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Management techniques for elasmobranch fisheries

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Foreword

It is with much pleasure that the FAO has taken the opportunity to fund the printing and distribution of this manual, which is published jointly by the Fisheries Department of the FAO and the Asia-Pacific Economic Cooperation (APEC). The FAO has earlier published a guide for the implementation of its International Plan of Action - Sharks that was prepared by Dr Terry Walker of the Marine and Freshwater Resources Institute, Victoria, Australia. This publication provides a synoptic guide to the goals and requirements for fisheries authorities to start addressing the needs for the management of national elasmobranch fisheries; it has been prepared in a highly condensed style consistent with the other sister publications in the same series. The present, far more comprehensive manual, edited by John A. (Jack) Musick and Ramón Bonfil, provides detailed information for the operational fisheries manager about methods to collect and analyse data necessary to assess stocks and prepare plans to sustainably manage elasmobranch fisheries.

This manual begins by establishing the objectives of fisheries management and then provides information about shark and ray identification with a key to families and a guide to regional keys. Tagging methods are then reviewed including tag data analyses. A chapter on stock structure and identification follows outlining genetic methods in particular. Two chapters respectively deal in detail with methods necessary to determine age and growth rates in sharks, and to define reproductive biology. Another chapter describes methods to estimate mortality. All of these subjects are required in order to move on to demographic modelling and stock assessments which are covered in the subsequent chapters. Data collection in the field is covered in the next two chapters, one on fishery dependent and the other on fishery independent sampling. The manual ends with chapters on management techniques, and shark utilization.

Collectively, the authors have produced a manual that will be invaluable not only to those involved in management of these highly diverse and fascinating fishes and their fisheries, but also to the reader whose responsibilities extends beyond the direct involvement of resources analysis and who is involved in the management of other groups of fishes. For this, the editors and authors deserve gratitude and compliments from those who will benefit from their experience, wisdom and endeavours.

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[1] FAO. 2000. Fisheries management. 1. Conservation and management of sharks. FAO Technical Guidelines for Responsible Fisheries. No. 4, Suppl. 1. Rome, FAO. 37p.

Abstract

This publication describes the scientific principles and techniques used for resource management of elasmobranch fisheries with emphasis on the particular context of elasmobranchs. The management characteristics of these fishes are described – their common bycatch character and their biological constraints on productivity – low growth rate, late maturity and low fecundity.

Stock assessment of elasmobranchs is described in the context of management objectives in a wide management context. Special attention is given to accurate species identification given the prevalent aggregating of landings data across species, genera and often families in this group. Techniques and experiences for tagging elasmobranchs for population estimation are described and methods of genetic techniques for stock identification.

Methods and problems involved in determining age, growth, fecundity and mortality rates are described and their use in age-structured models within the context of the reproductive biology of these fishes. Demographic models to determine the productivity of elasmobranch resources are described. Use of surveys to complement information derived from fisheries is described together with management measures. Last, practices of shark utilization are noted.

Key words: Fishery management, elasmobranchs, sharks, IPOA-sharks, rays, mortality, fecundity, ageing, reproductive biology, growth, stock assessment, species identification, tagging, genetic identification, utilization.

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Dedication

This book is dedicated to the shark fishers and fishery managers. May they have the wisdom and will to achieve and maintain sustainable shark fisheries.