lakes Fisheries they asked the Commission to create a habitat advisory capability to assist each lake committee to develop environmental objectives essential to achieving its fishery objectives.

To achieve this and other ends, the Commission established a Habitat Advisory Board (HAB) and asked the Board to work with the Commission to:

1. Identify and address current and emerging habitat issues that may impede achievement of fishery goals;
2. Propose strategies, programs, methods or criteria for habitat protection, rehabilitation, development or conservation;
3. Foster the development of quantitative and qualitative habitat assessment techniques for fish communities and species of concern;
4. Promote the formulation of habitat evaluation and management plans by the Lake Committees and assist in the development of a model plan for a discrete part of a lake to serve as a basis for a lakewide plan;
5. Encourage public support for habitat management by developing a public information program stressing the importance of habitat management in achieving fishery goals; and
6. Develop an integrated habitat policy and management approach among fishery and other resource management agencies and interest groups and seek commitments for implementation, thus providing security for the public and private sector investments in the fishery.

The Guidelines for Fish Habitat Management and Planning in the Great Lakes are an essential step for involvement in that proactive agenda. The Habitat Management and Planning Task Force was co-chaired by John Cooley (Fisheries and Oceans Canada) and Robert Pacific (U.S. Fish and Wildlife Service). The members were Dieter Busch (U.S. Fish and Wildlife Service), Clayton Edwards (International Joint Commission), Jon Rittgers (National Marine Fisheries Service), and Peter Sly (Environment Canada). Liaison members were the HAB Chairman William Pearce (New York State Department

of Environmental Conservation) and Vice Chairman Murray Johnson (Fisheries and Oceans Canada). The task force secretary was Carol Iancu, State University of New York-Syracuse.

Other members of the Habitat Advisory Board during production of the Fish Habitat Management and Planning Guidelines were Douglas Dodge (Ontario Ministry of Natural Resources), Elwin Evans (Michigan Department Of Natural Resources), John Gannon (International Joint Commission), Gerald Lowry (U.S. Fish and Wildlife Service), Murray Brooksbank (Environment Canada), Andrew Robertson (National Oceanic and Atmospheric Administration), and Kent Fuller (U.S. Environmental Protection Agency).

These guidelines were received by the Great Lakes Fishery Commission at its December 1986 Executive Meeting and are being distributed to the Committee of the Whole and Lake Committees for comment. Ruth Koerber used her considerable skills and patience in producing the camera-ready copy.

Carlos M. Fetterolf, Jr.  
Executive Secretary  
Great Lakes Fishery Commission

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PURPOSE

The purposes of this document are:

- to promote strong habitat components integral to tactical fisheries plans being developed by Lake Committees;
- to develop a generic framework for use by Lake Committees for habitat management and planning with emphasis on effective processes and a strong institutional and legal foundation, adequate information, and public support; and
- to identify actions which may be necessary or desirable to enable the successful implementation of habitat plans and planning processes.

BACKGROUND

On 17 June 1981 the 12 cooperating federal, state and provincial Great Lakes fishery agencies signed a memorandum of acceptance of the Joint Strategic Plan for Management of the Great Lakes Fisheries (SGLFMP). The Plan, completed in December 1980, recognized **that** fisheries planning, to be successful, needed a strong environmental component, one that addresses protection, rehabilitation and enhancement of fish habitat. After 5 years it is timely to review the progress that has been made towards this environmental strategy with a view to strengthening or modifying as necessary the approach that was outlined in that Agreement.

SGLFMP proposed a strategy to deal with environmental problems that may have been shortsighted:

“Fishery agencies shall endeavor to obtain full consideration by the Great Lakes environmental management agencies of the potential impacts of their activities and decisions on fishery needs and objectives.”

In essence, that strategy proposes only that fishery agencies ask someone else to protect fish habitat. The document does not advise what should be done if **the** strategy fails. This document will propose that a different approach be adopted for the protection of fish habitat, one that emphasizes planning and management by the fishery agencies themselves. Included in this strategy are rehabilitation and enhancement initiatives as part of the overall approach. Cooperation with other environmental agencies is still important, but other avenues exist that are not being used. The status quo should not be accepted by **the** fishery agencies either in terms of present responsibilities or mechanisms for improving and protecting habitat.

The Habitat Advisory Board (HAB) was requested by GLFC to promote the formulation of habitat management plans by Lake Committees. This report is the first

stage in this process. GLFC also asked HAB to develop an integrated habitat policy and management approach among fishery and other resource management agencies and interest groups. This priority task has now commenced. The habitat policy should be based on no net loss of habitat, and enhancement where needed. It Will recognize that greater benefits and economic returns from fisheries are not only possible, but also expected by a society which is not prepared to sacrifice quality of life to pressures from future population growth and intensified resource use.

## PRINCIPAL CONSIDERATIONS

Fish habitat plans are not separate from fish community plans, rather they are an important component of them and should include aspects that address protection, rehabilitation, and enhancement. Fish habitat is defined broadly to include the physical, biological, chemical and socio-economic components of the fishes' environment, as well as water quality.

If habitat planning by Lake Committees is to be successful, a web of involvement must be developed at all levels of responsibility and across numerous agency mandates. Developing a network for the purposes of informing and to be kept informed will neither be easy nor straightforward as it is perhaps a non-traditional activity for fishery managers. Network development is important because the habitat needs for fish communities must be decided by fishery managers, and consensus will need to be developed for those fisheries which are multi-jurisdictional Consensus must also be achieved among the environmental quality agencies to work toward the necessary objectives.

High level support is viewed as critically necessary for the success of habitat planning. Experience has shown that support from senior officials should not be viewed as obvious and automatic and that it should be secured very early in the planning process. It is better to address intra-agency concerns of one's own officials and incorporate them near the beginning of planning rather than try and fit them in near the end

Fish habitat plans will by their nature be different from lake to lake, reflecting the diversity of problems that are lake specific. However, the approach to planning will have substantial similarities reflecting common components that should be addressed by each plan. These components include:

- Information - both scientific and socio-economic, in order to make informed decisions.
- Legal - to be effective, habitat plans must have a strong legal basis particularly in relation to legal rights of the fishery resource beyond legislation under their direct control
- Working Arrangements - fishery agencies cannot solve all of their habitat problems by themselves and must develop better and more effective working relationships with sister agencies and the IJC.
- Intervention/Advocacy - fishery agencies and the GLFC must be prepared to intervene aggressively in decisions affecting habitat which are likely to affect their interests.

- public Participation and Information - fishery agencies and the GLFC must involve themselves more directly with the public to gain general and political support for habitat related initiatives.

The Habitat Advisory Board has prepared a generic habitat plan as its first step in encouraging and facilitating planning by the Lake Committees. Although the plan pertains specifically to habitat, it should become an integral component of an operational fishery plan. It is hierarchical and open-ended, yet comprehensive in terms of topics which should be addressed by planning teams.

Recommendation 1: Lake Committees should adopt a common approach in preparing lakewide habitat plans (see Table 1) and in the development of planning processes.

Recommendation 2: Lake Committees should establish Fish Habitat Planning committees to develop lakewide management plans and the Council of Lake Committees should coordinate the integration of these plans into a basinwide plan.

Although SGLFMP was signed in 1981 and called for the establishment of fish community plans as the first requirement in its list of “strategic procedures,” this activity has not been satisfactorily carried out. This has served to undermine much of the well-meaning intent of the other 12 procedures. SGLFMP lacked a timetable for the implementation of its strategies and did not clarify the accountability aspect of the Plan. Because of this, it is still not clear who should be held accountable for the less than spectacular progress with many parts of the Plan.

Recommendation 3: Habitat planning and implementation should be an integral part of operational fisheries plans. Responsibilities should be clearly defined and explicitly assigned, and means for accountability should be determined by agencies. This principle should be a formal policy statement by the Committee of the Whole (Great Lakes natural resource agency directors and ministers).

Recommendation 4: Agencies should request Lake Committees to identify means, timetable and costs to develop operational plans, and should provide resources commensurate with the magnitude of the task.

The role of the GLFC, as a body which can exercise third party objectivity and leadership, is critical to the success of the implementation of habitat plans activity. This role must be actively pursued and developed by the GLFC itself.

Recommendation 5: GLFC should have a major role in identifying constraints and issues and in evaluating progress made as plans are implemented.

## INFORMATION NEEDS

Fishery habitat management planning can be characterized as a two-part process: “anticipatory” and “responsive.” Fishery managers must develop a process which is intended to anticipate issues that pose threats to fishery resources and their habitats so that the fishery agencies can deal with them in conceptual or planning stages before multiple use conflicts develop. Such a process will provide managers with valuable

insight as to their long-term informational requirements. The process would include establishment of baseline data needs and monitoring requirements; studies to define relationships of habitats to fish production, biological effects studies, data management, policy development, legal constraints, socio-economic data **requirements**) and should focus attention on the highest priority immediate threats to fish habitats. Serious consideration should be given to establishment of an inter/intra-agency coordination system to pool agency resources and expertise in addressing high-priority issues. Where fishery interests and concerns intersect with those of other agencies (EPA, FDA, IJC) effective coordination offers many opportunities for identification and use of important information which would not otherwise be available to fishery managers and other regulatory agencies.

Recommendation 6: Lake Committees should employ new techniques and methods (e.g. simulation modelling, experimental management) in decision making.

To further facilitate the identification and acquisition of information, Lake Committee members, working through their agencies and the GLFC, might develop issue papers, prepare source documents on a central topic, sponsor scientific reviews (workshops) of a potential or actual threat to fishery resources, prepare baseline documents for any given lake or subunit, develop baseline monitoring proposals to document changes that they place in the biological, chemical, and physical parameters of the system over time, etc.

Recommendation 7: GLFC should assist Lake Committees and agencies by providing scientific analyses and position papers on major habitat issues.

## SOCIO-ECONOMIC CONSIDERATIONS

Public perception of fishery values are seldom based in economics. While there are those who rely on our fishery resources for a living, the vast majority of the public sector either view fish as an incidental and unimportant component of the environment (invisible) or as a component which contributes to the esthetic/recreational outdoor experience (largely non-quantifiable).

As fishery managers we must begin to think creatively in depicting the importance of fish in the environment and to society, in identifying the attributes of the environment most desired by the public, and in articulating fishery habitat values in terms more readily understood and desired by the public (e.g. water quality for beach and boating enthusiasts, human health for the general public, catch success rates and catch values for the fishermen, etc.).

As the Lake Committees identify critical habitat issues needing resolution, they will need to identify the various public and collateral organizations who would benefit from the particular fishery habitat objective and present their case in a way to demonstrate benefit to the target audience (enhanced value of a condominium project due to esthetically enriched fishery habitat; reduced costs of maintenance/operations for a municipal water supply, etc.).

To maximize the socio-economic value (support) of the fisheries and their habitat, fishery managers, relative to each environmental issue must:

1. establish the baseline value of the fishery to be protected, enhanced or rebuilt;

2. identify other interest groups/users whose goals and needs would be complemented by achievement of the fishery goals; and
3. enter into arrangements to share socio-economic information with other regulatory/management agencies as well as interested constituent organizations.

Recommendation 8: Habitat effects, real and potential, should be expressed in terms of effects on fisheries and socio-economic values.

Recommendation 9: Operational fisheries plans should call for sharing of socio-economic information on fisheries and they should espouse socio-economic values of fisheries and coincidental values to other users. Such information should be provided to a broad spectrum of policymakers as a major strategy to protect habitat.

## LEGAL CONSIDERATIONS

Fish habitat is being lost at an unacceptable rate and legislation has been available to address the concerns for habitat damage. The reasons for this include uneven application and sometimes lack of confidence in using legal proceedings, “grey” areas in legislation, and often a lack of solid information on values and extent of impacts.

Understanding possible underlying causes for this present situation is a key to corrective action. The abundance of habitat related legislation both addresses and creates problems because of overlapping jurisdiction, some of which rests outside fishery agencies. Unless interagency agreements are in place which address such situations and there is a common understanding of their application, there may be no action where action is warranted. Lake Committees through their membership will have to become aware of legislation related to habitat protection, both within their own agency and with other agencies. Agreements will have to be drawn up that explicitly address their application to habitat issues and perhaps other initiatives such as rehabilitation. Investment in the fishing industry, both commercial and recreational, may be jeopardized unless legislation is more effectively applied to protect and improve the resource.

Recommendation 10: Habitat plans should identify legislation and means of use in protection and rehabilitation of habitat, and should provide for more effective use of powers available to fishery agencies.

The Boundary Waters Treaty should be examined and its powers tested with respect to protection of fisheries. For example, there is great concern for the disruption of habitat resulting from the proposal to extend the Great Lakes navigation season. Briefs have been presented detailing the destruction that will result if the plans go ahead. Supplementary to these arguments there should be developed a case (possibly by the GLFC) relative to the Boundary Waters Treaty of 1909. Article VIII states that use of boundary waters shall “. . . not disturb any existing uses of boundary waters on either side of the boundary.” Included in these uses are fish and other aquatic resources.

Recommendation 11: GLFC should review legal approaches open to agencies and GLFC under international law (e.g. Boundary Waters Treaty) and be prepared to assist agencies.

## INTERVENTION AND WORKING ARRANGEMENTS

Fishery agencies have many options and procedures available to them to influence decisions that affect fish and fish habitats. While there are numerous legal mandates and requirements which fishery managers can **call** upon, the Lake Committees and their representative agencies should develop strategies to take advantage of pre-planning opportunities to work with planners, developers, and other regulatory agencies (COE, EPA, FDA, etc.) in an advisory and consultative capacity to:

1. advise developers and planners of the potential impact of their proposed projects on fishery resources;
2. work out ways to integrate impacts; and
3. advise applicants of alternative ways to do their projects well in order to save time and money and avoid later conflicts.

Decisions are more likely to be influenced by coordinated inter/intra-agency recommendations than by recommendations put forward by a single agency. Coordinated recommendations should be sought by Lake Committees on both broad, policy-related issues, and site-specific issues. While it may be difficult to reach consensus on issues later in the planning/development phase, the various agencies should meet routinely to inform each other of activities/concerns and to identify problems of a generic or chronic nature that would benefit from a longer term analysis and lead eventually to a jointly developed policy or recommendation.

Recommendation 12: Habitat plans should include defined decision-making processes, especially for implementation of strategic procedures set out in the Joint Strategic Plan for Management of Great Lakes Fisheries.

Recommendation 13: Lake Committees, through the planning process, should advocate actions to resolve habitat concerns and intervene as appropriate,

Lake Committee habitat planning efforts will result in identification of issues/problems which need to be addressed in a broader forum (e.g. water diversion, winter navigation, urban and port development, non-point source pollution, etc.). Committees should proceed to develop issue papers on these, as appropriate, and submit them to the Council of Lake Committees, Council of Great Lakes Governors, or the GLFC for resolution. For example, Great Lakes fishery agencies generally have made little direct use of the Canada/United States Great Lakes Water Quality Agreement of 1978 which is administered through the IJC. Most of the programs resulting from the agreement have been undertaken by environmental agencies. Presently, there is a focus for the development of remedial action plans for 42 areas of concern in the Great Lakes. Fishery agencies, possibly through coordination in the Lake Committees, should involve themselves in this process to insure that the plans adequately address fishery concerns.

Recommendation 14: Agencies should seek means to incorporate fish habitat management plans and requirements into remedial action plans and other measures developed under the Great Lakes Water Quality Agreement.

An overwhelming consideration for the future well-being Of Great Lakes fisheries is the issue of chemical contaminants. While significant progress was made during the 1970s in controlling and reducing contamination levels for some persistent chemical compounds (e.g. DDT, mercury, and PCBs), the rate of reduction has slowed considerably and remaining levels in some areas continue to interfere with full utilization of the fisheries. Other compounds, such as dieldrin, have not responded well to controls and levels remain unacceptably high. Meanwhile, improved analytical technology continues to identify previously undetected or new toxic chemicals found in fish and other Great Lakes biota (e.g. chlorinated dioxins, dibenzofurans, and PAHs and others from a list of several hundred anthropogenic chemicals). It is obvious that the actions of environmental and natural resource agencies have been inadequate to keep up with improving analytical technology or to control and eliminate the contaminant problem. The suggestion has been made and support voiced from several interests that IJC be given a reference to address the problem. Fishery agencies collectively through the GLFC should lend full support to this initiative.

Recommendation 15: Agencies should act together to promote a reference to IJC from governments on the toxic contaminants issue, including GLFC as a partner.

Further manipulation of levels and flows, possible diversions, and greater extractions may have significant impacts on fish habitat. Fishery agencies have not been represented on the primary boards concerned with water levels and flows, although they have provided advisors to subcommittees. Water quantity issues are of importance equal to water quality issues to fishery agencies. This constraint should be removed.

Recommendation 16: Agencies should make a formal request to IJC and water management agencies to include fishery experts on boards and committees responsible for Great Lakes water levels and flows.

## PUBLIC PARTICIPATION AND INFORMATION

There is much public support for the habitat goals of fishery agencies. Unfortunately, much of this support has not been effectively harnessed by those same agencies even though goals are overlapping, especially with respect to environmental concerns. Fishery agencies, possibly through the Lake Committees, must find meaningful ways to involve public interest groups in setting the agenda. The benefit will arise at the highest level of decision-making because politicians listen and react to credible public interest groups,

There are a number of actions which need to be taken by both agencies and Lake Committees if they are to utilize public opinion in achieving habitat goals. The first action is to identify those special interest groups which are allies and those which are not. Next, it must be determined how these groups can be involved. It may also be advisable to take similar action with other agencies.

To insure that the relationship is meaningful, agencies should involve the public early in the planning process. Too often public interest groups are asked to comment on or support a proposed action or policy after much of the work has been done. Such action is often viewed with suspicion and as being tokenism. The special interest groups can play a useful role in communicating with the public in ways that are generally unavailable to governments. It may also be desirable and necessary to make the same overtures to other agencies which may be affected by the proposed action.

Recommendation 17: Habitat plans should provide for early meaningful public participation, including means to select collaborating public and agencies.

These meaningful intentions will be nullified unless the public education is done effectively. The public (and other agencies) must be presented with non-technical material and an opportunity to “feed back.” Tokenism will quickly be seen for what it is.

It is recognized that the actions prescribed necessitate more interagency coordination at the Lake Committee level and more overall coordination at the GLFC level. The role of the GLFC in the area of public education regarding Great Lakes habitat problems needs to be reexamined with a view to increasing participation and providing more overall leadership.

Recommendation 18: GLFC should be proactive in providing public information on habitat issues and building the constituency for useful fisheries and quality habitat.

Recommendation 19: GLFC should take a greater role in influencing public policy at high levels to enhance effectiveness of fisheries and habitat planning (e.g. revision of Great Lakes Water Quality Agreement).

## SUMMARY AND RECOMMENDATIONS

The habitat component of a fisheries plan includes measures for protection, rehabilitation, and enhancement of habitat required to ensure accomplishment of fishery management objectives. Fish habitat includes physical, chemical, and biological features on which fish are dependent. Fishery managers must determine the habitat requirements, including water quality characteristics, for specific fish communities. In most of the Great Lakes, this requires agreement among fishery agencies and jurisdictions. Current habitat quality, if reversible, should not constrain objectives.

Planning processes should be harmonized both vertically from field to policy levels and horizontally across the various mandates which influence fisheries. Decision makers at all levels should participate in development and implementation in appropriate ways. The key to a successful implementation of the planning process is an effective set of arrangements for influencing decisions in policy fields beyond line control of fishery managers.

The strengths of effective plans are:

1. best use of scientific data;
2. strong socio-economic arguments;
3. establishment of a strong basis in legal authorities;
4. adequate emphasis on institutional arrangements and decision-making processes;  
and
5. support and participation by clients and public.

Information should be applied in systematic ways to examine choices and make decisions with critical attention to assumptions employed. The establishment of habitat

objectives by comparing requirements of desired fish communities with current habitat conditions will be a rigorous test of our habitat assessment programs and ecological knowledge. Fishery objectives need to be supported by strong, broadly-defined socio-economic arguments.

Habitat planning must be carried out pragmatically under a broad umbrella of legal authorities, many outside the jurisdiction of fishery agencies. The legal basis becomes a set of explicit statements on how each jurisdiction will use specified statutes for specific purposes. Fishery agencies should use full legal authority available to them, but strong socio-economic arguments also will be needed. The Boundary Waters Treaty and Canada/US Water Quality Agreement could be more effectively used in the interests of fisheries management.

Well-defined arrangements among fishery agencies and with other agencies form the ongoing machinery for making decisions in the best interests of fisheries. Fisheries will provide a factual basis for intervention in habitat issues and supportive evidence for positions taken by fishery agencies. Commitments for intervention and appropriate protocols should be specified. It is 'implicit that wildlife habitat concerns will be included whenever appropriate.

Plans should incorporate policies and programs to strengthen public support and political will and provide a better coordinated, stronger voice for fisheries. Habitat information should be in fisheries terms meaningful to the public. Plans should pay adequate attention to building constituency by fishery agencies and GLFC. Therefore, public participation should be meaningful involvement.

The following recommendations, aimed at various targets from Lake Committees, to agency heads, to the GLFC itself, are intended to stimulate broadly based support for the habitat components of fisheries plans

#### **Recommendations to the Agencies (Committee of the Whole)**

**Recommendation 3:** Habitat planning and implementation should be an integral part of operational fisheries plans. Responsibilities should be clearly defined and explicitly assigned, and means for accountability should be determined by agencies. This principle should be a formal policy statement by the Committee of the Whole (Great Lakes natural resource agency directors and ministers).

**Recommendation 4:** Agencies should request Lake Committees to identify means, timetable and costs to develop operational plans, and should provide resources commensurate with the magnitude of the task.

**Recommendation 14:** Agencies should seek means to incorporate fish habitat management plans and requirements into **remedial action plans** and other measures developed under the Great Lakes Water Quality Agreement.

**Recommendation 15:** Agencies should act together to promote a reference to IJC from governments on the toxic contaminants issue, including GLFC as a partner.

**Recommendation 16:** Agencies should make a formal request to IJC and water management agencies to include fishery experts on boards and committees responsible for Great Lakes water levels and flows.

## Recommendations to GLFC

Recommendation 5: GLFC should have a major role in identifying constraints and issues and in evaluating progress made as plans are implemented.

Recommendation 7: GLFC should assist Lake Committees and agencies by providing scientific analyses and position papers on major habitat issues.

Recommendation 11: GLFC should review legal approaches open to agencies and GLFC under international law (e.g. Boundary Waters Treaty) and be prepared to assist agencies.

Recommendation 18: GLFC should be proactive in providing public information on habitat issues and building the constituency for useful fisheries and quality habitat.

Recommendation 19: GLFC should take a greater role in influencing public policy at high levels to enhance effectiveness of fisheries and habitat planning, e.g. revisions of Great Lakes Water Quality Agreement.

## Recommendations to Lake Committees and the Council of Lake Committees

Recommendation 1: Lake Committees should adopt a common approach in preparing lakewide habitat plans (see Table 1) and in the development of planning processes.

Recommendation 2: Lake Committees should establish Fish Habitat Planning committees to develop lakewide management plans and the Council of Lake Committees should coordinate the integration of these plans into a basinwide plan.

Recommendation 6: Lake Committees should employ new technical methods (e.g. simulation modelling, experimental management) in decision-making.

Recommendation 8: Habitat effects, real and potential, should be expressed in terms of effects on fisheries and socio-economic values.

Recommendation 9: Operational fisheries plans should call for sharing of socio-economic information on fisheries and they should espouse socio-economic values of fisheries and coincidental values to other users. Such information should be provided to a broad spectrum of policymakers as a major strategy to protect habitat.

Recommendation 10: Habitat plans should identify legislation and means of use in protection and rehabilitation of habitat, and should provide for more effective use of powers available to fishery agencies.

Recommendation 12: Habitat plans should include defined decision-making processes, especially for implementation of strategic procedures set out in the Joint Strategic Plan for Management of Great Lakes Fisheries.

Recommendation 13: Lake Committees, through the planning process, should advocate actions to resolve habitat concerns and intervene as appropriate.

**Recommendation 17:** Habitat plans should provide for early meaningful public participation, including means to select collaborating public and agencies.

TABLE I: GENERIC HABITAT PLAN

L Habitat Requirements of Target Fish Communities

- A. Water quality, physical habitat, and other needs of target communities
  - 1. Critical habitat requirements
  - 2. Fish community considerations other than habitat
- B. Most reliable and relevant parameters to assess suitability of habitat
  - 1. State of knowledge of habitat conditions
  - 2. Needs for new kinds of information on habitat
- C. Areas where knowledge is lacking
  - 1. Protocols to set priorities and fund required research

II. Current Habitat Conditions and Deficiencies

- A. Background limnology of the lake
  - 1. Historical changes and implications to fisheries
  - 2. Food web structure in relation to cultural influences and water management initiatives
- B. Contemporary habitat issues, implications to fisheries
  - 1. Biophysical-chemical constraints due to cultural impacts which restrict achievement of goals
- C. Criteria for habitat restoration and production of fish suitable for human consumption
  - 1. Optional actions available to change environmental conditions in support of goals
  - 2. Short-term options in fisheries management to reduce effects of temporary environmental shortfall
- D. Priorities for habitat restoration and remedial activities
  - 1. Attainment of water quality and related objectives
  - 2. Physical habitat redevelopment
  - 3. Reducing contaminants to below consumptive guidelines
- E. Protocols to advise water management and other agencies
  - 1. State-of-the-lake profiles (to IJC, GLFC)
  - 2. Requests to environmental protection agencies to investigate and act on issues
- F. Coordination of legal actions

### III. Potential Habitat Issues and Protection Criteria

- A. Effective protocols for early detection of -habitat problems
  - 1. Continuing long-term data series and access
  - 2. Criteria for analysis and early warning
- B. Protocols for coordinated reaction by fisheries agencies
  - 1. Capabilities for rapid response
  - 2. Administrative arrangements for early warning
  - 3. Legal avenues
- C. Means to advise environmental research program managers on research needs

### IV. Opportunities for Enhancement of Habitat

- A. Opportunities to modify habitat to enhance benefits from fisheries
  - 1. Projects to augment fish stocks
  - 2. Projects to increase benefits from fishing
- B. Ways that developments by other sectors could provide positive values to fisheries
  - 1. Potentially beneficial modifications
  - 2. Means to collaborate in planning and share costs if necessary between fisheries and other sectors

### V. Legal Framework

- A. Legal authorities of fishery agencies
- B. Proposed uses of legislation for habitat issues and initiatives
- C. Administrative arrangements for use of other legislation (including Boundary Waters Treaty)

### VI. Public Information and Public Participation

- A. Values of fisheries and habitat
- B. Topics and arrangements for communicating with public
- C. "Ground rules" for public participation
- D. Means to assess client and public goals and concerns

## VII. Habitat Information Needs and Uses

- A. Coordinated information gathering and transfer (with emphasis on relevance and end use)
  - 1. Identification of information needs
  - 2. Criteria for specific actions based on information analyses
- B. Protocols to advise assessment and research managers on information gaps
- C. Means to use experimental management, simulation modelling, etc. to provide information
- D. Means to enhance information transfer with fisheries and among resource sectors

## VIII. Socio-Economic Rationale

- A. Coordinated information gathering and transfer (with emphasis on relevance and end use)
- B. Means for personnel exchange within fisheries and among resource sectors to enhance information transfer

## IX. Working Arrangements

- A. Priority-setting and decision-making processes, ensuring rapid response capability
- B. Responsible “offices”
- C. Personnel and financial requirements for effective planning

## X. Intervention

- A. Inter-agency administrative arrangements and protocols for action on issues beyond immediate mandates of fishery agencies
- B. Means to coordinate positions and actions where intervention is course of action decided
- C. Means to share information on values of fisheries and social consequences of injurious activities
- D. How fisheries habitat planning will interface with Great Lakes remedial programs, especially Water Quality Agreement programs
  - 1. Protocol to improve Great Lakes Water Quality Agreement
  - 2. Coordination of fishery plans with remedial action plans

## **XL Evaluation of Habitat Planning Process**

- A. Means to assess progress made through coordinated activities
- B. Institutional arrangements which impede accomplishment of fishery objectives by reason of habitat related problems

### **NOTES**

1. This generic plan pertains specifically to habitat, but it should be an integrated component of an operational fisheries plan.
2. Habitat planning begins with the assumption that the fisheries community knows what fish communities should be maintained or rehabilitated.
3. The generic plan is hierarchical and open-ended. These general headings suggest the kinds of detail which will be required by individual planning teams.

## GREAT LAKES FISHERY COMMISSION

### SPECIAL PUBLICATIONS

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- 84-2 Working papers developed at the August 1983 conference on lake trout research. 1984. Edited by R. L. Eshenroder, T. P. Poe, and C. H. Olver.
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