

**FAO
TECHNICAL
GUIDELINES FOR
RESPONSIBLE
FISHERIES**

6

Suppl. 1

INLAND FISHERIES

1. Rehabilitation of inland waters for fisheries



Cover photographs:

Left: A channelized stretch of the Mank River, Austria.

Right: The same stretch after river rehabilitation.

Courtesy of T. Kaufmann/"freiwasser", Austria.

INLAND FISHERIES

1. Rehabilitation of inland waters for fisheries

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PREPARATION OF THIS DOCUMENT

These guidelines supplement the Technical Guidelines No. 6 on Inland Fisheries of the FAO Technical Guidelines for Responsible Fisheries series. They address article 6.8 of the Code of Conduct for Responsible Fisheries which states that “All critical fisheries habitats in marine and fresh water ecosystems, such as wetlands, mangroves, reefs, lagoons, nursery and spawning areas, should be protected and rehabilitated as far as possible and where necessary. Particular effort should be made to protect such habitats from destruction, degradation, pollution and other significant impacts resulting from human activities that threaten the health and viability of the fishery resources”. This document deals with the rehabilitation of a wide range of inland and brackish waters including lakes, rivers and permanent wetlands. It also provides preliminary guidelines on estuaries and coastal lagoons. These guidelines examine procedures to improve the habitats of damaged aquatic ecosystems so as to improve their health and that of the fish living in them. They do not enter into detail as to the execution of individual projects but rather examine the advantages and constraints of the various approaches.

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FAO Fisheries Department
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ABSTRACT

Many rivers, lakes and other inland waters have been modified and degraded by human activities. Rehabilitation of degraded systems and mitigation of impacts of ongoing stresses are needed to preserve ecosystem services and fisheries, and are of a high priority if the aquatic biodiversity of inland waters is to be conserved. A number of technical solutions for rehabilitation and mitigation are available to restore habitat diversity, provide for environmental flows and ensure longitudinal and lateral connectivity within such systems. It is recommended that such methods are applied on a basin-wide scale but it is recognized that more restricted sections of waterbodies may have to be targeted. Planning for rehabilitation projects needs to be carefully conceived with a clear statement of the objectives of the rehabilitation and selection of the methods to be used. The selection of appropriate methods for any particular waterbody depends on local social and economic conditions and priorities. Land tenure, local laws and the interests of other local stakeholders in the resource also need to be incorporated into rehabilitation plans. In international rivers and lakes rehabilitation plans may need negotiation and cooperation by all riparian states. After execution, rehabilitation projects should be carefully monitored as to their success in meeting the objectives and modified should they fail to achieve the expected results.

CONTENTS

Preparation of this document	iii
Abstract	iv
Contents	v
Background	viii
Guidelines flow chart	1
1. Introduction	3
1.1 Context	3
1.2 Strategies	4
1.2.1 Protection	4
1.2.2 Restoration	5
1.2.3 Rehabilitation	5
1.2.4 Enhancement	5
1.2.5 Mitigation	6
1.2.6 Do nothing	6
1.3 Concepts and approaches	7
1.3.1 The basin approach	7
1.3.2 The ecosystem approach	8
1.3.3 The species approach	8
1.3.4 Scale	8
2. Social, economic and legal issues	10
2.1 Ecosystem services	10
2.2 Societal goals	10
2.2.1 Uses of aquatic environments	10
2.2.2 Land ownership	14
2.3 Legal aspects	15
2.3.1 International law and agreements	15
2.3.2 National legislation	16
2.3.3 Civil law	16
2.4 Goals and objectives	17
3. Ecosystem assessment and identification of rehabilitation actions	19
3.1 Assessment of Ecosystem Condition	19
3.2 Identification of disrupted ecosystem processes and potential rehabilitation actions	20
3.3 Prioritization of rehabilitation actions	22
4. Rehabilitation measures	26
4.1 Water quality	26
4.1.1 Pollution	26
4.1.2 Eutrophication	27

4.1.3 Siltation	29
4.1.4 Temperature	30
4.2 Vegetation	30
4.2.1 Issue	30
4.2.2 Importance of vegetation	31
4.2.3 Problems with vegetation	32
4.2.4 Control of vegetation	32
4.2.5 Use of aquatic and riparian vegetation to benefit fisheries	33
4.2.6 Use of vegetation to replace heavy engineering solutions	34
4.3 Rivers	35
4.3.1 Morphology	35
4.3.2 Fisheries ecology of rivers	36
4.3.3 Flow	38
4.3.4 Measures for the rehabilitation of rivers	43
4.3.5 Highland rivers	45
4.3.6 Lowland rivers	50
4.3.7 Estuaries and coastal wetlands	55
4.3.8 Connectivity	58
4.4 Lakes and reservoirs	64
4.4.1 Morphology of lakes and reservoirs	64
4.4.2 Fisheries ecology of lakes and reservoirs	65
4.4.3 Measures for the rehabilitation of lakes and reservoirs	65
5. Monitoring	71
5.1 Issue	71
5.1.1 Types of monitoring	71
5.1.2 Steps for developing a monitoring programme	71
6. References	77
7. Glossary	80
Annex I The main reproductive guilds of fish and their responses of to changes in flow regime and the form of the environment	91
Annex II The main feeding guilds of fish and their responses of to changes in flow regime and the form of the environment	97
Annex III The main ecological guilds of fish in rivers and their responses of to changes in flow regime and the form of the environment	101

ANNEX IV	Summary of criteria for broad-level classification of rivers	111
ANNEX V	Some habitats of river systems	115
ANNEX VI	The main ecological communities of fish in lakes and reservoirs, and their responses of to changes in flow regime and the form of the environment	121

BACKGROUND

From ancient times, fishing has been a major source of food for humanity and a provider of employment and economic benefits to those engaged in this activity. However, with increased knowledge and the dynamic development of fisheries, it was realized that living aquatic resources, although renewable, are not infinite and need to be properly managed, if their contribution to the nutritional, economic and social well-being of the growing world's population was to be sustained.

The adoption in 1982 of the United Nations Convention on the Law of the Sea provided a new framework for the better management of marine resources. The new legal regime of the oceans gave coastal States rights and responsibilities for the management and use of fishery resources within the areas of their national jurisdiction, which embrace some 90 percent of the world's marine fisheries.

In recent years, world fisheries have become a dynamically developing sector of the food industry, and many States have striven to take advantage of their new opportunities by investing in modern fishing fleets and processing factories in response to growing international demand for fish and fishery products. It became clear, however, that many fisheries resources could not sustain an often uncontrolled increase of exploitation.

Clear signs of overexploitation of important fish stocks, modifications of ecosystems, significant economic losses, and international conflicts on management and fish trade threatened the long-term sustainability of fisheries and the contribution of fisheries to food supply. Therefore, the nineteenth session of the FAO Committee on Fisheries (COFI), held in March 1991, recommended that new approaches to fisheries management embracing conservation and environmental, as well as social and economic, considerations were urgently needed. FAO was asked to develop the concept of responsible fisheries and elaborate a Code of Conduct to foster its application.

Subsequently, the Government of Mexico, in collaboration with FAO, organized an International Conference on Responsible Fishing in Cancun in May 1992. The Declaration of Cancun endorsed at that Conference was brought to the attention of the UNCED Summit in Rio de Janeiro, Brazil, in June 1992, which supported the preparation of a Code of Conduct for Responsible Fisheries. The FAO Technical Consultation on High Seas Fishing, held in September 1992, further recommended the elaboration of a Code to address the issues regarding high seas fisheries.

The One Hundred and Second Session of the FAO Council, held in November 1992, discussed the elaboration of the Code, recommending that priority be given to high seas issues and requested that proposals for the Code be presented to the 1993 session of the Committee on Fisheries.

The twentieth session of COFI, held in March 1993, examined in general the proposed framework and content for such a Code, including the elaboration of guidelines, and endorsed a time frame for the further elaboration of the Code. It also requested FAO to prepare, on a "fast track" basis, as part of the Code, proposals to prevent reflagging of fishing vessels which affect conservation and management measures on the high seas. This resulted in the FAO Conference, at its twenty-seventh session in November 1993, adopting the Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas, which, according to FAO Conference Resolution 15/93, forms an integral part of the Code.

The Code was formulated so as to be interpreted and applied in conformity with the relevant rules of international law, as reflected in the United Nations Convention on the Law of the Sea, 1982, as well as with the Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, 1995, and in the light of, *inter alia*, the 1992 Declaration of Cancun and the 1992 Rio Declaration on Environment and Development, in particular Chapter 17 of Agenda 21.

The development of the Code was carried out by FAO in consultation and collaboration with relevant United Nations Agencies and other international organizations, including non-governmental organizations.

The Code of Conduct consists of five introductory articles: Nature and Scope; Objectives; Relationship with Other International Instruments; Implementation, Monitoring and Updating and Special Requirements of Developing Countries. These introductory articles are followed by an article on General Principles, which precedes the six thematic articles on Fisheries Management, Fishing Operations, Aquaculture Development, Integration of Fisheries into Coastal Area Management, Post-Harvest Practices and Trade, and Fisheries Research. As already mentioned, the Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas forms an integral part of the Code.

The Code is voluntary. However, certain parts of it are based on relevant rules of international law, as reflected in the United Nations Convention on the Law of the Sea of 10 December 1982. The Code also contains provisions that may be or have already been given binding effect by means of other obligatory legal instruments amongst the Parties, such as the Agreement to Promote Compliance with Conservation and Management Measures by Fishing Vessels on the High Seas, 1993.

The twenty-eighth session of the Conference in Resolution 4/95 adopted the Code of Conduct for Responsible Fisheries on 31 October 1995. The same Resolution requested FAO *inter alia* to elaborate appropriate technical

guidelines in support of the implementation of the Code in collaboration with members and interested relevant organizations.

The Code was primarily elaborated to meet the needs of marine capture fisheries and in particular industrial fisheries. It is therefore difficult to interpret in the light of the rather different conditions pertaining in most of the world's inland waters. FAO Technical Guidelines for Responsible Fisheries No. 6: Inland Fisheries, to which this document is a supplement, therefore attempt to highlight these difficulties and to orient the interpretation of the various articles towards the specific needs of the inland fisheries sector.

GUIDELINES FLOW CHART

The following activities summarize the main processes that need to be undertaken in the planning, execution and follow-up of any rehabilitation project. They are described in more detail in these guidelines and are placed in the approximate order they should be considered:

PRIOR ACTIVITIES

- Establish database of benchmark rivers or lakes and typical fish assemblages
- Assess conditions in target river
- Identify disrupted ecosystem processes
- Prioritize target reaches and possible rehabilitation actions

IMPLEMENTATION

- Define need for and objective of rehabilitation – carry out overall feasibility study
- Assess water quality problems
- Define general scope and scale of project

Policy, legal and financial issues

- Clarify legal situation with regard to various options for rehabilitation
- Clarify social and economic aspects of proposed rehabilitation
- Consult with other stakeholders
- Obtain necessary funding and title or access to any land or water rights needed for project

Basin scale problems

- Control and improve water quality
- Undertake basin-scale operations needed to control excessive sediment loadings
- Define environmental flows for target environments, fish communities or species in rivers

Technical issues

Rivers

- Select methods for rehabilitation of target waterbodies
- Conserve or rehabilitate longitudinal connectivity
- Restore channel diversity and vegetation
- Conserve or rehabilitate lateral connectivity
- Restore seasonal floodplain, floodplain waterbodies and vegetation

Lakes

- Control water quality
- Select methods for rehabilitation of target waterbodies
- Conserve or rehabilitate longitudinal connectivity in tributary rivers
- Control or restore vegetation

FOLLOW-UP

- Carry out routine maintenance of fishpasses
- Monitor effectiveness of measure adopted
- Modify project to improve any deficiencies observed
- Introduction