FIGIS-FIRMS stocks and resources domain
Topic tree and related definitions

version 1-0

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Management Summary

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Definitions for the FIGIS-FIRMS Stocks and Resources domain

DOCUMENT SOURCE

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FIGIS Institutions objects are formal organizations (e.g. FAO) and/or their sub-divisions, departments, divisions, decentralized offices, dependent bodies, ... all with a legal status.

- The Institution's profile section describes its mandate, structure, membership and establishing legal texts.
- The features section deals with the Institution's life, e.g. meetings, programmes, projects, publications, or job opportunities.

Programme : programmes are the operational extensions of institutions. They generally represent homogeneous institutionalised units of small size focussed on specific objectives. Hence it is generally at the level of Programme units that intellectual products (of interest to information systems) are generated, and that corresponding working arrangements and practices (including quality assurance) are set. Thus programmes often represent the units at which level focussed information exchange can be defined, in a partnership agreement established with the responsible institution.

Collection : a collection is a set of information consisting of a combination of different data types such as statistics, text, images, maps, ..., prepared consistently according to agreed procedures, rules and generally presented using defined and agreed template. A collection is under the direct control of a programme, and in the absence of defined programme, an institution. Thus, a collection should be homogeneous enough to allow easy description of the concerned data types, rules and procedures. A statistical time series, or a publication series, are two typical examples of a collection. From a FIGIS system information management view point, the basic unit used for assigning permissions to users is the concept of "Collection".

Cover page : cover page provides information of bibliographical nature (title, author, year, ...) under which the content presented has been prepared

Definitions for the FIGIS-FIRMS Stocks and Resources domain

STOCKS AND RESOURCES

Concepts definition :

Stocks definition: The FAO Glossary for Responsible Fisheries indicates, *inter alia*, that from a pragmatic point of view, a **stock** is *"the part of a fish population which is under consideration from the point of view of actual or potential utilisation*. In more biological terms, it is also *"a group of individuals in a species occupying a well defined spatial range independent of other stocks of the same species. It can be affected by random dispersal movements and directed migrations due to seasonal or reproductive activity. It can be regarded as an entity for management or assessment purposes. A **unit stock** comprises all the individuals of fish in an area which are part of the same reproductive process. It is self-contained, with no emigration or immigration of individuals from or to the stock. On practical grounds, however, a fraction of the unit stock may be considered as a "stock" (or as **a management unit**) for management purposes as long as the results of the assessments and management remain close enough to what they would be on the unit stock."*

A stock is defined by a wide range of characteristics selected for their relevance to the fisheries that exploit the stock . A stock may consist of widely separated species such as fish, shrimp and clams, and may also be multi-species. It may be highly migratory, straddling or shared as well as global, ocean-wide, regional, national and local -- all attributes that carry diverse management implications. Stocks are units generally defined by scientists for assessment purposes, and their indicators tend to describe their size, potential, health status and trends.

- Hence, Stocks are identified in FIGIS as the compulsory combination of an AQUATIC SPECIES (or SPECIES GROUP) and a WATER AREA geographical location. This water area may be described at any scale using standard statistical areas, areas of competence (e.g. EEZs) or environmental geo-classification systems such as Large Marine Ecosystems.
- The Stocks profile section describes the water area main environmental characteristics, the stock's biological and ecological features, and if necessary it's structure.
- The Stocks features section presents a stock's dynamic aspects such as exploitation, assessment, management, and status and trends.

Aquatic resources definition: The term "**resources**" is also often used when referring to vaguely defined "stocks." The FAO Glossary for Responsible Fisheries indicates that **aquatic resources** are the *"biotic element of the aquatic ecosystem, including genetic resources, organisms or parts thereof, populations, etc. with actual or potential use or value (sensu lato) for humanity. Fishery resources are therefore those aquatic resources of value to fisheries."* Just like a stock, a fishery resource is delimited in space and its geographical demarcation often has a political or juridical connotation, e.g. Moroccan resources, EEZ or high seas resources. Potential or actual catch is a typical resources indicator reflecting the notions of **use** or **value** attached to the resource's concept. It could be local, national (e.g. the shrimp resource of Ghana), regional (e.g. Atlantic tuna) or global (e.g. cephalopod resources of the world.)

- Aquatic Resources are identified in FIGIS along the same patterns as are Stocks.
- The main structural difference between Resources and Stocks is the absence in the Resources Feature section of the Assessment topic, which is strictly reserved to Stocks as defined and assessed by scientists.

Definitions for the FIGIS-FIRMS Stocks and Resources domain

Topic tree definitions :

Stock / Resource identity : the identity section allows assignment of essential identifiers needed by computer systems for the creation and management of Stocks or Resources objects.

Name : the name of the Stock or Resource unit; it may be a commonly established local name, but in absence of such a name, the name should as much as possible combine the species and area components.

Species or species group reference : a compulsory reference to the species group, or the single species that compose the considered stock or resource. When the composition of the species group is known, then these species should be listed under the group's hat.

Area reference : a compulsory reference to one or more geographical area(s), be it of statistical, jurisdictional, or environmental type, or a combination of these. A minimum requirement is to geo-reference Stock or Resource units using an international referencing system such as FAO major area. More precision can be obtained in geo-referencing by using local statistical area systems, water of competence referencing systems, such as high seas, EEZs or territorial seas, convention areas or spatial management units, or environmental referencing system like Large Marine Ecosystems.

Stock / Resource type : a standard type assigned to the stock or resource unit according to a typology made up of meaningful combinations of governance-or-jurisdiction (high seas, shared, straddling, ...), geographical scale (regional, national, sub-national, ...), environment (oceanic, coastal,...), and view-discipline-or-approach prevailing in identifying the unit, or prevailing concept (stock, or resource). This type is an essential aspect of the stocks and resources domain quality assurance scheme, as it should participate in justifying the existence of the stock or resource unit inventoried in reference to the inventory objectives.

Stock / Resource profile : as for every FIGIS domain, the profile section contains topics which describe essential (or intrinsic) characteristics of stock or resource units, ie the reasons for creating the unit. Stocks and resources being built based on species and geographical criteria, the corresponding (scientific) knowledge (fish population biology, effect of the environment, jurisdiction considerations) will be organised under this section.
http://figis01/fiservlet/org.fao.fi.common.FiRefServlet?ds=resource&fid=8009
http://figis01/fiservlet/org.fao.fi.common.FiRefServlet?ds=resource&fid=8001
http://figis01/fiservlet/org.fao.fi.common.FiRefServlet?ds=resource&fid=6001
http://figis01/fiservlet/org.fao.fi.common.FiRefServlet?ds=stock&fid=5029

Area profile : a description of the water area where the stock occurs, including environmental characteristics, jurisdictional limits, ...
http://figis01/fiservlet/org.fao.fi.common.FiRefServlet?ds=resource&fid=8000

Habitat and biology : a description of the biological and ecological parameters of the fish population under consideration

Stock / Resource structure : this topic serves the purpose of introducing one or more sub-unit(s) of the stock or resource under consideration, ie gives access to a lower level of aggregation. Where possible, a short explanation should be provided to justify the existence of this sub-unit.

Definitions for the FIGIS-FIRMS Stocks and Resources domain

http://figis01/fiservlet/org.fao.fi.common.FiRefServlet?ds=resource&fid=8010
http://figis01/fiservlet/org.fao.fi.common.FiRefServlet?ds=resource&fid=6006

Stock / Resource feature : as for every FIGIS domain, feature contain topics which do not describe intrinsic (permanent) characteristics of the stock
http://figis01/fiservlet/org.fao.fi.common.FiRefServlet?ds=stock&fid=8301

Reporting year : corresponds to the year for which the latest indicators can be supplied for the stock (generally the year of the latest data available).

History : an historical review of the Stock or Resource exploitation, management regimes and their effect, and trends
http://figis01/fiservlet/org.fao.fi.common.FiRefServlet?ds=resource&fid=8000

Exploitation : this topic covers the description of both the level, and patterns of exploitation of a fishery resource. The level of exploitation is usually expressed using "simple" exploitation indicators such as catch, effort parameters, size of fish caught. The patterns of exploitation are usually developed describing the various fisheries in a more or less detailed way.

Exploitation indicator : this is a generic topic used to describe the common exploitation parameters such as catch, landings, efforts, discards, size of fish caught. The indicator has to be assigned one of these above listed types, is usually identified using a more precise indicator name, and includes quantitative related information such as value, unit, date, source, and/or qualitative such as statement on the status or trend of the indicator. When analytical work is reported, considerations are given as to how the overall indicator value applicable to the resource or stock unit is formed : the indicator is broken down into values given according to different reporting units, be it by species, or by area, or by geartype, etc...
http://figis01/fiservlet/org.fao.fi.common.FiRefServlet?ds=stock&fid=23

Reporting unit : an element allowing for the reporting of an indicator value (and associated data) for a given unit. The unit value(s) (a species name, a stock name, a geartype, ...) is (are) supplied together with the indicator value.

(Overall) fisheries : this topic is the description of the patterns of exploitation of the stock or resource unit, either by simply mentioning the different fisheries working on a stock, or by describing in more details how each of these fisheries operate on the stock

Fishery overview : topic to be used for those fisheries which interaction with the stock is described in details, including possibly the various exploitation indicators specific to this fishery on this stock. The fishery is identified through its key criteria such as target species, location, geartype, flagstate, ...
http://figis01/fiservlet/org.fao.fi.common.FiRefServlet?ds=stock&qid=st_33026&xp_obsfid=4131&xsl=figis/stockres/format/observation.xsl

Assessment : this topic describes the scientific assessment work done on a fish population identified as a stock unit. As such, this topic is not available within the "Resource" concept. It includes the description of data sources used for the assessment, the various assessment

methods applied with their individual results, and the overall assessment results, including possibly scientific advice.
http://figis01/fiservlet/org.fao.fi.common.FiRefServlet?ds=stock&fid=23

Available data : the data used to generate the exploitation indicators, or presented to the scientific assessment for the calculation of assessment indicators.

Assessment method : an assessment method is identified by its name, and ideally includes the description of available data, a summary of the methodology
http://figis01/fiservlet/org.fao.fi.common.FiRefServlet?ds=stock&fid=4
http://figis01/fiservlet/org.fao.fi.common.FiRefServlet?ds=stock&fid=5029

Methodology : a description of how the generic method has been applied in the context of the current assessment, considering shortcomings on the available data, expert knowledge, assumptions, ...

Results : result is a generic topic either found at the level of each individual assessment method, or for the overall assessment. It provides quantitative and/or qualitative details for each of the noticeable assessment indicators generated using one assessment method (in the former case), or the set of methods (in the later case).

Assessment indicator : this is a generic topic used to describe the assessment parameters commonly generated using stock assessment methods. Fishing mortality, biomass, recruitment, abundance index are classic ones. The indicator has to be assigned a type (one of these above listed for example), is usually identified using a more precise indicator name (eg f0.1, or Bmsy), and includes quantitative related information such as value, unit, date, source, and/or qualitative such as statement on the status or trend of the indicator. When analytical work is reported, considerations are given as to how the overall indicator value applicable to the stock unit is formed : the indicator is broken down into values given according to different reporting units, eg gender classes (female biomass), or age classes (recruitment at age 2) etc...

Results : see above. However, when results is provided for the overall assessment, it may specifically include a set of scientific advice (to be differentiated from management advice)
http://figis01/fiservlet/org.fao.fi.common.FiRefServlet?ds=stock&fid=3105

Scientific advice : advice provided by the scientists at completion of the assessment. The nature of the advice is of strictly scientific nature, ie clean of any management or political consideration. It may deal with the data to be provided, the assessment tools to be used, or the orientations that should be taken to allow a stock to recover, associated with types of measures, or results of simulation.

Management : from a Stock or Resource information perspective, management considerations are usually limited to summarising the management context, including a list of applied management methods and measures of direct interest to stock exploitation.

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Management advice is also included for those institutions having by mandate to provide advice to management bodies.
http://figis01/fiservlet/org.fao.fi.common.FiRefServlet?ds=stock&fid=3105

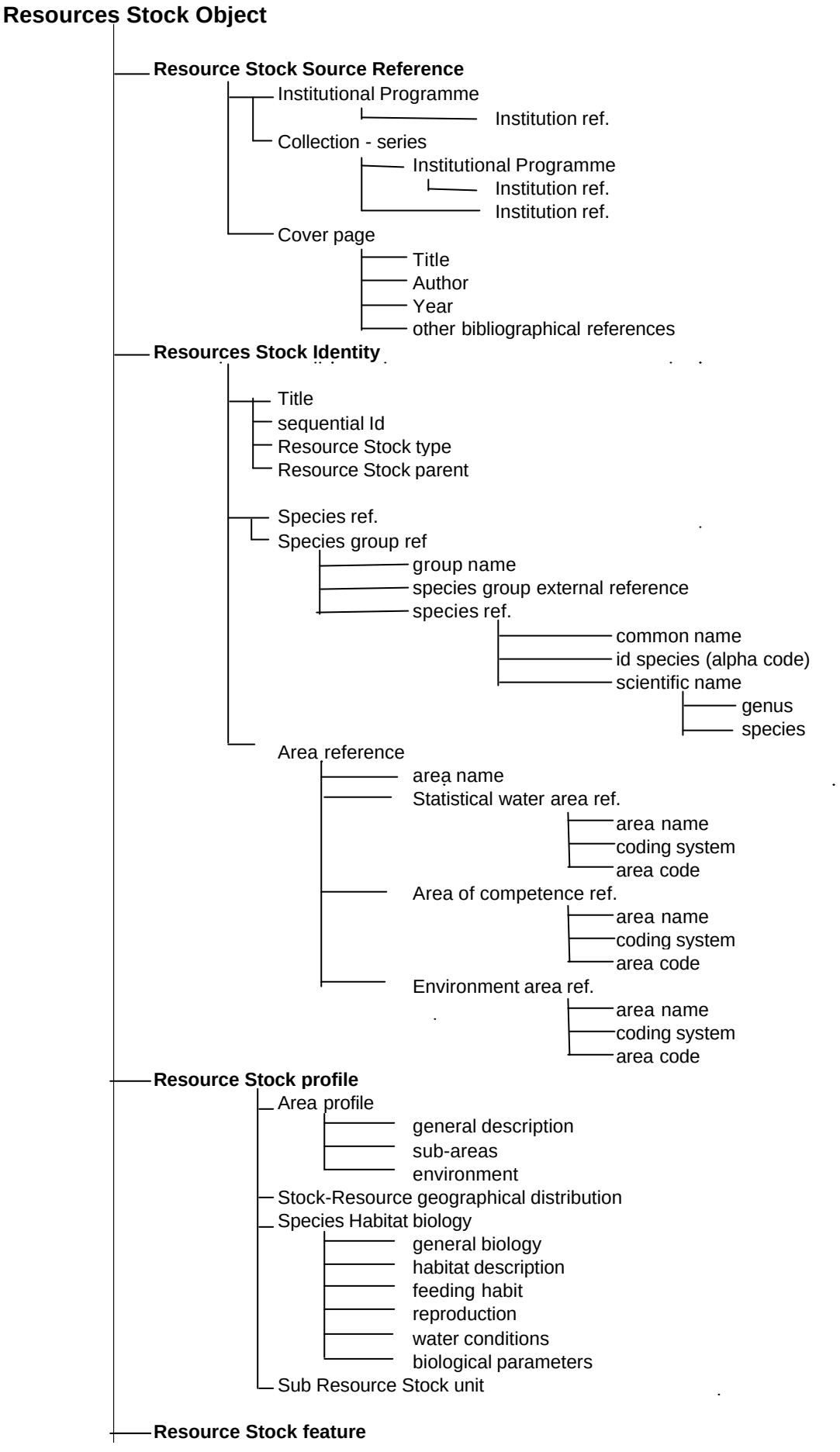
Management overview : a summarised description of the present management context applied to the stock or resource. It may gives some emphasys on the management objectives, strategies, and methods currently in force.
http://figis01/fiservlet/org.fao.fi.common.FiRefServlet?ds=resource&fid=6001
http://figis01/fiservlet/org.fao.fi.common.FiRefServlet?ds=stock&fid=5029

Management advice : by contrast to scientific advice (found under assessment results), management advice are those recommendations generally evolving from the assessment, addressed to management authorities. Advice may be proposed under different management options.
http://figis01/fiservlet/org.fao.fi.common.FiRefServlet?ds=stock&fid=4

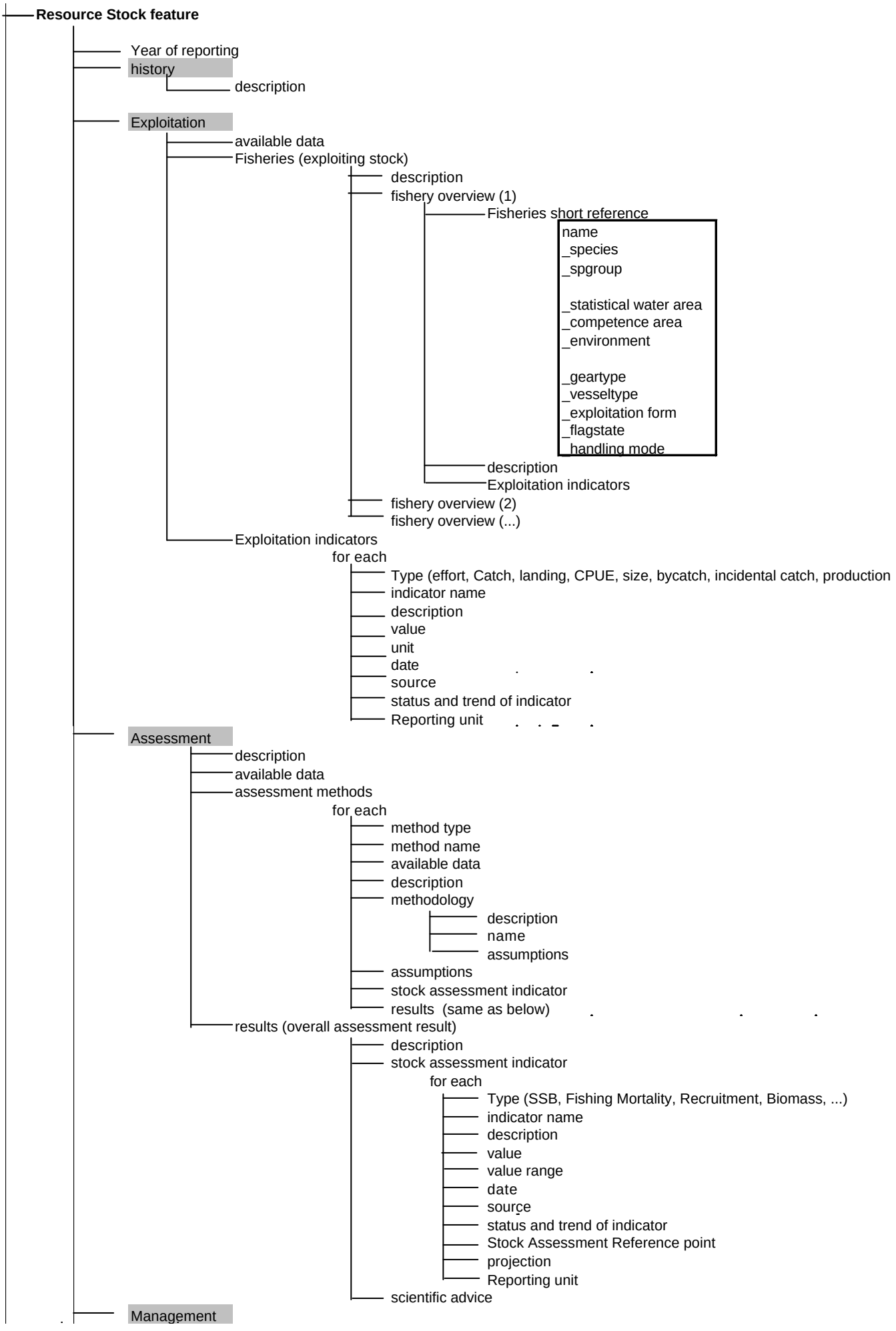
Status and Trends : this topic includes a short statement (which should be understandable by the public) summarising the current observation made on the resource or stock considered, with a focus on the status of the fish population and the trends characterising its evolution, and possibly outlooks on its future.
http://figis01/fiservlet/org.fao.fi.common.FiRefServlet?ds=resource&fid=8011
http://figis01/fiservlet/org.fao.fi.common.FiRefServlet?ds=resource&fid=6006

For resources units defined at aggregated level, this topic may consist of a general statement including a list of status and trends entries fitting each of the sub-units making up that aggregated Resource.
http://figis01/fiservlet/org.fao.fi.common.FiRefServlet?ds=resource&fid=8010

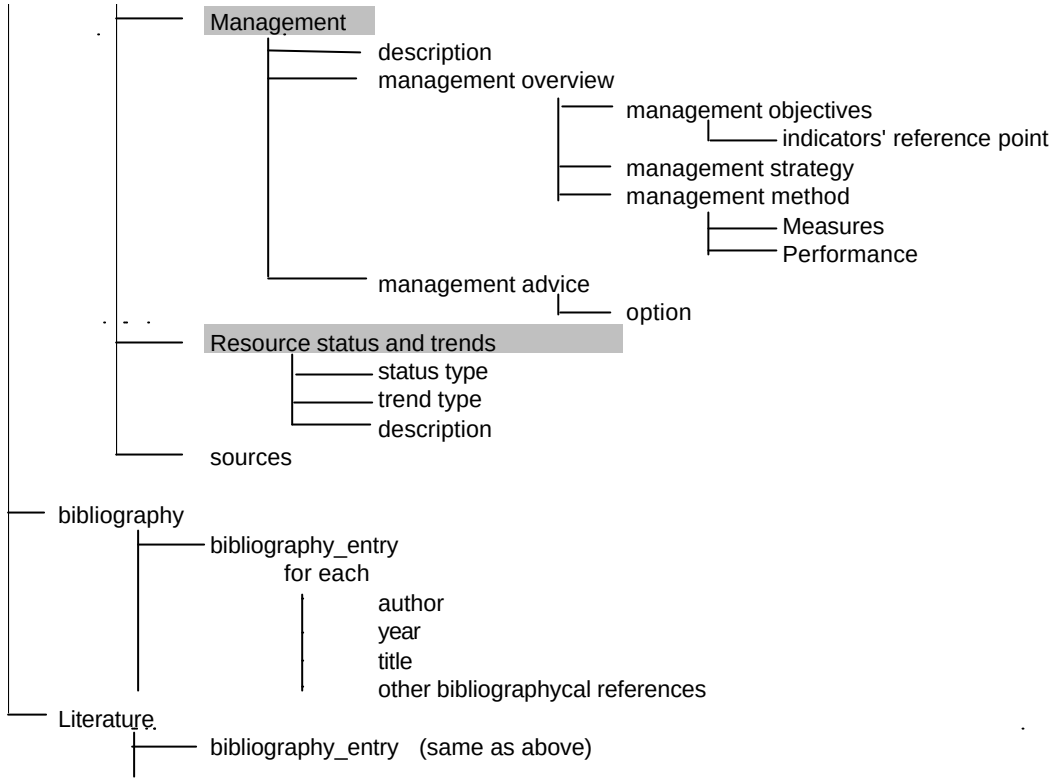
FIGIS-FIRMS Stocks and Resources topic tree



FIGIS-FIRMS Stocks and Resources topic tree



FIGIS-FIRMS Stocks and Resources topic tree



FIGIS-FIRMS Stocks and Resources topic tree

FISHERIES

Definition: The FAO Glossary indicates that *"**a fishery** is an activity leading to harvesting of fish (sensu lato) from the wild using some fishing technology (**capture fishery**) as well as activities producing fish through **aquaculture**."* Capture fisheries are generally identified by the target species, the area of operation and the gear used (e.g. Atlantic Northern Bluefin longline fishery.) They may also be identified by vessel nationality, exploitation form, and occasionally by fishing season. A given resource or stock may be exploited by many fisheries (e.g. a longline and a purse seine fishery may both exploit Yellowfin tuna), and a single fishery may exploit many stocks at the same time (e.g. multi-species trawl fisheries.)

- In FIGIS, it is proposed to define and characterise a fishery along three primary dimensions (or keys) resulting in a flexible nested structure of fisheries types according to various scales and aggregation levels. As an example, the western central-Pacific Japanese purse-seiner tuna fishery is identified in the following manner:
  1) The target SPECIES, or target GROUP OF SPECIES, e.g. tuna.
  2) The WATER AREA geographical location of the fisheries (e.g. the western central-Pacific) associated with a unique geographical identifier. However, because the geographical demarcation of the fishery's area may change over time (as demonstrated by tuna fisheries), the association between the fisheries geographical identifier and the standard geographical GIS objects (latitude and longitude, squares, statistical areas, EEZs, shelf/oceanic areas, or some intersection of these objects) should be flexible over time. GIS will be used systematically to index geo-references against all pertinent geographical typologies.
  3) The exploitation unit[1] (e.g. Japanese purse-seiner) may refer to any of the fisheries exploitation patterns: the GEARTYPE (e.g. trawl), the VESSELTYPE (e.g. trawler), the FISHING TECHNIQUE (e.g. drum seining), or the on-board HANDLING MODE (freezer-trawler), and/or any of the other aforementioned qualifiers, such as the FORM OF EXPLOITATION (e.g. subsistence, artisanal, industrial, commercial, recreational) or the VESSEL FLAG. The exploitation unit will allow effective linkage with the management units described in the Management System Profiles. The flag may be used to identify which countries participate in a fishery and aid in assessing new policies and management.

- The Fisheries profile section describes the essential aspects of the elements used in defining the Fishery.

- The Fisheries features section contains dynamic aspects of a fishery such as exploitation, management and related performance, and post-harvest topics.

[1] the term "fishing unit" may be preferred

FIGIS-FIRMS Stocks and Resources topic tree

Following on Richard last message, I tend to agree, based on definitions available that a Fishery may involve one or many metiers. There are fisheries (e.g. the Malvinas Jig/light squid fishery) that have only one metier (they are mono-metier fisheries?) while some others (e.g. the Moroccan hake fishery) are multi-metier fisheries.

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-----Original Message-----
From: Prado, Joel (FIIT)
Sent: Friday, March 01, 2002 10:55 AM
To: Grainger, Richard (FIDI); Garcia, Serge (FIRD); Maine, Ron (FIIT); Smith, Andrew (FIIT); Turner, Jeremy (FIIT); Everett, George (FIPP); Valdimarsson, Grimur (FIID); Wijkstrom, Ulf (FIPP); Taconet, Marc (FIDI); Greboval, Dominique (FIPP)
Subject: "Fisheries" and "Metier" definitions

Dear colleagues,

Referring to the difference between "metier" and "fishery" and, if, as a French, I can state something regarding English language:
As a matter of fact, **"Metier" refers, to a certain extent to "Art" which (according to the Oxford Dictionary) means (among other): Thing in which skill may be exercised; Practical application of any science; industrial pursuit; craft.**

In connection to the on-going discussion,
some time ago I had drafted a table concerning the "definition of a fishery". At that time I had not paid much attention to the terminology. I was assuming that a specific fishery is to be defined by a basic combination of Target species (if any) + Fishing gear or vessel used + Fishing area + Scale, with, however, when necessary, the possiblity to refine the definition with other elements such as Season, Presentation of the fish product (e.g. fishery for sashimi), Flag (of the vessels involved), Strategy of the fishing companies, Fishermen practices (which would practically refer to the "Fishing technique" concept in FIGIS; e.g. night fishing or fishing with light attraction). See attachment.
<< File: Fisheries definition3.doc >>

No, this on-going discussion is not completely useless if it make several "experts" giving some, second, thought to a term that we all use very frequently. It will be difficult to reach definit conclusion such this matter is to a certain extent subjective! However, it would be useful that FI agrees on a definition.

-----Original Message-----
From: Grainger, Richard (FIDI)
Sent: Thursday, February 28, 2002 8:55 AM
To: Garcia, Serge (FIRD); Prado, Joel (FIIT); Maine, Ron (FIIT); Smith, Andrew (FIIT); Turner, Jeremy (FIIT); Everett, George (FIPP)
Subject: RE:

Serge,

Not totally confusing, as you had hoped for!

I think the main point is that the term "fishery" is used in many different senses (whether it is a flexible term or just mis-used is debatable) whereas the term métier as defined by IFREMER people and generally used by fishery scientists is specific and clear. As you say, the definition of a "fishery" can be pragmatic and related to management. It has also been defined by Cadima to be the same as a métier (he saw the need for the métier concept, even if he did not call it that). But it is often used in different senses such as the "Mediterranean hake fishery" which in that sense includes many métiers. You simply could not use the term "Mediterranean hake métier" in the singular; it does not make sense. So I think the term "métier" is useful as it is more specific and the concept is essential, whatever it is called. The fact that the term "fishery" can be defined to be the same does not invalidate this, it is just a bit confusing.

Richard

-----Original Message-----
From: Garcia, Serge (FIRD)
Sent: Wednesday, February 27, 2002 5:57 PM
To: Grainger, Richard (FIDI); Prado, Joel (FIIT); Maine, Ron (FIIT); Smith, Andrew (FIIT); Turner, Jeremy (FIIT); Everett, George (FIPP)
Subject: RE:

I still have a problem. You knoew how Cartesian the french are. Starting from your definitions (From Prado modified by Grainger). See my reflections below following the given definitions (in bold):

> (1) **Fishery**: **the fishing operations effectively carried out by a number of vessels within a certain area/fishing ground**.
> I simply do not agree. We have never called a fishery (in stock assessment groups) by "a number of vessels in an area". Would you give me an example?

The old definition by Cadima (in a study done for FIDI with the view to replace Statlant B Forms and have a better relation between fishing effort and mortality) defined a "Fishery" as an intersection between a fleet of vessels of a particular type (or types?), using specific one or more specific gears, in some area, to catch one or many species. A fishery can also be seasonal. A Dictionary defintion is: the occupation, industry, or season of taking fish or other sea animals (as sponges, shrimp, or seals). A place for catching fish or taking other sea animals; the legal right to take fish at a particular place or in particular waters; the technology of fishery. In Cadima's sense, ensuring that F is proportional to f, a complete theoretical example would be the Winter (season) Moroccan (area) Hake & Shrimp (species) trawl (gear) fishery. However, this fishery had two components: a trawl fleet and and bottom set gillnet fleet. Are these different fisheries or different "segments" of a fishery (one of which could be artisanal and the other industrial). I believe that the notion of "segment" is accepted. Following the métier definition, you could easily have a clear F/age combining both segments. I also believe that the definition of "fishery"is

pragmatic and related to management. So, if you have one management scheme, you have one fishery, with two segments.

The attempt by IFREMER, in a way was similar to that of Cadima: Improve the relation between F and f. So, somehow, what Cadima called a fishery is called a métier by Ifremer

> (2) **Métier** (Craft): **describe a certain (planned) fishing activity, specific in term of target species, fishing gear in use and fishing area/ground**.

If this is the definition then, by reference to Cadima's definition, a Métier is a "planned" fishery? The only difference seem to be in the intention as opposed to the action. Seems odd to me. If we go back to the general definition, métier, in general, does not refer to a physical object. It is a human skill or specialization. It does not refer to a productive activity with its technology and targets but to a human occupation, tradition, culture, skill. The Dictionary definition is indeed: "***Occupation manuelle ou mécanique qui permet de gagner sa vie***. *Le métier de menuisier. Corps de métier. 2. Profession quelconque, considérée relativement au genre de travail qu'elle exige. Écrivain qui connaît bien son métier.* -- ***Un homme du métier: un professionnel, un spécialiste***. *|| Prov. Il n'y a pas de sot métier: toutes les professions sont honorables et utiles, même les plus humbles. 3.* ***Savoir-faire, habileté acquise dans l'exercice d'un métier, d'une profession***. *Cet acteur a du métier"*.

The English equivalent of Métier, in its general acception, is "craft. A dictinary definition of the latter is: skill in planning, making, or executing. An occupation or **trade** requiring manual dexterity or artistic skill (indeed "Trade"would do!).

From Grainger's statement QUOTE "considered the appropriate form of the definition of **components for the fishery**, and concluded that the concept of "métier" adopted by workers at IFREMER was most appropriate and recommends that this terminology and definition be used more generally". That workshop believed that the term "fishery" as generally used was not specific enough and often did not include a specification of the intended catch (target species) whereas IFREMER scientists had included this in the definition of a métier. Nobody at the workshop could think of a corresponding term in English. The term subsequently became quite widely used in ICES and the EC.UNQUOTE. I conclude that a métier is a "segment" of a fishery, a component, with sufficiently distinct properties and characteristics to generate different F/age vectors.

This is why they defined QUOTE "A métier is defined as a combination of gear, target species, location and seasonality (unless accounted for in the temporal resolution) for **which the catchability matrix (F-at-age) can be determined**. Here target implies a combination of gear type and preferably also the intention of fishing some subset of the resources. Vessels of different size and origin operating in the same place at the same time with the same target are assumed to generate **the same catchability matrix**,

(i.e. the same mortality by unit of effort (added by me)) but may have different fishing powers."

FIGIS-FIRMS Stocks and Resources topic tree

MANAGEMENT SYSTEM

Definition: Decision-makers manage fisheries by identifying management units. According to the FAO Glossary for Responsible Fishing, "*a **Fishery Management Unit (FMU**) is a fishery or a portion of a fishery identified in a Fishery Management Plan (FMP) relevant to the FMP's management objectives*." Therefore the makeup, the attributes and the focus of an FMU reflect it's sector's strategies and objectives. FMU's may be organised around fisheries biological, geographic, economic, technical, social or ecological dimensions. They are the focus for the application of the selected management methods and measures. Particular properties of the stocks and/or the fisheries may be incorporated in the definition of management units.

A management system is identified by:

- A **legal framework** (e.g. a law, set of decrees, management plan, 5 years development plan)

established within the mandate of

- A **Management Authority** (e.g. a regional body, a state, or provincial government)

and specifies management objectives, strategies or methods for at least

- One Fishery Management Unit. More detailed management rules applying to some of the identified fishery management units may be found in other [sub] management systems.

FIGIS-FIRMS Stocks and Resources topic tree

PRODUCTION SYSTEM