FAO Sheets

Fishing Areas 57,71

EXPLANATORY NOTES TO THE FAO PROGRAMME ON SPECIES IDENTIFICATION SHEETS FOR FISHERY PURPOSES

Preamble

Under this programme, which is of world-wide scope, FAO is issuing a number of series of Identification Sheets arranged by regions (major fishing areas) and designed (a) to facilitate the identification of the world's principal commercial aquatic species, (b) to further the standardization of their names, and (c) to provide general information on their basic characteristics and exploitation.

Each regional series of sheets (in one or more volumes) will eventually lead toward a complete inventory of commercially important species found in a given fishing area (or areas). Although new sheets may be added and old sheets replaced (as a result of continuing research), the basic plan of the inventory will be maintained. It will serve as a permanent reference frame which will provide the basis for any classifications required for biological, statistical, or other purposes.

FAO is implementing this programme in close collaboration with the regional fishery bodies established in the various areas of the world and with the generous assistance of zoologists and fishery biologists actively engaged in research on the aquatic species occurring in these areas.

It is hoped that the use of this new work tool will contribute to the improvement of national and regional fishery statistics and will facilitate fishery resources survey work, sampling schemes and fishery activities in general.

Contents and Presentation

The Identification Sheet programme covers the following major groups of aquatic organisms:

seaweeds; echinoderms (sea urchins, sea cucumbers, etc.);
crustaceans (shrimps, prawns, lobsters, crabs, etc.);
molluscs (snails, bivalves, squids, octopuses, etc.);
sharks/rays; bony fishes; aquatic reptiles (turtles,
sea snakes); aquatic mammals (whales, dolphins, seals, etc.).

Other groups may be included in the future, e.g. sponges, tunicates, etc.

In areas containing very large numbers of commercially important species (e.g. the Indo-Pacific), special Family Sheets are prepared. Such sheets contain information on the principal family characters, the appearance of typical representatives (drawings), distinction from similar families, explanations of technical terms, a key to the genera, and a list of species found in the area.

The Species Identification Sheets each describe a single species and give information on its name (scientific and vernacular), its appearance (drawing), its diagnostic field characters, its distinction from similar species in the area (including those for which no identification sheets have been prepared), its range and habits (where known) and data on its fishery and utilization.

The sheets of a regional series are filed in one or more volumes (binders) and for ease of handling the major groups of organisms and the Index are separated by plastic sheets with tabs.

The paramount aim in the arrangement of the sheets has been to ensure that species in a regional series can be found easily without impairing the open-ended character of the system. Species are numbered within each genus (in chronological order of preparation of sheets on a world. basis), the genera are arranged alphabetically within families and the families are also arranged alphabetically within their major group. Higher taxonomic categories (Sub-orders, Orders, Classes) are omitted on the Identification Sheets, but are included in the Family Picture Guide where practicable (for example the higher classification of fishes still lacks general agreement).

Where the number of species in an area for which Identification Sheets are prepared is small, these species are listed in the Family Picture Guide. Elsewhere (e.g. in the Indo-Pacific sheets), the species list is kept separate.

Four types of paper are used for the sheets

(i) Light yellow: Introductory material and indexes

(ii) Blue: Major Group Information Sheets (or Family Sheets, where present)

(iii) Pink: User's guide

(iv) White: Species Identification Sheets

For each region, major groups are printed, where possible, as soon as they are completed. The loose-leaf system will enable further groups to be added to their relevant regional series.

FAO Species Identification Sheets are issued, depending on the areas, in one or more of the three working languages of the Organization (English, French, Spanish). Usually, the first version of sheets for any major fishing area will be a preliminary one intended to be periodically updated and, if necessary, re-edited after the sheets have been thoroughly tested in the field.

Areas Covered

The intention is to produce one or more volumes of sheets covering a single major fishing area, but in several cases two or more areas might be grouped together. The area breakdown is that of the FAO Classification of Major Fishing Areas for Statistical Purposes (see FAO Fisheries Circular No. 420, Rome, December 1972).

It is obvious that the limits of the major fishing areas adopted for statistical purposes (in many cases they coincide with the areas of existing regional fishery bodies) do not normally follow the natural faunistic boundaries as they are based on a number of other criteria and practical requirements (collection of fishery statistics, geographical divisions of the oceans and seas, areas of application of regional conventions, etc.).

Selection of Species

Each regional series of Identification Sheets is intended to include all species known to be of commercial importance occurring in the area(s). The selection is based on: (a) regional and national fishery statistics; (b) national lists of commercial species; (c) recommendations of fishery bodies and related working groups; and (d) experience of the authors of the sheets and other fishery biologists actively engaged in resources research within the area.

In some instances, particularly in areas which are little known or characterized by a large variety of edible aquatic organisms, the selection of species is difficult and may need to be updated as more information becomes available, or when certain species become more intensively exploited.

Pagination and Sheet Codes

The Species Identification Sheets are a flexible work tool, capable of periodical updating through additions and revisions. Such an open-ended system cannot be paged like a book; it must be used in the manner of a dictionary. At the same time, however, it is desirable that at least similar forms within a family are not widely separated. To satisfy these requirements, the following system of pagination and numbering has been adopted:

Introductory sections and index (see Contents): Each independent section is separately paged to avoid complete re-issue when only one section is revised.

(ii) Species Identification Sheets: These bear Sheet Codes (top right, recto) composed of three elements - an abbreviation for the family name, e.g. CLUP for Clupeidae; an abbreviation for the generic name, e.g. Duss for *Dussumieria;* and a serial number for the species within that genus, e.g. 1 for *Dusswnieria acuta.* Below the sheet number are written the year of preparation of the sheet and the corresponding fishing area and number.

(iii) Family Sheets (where present): These bear the abbreviation for the family name (top right, recto) and the fishing area and number.

This system enables sheets to be found, first by referring to the appropriate major group, then alphabetically by family and generic name, and finally by species number. The method is fully explained in the section User's Guide (pink sheet).

Names

The correct scientific name for the species is given above the drawing. This is followed by other but invalid scientific names (synonyms) and the authors who have established them. Usually these refer to species once considered different but now known to be identical; a colon between the scientific name and the name of a zoologist shows that the latter has used the scientific name in a sense different from that given by the original author.

The widespread use of vernacular or common names for commercial aquatic species, particularly in the fields of fish processing and marketing, demands that special attention be given to them. In view of the confusion in the use of such names in many fishing areas, the need for standardization and consistency must be strongly emphasized. It is a rather complex task and for this reason the vernacular names of the species in the first edition of any regional series of Identification Sheets may be missing, or when listed, subject to revision by national authorities and regional fishery bodies. Where possible, two kinds of vernacular species names are used on FAO Species Identification Sheets:

1. FAO species names: those used in the FAO Yearbook of Fishery Statistics and in the FAO Thesaurus of Species and Stocks. They have been selected on the basis of the following criteria:

   (a) each name must apply to one species only;

   (b) names must conform to FAO rules of spelling nomenclature;

   (c) English, French and Spanish names commonly used within the area are preferred if they conform with (a) and (b).

Many FAO species names are consistent with those used by regional fishery bodies, and it is hoped that they will ultimately become regional standard species names and will generally remain unchanged, although there may be instances where an alteration is unavoidable.

2. National species names: those vernacular species names officially adopted by a country. They always apply to individual species and should not be confused with common names assigned to statistical categories or with trade names applying to groups of species. Like the regional standard species names, national species names should remain unchanged as far as possible.

   The choice of national species names is the responsibility of national authorities. However, to ensure consistency, it is recommended that in selecting such names the following criteria be observed:

(a) each name should apply to a single species;

(b) each species should have only one official national name;

(c) the name should be selected, wherever possible, from among the "local names" most widely used within the country, and preference might be given to that closest or identical to the FAO name;

(d) if a local name applies to more than one species (often to a genus or a family), a second word, characterizing the species, might be added (e.g. "hunched" snapper, "olive-striped" snapper, etc.);

(e) if a local name for a species is not available, consideration should be given to the use of the FAO species name as the national one.

It is hoped that the progressive use of national species names in all official government documents will substantially contribute to the standardization of vernacular terminology within individual countries. It is recommended that national fishery authorities issue documents giving the scientific and national names and the local names in use within their country for each species included in the relevant regional series of Species Identification Sheets.

Illustrations and Maps

These include a drawing of each species and sketches showing characteristic features. The drawings are basically outlines of the species, in many cases omitting a great deal of detail. Where, for instance, the shape and number of scales or the colour pattern is not of prime importance for identification, they have been omitted or only shown on part of the body. Generally, the illustrations are based on figures already published in pertinent scientific literature.

The purpose of the maps is to give at a glance an idea of the range of the species within the fishing area. In cases where data are incomplete a certain generalization in the range is unavoidable. Being necessarily on a very small scale, the maps are of course limited in their use as a guide for detailed distribution patterns.

Fisheries Information

The catch data recorded in the area are largely based on fishery statistics supplied to FAO by member countries for inclusion in the FAO Yearbook of Fishery Statistics. The information on fishing gear and forms of utilization of the species is provided by the authors of the sheets and completed by FAO, taking into account the information available to the Organization from national or regional sources and from field projects.

Indexing

An essential feature of the Species Identification Sheets is the comprehensive Index because the sheets will be used as a source of information (on correct nomenclature, vernacular names, succint biological information, etc.), as well as for identifying specimens. Since page numbers could not be used for the Identification Sheets (if the system is to be an open-ended one), and since a taxonomic arrangement was impractical, the Index has been keyed to families and genera, both of which are found alphabetically within each major group. Those who wish to use a taxonomic arrangement should consult the introductory pages (blue) to each major group.

A system has been used in the Index by which it is possible to:

(i) determine to which major group, family and genus a name applies;

(ii) locate the relevant sheet or sheets from a given valid (or invalid) scientific, or vernacular name;

(iii) locate information given on a species for which no separate Identification Sheet is included in the series of sheets for the region.

The system is described on the first page of the Index.

Revision of Sheets

From time to time additional sheets or revised sheets will be prepared. These should be filed in the binders by using the alphabetical system under families and genera, and the numerical system under species.

Replacement sheets will be marked with the indication Rev.l, Rev.2, etc. immediately below the Sheet Code (top right, recto) and with their date of issue.

The Index should be amended by hand on the receipt of additional or revised sheets. If a number of such sheets are issued at one time, a printed addendum to the Index will also be produced; a revised index will be prepared when appropriate.

INTRODUCTION TO THIS EDITION

This 4 volume set of Identification Sheets includes 324 species belonging to 48 fish families of economic interest from the Eastern Indian Ocean and Western Central Pacific. Many more species undoubtedly enter fisheries and it is intended that Sheets for these, as well as for other economi cally important marine organisms (sharks and rays, crustaceans, molluscs, sea cucumbers, turtles, etc.) will be provided in the future. The covers of the volumes have therefore been designed to accommodate at least 200 additional sheets within the set and, if necessary, further covers will be issued.

Because of the very large number of families, genera and species to be dealt with, special Family Sheets have been provided giving a family diagnosis, distinctions from similar families, a key to genera and a list of all species believed to occur in the area. These should help both the field worker in identifications and the statistician who is often obliged to handle data at generic or even family level.

However, even the identification of fishes at family level can present serious problems, particularly amongst the numerous families of perch-like fishes. No satisfactory key exists, but the Aid to Identification (blue pages 5-19) offers some practical guidance.

The main features and scope of the FAO Species Identification Sheet Programme are outlined in the Explanatory Notes preceding this Introduction, but attention should be drawn to the following points:

Selection of Families and Species

Originally, the families and species to be included in the series of Identification Sheets were selected at the FAO/DANIDA Seminar on Fish Taxonomy (Phuket, Thailand, November/December 1972), but the list was considerably revised and increased subsequently in collaboration with ichthyologists, fishery biologists and statisticians. In the case of some families and of many species, an objective assessment of economic importance appears to be virtually impossible in the light of information presently available, and sheets will undoubtedly be required for many further species (see improvements).

Names

The scientific names used here have been based as far as possible on the most recent revisional works. As a result, some scientific names still widely used in fisheries within the area have had to be corrected, but alternative names (junior synonyms) can be easily retrieved from the Index. Each sheet also shows the English world-wide family and species names proposed for use by FAO and, if found acceptable, by the regional fishery bodies concerned.

There is considerable confusion with vernacular species names used within the region. In many cases a single species is known by 5 or more different English names, some of which are misleading in the sense that they associate the species with entirely different families. For this reason an attempt is made here to standardize vernacular names for families and then, where possible, to use this name as the second element in the vernacular species name, e.g., Threadfin breams for members of the Nemipteridae, with species Golden threadfin bream, Red threadfin bream, etc. In families containing very diverse genera, the second element is essentially a generic vernacular name, e.g. "hardtail scad", "Kuweh trevally", or "longfin cavalla" for members of the Carangidae.

National species names have been omitted as it is considered that proper official species names in national languages can only be assigned once reliable identifications of species can be made. It is hoped that the use of the Identification Sheets in field work will enable national fishery authorities to establish official national species names following the criteria outlined on pages 2 and 3 (yellow).

Figures and Sketches

Where possible, illustrations were prepared from actual material available at Phuket, but most had to be adapted from existing literature. Unfortunately it is not possible to quote here the large number of sources used for this purpose. Many of the figures and sketches have been simplified to show primarily those characters considered most valuable for the diagnosis of the species. Where colour is a very important character for field identification (e.g., families Lutjanidae, Nemipteridae and Leiognathidae), the authors have kindly provided coloured versions of the original species drawings. It is intended to prepare further colour plates for other families in the future.

Distribution Maps

Since the sheets have been designed for fishery purposes, it has been necessary to adopt existing fishery statistical areas rather than natural zoogeographic ones. Area 71 and the major part of area 57 comprise tropical waters, hence the main emphasis has been given to tropical species. Sheets for the temperate water species found only off southern Australian coasts will be made available in the future. The distribution maps are meant to give only a rough idea of the range of the species within the region, since in many cases reliable information is very scanty mainly due to unreliable identifications in the past.

Bibliography

A list of references relevant to fish families of economic interest from the region has not been included. It is intended to produce, once the series is complete, a list of up-to-date books and scientific papers relevant to the identification and the fisheries of the living marine resources occurring in the region.

Improvements

The Identification Sheets for Fishing Areas 57 and 71 are issued as provisional working documents which must be tested in the field before revised versions can be produced. Many of the families are in urgent need of revision, so that corrections or additions will doubtless become necessary as new information accumulates. Users are strongly urged to let FAO benefit from their experience with the Sheets by sending suggestions to the Editor. The regional fishery bodies concerned are encouraged to examine the proposed English vernacular names and to adopt them as standard regional family and species names. National fisheries administrations are urged to establish one national name for each of the species included in this series of Identification Sheets.

The Editor and Assistant Editor wish to express their sincere gratitude to the taxonomists who prepared the original drafts at Phuket and to those who so willingly collaborated in the revision and completion of the Sheets.

This work could not have been undertaken without the generous support of the Danish International Development Agency (DANIDA), the Thai Government, and the Directors and staff of the Phuket Marine Biological Center (Thai/Danish Cooperation). Its publication and diffusion was made possible by the UNDP/FAO South China Sea Fisheries Development and Coordinating Programme and the UNDP/FAO Indian Ocean Survey and Development Programme, which provided the necessary funds for printing.

The Editor also wishes to express his personal thanks to all those who have assisted with typing and proof-reading, and in particular to Mrs. J. Kwang-Salvatori and Miss M. Taylor.

USER'S GUIDE

While the sequence of families in the picture guide (blue paper) of any major group is governed primarily by similarity in appearance (to facilitate identification), the arrangement of Identification Sheets (white paper) by families and by genera within families is alphabetic - to ensure easy retrieval.

Information from the sheets can be retrieved in several ways, depending on the user's requirements. Essentially, two approaches can be followed:

1. Field identification

   (a) Check your specimen against the Aid to Identification (Conspicuous Characters and Picture Guide to Families). Special attention should be paid to the shape and position of fins. Fins should be pulled forward to show their shape when erect. General appearance and arrows indicating conspicuous features will help you decide which family (or families) the specimen most resembles.

   (b) Find the Identification Sheets belonging to the family from its alphabetical sequence by using the capital letters of the Sheet Code (top right margin).

   (c) Determine the species within the family by looking through all the Species Identification Sheets belonging to the family. In some cases, the figure alone may be sufficient, but it is recommended that the sections "Distinctive Characters" and "Distinguishing Characters of Similar Species Occurring in the Area" are always read to ensure correct identification. This may also lead to identification of species for which a sheet is not included.

2. Searching the Index

   (a) Scientific (valid or invalid) or vernacular names are included in a single index and can be found alphabetically. In the case of scientific names, both the genus and the species names are cross-indexed, e.g. *Lates calcarifer* and *calcarifer, Lates.* This will help on occasions when a species name is coupled in the literature with an unusual generic name.

   (b) The name in the Index is followed by symbols referring to the Sheet Code. Names for families and genera are followed by the family abbreviation only, while species names are followed by the family abbreviation, generic abbreviation and species number.

   (c) In the case of species names, first, locate the family from the family abbreviation; second, locate the genus from its abbreviation; third, locate the species from its number (see Note overleaf).

Example:

Lates calcarifer

CENTRP	Lat	1
Family (CENTROPOMIDAE)	Genus *(Lates)*	Species *(calcarifer)*

(d) Remember that both the Index and the Identification Sheets indicate whether a scientific name is valid or obsolete, although it will always lead to the correct Identification Sheet.

NOTE:

The coding system is world-wide. Gaps in sequence of species code numbers indicate that the missing number has already been allocated to a species occurring in another fishing area (i.e. SERRAN Epin 1, 2 and 3 used for Mediterranean species).

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