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COORDINATING WORKING PARTY ON FISHERY STATISTICS

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Proposed additions and amendments to the CWP Handbook and Section on global guidelines for logbooks

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Document Summary

The CWP Handbook (http://www.fao.org/cwp-on-fishery-statistics/handbook/en/) is a web-based publication which describes general concepts and guidelines for capture fisheries statistics, aquaculture statistics and socio-economic data, and includes tools and resources and a search facility. The Handbook was first published in 1990. Since then, the Handbook has been updated with new sections on aquaculture, the ecosystem approach, green accounting and socio-economic statistics, and a revised classification for fishing gear.

New updates to the Handbook are proposed herein to align *inter alia* the capture fisheries section with related frameworks developed for the Fisheries and Resources Monitoring System (FIRMS) and Global Record of Stocks and Fisheries (GRSF). The updates also include new global guidelines for capture fisheries logbooks. These guidelines outline the use of logbooks for collecting data which may be used *inter alia* for statistical purposes, and identify common information that should be collected in all types of capture fisheries. The guidelines, which are consistent with the Code of Conduct for Responsible Fisheries, may be used by regional and national fishery/management authorities to ensure that appropriate standards are implemented and maintained when reporting fishery statistics at national and regional levels in support of the sustainable management of fisheries.

CWP members are kindly invited to provide feedback on the proposed additions and amendments to the Handbook. Agreed updates would be incorporated in the Handbook during the intersessional period.

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Revision history

Version	Description	Author(s)	Date
1.0	CWP Handbook - proposed additions and amendments in track change	CWP Secretariat	14 Feb 2019
2.0	Revised with input from SPRFMO NAFO EC ICES	CWP Secretariat	18 Apr 2019
3.0	Final version for CWP	CWP Secretariat	3 May 2019

[Editorial note: Editorial notes are provided in this document in blue font and in square brackets. These notes are intended to guide readers through proposed additions and amendments.]

[Editorial note: Proposed additions and amendments to the CWP Handbook were detailed in the draft document circulated on 18 February 2019 using track-change. Revised paragraphs were also highlighted in blue and new/additional paragraphs were highlighted in yellow. The majority of the proposed changes apply to the introduction and capture fisheries statistics. Sections of the Handbook not included below will remain as published in the current version of the Handbook.

In this document, only edits in response to comments provided by CWP Members since 18 February are shown in track-change, and blue and yellow highlighting is retained to indicate revised or new/additional paragraphs respectively.]

CWP Handbook: Introduction

[Editorial note: The Handbook introduction includes the following section: introductory page, data collection systems, methodology for data collection and confidentially (http://www.fao.org/cwp-on-fishery-statistics/handbook/introduction/en/). Amendments are proposed below to update the introductory page and the section on methodology for data collection; the other sections remain as published and are not included here.]

The eleventh session of the then Coordinating Working Party on Atlantic Fishery Statistics (now Coordinating Working Party on Fishery Statistics; CWP) proposed in 1982 that a "Handbook of fishery statistics" (referred herein as the Handbook) be brought together. The first edition of the Handbook was published in English in 1990 with L.P.D. Gertenbach, M.A. Robinson and David G. Cross as lead editors; the Spanish and French editions of the Handbook followed in 1993 and 1994 respectively. The Handbook included contributions by the secretariats of the CWP Member Agencies (refer http://www.fao.org/cwp-on-fishery-statistics/background/en/) and covered statistics on capture fisheries. The Handbook was converted to a live document on the CWP website in 1996 and was renamed "Handbook of fishery statistical standards" (http://www.fao.org/cwp-on-fishery-statistics/handbook/en/). Following the establishment of CWP-aquaculture in 2007 (CWP-22) the Handbook chapter on aquaculture was further developed. Further revisions in 2012-2013 and in 2016-2017 were led by the CWP Secretariat and included in particular reviews of the gear classifications plus new sections on ecosystem approach, green accounting and socio-economic statistics. The Handbook was further developed [Editorial note: i.e. as proposed in this document] to include concepts, definitions and guidelines for the collection of logbook data (this version) and is being complemented with standards for reference harmonization (refer CWP Task Group of Reference Harmonization). Within the CWP framework, further developments are envisaged including metadata standards for data exchange (e.g. OGC and ISO). These developments share the objective to harmonize common datasets structures and metadata to facilitate data reporting and exchange among data agencies at national, regional and global levels. The developments also align the Handbook with the related frameworks developed for the Fisheries and Resources Monitoring System (FIRMS) and Global Record of Stocks and Fisheries (GRSF).

The Handbook sections currently cover (1) General Concepts, (2) Capture fisheries including catch and effort statistics, logbook guidelines and biological data (fisheries dependent component only) , (3) Aquaculture statistics (aquaculture inputs and outputs and production units), (4) statistics on socio-economics of fisheries (gross value of the landings, total costs of fishing and employment), and (5) tools and resources (international classifications, reference classifications, concepts and data depository, and grid maps). The Handbook does not cover the fish processing industry which is based on fisheries and aquaculture. However there are examples when it is difficult to distinguish between

the industry resources used for fishing or aquaculture and those used for processing the fish, e.g. processing of fish on-board a fishing vessel.

Statistics on fisheries and aquaculture are based on the same concepts and definitions that are used for national statistics. Definitions are agreed by the UN Statistical Commission which is the highest decision-making body for international statistical activities especially the setting of statistical standards, the development of concepts and methods and their implementation at the national and international level (refer https://unstats.un.org/unsd/statcom).

The International Standard Industrial Classification of all Economic Activities (ISIC) is a United Nations system for classifying economic data and the socio-economic data should be consistent with that classification. ISIC is a basic tool for studying economic phenomena, fostering international comparability of data, providing guidance for the development of national classifications and for promoting the development of sound national statistical systems.

The International Organization for Standardization (ISO) promulgates worldwide proprietary, industrial, and commercial standards. Codes and several other identifiers used in this Handbook are defined through the ISO.

CWP supplements these definitions for concepts that are specific for fisheries and aquaculture statistics and the Handbook is the documentation of this work.

The scope of the Handbook is to:

- Document concepts that are relevant for fisheries and aquaculture statistics
- Define statistical standards for specialised concepts as adopted by CWP
- Define statistical standards for concepts that have a wider scope as adopted internationally (mainly UN Statistical standards)
- Review methodological issues that are specific for fisheries and aquaculture statistics
- Define minimum requirements for data collection including logbook guidelines and standards for collecting fishery data
- Define desirable level of information.

Many of the specific CWP-defined concepts and definitions are applied in a wider context and the user is advised to check the validity of such applications.

In its efforts to develop useful and practical systems, the CWP is consistently keeping these standards under review and welcomes the comments of the national authorities on the application of these international standards at the national level.

Methodology for data collection

Methodology in this note is used as a generic term encompassing mechanisms, processes, techniques, and approaches and working concepts, all developed and applied when the need arises to collect data in order to manage the economic and social aspects of a given activity, in this context "fisheries".

The variables on which information is collected differ according to the main objectives of national fishery policies. The main topics in a design of a survey would include:

1. Objective of the statistical program~~me~~ and an analysis of which data are required to meet the objective.
2. Reflections on the use of different data sources and collection techniques (survey or enumeration), including total survey error estimation and data analysis methods e.g. time series analysis and seasonal adjustment. The diverse economic conditions, the varying cost of systematic data collection, and the different amount of resources made available for establishing and maintaining a fishery statistical collection system or for improvements to an existing system, necessitate the adoption of firm priorities.
3. Practical design issues. Data types and variables on which information needs to be collected should be tailored to the structure of national fisheries and an overall strategy is required to decide on the data collection methods. As with other types of statistical series, the methods most commonly used include surveys, based on either complete enumeration (e.g. vessel registers, infra-structural data, aquaculture production units) or on sampling. Complete enumeration is expensive, but may be essential for certain data sets. Sampling is more cost-effective, but caution is required in designing the distribution of sampling effort in time and space. Some fisheries are small and a ~~fully fledged~~fully-fledged statistical program~~me can~~may not be justified based on costs.
4. Survey evaluation. The survey should be kept under review; a valid design may become obsolete because of changes in fishing or landing practices. In general, it is preferable to invest in the improvement of the existing system rather than to set up a new independent data collection system. Where the industry is sufficiently organized with centralized marketing facilities or auctions, it is possible to obtain reliable records of the total catch and value without the need for sampling and recording directly, except for occasional checks. Where no records are available, the collecting system must start with a complete survey to obtain the most basic information on ports, landing sites, numbers and type of vessels, and sample surveys to identify species landed and their utilization.

Experience has shown that national and regional statistical programs generally rely on census-based and sample-based schemes for data collection as well as licensing and compliance data available from fishery agencies and registries. Census-based schemes apply primarily to industrial and semi-industrial fisheries, where data are ~~directly~~ collected by ~~obtained from~~ the operators ~~themselves~~and reported to the relevant fishery authority, usually as part of the licensing and reporting requirements~~process~~. Sample-based schemes are used for the artisanal fleets which are often characterized by ad-hoc local/community based sub-sectors and a large number of fishers which are geographically dispersed, thus making difficult the collection of information covering the whole of the fishing activity.

Fishery data and statistics ~~data~~ are used extensively for resource status evaluation and sampling programs are often focused on the data required for the management of the biological resources. However, best practice requires an integrated approach to fishery management which takes into account the biological, environmental, social and economic aspects of fisheries.

The lack of adequate and reliable capture fishery and aquaculture statistics for many countries, and for developing countries in particular, are issues that CWP and its member agencies address and provide guidance on the establishment of cost-effective and sustainable data collection schemes and methodologies. CWP may also be influential in motivating donor-support for fishery statistical development, projects and training. In order to address inadequacies in reliable capture fishery and aquaculture statistics, CWP has included in this handbook the concepts and definitions for logbooks for use in census-based and sample-based schemes for collecting primary data which may be used *inter alia* for statistical purposes ~~collection~~ (refer Logbook ~~i.e. collecting primary~~guidelines data).

There are a number of other issues that affect the quality of national and regional fishery statistics.~~:~~

1. ~~The first concerns~~ D~~d~~ata coverage. The data may be incomplete in terms of the range of variables and fishery sectors sampled. Consequently, records in the national or regional databases may include estimates which are derived from assumptions made about fishery sectors and variables which may not have been adequately sampled.
2. ~~A second issue relates to d~~Differences in statistical concepts and methodologies used by national or regional authorities for collecting the data. Methodological variations often make comparability of statistics a difficult task, especially when the degree of accuracy of national or regional data varies amongst fishery authorities.
3. ~~A third issue concerns the q~~Quality of primary data. Although data quality assurance ~~–~~is the responsibility of the relevant fishery authority, it nevertheless has a strong impact on the overall quality of regional and global statistics. Thus, improving data quality and protecting the credibility of fishery statistics requires interaction with relevant fishery authorities and countries and resources invested in capacity building at the national level, including the development and improvement of logbook data collection.

With regards to the ~~latter~~point (3) above, political willingness of the national authorities backed by adequate funding is ~~necessary~~ needed for the adoption of measures deemed necessary to improve and maintain data quality.

CWP Handbook: General concepts

[Editorial note: General concepts include the following section: introductory page, country or areas; time units; currencies and finds; major fishing areas – general; fishing areas for statistical purposes; identifiers for aquatic animals and plants (http://www.fao.org/cwp-on-fishery-statistics/handbook/general-concepts/country-or-areas/en/). It is proposed to move conversion factors into general concepts as conversion factors apply to both capture fisheries and aquaculture. In addition, a new paragraph (highlighted below) on date and time is proposed in the section on time units; the other sections remain as published and are not included here.]

Conversion factors

[Editorial note: It is proposed to move conversion factors (http://www.fao.org/cwp-on-fishery-statistics/handbook/capture-fisheries-statistics/conversion-factors/en/) here, as conversion factors apply to both capture fisheries and aquaculture].

Time units

The ~~Gregorian civil~~ calendar year (Gregorian calendar, ISO 8601~~, referred herein as calendar year~~), i.e. the period between 1 January and 31 December, is the annual time unit ~~normally~~ often used in fishery statistics.

For certain specific purposes (e.g. ~~historic~~ Antarctic fisheries~~, ; and~~ fiscal purposes) it may be deemed more appropriate to use a different 12-month period which may be referred to as a split year. Such situations arise when the sector under consideration exhibits appreciable activity over the end of the

calendar year. The end points of ~~a~~the split year may be selected as desired but should be preferably at a time when activity in the sector is reduced. Examples of split years in use by various fishery authorities include 1 July - 30 June (of the following year), 1 October – 30 September and 1 December – 30 November. ~~For historic Antarctic fisheries, the split year was defined as 1 July-30 June. Countries using a split year are: Australia (1 July - 30 June); Bangladesh; Myanmar (1 July - 30 June); Nepal; US Virgin Islands (1 July - 30 June).~~ [See also: Key economic variables and indicators]

~~The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) covering the FAO Major Fishing Areas 48, 58 and 88, used to collect data on a split year basis 1 July - 30 June up to June 2002. In November 2002 the Commission adopted the "CCAMLR fishing season" as the annual interval for reporting fishery activities. The "CCAMLR fishing season" begins on 1 December and ends on 30 November of the following year. All fisheries managed by CCAMLR now operate within this annual interval, and the "CCAMLR fishing season" has replaced the previously used split year.~~

In tabulations where space restricts the labeling of a split year to a single year or where data for calendar and split years are tabulated together, the practice is for the split year to be represented by the calendar year in which the split year ends. Thus a split year recorded in a statistical bulletin as 2002 refers to the split year 2001-2002.

Attention is drawn to the apparent anomalies that may be observed when comparing data from two sectors of fishery statistics. For example, in highly seasonal fisheries occurring at the end of the time period, recorded data on catches may not be matched by corresponding data on landings. This is explained by the catches being made in one time period, and the landings in the following one. Similar situations can arise with fishery commodities production and trade data.

~~UTC~~ Date and time standard

For compatibility of national and regional fishery statistics, it is recommended that ~~D~~date and time ~~must~~ be recorded in ISO 8601 format using the Gregorian calendar and 24-hour time keeping system. The general format is to record date as YYYY-MM-DD (or YYYYMMDD), time as hh:mm:ss (or hhmmss), and date time as YYYY-MM-DDThh:mm:ss (or YYYYMMDDThhmmss); seconds may be provided optionally. The recorded date and- time should ~~and~~ represent the date and time of a measurement, observation or event, or the date and time when data were obtained by a vessel's navigation equipment or other electronic device, ~~e.g. 2008-10-31T15:07:38Z (milliseconds can be provided optionally). For compatibility of national and regional fishery statistics,~~ and all dates and times reported in logbooks and fishery statistics should~~must~~ be refer~~r~~enced to Coordinated Universal Time (UTC). In cases where dates and times are reported in local time, then the UTC offset (±hh or ±hh:mm) at the location ~~must~~ should also be reported. For example:

UTC date and- time 2008-10-31T15:07Z (where Z denotes a zero UTC offset), or

local date and -time 2008-10-31T17:07+02 (where +02 denotes a UTC offset of +2 hours)

Note that to calculate UTC date and -time one has to subtract the offset from the local date and -time.

CWP Handbook: Capture fisheries statistics

[Editorial note: Capture fisheries statistics includes the following sections: introductory page, catch and landings, nationality of catch and landings, fishery fleet, fishing gear classification, logbooks and VMS, ~~conversion factors,~~ fishing effort, integrated environmental and economic accounting for fisheries, fisheries statistics for an ecosystem approach (http://www.fao.org/cwp-on-fishery-statistics/handbook/capture-fisheries-statistics/en/). Additions and amendments are proposed below for the introductory page and sections on catch and landings, nationality of catch and landings, fishery fleet, fishing gear classification, fishing effort, and logbooks and VMS. A new section on logbook guidelines outlines the use of logbook modules for collecting data which in turn may be used *inter alia* for statistical purposes. In addition, it is proposed to change the menu selection order for the sections on conversion factors and fishing effort for improved flow. The other sections remain as published and are not included here].

Capture fisheries are characterized by wide diversification which reflects each fishery's purpose and adaptation to regional, economic and cultural factors. Fisheries are conducted in marine, brackish and freshwater environments and may involve subsistence, artisanal, industrial and recreational fishery sectors. Some ~~F~~fisheries ~~may~~ require the use of~~involve~~ fishing vessels while other fisheries may be~~or be~~ land-based. ~~, and t~~The catch may be used solely by fishers and their families or traded amongst communities or markets. In addition, some fisheries may be integrated with aquaculture, such as the collection of wild-caught fish for subsequent rearing in cages or the release of fingerlings in fish restocking operations (http://www.fao.org/cwp-on-fishery-statistics/handbook/aquaculture-statistics/en/).

Each capture fishery may be characterised by a specific set of activities which relate to the type of fishing gear used, the target species, the fishing area (i.e. fishing zone or ground) and the flag of the fishing vessel (when used) or nationality of the fisher. These activities may include some or all of the following (refer to Logbook Guidelines for definitions):

- searching for, attracting, locating, catching, taking or harvesting fish or any activity which can reasonably be expected to result in the attracting, locating, catching, taking or harvesting of fish,
- supporting, or preparing for, fishing, including the landing, packaging, processing, transhipping or transporting of fish that have not been previously landed at a port, as well as the provisioning of personnel, fuel, gear and other supplies at sea.

The capture fishery concept (Figure 1) outlines the key components of the fishery and the flow of logbook data collected during the course of fishing (refer to 'Logbook Guidelines' for definition of terms). The logbook data may be used *inter alia* to derive fisheries statistics on ~~fundamentally gathers indication of~~ human fishing activity, including from economic, management, biological/~~-~~environmental and technological viewpoints (http://firms.fao.org/firms/concepts/en). Fisheries are an economic sector of society and fisheries statistics are required for effective policy-making and sectoral planning.

Fisheries statistics fall into three categories: (1) statistics documenting the removal of fish and other aquatic organisms, (2) statistics documenting the fishing effort and the fleets that exploit the resources, and (3) statistics documenting the labour force, income, costs and invested capital that are used in this exploitation ~~(Figure 1)~~. Fisheries statistics are essential as a basis for describing the contribution of fisheries to the national food supply and ~~to~~ the economy (e.g. through the system of

national economic accounts). Policy-making often is done with one or more of the following objectives:

- to assure that exploitation is within sustainable limits and generally in accordance with the FAO Code of conduct on responsible fisheries
- to sustainably harvest fish for domestic requirements
- to develop exports (foreign currency income to the country)
- to improve the socio-economic conditions of fishers
- to promote the sustainable expansion of fisheries (improve the economy of the country).

The relationships between fishery statistics and the essential policy objectives are key determining factors in analysing the needs for fishery information. Fisheries statistics are also required in relation to monitoring, surveillance and control of the exploitation of the resources.

The focus in best practice fisheries management is ~~based on~~ the conservation and sustainability of natural resources using an ecosystem approach, food supply security and maximization of economic performance through the control of fishing capacity, fishing effort (e.g. temporal/spatial access to resources) and the allocation of catch limits and/or quotas ~~and temporal/spatial access to resources~~. Fishery statistics, including data on fishers and fishing vessels, are essential ~~to~~ for the monitoring and management of fisheries. These statistics may be derived from logbook data which are collected by fishers and submitted to the relevant fishery authorities, and the 'Logbook Guidelines' outline the logbooks for such a purpose.

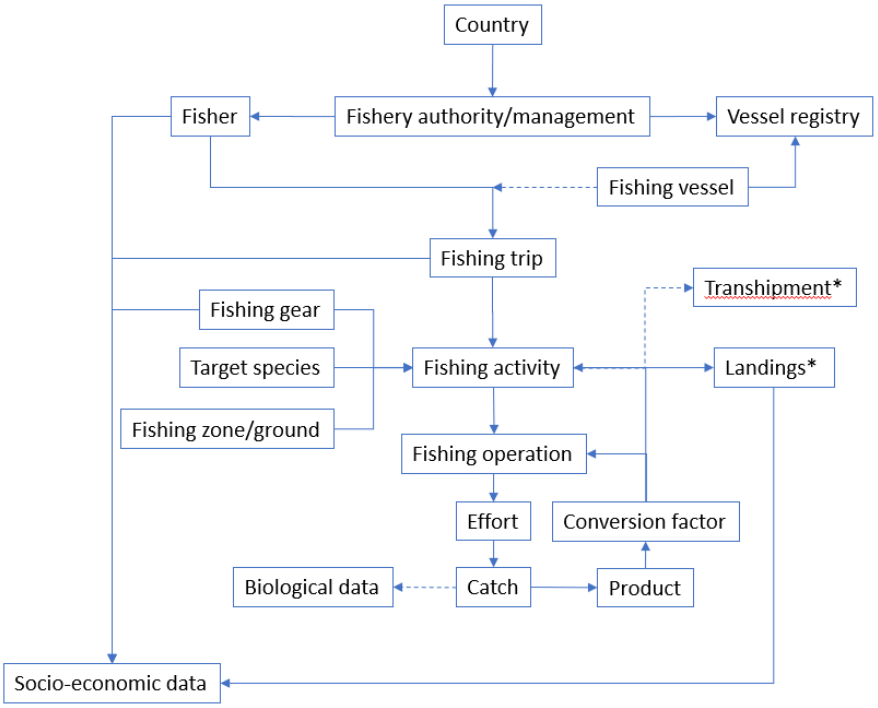

Figure 1: Capture fishery concept. Key components (boxes) of a capture fishery and flow of logbook data (arrows) during the course of fishing. The data may be used *inter alia* for statistical purposes (refer to 'Logbook Guidelines' for definition of terms). * = Subset of fishing activity; dashed line: optional.

Catch and landings

The overall aim for statistics on catch and landings is to report on fisheries contribution to the national economy, to the provision of food (subsistence) and on the total removal of fish and other organisms from the sea. Catch Statistics are internationally reported as "nominal catches" which refers to the landed weight of productsings converted to a live weight basis. There are fisheries where the number of individuals caught is also required to be reported. However, fisheries impact on the ecosystem goes beyond the landed fish and shellfish and includes fish otherand organisms impacted by the fishing gear. Some of these are brought on deck and later discarded. The various components of the catch are described in the catch concept diagram (Figure 24) and the definitions of these components provided below.

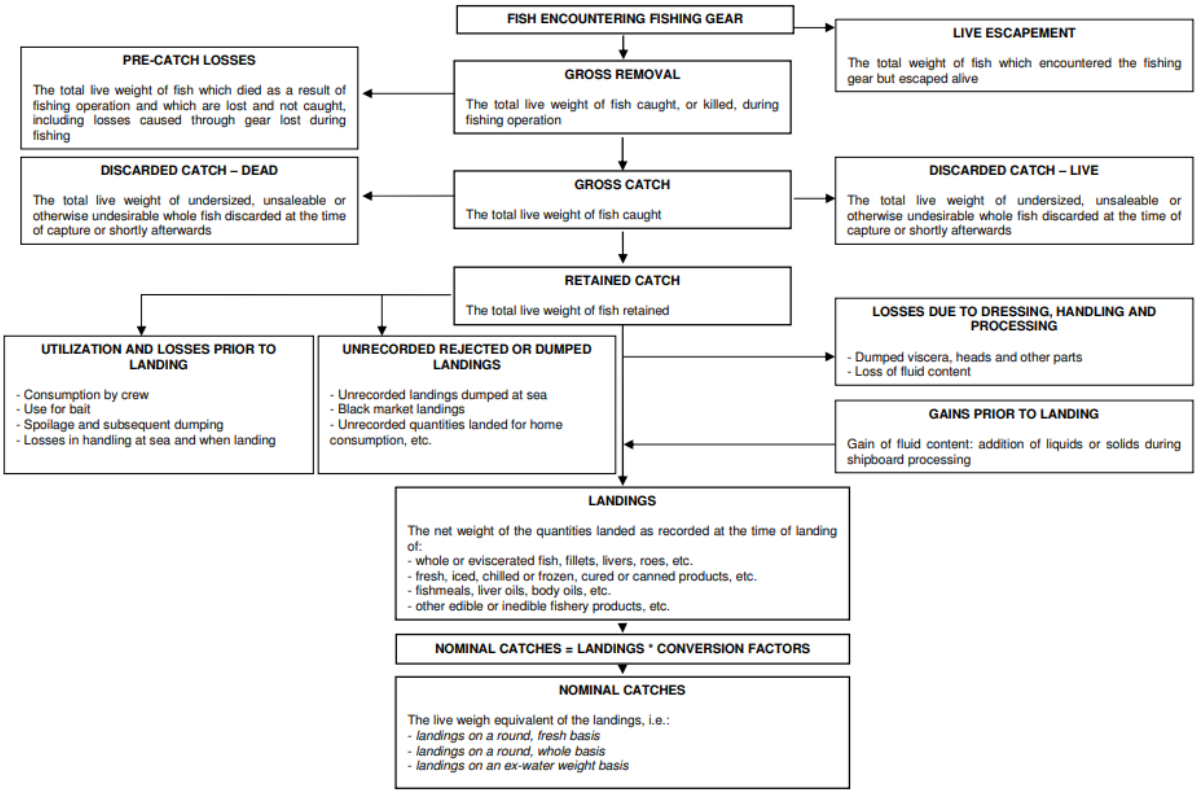

Figure 2: Catch conceptss diagram
(as published in the Handbook, refer http://www.fao.org/3/bt981t/bt981t.pdf)

Catch and landings statistics are for many purposes required as detailed data e.g. broken down by fleet, gear, season, target species and geographic area or fishing zone. The nationality of landings follows the vessel flag state principle as described in Nationality of Catch and Landings.

National and regional fisheries organisations publish annually catch statistics in different forms. FAO collects and collates national reportsing with the goal ofto disseminatinge global capture production statistics. These statistics are summarised in "FAO Statistical Yearbooks" and are available from the FAO Fisheries and Aquaculture Statistics website (http://www.fao.org/fishery/statistics/global-capture-production/en). When using published catch and landing statistics it is to be recognised that

the catch of certain species (e.g. discarded catch and bycatch) may be under-reported or not reported ~~non-reporting of landings is a major concern~~ in some fisheries.

[Editorial note: The ordering of the definitions below has been revised]

The following definitions are provided for the purpose of collecting statistical data.

Fish: A species or group of species of living aquatic (i.e. marine, freshwater or brackish) resources which are targeted during fishing or associated with the catch of the target species or group, subsequently~~whether~~ processed or not, many of which ~~is/~~are recorded in the ASFIS List of Species for Fishery Statistical Purposes. The ASFIS classification system provides information on the species descriptors (ISSCAAP code, taxonomic code, 3-alpha code, scientific name, Names in English, French and Arabic etc.) and ISSCAAP codes which allow species to be grouped taxonomically. Other types of grouping or splitting of species may be implemented to meet specific national or regional reporting requirements, and in such cases the mapping against codes of the ASFIS classification is essential in order to facilitate data exchange.

Live weight: Weight of fish ~~or other organisms~~ when brought on board alive and prior to processing.

Retained catch: Component of the catch which is retained during a fishing trip ~~on board the fishing vessel~~ (refer to the catch concept, Fig. ~~4~~2). The retained catch is reported as total live weight of fish ~~and other organisms~~ retained and in some fisheries the number of individuals retained is also required to be reported. If a retained catch is intended to be transferred to cages for the fattening of fish in aquaculture, then for fishery statistics that retained catch is required to be ~~subsequently~~ recorded as 'for other purposes of utilization and process' ~~unrecorded, rejected or dumped landings'~~ and any post-release mortality of that catch is required to be recor~~d~~ded as 'discarded catch'.

Product weight: Weight of a fish product, often measured at-sea at the conclusion of processing ~~at the time of weighing~~. Information on product type, product homogeneity and conversion factors is also required in order to interprete product weight. ~~Thus it does not describe the presentation of the product and, unless it is known that the product is homogenous in form, further analysis has to proceed with caution.~~ As for landed weight, relevant when calculating the value of the catch.

Landed weight ~~(often referred to as landings)~~: Weight of a product at the time of landing, regardless of the state in which the product is landed. That is, the fish may be *inter alia* whole, or gutted or filleted. Consequently this measure is of limited use for further analysis except where information is available on product type and homogeneity~~it is known that the product is homogenous in nature~~. Where more detailed analysis of the data is required, the landed weight is generally converted to a more meaningful measure often by use of a conversion factor (refer Conversion Factors), the most frequently used measure being ~~the~~ "nominal catch~~"~~ (refer below). The landed weight is relevant in economic analysis being the one to which first-hand sales prices refer.

Nominal catch (also referred to as nominal landings): Landed weight~~ings~~ converted to a live weight basis often by use of a conversion factor (refer Conversion Factors). Nominal catch is often referred to as the l"~~L~~ive weight equivalent of the landed weight~~ings~~" or shortened to the "Live weight", and in some national publications it is also referred to as "Landings on a round, fresh basis", "Landings on a round, whole basis" or "Landings on an ex-water basis". Care should be taken when referring to the nominal catch as the 'catch' since in many situations the catch includes discarded components which

are not landed (refer to the catch concept, Fig. 4). Often, in further processing the data, conversion factors are applied to the individual products (i.e. landed weight) which express the weight in a more homogenous way. Once verified, nominal catch is also in many cases the definitive declaration of what was caught and the amount which is applied against quotas or reported by a country.

Discarded catch: Component of the catch which is ~~discarded overboard (refer to the catch concept, Fig. 4). The discarded catch is~~ the total live weight of undersized, unsaleable or otherwise undesirable whole fish and other aquatic organisms which are discarded at the time of the capture or shortly afterwards (refer to the catch concept, Fig. 2~~4~~). Discarded catch refers to whole fish and other aquatic organisms ~~may be~~ discarded dead or alive, and may include species taken as bycatch. Discarding in some fisheries is prohibited.

Bycatch: [Editorial note: this definition of bycatch includes incidental catch, and is presented here for further consideration by CWP]. Component of the ~~Part of a~~ catch which represents non-targeted fish associated with the catch of the target species or group towards which fishing effort is directed, or other aquatic organisms taken incidentally during the course of fishing (e.g. birds, mammals, reptiles, invertebrates)~~, or associated with the catch of the target species towards which fishing effort is directed~~. Some or all of the bycatch may be returned to the sea as discarded catch~~s~~, either dead or alive ~~usually dead or dying (i.e. injured)~~. The catch taken incidentally is also referred to as incidental catch.

~~Logbooks provide estimates of the catch and for many~~ In industrialised fisheries catches are often recorded in logbooks and these ~~information~~ data ~~is available and~~ may be used to derive catch statistics~~for a direct estimate of the catch~~. However, the accuracy of weights measured at-sea and~~s~~ recorded in logbooks ~~on fishing logsheets~~ depends on the available weighing technology and/or the experience of the person making a visual assessment of the volume and composition of a catch (refer to the section 'Logbook guidelines').

Non-reporting of ~~landings~~ nominal catch is a major concern in some fisheries. Further, ~~M~~many national statistical publications do not use the terms associated with "~~"~~catch~~"~~ and "~~"~~landings~~"~~ with the precise meanings as described in this section. In such publications, "nominal catches" may in fact refer to the ~~"landings" and be expressed on a~~ landed weight ~~basis~~ of products. However, only where the primary production (used in the economic and not the biological sense) is landed as whole fish is it ~~is~~ correct to refer to such quantities as nominal "~~"~~catch~~es~~".

Nationality of catch and landings

Nationality of catch and landings: For the purpose of reporting national fishery statistics, ~~the~~ catch and landings are ~~generally~~ assigned to the country of the flag flown by the fishing vessel. However, the CWP recommend~~sed~~ that this may be over-ridden ~~only when~~if one of the following arrangements between a foreign flag vessel and the host country exists:

- the vessel is chartered by a company based in the host country to augment its fishing fleet;
- or the vessel fishes for the country by joint venture contracts or similar agreements (as opposed to the ad-hoc practice of a vessel selling catches to a foreign vessel or landing catches

at a foreign port) and the operation of such vessel is an integral part of the economy of the host country.

In either case, the assignment of nationality to catch and landings data should be specified in the charter or joint-venture agreements.

To ~~cover~~ facilitate assigning the nationality of catch and landings, the Handbook includes a list of countries and areas (http://www.fao.org/3/bt978e/bt978e.pdf) with ISO Alpha 2 codes, ISO Alpha 3 codes and the M49 standard ('Standard Country or Area Codes for Statistical Use' originally published as Series M, No. 49).

Fishery Fleet

[Editorial note: the text from the Handbook has been modified with minor edits to improve clarity. CWP-26 will be requested to endorse a revised ISSCFV classification and therefore the text below will need to be amended according to the outcome of the meeting]

The term "fishery fleet" or "fishery vessels" refers to mobile floating ~~objects~~ platforms of any kind and size, operating in fresh, brackish or marine waters which are used for catching, harvesting, searching, transporting, landing, preserving and/or processing fish, shellfish and other aquatic organisms, residues and plants. Fishery vessels include both 'fishing vessels' and 'non-fishing vessels'.

The term "fishing vessel" is used instead when the vessel is engaged only in catching operations.

The term "non-fishing vessel" applies to vessels performing other functions related to fisheries, such as supplying, protecting, rendering assistance or conducting research or training.

In order to assess fleet capacity, it is necessary as a bare minimum to have estimates of vessel numbers and main vessel characteristics. If the fleet consists of only one type of vessel, the number of fishing vessels may be used to express the total fishing power or capacity of the fishing fleet. If the fleet consists of vessels of different types, any survey to determine the capacity of a given fishing vessel would need to collect information on a number of vessel characteristics. Vessel type, gross tonnage, length and engine power would be amongst the most important characteristics. The exact fishing capacity indicator used will depend on the characteristics of the fishery or fleet and the availability of reliable data. For example, it is generally accepted that for trawlers the single most important factor is engine power. For gillnetters, however, engine power would be of limited importance. Applying a universal capacity measure across a range of fisheries may therefore prove inadequate in addressing the issue of global fishing capacity measurement.

In international law, as well as in practice, ~~several~~ two systems of tonnage measurement of ships have existed side by side[1]: Gross Registered Tonnage (GRT) defined by the Oslo Convention (1947), and

[1] Traditionally, records of measurements of a ship's size were expressed in tons of 100 cubic feet each (Gross Registered Tonnage or GRT); tonnage was used as a basis for taxes, berthing, docking, passage through canals and other facilities. This system of tonnage was defined by the Oslo Convention in 1947. However, the method of tonnage measurement has evolved and differs considerably from country to country. The International Convention on Tonnage Measurement of Ships, known as the 1969 Tonnage Convention, entered into force in July 1982, though existing ships were not required to comply with the Convention until July 1994. At that time, gross tonnage (GT), as defined by the 1969 London Convention, became obligatory for all vessels of 24 m in length and over, and engaged in international voyages. Until 1994 the system of tonnage defined by the Oslo Convention (1947, using GRT as unit of measurement) continued to be valid.

Gross Tonnage (GT) defined by the London Convention (1969). [Editorial note: the following text has been move to a footnote]. ~~Traditionally, records of measurements of a ship's size were expressed in tons of 100 cubic feet each (Gross Registered Tonnage or GRT); tonnage was used as a basis for taxes, berthing, docking, passage through canals and other facilities. This system of tonnage was defined by the Oslo Convention in 1947. However, the method of tonnage measurement has evolved and differs considerably from country to country. The International Convention on Tonnage Measurement of Ships, known as the 1969 Tonnage Convention, entered into force in July 1982, though existing ships were not required to comply with the Convention until July 1994. At that time, gross tonnage (GT), as defined by the 1969 London Convention, became obligatory for all vessels of 24 metres in length and over, and engaged in international voyages. Until 1994 the system of tonnage defined by the Oslo Convention (1947, using GRT as unit of measurement) continued to be valid.~~

Although the London Convention has been adopted for vessels of 24 m in length and over, for many vessels only data by the Oslo Convention are available. The two conventions produce very different tonnage values[2], and the~~.~~ ~~The~~ situation may var~~ies~~ from country to country, as measuring units defined at national level can also be used to determine the tonnage of vessels operating without an international tonnage certificate.

~~The two conventions produce very different tonnage values.~~ [Editorial note: the following text has been move to a footnote]. ~~GRT refers to the total measured cubic content of the permanently enclosed spaces of a vessel, with some allowances or deductions for exempt spaces such as living quarters (1 gross register ton = 100 cubic feet = 2.83 cubic metres). GT for vessels of 24 metres in length and over refers to the volume of all enclosed spaces (from keel to funnel) measured to the outside of the hull framing. Although GT measurement is higher than GRT, there is no simple correlation between the two units (GT is often double the GRT, but sometimes as much as four times the GRT).~~

The magnitude of the task of reaching international agreement on standardized measurement units for vessel tonnage, of introducing these units into national regulations, and of re-measuring all fishing vessels is a lengthy, complex and costly process.

[Editorial note: the text which follows will probably have to be amended after CWP-26 based on the outcome of the meeting; CWP-26 will be requested to endorse a revised ISSCFV classification. The revised ISSCFV standard is based on the main structural characteristics of fishing and non-fishing vessels, and the use of LOA classes]

For statistical purposes three~~two~~ main classifications were adopted by the CWP for classifying fishery vessels by tonnage, ~~and~~ type~~s~~, and length:

1. The ~~"~~International Standard Statistical Classification of Fishery Vessels by GRT Categories~~"~~ (ISSCFV) - Annex L. I. based on the Gross Register Tonnage of the vessels, approved by the CWP (Coordinating Working Party on Fishery Statistics) in 1977. (Download pdf or csv file)

[2] GRT refers to the total measured cubic content of the permanently enclosed spaces of a vessel, with some allowances or deductions for exempt spaces such as living quarters (1 gross register ton = 100 cubic feet = 2.83 m^3). GT for vessels of 24 m in length and over refers to the volume of all enclosed spaces (from keel to funnel) measured to the outside of the hull framing. Although GT measurement is higher than GRT, there is no simple correlation between the two units (GT is often double the GRT, but sometimes as much as four times the GRT).

2. The 'International Standard Statistical Classification of Fishery Vessels by Vessel Types' (ISSCFV), based on the type of gear used by the vessels, Annex L. II, approved by the CWP in 1984. (Download pdf or csv file)

2.

3. In addition, CWP in 1982 agreed on anThe 'International Standard Statistical Classification of Fishery Vessels by by Length Classesategories Vessel Types' (ISSCFV) based on vessel length overall (–Annex L. VI) , based on vessel size, Annex L. VI.

Length overall (LOA): The most frequently used and preferred measure of the length of a fishing vessel is length overall (LOA) which and refers to the maximum length of a vessel from the two points on the hull most distant from each other, measured perpendicular parallel to the waterline.

Other measures of the length of vessels are:

- Waterline length (LWL) refers to the length of the designed waterline of the vessel from the stern to the stern. This measure is used in determining certain properties of a vessel for example, the water displacement;
- Length between perpendiculars (LBP) refers to the length of a vessel along the waterline from the forward surface of the stern, or main bow perpendicular member, to the after surface of the sternpost, or main stern perpendicular member. This is believed to give a reasonable idea of the vessel's carrying capacity, as it excludes the small, often unusable volume contained in her overhanging ends. On some types of vessels this is, for all practical purposes, a waterline measurement. In a vessel with raked stern, naturally this length change as the draught of the ship changes, therefore it is measured from the defined loaded condition.

Standards for fishery fleet reporting (STATLANT questionnaires)

Data on fishery fleet are collected by means of the statistical questionnaire FISHSTAT FF. Form FF1 is used for the collection of data on "decked vessels", whereas form FF2 is intended for "undecked vessels" for which the most important distinction is made between "powered" and "not-powered" crafts. Starting with the collection of data for 1996 several other changes were implemented in the FISHSTAT FF inquiry: non-fishing vessels were excluded from the inquiry (see Annex L. III, http://www.fao.org/3/a-bt984e.pdf), numbers and capacity data are now collected for broad groups of fishing vessels types and length overall has been defined as the main characteristic of measurement in international data collation (see Annex L. IV, http://www.fao.org/3/a-bt985e.pdf).

Fishing Gear Classification

[Editorial note: Proposed revision of the text from the Handbook to reflect the current status of ISSCFG. Annexes M I and II have been removed, and Annex M III is now Annex M with a revised heading. The references and resources remain as published, with the addition of a reference included at the end of this section. Annex M is included at the end of this document.]

The International Standard Statistical Classification of Fishing Gear (ISSCFG) was originally adopted at the 10th CWP Session (Madrid, 22-29 July 1980).

The current ISSCFG (Annex M) was adopted at the 25th CWP Session (FAO 2016) following a revision conducted by the 'Ad hoc group for developing the draft revision of CWP gear classification' in collaboration with the ICES/FAO Working Group on Fishing Technology and Fish Behaviour (WGFTFB)

(refer FAO 2010 and FAO 2014). The ISSCFG standard abbreviations are based on the alpha-codes used in the original classification (FAO 1980), and the relationship between the current ISSCFG and the original version (1980) is shown in Annex M. The ISSCFG provides a global ~~level~~ structure for the classification of fishing gear and provides for national or regional variations to be ~~may be subsequently~~ included a~~ts~~ sub-levels of the classification.

Although this classification was initially designed to improve the compilation of harmonised catch and effort data in the STATLANT B questionnaires and fish stock assessment exercises, it has also been found useful for fisheries technology development and the training of fishers. ~~It~~The ISSCFG has been used in particular for reference in work dealing with the theory and construction of gear and for the preparation of specialized catalogues on both artisanal and industrial fishing methods.

[Editorial note: additional reference below]

FAO. Report of the twenty-four session of the Coordinating Working Party on Fishery Statistics. Rome, Italy, 5-8 February 2013. FAO Fisheries and Aquaculture Report. No. 1077. Rome, FAO. 2014. 124p.

Fishing effort

[Editorial note: It is proposed to move this section here, so as it immediately follows the section on fishing gear classification]

Fishing effort is generally defined in terms of ~~as the sum of~~ the time spent searching for fish (search duration) and/or the amount of fishing gear of a specific type used on the fishing grounds over a given unit of time e.g. a fishing operation, fishing activity, day or fishing trip. The measure of effort (unit of fishing effort) depends on the fishery and type of gear used. The impact of a unit of fishing effort on the fish populations and the ecosystem in general differs amongst vessels and fishers and depends on the gear deployed. As a result, effort statistics often need to be qualified (e.g. by vessel type, ~~and size and~~ engine power, seasonal effect). When two or more kinds of gear are used or when the same gear is used for example by different classes of vessel, the respective efforts must be adjusted to some common standard before being aggregated across all classes. This common standard is sometimes referred to as effective fishing effort. Standard measures of effort for each ISSCFG category of fishing gear are listed in Table 1. The parameters from haul-by-haul data (i.e. logbook~~primary~~ data) required to obtain these standard measures are listed in Table 2 (refer section 'Logbook guidelines').

[Editorial note: The CWP ad-hoc Task Group on reference harmonization for capture fisheries and aquaculture is currently developing the standard measures of effort and globally applicable outcomes of this work will be reflected here in due course].

Table 1: Standard measures of effort for each category of fishing gear. See also Table 2, and Report of technical workshop on global harmonization of Tuna fisheries statistics, March 2018, Session 6.2 and Appendix 8.

Fishing gear category (ISSCFG, 2016)	Standard measures of effort Haul-by-haul data	 Aggregated data
Surrounding net (01)	Soak time	Number of sets

		Number of days fished
Seine (02)	Soak time	Number of sets Number of days fished
Trawl (03)	Tow duration Tow length, volume, swept area	Number of tows Tow duration Number of days fished
Dredge (04)	Tow duration Tow length, volume, swept area	Number of tow Tow duration Number of days fished
Lift net (05)	Soak time	Number of sets Soak time Number of days fished
Falling gear (06)	Soak time	Number of sets Soak time Number of days fished
Gillnet and Entangling net (07)	Soak time Length of net set	Number of nets set Number of sets Length of net set Number of days fished
Trap (08)	Soak time	Number of traps set Number of sets Soak time Number of days fished
Hook and line (09)	Soak time Number of hooks set Length of line	Number of fishers Number of reels/machines, hours operated Number of hooks set Number of lines set Length of line set
Dive (10.8)	Dive time	Number of hours dived Number of days fished

Standards for fishing effort reporting (STATLANT questionnaires)

Three levels of precision of fishing effort are identified in reporting forms used in STATLANT questionnaires. Data should be provided for all three levels under the following categories.

Category A refers to a detailed unit of measure, e.g. hours fished or number of sets, etc. These units of measure will vary with the gear used. For possible combinations of gear and effort see Annex N I (http://www.fao.org/3/a-bs245e.pdf).

Category B refers to "number of days fished", i.e., the number of days on which fishing took place. For those fisheries in which searching is a substantial part of the fishing operation, days in which searching occurred but no fishing took place should be included in "days fished" data.

Category C refers to "number of days on ground" in addition to days fishing and searching; here all other days while the vessel was on the ground should be indicated.

Another category (Category D in STATLANT form B21) uses the "percent of pro-rated effort" to estimate the percentages of the catches when data are incomplete.

The effort may be nominal, reflecting the simple total of effort units exerted on a stock in a given time period. It may also be standard or effective when corrected to take account of differences in fishing power and efficiency and ensure direct proportionality with fishing mortality and this relates usually to a specific fishery and gear. If more than one gear is considered, standardization in relation to one of them is necessary. For biologists, a good measure of fishing effort should be proportional to fishing mortality. For economists it should be proportional to the cost of fishing.

[Editorial note: A proposed standard list of required effort units for each gear has been elaborated by Tuna RFMOs (refer to Report of technical workshop on global harmonization of Tuna fisheries statistics, March 2018, Session 6.2) and globally applicable outcome of this work will be reflected here in due course].

Logbook guidelines

The compilation of comprehensive and representative regional and global fishery statistics is largely dependent on the availability of primary data from capture fisheries which are collected using standard methodology (refer Methodology for data collection). The use of standard methodology facilitates the collection of quality assured data which are compatible across fisheries and fishery authorities. This methodology includes globally-agreed logbook guidelines for the collection of primary data from capture fisheries which, in turn, provides a data collection tool for generating statistics. These guidelines define metadata standards for data collection which encompass concepts, classifications and reference harmonization standards which facilitate the exchange of fishery statistics derived from aggregated primary data.

Application of logbook guidelines at national and regional level

The logbook guidelines in this Handbook outline the use of logbooks for collecting data which may be used *inter alia* for statistical purposes. The guidelines identify common information that should be collected in all types of capture fisheries. Regional and national fishery/management authorities are encouraged to implement these guidelines, or an equivalent approach, to ensure that appropriate standards are implemented and maintained when reporting fishery statistics at national and regional levels in support of the sustainable management of fisheries. These guidelines are consistent with the Code of Conduct for Responsible Fisheries (http://www.fao.org/fishery/code/en).

These ~~global~~ guidelines provide standard concepts and definitions for logbooks for use for statistical purposes, and promote a modular approach to the development of regional and national logbook programs~~guidelines~~. The modular approach provides flexibility in the collection and reporting of essential data and fishery statistics ~~information~~ required to meet the fishery monitoring, assessment and management needs of a fishery/management authority which implements regional or national logbook programs~~guidelines~~. Each module contributes to an incremental increase in the level of detail in data collection and reporting for a fishing trip and related fishing activities and operations.

The modular approach encompasses a broad range of data types which may be reported in either a simple logsheet recording the daily activity of a small-scale fisher or a detailed logbook recording information for each fishing operation (often referred to as haul-by-haul or per haul data). A logbook provides *inter alia* a method of collecting statistical information on capture fisheries~~commercial fishing activities~~, and may also assist the master of a vessel ~~to~~ in recording systematic information on fishing ~~operations~~ for future reference and decision-making.

Best-practice census-based schemes for data collection record logbook data from each individual fishing operation while sample-based schemes generally collect data aggregated by individual fishing trip. The aggregated data reported in the STATLANT questionnnaires (Category A, B and C above) are derived from logbooks where catch and effort are reported at the level of a fishing trip, fishing activity or fishing operation.

[Editorial note: It is proposed to include here a link to a CWP repository listing regional standards for logbooks or guidelines with corresponding links to relevant documents and authorities]

Logbooks

Fishing vessels use paper-based or electronic logbooks to record information related to fishing trips, activities and operations, including vessel and trip specifications and catch and effort data. The level of detail reported in a logbook (i.e. level of granularity) is usually defined as a condition of a fishing licence issued by a fishery/management authority. At the highest level of granularity, relevant data are recorded for each fishing operation. At lower levels of granularity, data may be recorded for each fishing activity, or a cluster of fishing activities (including daily reporting), or a fishing trip. This section provides global guidelines for logbooks which address the needs for types of data and definitions for logbook implementation at national and regional levels.

With the ever-growing amount of control being exercised in many fisheries, the provision of fisheries data ~~statistical information~~ has become increasingly used or contemplated as a mandatory requirement for the granting of licenses or permits to fish. Even where no licensing system is in operation, but where monitoring of fishing activities forms an essential aspect of control, the need to maintain precise records of fishing activities and operations in the form of logbooks is recognised and is frequently a mandatory requirement.

Logbooks record data in live weight and where these data are of sufficient quality dependent on the available weighing technology on board, these data can replace the use of 'Conversion factors'.

The requirement for the use of logbooks is usually dependent on the size of the vessel and the fishery sector. For example, the European Union requires that all commercial fishing vessels over 10 metres in length should use logbooks, except when absent from port for less than 24 hours.

Logbooks may be considered as having two main functions:

a. surveillance-orientated objectives, as a tool in the enforcement of fishing regulations and to ensure compliance with resource management controls.
b. data-orientated objectives, as a method of collecting primary fishery ~~statistics~~ data and as a principal source of information on fishing inputs and outputs.

Logbooks have the important role for data collection and two distinct major groups of users are:

a. biologist-economist (fishing activity data, catch and effort data).
b. Control and enforcement authorities (especially under licensed fisheries schemes).

In most situations for the compilation of fisheries data, logbooks should not be considered in isolation, but as an essential component of an integrated system which includes other documentation, such as landings declarations and sales notes. The quantities of fish recorded in logbooks are, in most cases, weighed at-sea in ~~not accurate values, but estimates. Due to~~ often difficult working conditions on fishing vessels. As a result, the first opportunity to accurately record the quantity of fish is usually at the time of landing. The value of the logbooks from the point of view of the quantity of fish caught is in situations where on a single trip a vessel fishes in two or more fishing areas or uses two or more types of fishing gear. In such circumstances the quantities recorded in the logbooks may be used to allocate the quantities landed between the different fishing areas and/or methods. The other essential statistical information obtained from logbooks is the fishing effort responsible for the catches.

The recording of data on fishing operations on a per gear deployment (or haul-~~to~~by-haul) basis may not be essential and practicable. In such cases day-to-day records of fishing activity, or records from a fishing trip may be sufficient. However, separate records should be kept for each change of fishing gear or method (i.e. fishing activity) and for each change of fishing area.

The most representative position of the gear deployment and/or retrieval ~~haul~~ should be recorded, indicating latitude and longitude (refer fishing effort). It should be mandatory to record the retained catch by species while recording of discarded catch separately is strongly recommended (refer catch).

~~Essential~~ Recommended ~~requirements~~ data~~to the~~ entries at the head of a logbook page, irrespective of the tailoring to different circumstances, are~~should be~~:

a. Vessel name
b. Vessel flag (nationality)
c. Vessel registration number and/or IMO number (if available)
d. Radio call sign
e. Trip number (where appropriate)
f. Master's name
g. Name of partner vessels (where applicable)
h. Flag (nationality) of partner vessel
i. Registration number of partner vessel
j. Type of gear (a separate entry for each gear)
k. Gear specifications (e.g. mesh size)
l. Port of landing (or name, nationality and registration number of the vessel to which catch is trans-shipped)
m. Quantity of fish landed or transhipped (where applicable)
n. Date of landing

Days when there is no fishing activity conducted, for example due to bad weather, loading, unloading, repairs, steaming, etc., should also be recorded in the logbook.

Vessel Transmitted Information

Vessel transmitted information (VTI) includes the reporting or catch, effort and entry and exit notifications, and may be supplemented by a vessel monitoring system (VMS) ~~and~~ or possibly an automatic identification system (AIS). VMS and AIS ~~-~~report the movement of a vessel at ~~specified~~ timed intervals through the automatic transmitting of the vessel's position via satellite, telephone or radio to a land-based station. The frequency of this transmission varies between every 6 hours to every few minutes. VTI has mainly been used to date for control and enforcement purposes; however, recently VTI is proving useful in aiding scientists with modelling the impact of fishing effort and in transmitting catch and effort data. For further information about VMS application and standards see here (http://www.fao.org/fishery/vms/en).

Combining information from ~~Merging~~ logbook, VMS and AIS, possibly ~~information sometimes~~ adjusted by landings data, can provide detailed maps of fishing activities. Technologies are now available that allow~~s~~ the logbook data to be transmitted to a shore station shortly after each fishing operation has been completed using e-logbooks.

Logbook data

Fishery statistics are generally derived from logbook data collected from either fishing trips, and/or fishing activities and/or fishing operations. The level of detail recorded by fishers varies depending on the type of fishing (refer Methodology for data collection), however the concepts of a fishing trip, a fishing activity and a fishing operation generally apply and can be used to develop national and regional logbook guidelines (refer Figs. ~~2~~ 3 and ~~3~~ 4 and associated definitions).

A fisher departing a base (port or beach) with the aim to catch fish is considered to be on a fishing trip and conducting fishing activities and operations until the fisher returns to base. The fishing trip may be conducted with or without the use of a fishing vessel~~,~~ and consists of a set of fishing activities (for scope, ~~for scope,~~ refer to definitions below) which may be characterised by the type of fishing gear used, the target species, fishing area (i.e. fishing zone or ground) and the flag of the fishing vessel (when used) or nationality of the fisher. A fishing activity may notably encompass one or many fishing operations which, if successful, result in catch which may be landed for subsistence use by the fisher or traded for consumption or industrial use.

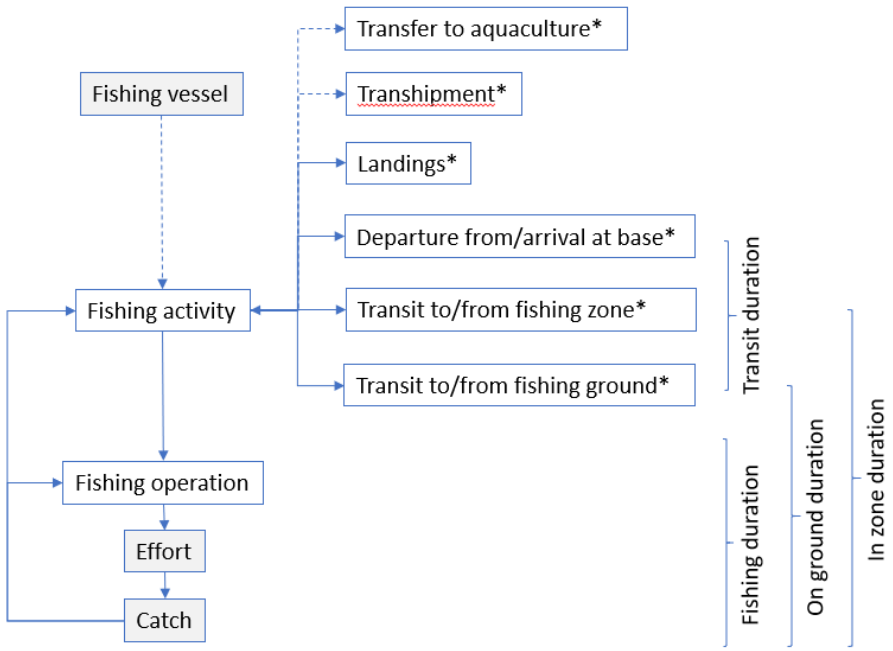

Figure 3: Fishing trip concept. Key components (boxes) of a fishing trip and flow of logbook data (arrows) during the course of fishing. The data may be used *inter alia* for statistical purposes (refer to text for definition of terms). * = Subset of fishing activity; dashed line: optional.

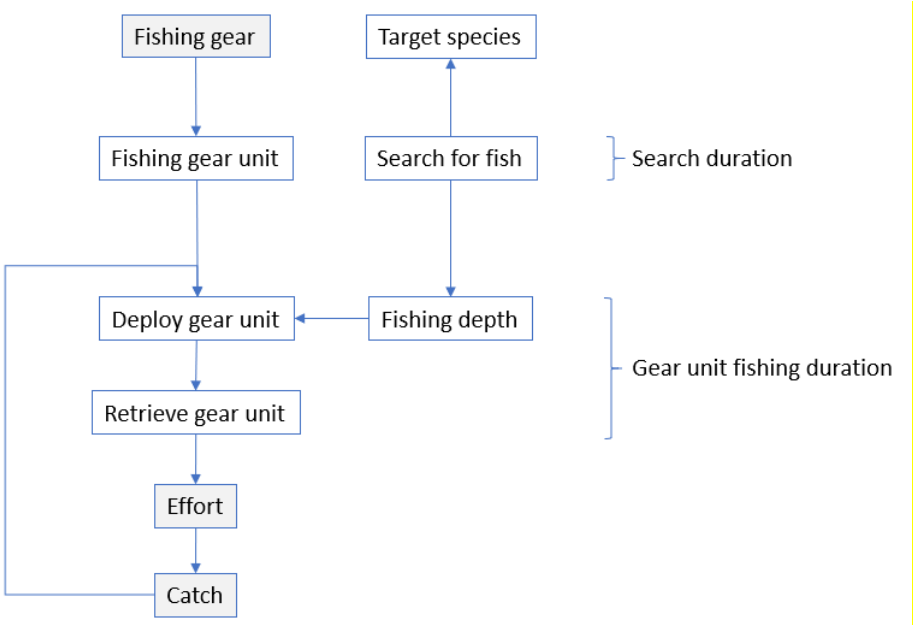

Figure 4: Fishing operation concept. Key components (boxes) of a fishing operation and flow of logbook data (arrows) during the course of fishing. The data may be used *inter alia* for statistical purposes (refer to text for definition of terms).

[Editorial note: some/all of the definitions below may be moved to an operational section or glossary]

Fishing trip: A period of time (duration) that begins when a fishing vessel (flagged to a country) ~~departs from a base~~ begins to carry out fishing activities (refer below) and that terminates when the vessel lands or transships the fish caught. ~~returns to the same or another base.~~

Base: A port or other geographic location such as a dock, berth, ramp, beach or seawall which is used repeatedly by a fishing vessel.

Port: A location with permanent facilities at which vessels can load or discharge cargo moving in maritime traffic. Ports are listed in the UN Code for Trade and Transport Locations (UN/LOCODE, December 2017).

Fishing Zone: A fishery management area where fishing activities are conducted.

Fishing Ground: A location in a fishing zone where fishing activities are conducted.

Transit to/from fishing zone: A fishing vessel steams from its departure base to a fishing zone, or relocates from one fishing zone to another fishing zone, or steams from a fishing zone to its return base.

Transit duration: Total period of time when a fishing vessel is transiting to/from fishing zone(s) and fishing ground(s) during a single fishing trip.

In zone duration: Total period of time spent by a fishing vessel in fishing zone(s) during a single fishing trip.

Transit to/from fishing ground: A fishing vessel steams from a fishing zone to a fishing ground located within that zone, or relocates from one fishing ground to another fishing ground both within the same fishing zone.

On ground duration: Total period of time spent by a fishing vessel on fishing ground(s) during a single fishing trip, reported in hours (if less than 24 hours) or days. This is equivalent to the fishing effort reported under Category C (refer STATLANT section above).

Search for fish: refer below.

Fishing activity: Any activity conducted with the intention of catching fish in the wild, or transferring, caging or fattening fish in aquaculture. A fishing activity may involve one or many fishing operations (refer below) in which case a fishing activity is characterized by a fishing area, target species and/or fishing gear, and a new activity is recorded when any of these parameters change. Fishing activities in capture fisheries include *inter alia* prior notifications, landings, departing and returning to port, and entering and exiting fishing areas (i.e. fishing zone or ground), transport of fish for aquaculture, and transhipments (refer below).

Transhipment: A fishing activity which may occur during a fishing trip, and involves the transfer of harvested living resources and any other goods or materials between the fishing vessel and another vessel.

Fishing operation: A repeated (i.e. routine) operation within a fishing activity and which may involve *inter alia* searching for fish (refer below), deployment and retrieval of fishing gear (refer below), removal of catch from the gear~~, or transport of fish for aquaculture~~.

Fishing duration: Total period of time during which fishing activities are conducted during a single fishing trip, reported in hours (if less than 24 hours) or days. This is equivalent to the fishing effort reported under Category B (refer STATLANT section above).

Effort: refer 'fishing effort'

Catch: refer 'Catch and landings'

The following definitions are related to the fishing operation.

Target species: A species or group of species which is target~~t~~ted during a fishing activity or operation (refer also 'fish' above).

Search for fish: A component of fishing operation ~~activity~~ aimed ~~to~~ at locating~~e~~ target species prior to the setting of fishing gear, using local knowledge and ancillary data (e.g. water temperature, seabed topography, seabird activity, echograms) to identify aggregations of target species or areas where a target species occurs.

Search duration: The period of time spent searching for fish.

Fishing gear unit: An item or items of fishing gear which is/are operated as a single unit (e.g. trawl net, longline, string of traps, seine net).

Deploy gear unit: A deployment of a fishing gear unit with associated data about the time and position of deployment (refer Table 2).

Retrieve gear unit: A retrieval of a fishing gear unit with associated data about the time and position of retrieval (refer Table 2).

Gear unit fishing duration: The period of time when the fishing gear unit was effectively fishing (e.g. soak time, tow duration or dive time, refer Table 2). [Editorial note: A proposal of standard measures of effort unit for gears was developed by the Tuna RFMOs under the CWP ad-hoc Task Group on reference harmonization for capture fisheries and aquaculture, refer Report of technical workshop on global harmonization of Tuna fisheries statistics, March 2018, Session 6.2. ~~The~~ Relevant outcomes of this work will be reflected here in due course]

Fishing depth: Depth at which a fishing gear unit was fished.

Table 2: Deployment and retrieval parameters by fishing gear unit

Fishing gear category (ISSCFG 2016)	Surrounding net (01) Seine (02) Lift net (05) Falling gear (06) Gillnet and Entangling net (07) Trap (08) Hook and line (09)	Trawl (03) Dredge (04)	Dive (10.8)
Parameter			
Date and time Position Fishing depth	Start set End set Start haul End haul	Start set End set Start tow End tow Start haul End haul	Start dive End dive
Gear fishing duration	Start haul – End set (Soak time)	End tow – Start tow (Tow duration)	End dive – Start dive (Dive time)

Biological data

The collection of biological data from target and associated species is essential for the purpose of stock assessments and sustainable management of fishery resources. A biological data concept is illustrated in Figure 5.

Biological data are usually reported in logbooks and the collection and reporting of these data may be done by fishers or delegated to scientific observers (at-sea) or fishery enumerators (at-market). Data collected by observers and enumerators are generally collected in dedicated logbooks and submitted through national or regional programs. The collection of biological data by observers and enumerators may also require formal agreement between a Flag State and the relevant national or regional program in order to coordinate the collection of these data and ensure comprehensive coverage of the fishery. The collection of biological samples such as otoliths may also be recorded in the biological data.

Biological data are collected for scientific purposes. However, biological data of the species and size composition of the catch may also be used for statistical purposes.

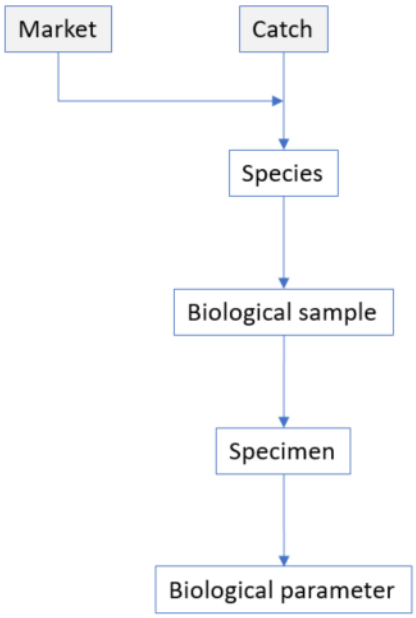

Figure 5: Biological data concept. Biological components (boxes) and flow of logbook data (arrows) during the course of sampling. The data may be used *inter alia* for statistical purposes (refer to text for definition of terms).

Species: The basic unit of taxonomic classification of fish and other organisms (refer also to 'Fish' above)

Biological sample: A subset of the catch which is collected using a statistical ~~s~~ampling method.

Specimen: Individual of a species which is subject to biological or taxonomic measurements.

Biological parameter: Biological characteristic of a specimen which is measured by a standard method and reported in a logbook. Parameters typically recorded for the purpose of stock assessment include:

- Whole weight: Weight of a specimen prior to processing.
- Length: Length of a specimen prior to processing. The type of length measured usually depends on the body form of the species (e.g. total length, length to the caudal fork, wing span, carapace length).
- Sex and maturity: Sex of a specimen (i.e. female, male, immature) and stage of sexual maturity. The visual assessment of ovaries to determine maturity stage ~~is felt~~has proven to be an imprecise indicator of reproductive condition. Thus, it is recommended whenever possible, to evaluate the maturity from ~~macroscopic~~ microscopic staging of gonads based on a standard method such as use of histological and/or chemical methods.
- ~~Age: Age of a specimen determined using a standard method (e.g. otolith ageing).~~

Integrated environmental and economic accounting for fisheries

[Editorial note: This section remains as published and is not included here.]

Fisheries statistics for an ecosystem approach

[Editorial note: This section remains as published and is not included here.]

CWP Handbook: Aquaculture statistics

[Editorial note: This section remains as published and is not included here.]

CWP Handbook: Socio-economic data

[Editorial note: This section remains as published and is not included here.]

CWP Handbook: Tools and resources

[Editorial note: This section remains as published and is not included here.]

Annex M [Editorial note: the table below is Annex M III, with revised title and headings]

International Standard Statistical Classification of Fishing Gear (ISSCFG, 2016). The relationship between the current ISSCFG codes and those used in the previous classification (1980) is included.

Gear category	Standard abbreviation	ISSCFG code	
		Current (2016)	Previous (1980)
SURROUNDING NETS	-	**01**	01.0.0
Purse seines	PS	**01.1**	01.1.0
Surrounding nets without purse lines	LA	**01.2**	01.2.0
Surrounding nets (nei)	SUX	**01.9**	-
SEINE NETS	-	**02**	02.0.0
Beach seines	SB	**02.1**	02.1.0
Boat seines	SV	**02.2**	02.2.0
Seine nets (nei)	SX	**02.9**	02.9.0
TRAWLS	-	**03**	03.0.0
Beam trawls	TBB	**03.11**	03.1.1
Single boat bottom otter trawls	OTB	**03.12**	03.1.2
Twin bottom otter trawls	OTT	**03.13**	03.3.0
Multiple bottom otter trawls	OTP	**03.14**	-
Bottom pair trawls	PTB	**03.15**	03.1.3
Bottom trawls (nei)	TB	**03.19**	03.1.9
Single boat midwater otter trawls	OTM	**03.21**	03.2.1
Midwater pair trawls	PTM	**03.22**	03.2.2
Midwater trawls (nei)	TM	**03.29**	03.2.9
Semipelagic trawls	TSP	**03.3**	-
Trawls (nei)	TX	**03.9**	03.9.0
DREDGES	-	**04**	04.0.0
Towed dredges	DRB	**04.1**	04.1.0
Hand dredges	DRH	**04.2**	04.2.0
Mechanized dredges	DRM	**04.3**	11.2.0
Dredges (nei)	DRX	**04.9**	-
LIFT NETS	-	**05**	05.0.0
Portable lift nets	LNP	**05.1**	05.1.0
Boat-operated lift nets	LNB	**05.2**	05.2.0
Shore-operated stationary lift nets	LNS	**05.3**	05.3.0
Lift nets (nei)	LN	**05.9**	05.9.0
FALLING GEAR	-	**06**	06.0.0
Cast nets	FCN	**06.1**	06.1.0
Cover pots/Lantern nets	FCO	**06.2**	-
Falling gear (nei)	FG	**06.9**	06.9.0
GILLNETS AND ENTANGLING NETS	-	**07**	07.0.0
Set gillnets (anchored)	GNS	**07.1**	07.1.0
Drift gillnets	GND	**07.2**	07.2.0
Encircling gillnets	GNC	**07.3**	07.3.0
Fixed gillnets (on stakes)	GNF	**07.4**	07.4.0
Trammel nets	GTR	**07.5**	07.5.0
Combined gillnets-trammel nets	GTN	**07.6**	07.6.0
Gillnets and entangling nets (nei)	GEN	**07.9**	07.9.0
TRAPS	-	**08**	08.0.0
Stationary uncovered pound nets	FPN	**08.1**	08.1.0
Pots	FPO	**08.2**	08.2.0

Fyke nets	FYK	**08.3**	08.3.0
Stow nets	FSN	**08.4**	08.4.0
Barriers, fences, weirs, etc.	FWR	**08.5**	08.5.0
Aerial traps	FAR	**08.6**	08.6.0
Traps (nei)	FIX	**08.9**	08.9.0
HOOKS AND LINES	-	**09**	09.0.0
Handlines and hand-operated pole-and-lines	LHP	**09.1**	09.1.0
Mechanized lines and pole-and-lines	LHM	**09.2**	09.2.0
Set longlines	LLS	**09.31**	09.3.0
Drifting longlines	LLD	**09.32**	09.4.0
Longlines (nei)	LL	**09.39**	09.5.0
Vertical lines	LVT	**09.4**	-
Trolling lines	LTL	**09.5**	09.6.0
Hooks and lines (nei)	LX	**09.9**	09.9.0
MISCELLANEOUS Gear	-	**10**	10.0.0
Harpoons	HAR	**10.1**	10.1.0
Hand implements (Wrenching gear, Clamps, Tongs, Rakes, Spears)	MHI	**10.2**	-
Pumps	MPM	**10.3**	11.1.0
Electric fishing	MEL	**10.4**	-
Pushnets	MPN	**10.5**	-
Scoopnets	MSP	**10.6**	-
Drive-in nets	MDR	**10.7**	-
Diving	MDV	**10.8**	-
Gear nei	MIS	**10.9**	20.0.0
GEAR NOT KNOWN	-	**99**	99.0.0
Gear not known	NK	**99.9**	-