Development of a Comprehensive Global Record of Fishing Vessels, Refrigerated Transport Vessels and Supply Vessels

Investigation of Unique Vessel Identifier (UVI) and Phasing Options

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prepared by

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On behalf of the

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List of Acronyms

AFMA	Australian Fisheries Management Authority
AIS	Automatic Information System
CAST	Commercial Aviation Safety Team
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
CCSBT	Commission for the Conservation of Southern Bluefin Tuna
CFR	the unique vessel identifier in the EU Fleet Register
COFI	FAO Committee on Fisheries
CSR	Continuous Synoptic Record
CWPFS	Coordinating Working Party of Fishery Statistics
DG MARE	EU Directorate General for Maritime Affairs and Fisheries
DG SANCO	EU Directorate-General for Health and Consumer Protection
EIR	Equipment Identity Register
ETSI	European Telecommunications Standards Institute
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FEI	Fédération Equestre Internationale
FFA	Forum Fisheries Agency
FIGIS	Fisheries Global Information System
GRFV	Global Record of Fishing Vessels
GRT	Gross Register Tonnage
GSM	Global System for Mobile communications
GT	Gross Tonnage
HIN	Hull Identification Number
HSTF	High Seas Task Force
HSVAR	High Seas Vessel Authorization Record
IATTC	Inter-American Tropical Tuna Commission
ICAO	International Civil Aviation Organization
ICCAT	International Commission for the Conservation of Atlantic Tunas
ILO	International Labour Organization
IMEI	International Mobile Equipment Identity number
IMO	International Maritime Organization
IMO/LR	International Maritime Organization / Lloyd's Register-Fairplay
IOTC	Indian Ocean Tuna Commission
IRCA	International Register of Civil Aircraft
IRCS	International Radio Call Sign
ISC	Code on Intact Stability for all Types of Ships
ISO	International Organization for Standardization
ISPS	International Ship and Port Facility Security code
ISSC	International Ship Security Certificate
ISSCFV	International Standard Statistical Classification of Fishery Vessels by Vessel Types
ITU	International Telecommunication Union
IUU	Illegal, Unreported and Unregulated fishing
LOA	Length Overall
LRF	Lloyd's Register-Fairplay (changed to HIS-Fairplay as of March 2010)
LRIT	Long Range Identification and Tracking
MARPOL	International Convention for the Prevention of Pollution from Ships
MMSI	Maritime Mobile Service Identity
MOU	Memorandum of Understanding
NAFO	Northwest Atlantic Fisheries Organization
NEAFC	Northeast Atlantic Fisheries Commission
NMFS	United States National Marine Fisheries Service
OSPESCA	Organización del Sector Pesquero y Acuícola del Istmo Centroamericano
PRC	People's Republic of China
PSC	Port State Control
RFMO	Regional Fisheries Management Organization

SOLAS	International Convention for the Safety of Life At Sea
STCW-F	International Convention on Standards of Training, Certification and Watchkeeping for Fishing Vessel Personnel
T-RFMOs	Joint Tuna Regional Fisheries Management Organizations
UELN	Universal Equine Life Number
UK	United Kingdom
UN	United Nations
USCG	United States Coast Guard
UVI	Unique Vessel Identifiers
VIS	Vessel Identification System
VTS	Vessel Traffic Service
WCPFC	Western and Central Pacific Fisheries Commission
WHIRDEC	World Horse Identification, Registration and Data Exchange Committee

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Abstract

This study explores options for the development of a unique vessel identifier (UVI) for fishing vessels within the broader Global Record of Fishing Vessels (GRFV) project led by the Food and Agriculture Organization of the United Nations (FAO). In addition to identifying a preferred option for the structure of the UVI, this study provides recommendations for the incorporation of sets of fishing vessels into the GRFV under a phased implementation programme. UVIs should be unique, permanent and capable of facilitating an ongoing record of fishing activities so as to serve as a tool to combat IUU fishing. It is considered that there is no need to treat fishery support vessels any differently than fishing vessels since under most legal definitions of fishing vessels, fishery support vessels must comply with applicable fisheries management regulations whenever they are carrying fish.

Investigation of models for a potential UVI scheme for fishing vessels included an analysis of ten existing vessel-based schemes. Unique identifier schemes applied outside the maritime sector, i.e. to aircraft, mobile phones and horses, were also examined. In general, the schemes can be classified into three types: identifiers assigned by a single, centralised entity; identifiers assigned by intermediaries using allocated code blocks; and identifiers assigned by local authorities. The advantages and disadvantages of each type are discussed.

In order to understand the data content of national vessel registers/records, as well as assess their suitability as platforms for large-scale data exchanges supporting a UVI scheme, 22 countries were surveyed. The analysis found that most national registers/records can meet the immediate data requirements, defined under a recent UVI proposal by Lloyd's Register-Fairplay (LRF) to the Joint Tuna Regional Fisheries Management Organizations (RFMOs), with the addition of a small number of data fields (i.e. mainly operator-related information). National registers would need to make at least minor adjustments to achieve the required standardised formats (including digitisation). However, these issues should not be insurmountable as many of these countries already manage to achieve a high level of compliance with the vessel data requirements of the tuna RFMOs when placing their vessels on RFMO authorised vessel lists.

Four options for a fishing vessel UVI were formulated and assessed in terms of feasibility of including the full range of vessels envisaged by the GRFV; practicality of the data requirements and the likelihood these requirements can be met; viability in terms of management structure and cost. Option 1, consisting of IMO/LR numbers for fishing vessels both ≥100 GT and <100 GT, was selected as the preferred option on the basis that it represents the highest system integrity, the minimum amount of duplication, the maximum amount of compatibility with existing maritime vessel systems, the most rapid start-up, and probably the lowest cost. However, this option requires the participation of LRF, and if this cannot be secured, Option 2 involving IMO/LR numbers for fishing vessels ≥100 GT, and a separate UVI system based on allocated code blocks for fishing vessels <100 GT, would become the preferred option.

On the basis of an analysis of vessel categories defined across the global fishing fleet, as well as a vessel-based risk assessment of IUU fishing, three phases of UVI implementation were defined. Phase 1 would incorporate all fishing vessels ≥100 GT into the UVI scheme. Phase 2 would extend the scheme to vessels ≥50 GT or ≥18 m, and to all vessels on T-RFMO authorised vessel lists. The final Phase 3 would extend the system to all vessels above the minimum size limit (≥10 GT or ≥12 m) which are not included in Phases 1 and 2. The total number of vessels to be incorporated is estimated at approximately 700,000.

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1 Introduction

1.1 Background to the Development of a UVI for Fishing Vessels

The ongoing battle against illegal, unreported and unregulated (IUU) fishing is confounded when the vessels involved in these activities hide or change their identities to escape control mechanisms and sanctions. To remedy this situation, the *Rome Declaration on Illegal, Unreported and Unregulated Fishing* adopted by the FAO Ministerial Meeting on Fisheries in March 2005 called for better and more accessible information on fishing vessels and their owners to be compiled. In response, a project entitled *Development of a Comprehensive Global Record of Fishing Vessels (GRFV), Refrigerated Transport Vessels and Supply Vessels* was initiated within the FAO and has been supported by subsequent sessions of the FAO Committee on Fisheries (COFI) (FAO 2007, FAO 2009a).

Useful lessons regarding fishing vessel information systems have been learned through efforts associated with the *Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas* of 1993, often referred to as the FAO Compliance Agreement. One of the components of this agreement, the High Seas Vessel Authorization Record (HSVAR), represents the first attempt to create an international database of vessels involved in high seas fishing (FAO 1993). Over the last 15 years, progress toward an accurate and comprehensive database of high seas fishing vessels has been slow, and it is widely acknowledged that the HSVAR has not achieved its originally intended purpose (Friedrich 2008, Hedley 2008, FAO 2008a). This is attributed to a variety of factors including that it is aimed primarily at vessels >24 m, and that only a limited set of vessel attributes are required to be provided (Lugten 2008). As a result, discussions convened following creation of the GRFV project advised that the HSVAR would not provide an adequate basis for the GRFV, and that a new and more expansive system would be required (CWPFS 2007, FAO 2008a).

Much consideration has been given to the possible form and components of this new system. One of the most conspicuous models is the International Maritime Organization/Lloyd's Register (IMO/LR) numbering system and database for the global merchant shipping fleet. The potential parallels between the IMO system for merchant ships and the situation for fishing vessels were recognised in the first meeting of the Joint FAO/IMO Ad Hoc Working Group held in 2000 (Joint Tuna RFMOs 2009a). These discussions highlighted the need to trace fishing vessels over time, regardless of changes in registration or name, using a unique vessel identifier (UVI) potentially similar to that which provides the backbone of the IMO/LR system. Support for a UVI for fishing vessels was reinforced by subsequent discussions at FAO's Coordinated Working Party on Fisheries Statistics (CWPFS 2003), the twenty-seventh session of COFI (FAO 2007), a United Nations General Assembly resolution on sustainable fisheries (UN 2007), and the FAO's Expert Consultation on the Development of a Comprehensive GRFV (FAO 2008a).

Since the February 2008 Expert Consultation on the Development of a Comprehensive GRFV a number of reports have been produced on various elements of the GRFV. These reports include documents produced by a correspondence group convened from amongst participants at the February 2008 Expert Consultation and others (FAOCG 2009); a paper on database architecture and data management (Jones 2008); and studies on GRFV structure and governance, and project planning (Poseidon 2009a, b). The concepts in these materials, and the information presented in this report regarding the development of

the UVI specifically, will be drawn together to form the basis for a Technical Consultation on the GRFV to be held in late 2010.

1.2 Objectives of the Assignment

As set by the terms of reference, the objectives of this assignment were to:

1. Review potential UVI schemes which can assure unique and permanent vessel numbers and describe for each scheme why it is or is not recommended;
2. Consider the extent to which a UVI for fishing vessels (both above and below 100 GT) should be administered as a parallel and/or separate scheme to the IMO/LR numbering scheme, and if so, whether this approach would provide unique benefits;
3. Describe the data required to support the recommended UVI option(s);
4. Assess data gaps in national and regional vessel registers with regard to the requirements for obtaining an IMO/LR number;
5. Identify practical implementation issues of the UVI scheme for flag States such as domestic coordination processes and economic impacts; and
6. Provide a comprehensive set of recommendations for implementing the UVI scheme in a phased manner, e.g. for vessels ≥100 GT, then for vessels from 50-100 GT, etc., based on existing vessel categories, and assessment of risk and practicality.

1.3 Key Definitions and Assumptions

Before initiating a study of a UVI for fishing vessels it is essential to clearly define what constitutes a UVI and which vessel types are considered fishing vessels. Understandings based on the terms of reference; the findings of previous consultative groups; and the concepts in current, common usage are outlined below.

1.3.1 Definition of a Unique Vessel Identifier

The terms of reference for this study state that "the idea that a UVI is an essential prerequisite for Global Record functionality is assumed". Also, as discussed in Section 1.1., the need for a UVI scheme has been articulated numerous times in recent years by FAO and other UN bodies. In defining the characteristics of a UVI, the terms of reference for this study specify that a UVI should be unique, permanent and capable of providing an ongoing record of fishing activities to thus serve as a tool to combat IUU fishing.

It is intuitively obvious that any enforcement scenario in which persons and equipment used in illegal activities are able to disguise themselves under new identities and markings, often within a matter of hours, will simply lead to a continuous game of cat and mouse. The only way to prevent such a situation is to uniquely and permanently credential all legitimate participants in the system and to police the system through strict control and monitoring of those credentials. A UVI scheme for fishing vessels can thus be thought of as a kind of credential system.

Given the wide support already expressed for such a credential system in the form of a UVI for fishing vessels, it is not the role of this study to question the desirability of such a system. However, before beginning an in-depth analysis of various options for a UVI, it is necessary to consider whether existing

identification systems for fishing vessels already serve the purpose of a UVI, either explicitly or implicitly. As mentioned above and as will be discussed further in Section 2.1.1, the existing UVI scheme for merchant vessels (the IMO/LR number) provides for voluntary participation of some fishing vessels, mainly those which are ≥100 GT (see Table 1 in Section 2.1.1). The number of participating fishing vessels, though reasonable considering the system is voluntary and aimed at vessels ≥100 GT, is at present small compared to the total number of vessels in the global fishing fleet. Therefore it cannot be considered that the IMO/LR system currently serves as a UVI scheme for fishing vessels. As will be discussed in Section 2.1.9, the existing system of international radio call signs (IRCS) applies to fishing vessels and results in a unique UVI. However, the IRCSs are not permanent as they can be transferred from vessel to vessel and re-used, and a single vessel may have more than one IRCS over its lifetime. Finally, it cannot be considered that national/EU registration numbering schemes currently provide vessel identifiers which are permanent and unique when examined from a global perspective. Although national/EU identifiers may be unique and permanent within their own systems, there is a clear lack of bilateral coordination when vessels transfer from one register to another, and there are chartering situations in which a single vessel may be included in more than one register at a time. Both situations would easily lead to duplicate identifiers for a single vessel. (While existing national/EU systems do not form a UVI, the possibility of coordinating national/EU registers to achieve a global UVI is discussed in Sections 2 and 4). In summary, while some existing systems have potential as UVI schemes for fishing vessels if modified or extended, there is no existing system for fishing vessels which already meets the design criteria.

1.3.2 Definition of a Fishing Vessel

Different legal instruments provide slightly different definitions of the term fishing vessel. The examples given in Box 1 represent definitions used in major international and national laws relating to fishing activities, all of which include references to fishery support vessels such as fish carriers, bunkers, reefers, and motherships. In addition, FAO's International Standard Statistical Classification of Fishery Vessels by Vessel Types (FAO 1984) includes categories for fish carriers and motherships. The February 2008 Expert Consultation on the GRFV stated that the draft definitions which were at that time under consideration for the FAO Port State Agreement would be useful for the GRFV, and that compatibility of definitions with this instrument would be desirable. The definition of "fishing vessel" eventually adopted for the FAO Port State Agreement is shown in Box 1.

As there is thus widespread agreement that support vessels are an inseparable component of fishing activities, there seems to be no basis for excluding these support vessels from any UVI scheme designed for fishing vessels. Furthermore, as support vessels can be categorised using the same vessel attribute and risk criteria as vessels which actually catch fish, there appears to be no *a priori* reason to structure the UVI scheme to contain separate categories for support vessels. On this basis, unless otherwise specified, when this study uses the term "fishing vessels" it refers to all fishing and fishery support vessels and treats them as a single population when designing the UVI scheme. In deciding whether a given support vessel should or should not be included in the GRFV, the flag State will need to consider whether that support vessel ever operates as a fishery support vessel under any of the applicable legal definitions. It is suggested that if the support vessel never operates as a fishery support vessel it need not be included in the GRFV. However, if there is any uncertainty about its potential for operation as a fishery support vessel, the presumption should be to include the support vessel in the GRFV.

Box 1. Definitions of "fishing vessel" in various international and national legal instruments.

Definitions of "Fishing Vessel"

Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (FAO 2009b):

> "*Any vessel, ship of another type or boat used for, equipped to be used for, or intended to be used for, fishing or fishing related activities*. "

Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas (FAO 1993):

> "*Any vessel used or intended for use for the purposes of the commercial exploitation of living marine resources, including mother ships and any other vessels directly engaged in such fishing operations*. "

United States Magnuson-Stevens Fishery Conservation and Management Act (United States Code 1996):

> *"Any vessel, boat, ship or other craft which is used for, equipped to be used for, or of a type which is normally used for—(a) fishing; or (b) aiding or assisting one or more vessels at sea in the performance of any activity relating to fishing, including, but not limited to, preparation, supply, storage, refrigeration, transportation, or processing."*

European Community Council Regulation (EC) No 1005/2008 establishing a Community System to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated fishing (EU 2009):

> "*Any vessel of any size used or intended for use for the purposes of commercial exploitation of fishery resources, including support ships, fish processing vessels, vessels engaged in transhipment and carrier vessels equipped for the transportation of fishery products, except container vessels.*"

2 Review of Existing Numbering Schemes and Databases

The concept of unique identifiers is not new or complicated: many existing systems both within and beyond the maritime sector make use of serial numbers or numbers assigned and tracked from a central registry. This section reviews ten of these systems to determine whether they provide useful models or insights for a unique identifier for fishing vessels. In addition, in order to examine key issues associated with unique identifiers from a novel perspective, unique identifier systems for aircraft, horses and mobile phones are also reviewed.

At the end of each system's review, a summary is provided in a common format based on the following structure:

- **Mechanism**: Is the system mandatory or voluntary? If voluntary, what are the incentives for participation?
- **Degree of Uniqueness and Permanency**: Is the identifier globally unique? To what extent is it permanent?
- **Origin of Data**: Are the identifiers assigned locally and agglomerated into a global database, or assigned centrally or through a small number of intermediaries? Are data collected specifically for this scheme or does it rely upon external datasets?
- **Verification**: What systems are in place to ensure the assigned identifier is used correctly and updated as other attribute data change?
- **Comprehensiveness**: To what extent does the identifier/database succeed in capturing all of the objects to which it applies? To what extent is it used?
- **Hosting:** Which organisation supports the identifier and database financially and operationally? Are the data publicly available on a free of charge basis?

The final section provides a composite analysis of the salient features of the reviewed systems with specific reference to the proposed UVI for fishing vessels. This analysis provides the basis for drawing conclusions regarding desirable attributes and possible models for unique identifiers for fishing vessels later in the report.

2.1 Numbering Schemes and Databases for Maritime Vessels

This section introduces ten numbering schemes or databases for maritime vessels chosen on the basis that they employ a unique number which can be used as a vessel identifier. In some cases the identifier is permanent, whereas in others the linkage between the identifier and vessel may be broken either intentionally or unintentionally. Schemes with impermanent identifiers obviously would not serve the purpose of a UVI for fishing vessels (see Section 1), but in analysing them the features of the schemes which contribute to this impermanence are highlighted and can be taken into consideration when formulating a UVI for fishing vessels. The reviewed schemes and databases range along a spectrum from mandatory to voluntary; from global to regional/national; from freely accessible to proprietary; and from

widely applied to decidedly under-subscribed. Each case study aims to focus on the key lessons for development of a UVI for fishing vessels which is practical, comprehensive and effective.

2.1.1 IMO/LR Number

Development and Background

The most comprehensive global ship identification system in use today is the International Maritime Organization (IMO) Ship Identification Number Scheme. This scheme was initiated with IMO Resolution A.600(15) in 1987 which adopted a unique and permanent seven-digit vessel identification system in use by Lloyd's Register-Fairplay (LRF[1]) since 1969. The purpose of the scheme is to enhance maritime safety, prevent pollution and discourage ship-related fraud. The scheme is designed to apply to seagoing ships of ≥100 gross tonnes (GT) engaged in international voyages, although ships ≥100 GT not engaged in international voyages are also eligible. A number of vessel types are excluded from the mandatory requirements of the scheme, most notably 'vessels solely engaged in fishing' (IMO 2010a).

At first the IMO encouraged voluntary implementation of the scheme by its member States. However, amendments to the International Convention for the Safety of Life At Sea of 1974 (SOLAS XI-1/3) adopted in 1994 made the application of the numbering scheme a requirement for all passenger ships ≥100 GT and for all cargo ships ≥300 GT. The requirement was extended to all ships subject to SOLAS in January 1996[2]. Further amendments to SOLAS entered into force in July 2004 and mandated that all vessels required to have IMO numbers must permanently mark them in a visible place either on the ship's hull or superstructure, as well as internally (IMO 2010b).

At the same time, an amendment which is ancillary to the IMO numbering scheme but important for ship tracking also entered into force. This regulation (SOLAS XI-1/5) requires that all passenger ships, cargo ships ≥500 GT, and offshore drilling units engaged on international voyages carry onboard and provide for inspection a Continuous Synopsis Record (CSR) detailing the complete history of the vessel including changes of registration (flag) and ownership. The CSR need only cover the period after 1 July 2004 (UK Government 2010).

While these SOLAS amendments strengthened both the IMO ship identification number scheme and the need for vessel histories, all fishing vessels, as well as some fishery support vessels (those<100 GT are not subject to the numbering scheme, and those <500 GT are not subject to the CSR), continue to be exempt from SOLAS requirements. Nevertheless, some fishing vessels do possess unique identification numbers. This is because LRF has allowed fishing vessels ≥100GT (and a small number <100 GT) to obtain unique numbers under the IMO/LR numbering scheme. These unique numbers for fishing vessels are distinct from IMO numbers only in that they do not possess the prefix IMO, however, they follow the same seven-digit (six-digit unique number plus a check digit) format and are issued from within the IMO number sequence.

[1] Lloyd's Register-Fairplay changed its name to IHS-Fairplay in March 2010.

[2] SOLAS 1974 has 159 contracting parties and is estimated to cover 99.04% of the world's merchant shipping tonnage.

In its continuing efforts to improve safety at sea, the IMO adopted Resolution MSC 160(78) of May 2004 containing voluntary measures for assigning a unique identification number to companies and registered owners operating any vessel subject to SOLAS requirements (IMO 2010c). Like the unique vessel numbering scheme, this database of companies and registered owners was also based on an existing system maintained by LRF and on a seven-digit number with the prefix "IMO". Also like the unique vessel numbering scheme, the scheme was subsequently made mandatory by further amendments to SOLAS, in this case changes to SOLAS XI-1/3 and XI-1/5 in May 2005 which entered into force in January 2009 (IMO 2010b). Implementation of IMO unique numbering systems for both vessels and companies/owners is designed to allow linkage of information and therefore provide a more comprehensive record of maritime activities. Although vessels "solely engaged in fishing" are exempt under SOLAS from the requirement to obtain an IMO company and registered owner number, some fishing owners may have IMO company/owner numbers either because they own non-fishing ships which require them to obtain such numbers, or because they have applied for them voluntarily. In such cases, the fact that their ownership relates to a fishing vessel would only be identified through the matching of the record in company/registered ownership database with an IMO/LR number for a fishing vessel in the ship number database (i.e. there is no field in the company/registered ownership database which indicates that the owned vessel is a fishing vessel).

The use of these two IMO numbering schemes is expanding with the requirements to list the numbers on, or in association with, *inter alia*:

- the Continuous Synopsis Record (CSR) under SOLAS XI-1 (IMO 2010b);
- the International Ship Security Certificate (ISSC) under the International Ship and Port Facility Security (ISPS) Code adopted as SOLAS XI-2 (IAASP 2010);
- the Long Range Identification and Tracking (LRIT) system under IMO Resolution MSC 263(84) (IMSO 2010);
- the Automatic Information System (AIS) under IMO Circular SN/227 (IMO 2010d); and
- all safety certificates, the international loadline certificate, and most certificates issued under the International Convention for the Prevention of Pollution from Ships of 1973 (MARPOL).

Compliance with these and other requirements is verified through the Port State Control Scheme coordinated by the IMO (IMO 2010e). Verification of the vessel's IMO number (if assigned) is also mentioned as an item to be inspected under the FAO Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (FAO 2009b).

Operational Aspects

By adopting existing LRF databases as the foundation for the two unique numbering systems, IMO accepted the pre-defined structures of these databases. These are now specified in IMO Circular 1886/Rev. 3 of December 2006 for vessel numbering (IMO 2006) and IMO Circular 2554/Rev. 1/Corr. 1 of January 2008 for company/owner numbering. In some cases, LRF has had to formalise or develop new and more precise definitions for data fields in order to standardise information among flag States. LRF also collects and stores additional information, i.e. beyond the required fields, for validation purposes.

LRF contends that data for all required fields are necessary in order to perform essential validation of applications for unique numbers, to guard against issuing more than one number for each vessel, and to

otherwise ensure the quality of the databases is maintained. It therefore will not issue IMO numbers under either scheme unless data for all required fields are submitted. Validation of applications is undertaken internally by LRF and involves the use of in-house expertise combined with multiple sources of information available to them including information from classification societies, owners, clients; and Vessel Traffic Service (VTS) and Automated Information System (AIS) data. As there is no publicly available information on how validation is achieved, it is not possible to independently evaluate whether the required data fields are essential or excessive, or whether the validation could be performed to a similar standard by another organisation.

Applications for IMO ship or company/registered owner numbers can be submitted by individuals or by the flag State administration through a web-based interface. However, LRF prefers that the requests be channelled through the flag State administrations as this process in theory provides an initial check on the accuracy of the submitted information and therefore speeds the validation process. Direct communication with flag States has been facilitated by the agreement of electronic data exchange procedures under IMO Circular 2554/Rev. 1/Corr. 1. Exchanges are underway in electronic format for some flags, and under other less formal and standardised procedures for a number of other flags[3].

The existence of ship and company/owner numbering schemes in the private sector (i.e. LRF) prior to their adoption by IMO clearly attests to their commercial viability. However, this viability is underpinned by the reliability of the identification provided by the unique number which is in turn premised on the credibility of the underlying database. According to LRF, one of the issues associated with extending the IMO ship numbering system to fishing vessels (and to those fishery support vessels not already included) is the lack of available cross-validation data for fishing vessels. Even if such data could be acquired, LRF maintains that a unique numbering system for fishing vessels is not commercially viable because the commercial and regulatory systems that drive the demand for merchant shipping information do not currently exist for fishing fleet data[4]. In the case of the merchant fleet, the cost of the intensive validation undertaken by LRF of new and existing database records is offset by the ability to market the information for a fee, i.e. the only information made freely available is the owner/company number by owner/company name (LRF 2010a).

The cost of processing unique vessel numbering applications for fishing vessels will depend to a large extent on the amount of available validation information and the amount of cooperation between vessel owners, the UVI-assigning body and any intermediaries such as the flag State and/or an RFMO (see Section 4). An estimate produced by LRF in February 2008, based on the assumption that flag States will assist with UVI applications and validation, suggested that five full-time staff would be required in the first year to manage the incoming information. In addition, one or two LRF staff would be required to modify the existing IMO/LR database to account for special considerations associated with the inclusion of fishing vessels (e.g. greater incidence of parallel registries, more convoluted ownership structures). Although these estimates are provisional, the basic premise that additional resources will be required to incorporate fishing vessels into the existing system has been clearly articulated.

[3] T. Downing, LRF, personal communication.

[4] *ibid*

The existing IMO/LR system can accommodate the assignment of IMO/LR number for ships registered to both the People's Republic of China and Taiwan, Province of China. Therefore, the current system does not appear to pose problems for use by UN organisations.

Coverage and Uptake

In total as of January 2010, there are approximately 116,000 active (live) vessels with IMO numbers, including ship types which also fall outside the SOLAS Convention (e.g. fishing vessels, yachts and non ocean-going vessels) but have been given IMO/LR numbers by LRF on a voluntary basis[5]. This figure includes 23,436 fishing and fishing-related vessels, 174 of which are confirmed to be <100 GT (Table 1, row 2). It was reported by the FAO Correspondence Group on the GRFV (FAOCG 2009) that some flag States require their larger fishing vessels to have an IMO number, but no further information on this was obtained under this study. The FAO Expert Consultation on the GRFV also discussed estimates of an additional ~30,000 fishing vessels ≥100 GT without IMO/LR numbers, and over four million fishing vessels <100 GT without IMO/LR numbers (Table 1; LRF 2008). While a lack of sufficient unique numbers was cited as a key reason for not extending the numbering scheme to all fishing vessels <100 GT, it was also made clear that LRF would have neither the resources, nor the commercial interest, in extending the system to encompass all of these vessels (LRF 2008).

Table 1. Summary of fishing and fishery support vessels[6] in the IMO/LR database (Sources: Row 2: LRF 2010b; Row 3: LRF 2008).

		Fishing Vessel ≥100 GT	Fishing Vessel <100 GT	Fishery Support Vessel ≥100 GT	Fishery Support Vessel <100 GT
1	IMO Ship Number Required?	No	No	Yes	No
2	Number of Vessels with IMO Ship Numbers	21,922	161 (+ 272 of unknown tonnage)	1,068	13
3	Total Number of Vessels	~ 56,000	~ 4,000,000	Unknown, but likely to be very small	Unknown, but most fishery support vessels are likely to be ≥100 GT

Despite the fact that there are now approximately 23,000 fishing and fishing-related vessels ≥100 GT with IMO/LR numbers, it appears that IMO/LR numbers are not commonly used as identification by fisheries management organisations, perhaps because they are not required and are obtained only on a voluntary basis by larger vessels. This is illustrated by a composite record of fishing vessels and fishery support vessels prepared by the Joint Tuna RFMOs in mid 2009, in which of the 18,086 records in the database, 5,987 are ≥100 GT, and only 161 report IMO/LR numbers (Joint Tuna RFMOs 2009c). However, this low figure may arise from the lack of a reporting requirement rather than a real lack of IMO/LR

[5] *ibid*

[6] Fishery support vessels include 'fish carriers', 'fish factory ships' and 'fishing support vessels' in the IMO/LR database.

numbers. For example, the Indian Ocean Tuna Commission (IOTC) has requested since 2007 that IMO/LR numbers be reported (IOTC 2007), but reporting has been limited thus far and to date of the 3,441 vessels on the record, half of which report they are ≥100 GT, only 309 report IMO/LR numbers. IATTC does not require information on its vessels' IMO numbers, but it stores and displays the IMO number for 329 vessels which have provided it (IATTC 2000)[7]. The three other tuna RFMOs (i.e. CCSBT, ICCAT, and WCPFC) do not require the IMO/LR to be reported when the vessel is placed on the authorised vessel list (CCSBT 2008a and 2008b, ICCAT 2009, WCPFC 2004 and 2009a).

In contrast to the T-RFMOs, the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) has requested reporting of the IMO/LR number for the CCAMLR list of authorised vessels since 2005 (CCAMLR 2004). Of the 53 vessels authorised to fish in the area between December 2006 and November 2010, all of which are assumed to be ≥100 GT due to sea conditions in the Convention area, 40 show IMO/LR numbers in the CCAMLR database (CCAMLR 2010). Others may have IMO numbers that do not appear in the CCAMLR database.

Consultation with LRF as part of this study indicated that the records of fishing vessels held in the IMO/LR database are not maintained to the same standard as the records for the commercial fleet. This is due both to a substantially lesser amount of information available for cross-validation of the fishing fleet and, probably as a corollary, a considerably lesser amount of commercial interest in the fishing fleet data[8]. A comparison of IMO/LR data (via SeaWeb (LRF 2010b)) and the EU Fleet Register data for Denmark, Spain and the United Kingdom vessels (EU 2010a) indicated a large number of discrepancies. For example, 32 vessels flagged to Denmark, 474 vessels flagged to Spain, and 158 vessels flagged to the United Kingdom with IMO numbers in the SeaWeb database were not found in the EU Fleet Register under the International Radio Call Signs (IRCS) listed in SeaWeb. From amongst this tri-nation subset (n=664) there were also 56 vessels with IRCSs that duplicate those of other vessels in SeaWeb, and 52 vessels without an IRCS listed. Across the entire IMO/LR database of 23,436 active fishing vessels approximately 9% (n=2,049) are of unknown flag (LRF 2010b). These figures indicate that although fishing vessels reside within the IMO/LR system, their records may be less reliable; this may need to be remedied to meet the objectives of the proposed GRFV.

[7] G. Compean, IATTC, personal communication

[8] T. Downing, LFR, personal communication

Summary of IMO/LR number

- **Mechanism**: The identifier is mandatory under a widely ratified international convention (SOLAS; 159 contracting parties) for certain vessel types and can be voluntarily implemented for certain other vessel types.
- **Degree of Uniqueness and Permanency**: The identifier is globally unique and permanent.
- **Origin of Data**: The identifier is assigned by a single, global body upon request by individuals or by national bodies acting as intermediaries.
- **Verification**: The identifier must be listed on a number of requisite certificates and is checked during inspections (for certain vessel types). The database is continuously verified through these and other means.
- **Comprehensiveness:** There are no issues with uptake by vessels for which the identifier is required. Voluntary uptake is reasonably good (~50%) for fishing vessels.
- **Hosting:** The database is maintained by a private entity on behalf of an intergovernmental organization. Data are marketed by the private entity in return for its investment in building the database.

2.1.2 Equasis

Development and Background

For the purposes of considering unique vessel identification systems, the Equasis database can be considered a subset of the IMO/LR database. As the Equasis database focuses exclusively on merchant ships ≥100 GT, it is able to use the IMO/LR number as its vessel identifier.

Equasis was developed under the auspices of the Quality Shipping Campaign begun in 1997, and initiated by the European Union, France, Japan, Singapore, Spain, the United Kingdom and the United States. The project is currently supported by an MOU signed by Australia, France, Japan, Norway, Spain, the United Kingdom, and the European Maritime Safety Agency (EMSA), representing the European Union, with the IMO and the United States Coast Guard as observers. France and the EU contributed the funds to develop the system, and support costs are now borne by these countries and by Japan, Singapore, Spain and the United Kingdom (Equasis 2010).

Operational Aspects

The database is intended to focus on disseminating information on the quality of shipping services provided by individual vessels (Equasis 2010). The foundation of the database is the LRF ship and owner/company data, and the associated numbering schemes. Using these numbering schemes, the Equasis operator (currently a French company, DSI) integrates data from 40 different sources including Port State Control authorities, private inspection groups, ship classification societies, and protection and indemnity (P&I) clubs. The database also operates as a clearinghouse for existing data by connecting the user to other original sources of data through hyperlinks (Poseidon 2009a). As Equasis relies on the original source data providers to maintain the quality and timeliness of the data, any user queries and complaints are passed on to the source providers (Marchand 2001). It was reported in 2005 that the

annual operating costs of Equasis are on the order of €700,000 which includes purchasing the right to display proprietary data from the source data providers (HSTF 2005). However, in January 2009 the European Maritime Safety Agency was granted responsibility for hosting the Equasis management unit. Recent communication with this unit on behalf of this study indicates that the change in hosting has resulted in a "significant" decrease in overall expenses[9].

Access to Equasis is publicly available and free of charge and is intended to remain so as the provision of the information is considered a public service (Equasis 2010). At present Equasis is the only free of charge provider of these data but even so some users lament that the proprietary nature of some of the data sets deprives the industry of information quality and transparency (Lunde 2005). In order to avoid compromising the commercial interest of the data providers, Equasis data can only be downloaded on a vessel-by-vessel basis, and data are limited to those fields which are considered to be quality-related.

The basic ship information available in Equasis consists of: IMO number, vessel name, call sign, MMSI, gross tonnage, deadweight, type of ship, year of build, flag and ship status, as well as data on management, classification, safety management certificates and P&I insurance. All of the information provided by Equasis is factual; it does not rank or rate ships' quality and does not provide black or white lists.

Coverage and Uptake

As of 2007 (the most recent available statistics), the Equasis database contained 71,929 ships. The database, by definition, excludes fishing vessels (Equasis 2010), but contains some fishery support vessels ≥100 GT (i.e. slightly over 1,000 of these vessels are contained in the IMO/LR database). The number of ships in Equasis (~72,000) can be related to the figure given by LRF in February 2008 of 103,000 active vessels of ≥100 GT with IMO/LR numbers (as of January 2010 estimated at 116,000), of which approximately 23,000 are fishing vessels (i.e. 103,000 – 23,000 = approximately 80,000 non-fishing vessels versus 72,000 vessels in Equasis). Equasis statistics indicate that approximately 35% of the vessels in the database are <500 GT (Equasis 2010). The website receives 400,000 hits per month mainly from charterers, insurers, shippers, brokers, and finance institutions (HSTF 2005, Marchand 2001).

[9] H. Ringbom, Equasis Management Unit (European Maritime Safety Agency), personal communication

Summary of Equasis

- **Mechanism**: Created by a multilateral government consortium and uses only pre-existing data.
- **Degree of Uniqueness and Permanency**: Uses the IMO/LR number (see above), therefore the identifier is globally unique and permanent.
- **Origin of Data**: All data are drawn from existing sources, some of which are proprietary and must be purchased by Equasis.
- **Verification**: Verification is the responsibility of the independent data providers.
- **Comprehensiveness:** Uses the IMO/LR number (see above) which has excellent mandatory uptake and good voluntary uptake.
- **Hosting:** Database is maintained by a private entity on behalf of a multilateral government consortium. Under an agreement with LRF and other data providers data are available to the public free of charge on a record-by-record basis.

2.1.3 CaribShip Unique Numbering Schemes

Development and Background

CaribShip is example of a unique numbering scheme for vessels which complements the IMO/LR scheme described in the preceding section (CaribShip 2010). Developed by LRF in the late 1990s, CaribShip supports 22 countries participating in the 1996 Caribbean Memorandum of Understanding (MOU) on Port State Control. This MOU is one of several regional agreements aimed at coordinating, standardising and monitoring the results of port state ship inspections (Hoppe 2000). The CaribShip database is designed to facilitate information exchange on small (< 100 GT) ships, including fishing vessels, trading between the Caribbean islands. It operates on a voluntary basis with a format closely based on the IMO/LF system. LRF contributed the initial funding for the development of the database and provides for its continuing operation[10].

Operational Aspects

The unique vessel numbering system consists of a 2-digit alphabetic country code followed by a 6-digit number. Blocks of numbers have been assigned to each of the flag States with the size of each block based on the expected number of vessels each flag State would be uploading to the database. If a vessel in the system re-flags to another participating country, the 2-digit country code will change but the 6-digit number will remain the same (LRF 2008). If the vessel re-flags to a country outside the system, the number should lapse.

[10] T. Downing, LRF, personal communication

Unlike the IMO/LR database for which LRF validates and continuously updates records, the CaribShip database is populated by register data provided by the flag States to LRF. A system under which member States update their own data subject to onscreen data validation rules is envisaged but not yet operative. Under the existing system, data are provided in a wide variety of formats including hard copies and do not use standardised values in each data field (LRF 2008). These formatting issues mean that loading of new vessels, as well as updating existing records, can be time consuming, however, only three flag States regularly provide fleet updates. Since LRF does not conduct independent research on the vessels in the database, the CaribShip database does not operate to the same standards as does the IMO/LR database in terms of validation of new number assignments, changes to existing vessels, or movements of vessels from one registry to another[11].

Despite these difficulties, LRF believes that the unique numbering system represented by CaribShip is effective, largely because of the observed low incidence of re-flagging of the ships in the database. It is noted however that only half of the Caribbean MOU member States apply the CaribShip number to their vessels, thus the incidence of re-flagging can be effectively assessed for only a portion of the database (LRF 2008).

Coverage and Uptake

As of January 2010, the CaribShip database contains 8,523 vessels of which 2,353 are fishing vessels. However, as indicated above, there is not full implementation of the ship numbering system and only 3,845 (45%) of the database entries have unique numbers attached. The database is hosted online by LRF with access limited to Caribbean MOU member states, and the United States Coast Guard and IMO which are observers to the MOU (Caribbean MOU 2010). The database is not known to be used for any fisheries management or fishery control-related purposes.

Summary of CaribShip

- **Mechanism**: The database was created by a multilateral government consortium for their own vessels and operates on a voluntary basis.
- **Degree of Uniqueness and Permanency**: The identifier is unique; part of the identifier is designed to stay with the vessel if it re-flags within the CaribShip system.
- **Origin of Data**: Identifiers are distributed centrally to participating flag States which assign them and then populate the database with identifiers and their attributes.
- **Verification**: The only sources of database updates are the flag States themselves. Issues with the scope and timeliness of updates have been raised.
- **Comprehensiveness:** The system applies to 22 Caribbean countries. Uptake is estimated at 45% of optimal.
- **Hosting:** The database is maintained on a pro bono basis by a private entity on behalf of a multilateral government consortium. Access is limited to consortium members.

[11] *ibid*

2.1.4 Joint Tuna RFMOs

Development and Background

A recent effort aimed specifically toward developing a unique vessel identification scheme for fishing vessels has arisen from the Joint Tuna RFMOs group (T-RFMOs) which first met in Kobe, Japan in 2007. At that meeting unification of lists of authorised vessels and lists of IUU vessels among RFMOs was identified as a priority activity and the following action item was agreed:

> "*creation of a harmonized list of tuna fishing vessels that is as comprehensive as possible (positive list […including support vessels]) including use of a permanent unique identifier for each vessel such as an IMO number.* " (Joint Tuna RMFOs 2007).

As result, the five tuna RFMOs (CCSBT, IATTC, ICCAT, IOTC and WCPFC) combined and reconciled their authorised vessel lists into a single database containing 18,086 vessels (Joint Tuna RFMOs 2009c). (It should be noted, however, that the WCPFC maintained until February 2010 only a temporary register of fish carriers and bunkers, and these 112 vessels are not included in the T-RFMO database).

At the second meeting of the T-RFMOs group in July 2009, a proposal was presented on establishing a unique vessel identifier for fishing vessels and harmonising tuna RFMO vessel lists (Joint Tuna RFMOs 2009a). A list of data fields used in the IMO/LR database, and a list of fields proposed by LRF as a minimum standard for assigning a UVI to fishing vessels, were contrasted against data currently collected by the five T-RFMOs when forming their authorised vessel lists. Of the 31 data fields identified as necessary by LRF in that proposal, IATTC collects 22, WCPFC collects 17 and the others collect only 12.

Operational Aspects

The LRF proposal outlined a process under which all vessels on the T-RFMO authorised vessel lists without IMO/LR numbers, including the approximately 14,500 vessels <100 GT, could obtain them (Joint Tuna RFMOs 2009a). First, the T-RFMOs would need to amend their vessel records to collect all of the required information from the flag States (as specified below). The flag States would then provide the information to the T-RFMOs, which would transmit it to LRF and receive from LRF a unique vessel identifier for each vessel (assuming validation is successful). The vessel data, including the UVI, would then be made available to each flag State, as well as to the public, by means of non-downloadable web interfaces on each individual RFMO website, the T-RFMO website, and possibly via the Equasis website. Updating of vessel attributes in the database should occur in the national registries which are periodically transmitted to the RFMOs and then to the T-RFMO database. Under this arrangement, LRF offered to provide UVIs to fishing vessels on T-RFMO vessel lists both above and below 100 GT at no cost. It was agreed at the meeting that the individual RFMOs would continue their efforts toward implementing this proposal (Joint Tuna RFMOs 2009b).

LRF was consulted during this study to determine the extent to which the T-RFMO proposal could be generalised to fishing vessels which are not on the T-RFMO authorised vessel lists. LRF advised that assuming appropriate funding can be negotiated with and provided to LRF, the proposal could apply to other vessels on the following similar conditions:

- All required data fields (as specified below) will be provided in accordance with LRF definitions and in a standardised manner (i.e. data format, units and language);
- Data will be supplied electronically through an intermediary coordinating body (e.g. the flag State or other) which will respond to and assist with queries during validation;
- Once assigned, the UVI (IMO/LR number) will be attached to and maintained with the vessel record in the intermediary coordinating bodies' database; and
- The intermediary coordinating body will provide LRF with periodic updates using the UVI as the vessel reference[12].

Coverage and Uptake

Since July 2009, ICCAT has amended its requirements for its authorised vessel list by extending the list to include vessels between 20-24 metres (which were previously excluded). However, except for including a new requirement to report vessel tonnage in gross tonnage (if possible), and to report length as length overall (Annex B2), it did not otherwise change the data fields to be provided by the flag States (ICCAT 2009). WCPFC also adopted new measures for vessel registration in December 2009, specifically to add fish carriers and bunkers to the permanent WCPFC Record of Fishing Vessels, but it too did not amend the data fields to be provided by the flag States (WCPFC 2009b).

WCPFC has however initiated a proposal for a pilot scheme to assign UVIs to some of the vessels on the WCPFC Record of Fishing Vessels. In response to WCPFC interest, LRF has agreed to provide UVIs for fishing vessels (either above or below 100 GT) which provide information in 22 data fields[13]. An additional 11 data fields will be required to be supplied within 5 years in order to fully meet the LRF requirements[14] (WCPFC 2009c). It was confirmed during the course of this study that this most recent offer from LRF represents the minimum data requirements for assignment of an IMO/LR number under the proposal offered to the T-RFMOs[15].

WCPFC members discussed the proposal in October 2009, including the need for flag States to provide five data fields to WCPFC which they do not currently provide (address of the operator (Master); fishing vessel number (national registration number); ship builder; nationality of ship builder; and gross tonnage) to meet the initial minimum data requirement from LRF. While some members were generally supportive, others raised issues such as national data privacy policies preventing the release of some data, and the need to maintain a focus on national vessel register identification numbers rather than assigning a UVI (WCPFC 2009d). The WCPFC Secretariat plans to work with interested WCPFC flag State

[12] T. Downing, LRF, personal communication

[13] RFMO unique vessel identifier, registered owner, address of owner, operator, address of operator, flag, previous flag, fishing number (national registration number), vessel name, previous vessel name, port of registry, call sign, ship builder, national of ship builder, year of build, type of vessel, length, molded depth, beam, GRT (if applicable), GT (if applicable), and power of main engines.

[14] Parent company, ship manager, bareboat/demise charterer, MMSI no., deadweight, parallel-in, parallel-out, official number, net tonnage, date ship entered registry, and date ship de-registered.

[15] T. Downing, LRF, personal communication

members on pilot projects to implement the proposal and assign UVIs to some fishing vessels (both above and below 100 GT) on the WCPFC Record of Fishing Vessels in 2010[16].

Summary of Joint T-RFMOs Database

- **Mechanism**: Five intergovernmental organizations have agreed to combine their individual vessel databases and work toward assigning permanent unique identifiers. Flag state participation is voluntary.
- **Degree of Uniqueness and Permanency**: The identifiers have been proposed to be based on the IMO/LR number and if so would be unique and permanent.
- **Origin of Data**: Existing national records would be passed through one of the intergovernmental organizations to a private, centralized body which will assign the identifier.
- **Verification**: Participating flag States would be responsible for providing and updating data through the intergovernmental organization intermediaries.
- **Comprehensiveness:** Implementation of the current proposal has not yet begun.
- **Hosting:** The database is proposed to be hosted by one of the intergovernmental organizations or by Equasis. A private entity will manage the identifier assignment and database initially on a free of charge basis.

2.1.5 High Seas Vessel Authorization Record

Development and Background

The Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas of 1993 (also known as the FAO Compliance Agreement) was designed to reinforce flag State responsibility for fishing activities and to provide for data exchange regarding high seas fishing operations. Originally intended as a mechanism to prevent re-flagging of fishing vessels for the purposes of avoiding international conservation and management measures (Kuemlangan 2003), negotiation of the agreement reduced its ambitions to calling for the establishment of a record of fishing vessels authorised to fish on the high seas by every flag State which is a party to the agreement. This record, called the High Seas Vessel Authorization Record (HSVAR), may exclude vessels <24 m at the flag State's discretion (FAO 1993).

The FAO Compliance Agreement also provides a framework for flag States to report any violations of international conservation and management by their own vessels, and for Parties to the agreement to bring to the attention of FAO and the flag State any potential violations of which they become aware. However, these reports as well as the record itself are not intended for public use. Under the Agreement, access is limited to FAO and States which are parties to the agreement, although information can be distributed to global, regional and subregional fisheries organisations with the permission of the Party

[16] A. Wright, WCPFC Secretariat, personal communication

concerned. In addition, FAO shall not circulate information amongst the Parties to the agreement until the flag State concerned has been provided with the opportunity to comment or object (FAO 1993).

Operational Aspects

Article VI of the Compliance Agreement specifies that flag States shall provide seven data types for the HSVAR as well as another six data types to the extent practical (Table 2; some data types split for tabulation purposes). As noted by Grainger (2000) and Lugten (2008), while the Compliance Agreement data fields do provide a benchmark for the types of data that should be exchanged on high seas fishing vessels, subsequent legal instruments including the United Nations Fish Stocks Agreement (UN 1995) and the International Plan of Action to Prevent, Deter and Eliminate IUU Fishing (FAO 2001) suggest other data types which should be considered. A comparison of these data types is shown in Table 2.

The FAO's Coordinating Working Party on Fishery Statistics in 2003 recommended to member States and RFMOs that a unique vessel identifier field be added to each vessel record to facilitate interagency data exchange (CWPFS 2003). FAO's approach to this UVI issue has been to request IMO/LR numbers, if available, for each vessel. If IMO/LR numbers are not provided, FAO attempts to match flag States' supplied vessel data to the IMO/LR database and if a sufficient match is found, to attach the existing IMO/LR number to the vessel. It was further proposed in 2008 that flag State permission should be sought to transmit data to LRF for the purposes of assigning an IMO/LR number to all those HSVAR vessels which do not already have them. However, a lack of resources has resulted in low levels of maintenance and data validation for the HSVAR, and little progress on these proposals.

Table 2. Comparison between vessel data to be provided under the FAO Compliance Agreement, the United Nation's Fish Stocks Agreement and the International Plan of Action to Prevent, Deter and Eliminate IUU Fishing. Under the Compliance Agreement required data types are shown in bold; data to be provided to the extent practicable are shown in italics.

	FAO Compliance Agreement (1993)	United Nations Fish Stocks Agreement (1995)	IPOA – IUU (2001)
Flag	(implied)	**X**	
Vessel name	**X**	(vessel identification)	**X**
Registration number	**X**		**X**
Previous name	**X**		**X**
Port of Registry	**X**	**X**	**X**
Previous flag	**X**		**X**
International Radio Call Sign	**X**	(and communication equipment)	**X**
Name and address of owner	**X**		**X**
Date of build	**X**	**X**	**X**
Place of build	**X**		**X**
Type of vessel	**X**	**X**	**X**
Length	**X**	**X**	**X**
Name and address of operator	**X**		**X**
Type of fishing method(s)	**X**	**X**	**X**
Moulded depth	**X**		**X**
Beam	**X**		**X**
Gross register tonnage	**X**	**X**	**X**
Power of main engines	**X**	**X**	**X**
Material of construction		**X**	
Hold capacity and catch storage methods		**X**	
Gear specification and quantity		**X**	
Navigation and position fixing aids		**X**	
Crew size		**X**	
Name and address of party registering the vessel			**X**
Name and address of beneficial owner			**X**
Ownership and compliance history			**X**
Vessel dimensions and photograph			**X**

Coverage and Uptake

There are currently 39 parties to the FAO Compliance Agreement, including Cyprus and Sweden which joined the EU after accepting the Agreement. These parties represent a total of 58 flag States of which 38 have listed a total of 5,641 vessels on the High Seas Vessel Authorization Record (HSVAR) (FAO 2010a)[17]. Vessels flagged to EU member States comprise 45%, and vessels flagged to Japan comprise 27%, of this total[18]. It was reported to the 2008 FAO Expert Consultation on the GRFV that approximately 60% of the vessels in the HSVAR have IMO/LR numbers. It was also reported that a comparison of the HSVAR and IMO/LR databases for 22 flag States as of 2002 indicated that these Parties

[17] Website data updated by F. Jara, FAO, personal communication

[18] *ibid*

to the Agreement have reported only 65% of the eligible vessels (FAO 2008b, (Annex II). Furthermore, in terms of the overall comprehensiveness of the HSVAR, given estimates of approximately 56,000 fishing vessels ≥100 GT, and an additional large but uncertain number of smaller vessels that may also fish on the high seas (see Section 2.1.1) and could voluntarily be included, it appears that the number of vessels contained in the HSVAR is very limited.

The FAO analysis of the HSVAR for the February 2008 Expert Consultation on the GRFV also indicated that there were numerous issues associated with incomplete data submissions (FAO 2008b (Annex II)). The 'type of vessel' and 'owner/operator' data fields were identified as being particularly problematic. In addition, problems with compliant reporting by Parties to the agreement in the agreed units of tonnage and length, compounded by uncertainties regarding the exact definitions of these units under the agreement, were noted as issues for the HSVAR.

While the FAO Compliance Agreement is recognised for its potential to improve the degree of flag State responsibility, this potential is largely unrealised due to the low number of ratifying States (Hedley 2008, Friedrich 2008) resulting in a limited HSVAR. This situation is reportedly due, *inter alia*, to a view by some distant water fishing States that the provisions of the Agreement are burdensome, and to the poor state of many national vessel registers (Hedley 2008). It is also clear that the restricted access to the HSVAR data imposed by the text of the Compliance Agreement works against the exchange of information it is designed to promote, in effect preventing cross-checking and use of data by non-participating flag and port States. After discussing these and other issues associated with the HSVAR, the February 2008 Expert Consultation on the GRFV considered that "efforts would be better directed towards a new and more comprehensive system rather than trying to modify the scope of the HSVAR" (FAO 2008a). The Coordinated Working Party on Fishery Statistics held a similar view stating that "no presumption should be made on [the] future relationship between HSVAR and global vessel list" (CWPFS 2007).

Summary of High Seas Vessel Authorization Record

- **Mechanism**: Participation is mandatory under the FAO Compliance Agreement of 1993 but the number of ratifying States remains low.
- **Degree of Uniqueness and Permanency**: It was recommended in 2003 to implement a unique identifier based on the IMO/LR number but little progress has been made.
- **Origin of Data**: Data are provided by participating flag States.
- **Verification**: Participating flag States are responsible for data updates. In theory, the FAO Secretariat may also undertake verification activities but funding constraints have prevented this.
- **Comprehensiveness:** In total 38 flag States have submitted data to the HSVAR but estimates indicate only a fraction of the global fishing fleet has been incorporated.
- **Hosting:** The HSVAR is hosted by FAO. Data are not publicly available and access is subject to several conditions even among parties to the Compliance Agreement.

2.1.6 European Union Fleet Register

Development and Background

Information collection for an EU Fleet Register began in January 1989 after a decision was taken that a detailed database was necessary to assist with assessing and managing financial support to the fishing industry (EU 2010a). The format for the database evolved over time with a particularly important amendment in 2002 creating compatibility with the FAO Compliance Agreement's HSVAR data requirements. Unique and permanent identification numbers for each vessel have been required since at least 1998 (EU 1998). This unique number was at first called the "internal number" but was later re-named the "CFR" (EU 2003).

The CFR is composed of the three character ISO country code (prefix) for the flag State of first registration, followed by nine digits for the flag State's identifier which can be letters or numbers (EU 1998). If the flag State's identifier is less than nine digits in length, zeros are placed between the country code and the identifier so that in total the identifier is twelve digits in length. The CFR is intended to be permanent, therefore even if the vessel changes flag, this number is maintained (as long as the new flag State is also an EU member State).

Operational Aspects

Under EU law, all member States are required to submit data on all fishing vessels flying their flag to the EU Fleet Register. As of September 2004, these data must be updated quarterly by the EU member States (EU 2003). "Snapshots" of current member State databases are submitted to the central system where they are validated and uploaded, or returned to the member States for correction. The EU Directorate General for Maritime Affairs and Fisheries (DG MARE), which manages the database (EU 2010a), is not empowered to make any unilateral changes to the data (Poseidon 2009a).

Coverage and Uptake

There are currently 84,728 vessels in the database flagged to EU member States (EU 2010a). Some sources report that the database also contains similar information for the fleets of Norway and Iceland through a special agreement with these non-EU countries (Eurostat 2010) but these data are not publicly accessible (EU 2010a).

The database is comprised of 38 data fields. These data fields cover most of the information required under the LRF proposal to the T-RFMOs (Section 2.1.4) with the notable exceptions of ship builder, moulded depth and beam. In addition, while the EU Fleet Register contains information on the name and address of the owner and operator, as required by LRF, these data are not publicly accessible due to confidentiality requirements under EU law (Poseidon 2009a). The EU Fleet Register does not collect, store or display vessels' IMO/LR number.

One of the key strengths of the EU Fleet Register is its ability to use the unique vessel identifier to track the vessel throughout its lifespan. However, the system is only effective in this regard if the vessel retains an EU flag. Since the unique identifier is not recorded in the certificate of registry, when an EU vessel re-flags outside of the EU, the unique identifier is lost. This situation could lead to assignment of a

new identifier should the vessel return to an EU flag later, thereby creating duplicates in the database. It is also clear that the database does not store information on the prior history of vessels imported to the EU.

A further analysis of the issue of re-flagging within the EU Fleet Register in presented in Section 3.3.3. If the observed level of re-flagging in this analysis reflects a similar level of re-flagging to and from non-EU member States (i.e. low), re-flagging should not pose a major threat to the integrity of the EU Fleet Register.

Summary of EU Fleet Register

- **Mechanism**: Participation is mandatory under EU regulations.
- **Degree of Uniqueness and Permanency**: Identifiers are unique and are retained upon re-flagging within the EU. If re-flagging outside the EU, it is likely that the identifier will not follow the vessel.
- **Origin of Data**: Data are provided by EU member States via standardised formats and validation routines.
- **Verification**: EU member States are responsible for data corrections identified during validation, and for quarterly "snapshot" data updates.
- **Comprehensiveness:** It appears that all EU-flagged vessels are incorporated and tracked. Vessel histories may, however, be discontinuous if they have re-flagged outside the EU.
- **Hosting:** The EU Fleet Register is hosted by the European Commission. With the exception of owner/operator information which is restricted due to confidentiality requirements, most data are publicly accessible through a free of charge web portal.

2.1.7 United States Vessel Identification System

Development and Background

Unique vessel identifiers were implemented in the United States as early as 1972 through the assignment of hull identification numbers (HIN) to recreational vessels. The system was, however, not comprehensive or well-integrated, and problems came to light when the United States Coast Guard (USCG) was given a mandate to develop a Vessel Identification System (VIS) under Public Law 100-710 of 1988. The VIS was initially intended to assist in identifying stolen vessels, but after the terrorist attacks of September 2001, port and maritime security objectives were also prioritised (GAO 2002).

An audit of the VIS development process in 2002 (GAO 2002), exposed several ongoing issues inhibiting the development of an effective VIS. These included:

- No requirement for unique vessel identifiers for some vessels (i.e. those less than 5 net tonnes and older vessels whose registration pre-dated the current requirements);
- Non-unique vessel identifiers for vessels which are required to have them, most often due to data entry errors resulting in multiple identifiers per vessel (i.e. many-to-one, possibly due to

inter-State re-registering); identifiers duplicated among several vessels (i.e. one-to-many); or otherwise invalid identifiers; and

- No mechanism to induce States to incur the cost and effort necessary to upload their data into a standardised national system.

In response to the GAO report, a new approach to the VIS was initiated. A private entity was contracted to collect vessel data from the States, convert it to a common format, and supply it to the USCG who would then supply it to authorised users. This is the basis for the current version of the VIS[19].

Operational Aspects

All vessels of five net tonnes or greater, engaging in fishing activities in United States waters, or in coastwise trade, require a certificate of documentation and are referred to as "documented vessels". Vessels which require a certificate of documentation must possess a unique USCG-assigned vessel identification number in addition to a HIN if a recreational vessel, both of which are permanently assigned to the vessel[20]. (It should be noted that some of the HINs used in the United States pre-date and do not necessarily conform to the ISO hull numbering standard described in the following Section). As the requirement for an HIN does not apply to commercial fishing vessels, they will use the USCG-assigned vessel identification number as the primary identifier. This identification number, called an "official number" is a six or seven digit number assigned to the vessel by the National Vessel Documentation Center. Applications for an official number must contain the vessel name, HIN (if any), owner's identity and contact details, hailing port, proposed use of the vessel, construction location and date, length, hull material and previous registration information (USCG 2010a). The Certificate of Documentation must be renewed every year (USCG 2010b). There are legal requirements for both HINs and official numbers to be permanently affixed to the vessel such that alteration, removal, or replacement would be obvious (USCFR 2010).

The current version of the VIS is maintained by the U.S. Coast Guard based on data provided by State vessel registries under an MOU arrangement. The MOU template fixes the data fields required to be submitted by each State and includes 14 data fields for the vessel itself[21], as well as 6 title-related fields and 5 law enforcement-related fields (USCG 2010c). The U.S. Coast Guard is in the process of obtaining regulatory authority to grant waivers to states which do not collect all of the required information so that they can still participate in the VIS if the U.S. Coast Guard determines that minimum data requirements can be met (USCG 2010d). In the meantime, the partial data from some of these States has been included in the database and the USCG is working with these States to complete all of the minimum data requirements[22].

[19] J. Hoedt, United States Coast Guard, personal communication

[20] *ibid*

[21] HIN, official number (if any), state certificate number, expiry date of state certificate, previous number, name of builder, year of builder, length overall, vessel type, hull material, propulsion type, engine drive type, fuel, and primary use.

[22] J. Hoedt, United States Coast Guard, personal communication

Access to the full database is limited to authorised administrative and law enforcement personnel from federal agencies and states participating in the MOU (USCG 2010d). Access to a subset of the data, i.e. omitting vessel title and lien data, for all documented vessels is publicly available through a U.S. National Marine Fisheries Service website (NMFS 2010). This data subset provides all of the vessel-related information in the database (see footnote above), as well as (if available) tonnage, call sign, IMO number, previous vessel names, current owner name and address, and past owners.

Coverage and Uptake

Of a total of 56 states and participating territories, 31 have signed the VIS MOU and meet all of the data requirements. A number of other states may also have signed the VIS MOU but do not currently meet all of the data requirements and are awaiting issuance of a waiver to formalise their participation. Of 28 coastal states and participating territories, 19 are formally participating in the VIS[23].

There are currently 267,022 "documented" vessels (i.e. those with official numbers, all of which should reside in the VIS), of which 25,648 are fishing vessels. There are another 12.5 million "undocumented" vessels (i.e. those with HINs and state registration numbers). Slightly more than half of the "undocumented" vessels are registered in States not participating in the MOU and thus would not be expected to reside in the VIS. With participation in the VIS thus limited to a portion of the States, the number of records in the system would be expected to be ≤7 million (i.e. 267,022 + (12.5 million/2)), however the number of records in the VIS is close to 20 million. The higher number results from multiple registrations per vessel due to desirable historical ownership data on recreational vessels (which often change owners), registrations that are inadvertently recorded as separate records, and inclusion of registration records for vessels which are no longer active. The USCG notes that most of the previously observed problems with vessel identifiers in the VIS have been due to data entry errors. Some States have attempted to correct such problems through inspecting vessels with duplicate or missing identification numbers at re-registration, but this is an intensive, time-consuming process[24].

Although the USCG is working to incorporate more State data into the VIS, various concerns including data privacy, system incompatibility, data gaps and costs suggest that progress will be slow. Congressional action to limit use of the data to enforcement, safety and security purposes is being discussed as a potential way to address some of the States' concerns[25]. Although the VIS does not yet cover all state-registered vessels, and still suffers from inaccuracies arising from data entry errors, the USCG considers that the majority of the data in the VIS are accurate and allow for effective functioning of the system[26].

[23] *ibid*

[24] J. Hoedt, USCG and P. Williams, National Vessel Documentation Center, personal communication

[25] J. Hoedt, USCG, personal communication

[26] *ibid*

Summary of United States Vessel Identification System

- **Mechanism**: National regulations require unique identifiers for certain vessel types. Other identifiers apply to other vessel types and are assigned by States.
- **Degree of Uniqueness and Permanency**: The identifiers are designed to be unique and permanent within the United States.
- **Origin of Data**: There were initial problems in compiling all State-assigned identifiers into a common database.
- **Verification**: Participating States and a national vessel documentation centre are responsible for providing and updating data.
- **Comprehensiveness:** Mainly due to data privacy concerns, 25 of 56 States and Territories do not participate in the system. Some issues with duplicate/erroneous historical records persist.
- **Hosting:** The database is hosted by a national government agency. Access to a subset of the data (excluding title and lien data) is publicly available and free of charge.

2.1.8 International Organization for Standardization (ISO) Hull Numbers (ISO 10087)

Development and Background

The International Organization for Standardization (ISO), a non-governmental organisation composed of the national standards institutes of 163 countries, has published over 17,500 standards covering engineering, technology, transport and other fields. In 1995, ISO adopted a 14-digit format for hull numbers applicable to small craft of hull length up to 24 m (ISO 10087, revised in 2006)(ISO 2010a). This standard was based on the 12-digit hull identification used in the United States since 1972 (see preceding section) but added the ISO two-letter country-specific prefix (USEPA 2010). (These prefixes are available for 246 country names, and include the code "TW" for "Taiwan, Province of China" (ISO 2010b [27]). There is no comparable standard applicable for vessels ≥24 m, although as noted in the preceding section, requirements for an IMO number would be expected to capture a substantial portion of such ships.

Operational Aspects

An ISO 10087-compliant hull number is designed to be assigned at the point of manufacture. It is composed of 14 digits as follows:

[27] Concerns about the use of systems which include country codes for Taiwan, Province of China in the development of a GRFV have been expressed (FAO 2009). The issue appears to revolve not around whether there is a separate country code for Taiwan (i.e. the ISO website indicates that FAO uses its TW country code system for some applications (ISO 2010c)), but around whether Taiwan is granted separate authority to assign its own codes. With regard to use of such codes for a fishing vessel UVI, the procedures followed when assigning ITU radio call signs as aircraft registration numbers under the Chicago Convention should provide a useful precedent (see Section 2.2.1).

- Characters 1 through 2 consist of the ISO two-letter code of the country of manufacture followed by a hyphen;
- Characters 3 through 5 consist of the alphabetic manufacturer identification code or importer designation;
- Characters 6 through 10 consist of alphanumeric manufacturer's serial numbers excluding the letters I, O and Q;
- Characters 11 through 12 consist of the month (alphabetic characters A through L) and year (last digit of year as a numeric character) of manufacture;
- Characters 13 through 14 consist of the model year (final two year digits as numeric characters) (USCFR 2010).

An example of an ISO 10087 compliant hull number would thus be CA-ABC2AB41G091.

The standard requires that the hull number be displayed in one of various specified locations onboard the vessel as well as in a duplicate, unexposed location. Hull numbers must be permanently affixed to the vessel such that alteration, removal, or replacement would be obvious (USEPA 2010).

Coverage and Uptake

Several national vessel numbering schemes use the ISO 10087 standard including *inter alia* the United States (see preceding section), the European Union (EU 2010b), Australia (GWA 2010) and Canada (Canadian Government 2010a). National regulations governing which vessels require hull numbers vary and can be complex but in most cases commercial fishing vessels are exempted even if they are <24 m (NMFS 2009, FitzPatrick 2009).

The standard is implemented in the United States through the requirement for certain vessels to obtain an HIN and to use this HIN as the vessel identifier (see Section 2.1.7). Under the United States system, the Coast Guard assigns the three character manufacturer identification code or importer designation (State of Alaska 2010).

Summary of ISO Hull Numbers (ISO 10087)

- **Mechanism**: This is a voluntary standard which has been codified in some national regulations (e.g. the United States, European Union, Australia and Canada).
- **Degree of Uniqueness and Permanency**: Identifiers are designed to be unique (assuming manufacturer's serial numbers are unique). Whether they are also permanent will depend on the national regulations which apply the standard.
- **Origin of Data**: Hull numbers are assigned by manufacturers; the extent to which they are uploaded to a database will vary by country.
- **Verification**: Hull numbers may be required for some vessel registration and inspection processes.
- **Comprehensiveness:** The standard is applied in some countries (e.g. the United States, European Union, Australia and Canada) but global uptake is unknown.
- **Hosting:** Databases of hull numbers may exist in countries which apply the standard but there is no known global database.

2.1.9 Ship Telecommunication Identities: IRCS and MMSI

Two systems of vessel identification used in association with ships' telecommunications devices are the International Radio Call Sign (IRCS) and the Maritime Mobile Service Identity (MMSI) number. Both identifiers are assigned to vessels by national authorities based on codes allocated to each national authority by the International Telecommunication Union (ITU), a specialised agency of the UN. The ITU provides annual lists of assigned IRCSs and MMSIs for a fee (ITU 2010a).

Under ITU's Radio Regulations Articles 19 and 47, maritime service transmitters must use an assigned IRCS (ITU 2010b, New Zealand Government 2010). The IRCS can take a variety of formats depending on the flag State. The ITU national codes are composed of three letters, or two letters and a number (with the number in the first or second position) (FAO 1989). When assigning vessel call signs, national authorities add either letters or numbers to all three of, or the first two of, the ITU national code producing a call sign which is usually 4 to 6 digits in length. The FAO's Standard Specifications for the Marking and Identification of Fishing Vessels (FAO 1989) calls for vessels with assigned IRCSs to display them prominently on the vessel. These standards also suggest that those vessels without IRCSs display the ITU flag State code (first two or all three digits) followed by a hyphen and the flag State licence or registration number. Some vessel registers, for example the WCPFC's Record of Fishing Vessels, use the IRCS as the vessel's unique identifier.

Requirements for the MMSI are documented in the ITU's Radio Regulations, Article 19 and in ITU-R Recommendation M.585-4 (USCG 2010e). In contrast to the IRCS, the format of the MMSI is more standardised. MMSIs always consist of a 9-digit number of which the first three digits correspond to flag State-specific codes allocated by ITU following a regional structure (e.g. codes beginning with "6" belong to African countries). The MMSI is broadcast by the vessel's Automatic Identification System (AIS) every 2 to 10 seconds while underway, and every 3 minutes while at anchor. AISs, which are required for all internationally voyaging ships of 500 GT or more, and for all passenger ships, also broadcast the ship's IMO number and IRCS every six minutes.

Although both the IRCS and MMSI identifiers are designed to be unique to the vessel at any given point in time, neither is permanent. In particular, if the vessel re-flags, the structure of both identifiers requires that the national prefix will change to the new flag State, and there are no international provisions for the non-national digits of the identifier to remain constant. Furthermore, under a domestic change of ownership, many flag States allow the IRCS and the MMSI to either stay with the vessel and migrate to the new owner, or be retained by the original owner and applied to his or her new vessel (BoatUS 2010, Coastguard Boating Education 2010, Yachting and Boating World 2010). Therefore, there is no permanent link between a call sign and a particular vessel or owner. Finally, re-assignment of previously used identifiers, e.g. when a call sign is de-registered, is common and is even encouraged by ITU.

Summary of IRCS and MMSI

- **Mechanism**: Mandatory under International Telecommunication Union regulations for marine radios and transmitters.
- **Degree of Uniqueness and Permanency**: The identifiers are designed to be unique at any given point in time, but can be changed and re-used and thus are not permanent
- **Origin of Data**: Identifiers are distributed centrally to participating States which assign them.
- **Verification**: Identifiers are recorded as part of some vessel registration processes and potentially checked during port inspections. Some vessels are required to, or voluntarily, display the IRCS in a prominent position.
- **Comprehensiveness:** Vessels with marine radios will have IRCSs and those vessels which require automatically transmitting ship stations will have MMSIs.
- **Hosting:** The ITU provides annual master lists of IRCSs and MMSIs to the public for a fee.

2.2 Numbering Schemes and Databases from Other Sectors

This section presents examples of unique identifiers which are similar in aim to the proposed unique fishing vessel identifier but applied in very different contexts. The objective of this review is to determine whether there are concepts from other sectors that may aid in the development of a fishing vessel identifier and whether there are lessons to be learned regarding potential pitfalls.

The first example is drawn from the aviation sector. A unique identifier scheme for aircraft is perhaps the most clearly analogous to fishing vessels as it involves coordination of national numbering systems, as well as the movement of aircraft between national registers. However, as will be described in the following section, despite their long history and wide international support, aircraft identifiers do not provide a continuous history for each craft. In order to focus on traceability, an international system of horse passports which specifically seeks to track a unique individual throughout its lifespan regardless of international movements was also reviewed. The horse passport system incorporates many features which would be desirable for a fishing vessel UVI but its voluntary nature (except within the EU), and concerns regarding the number of horses potentially involved, have limited its uptake. Finally, as an example of a private sector-led scheme, a system of unique identifiers for mobile phones is presented. This scheme is particularly interesting because of the way in which it compiles local blacklists into a global database which is then used to block non-compliant units.

2.2.1 International Register of Civil Aircraft

Development and Background

The international legal instrument governing aircraft registration is the Convention on International Civil Aviation, also known as the Chicago Convention, of 1944 (ICAO 2006a). This Convention, which now has 190 Contracting States, established the International Civil Aviation Organization (ICAO), a UN body responsible for cooperation in aircraft regulation. The Convention itself states only general

requirements for aircraft registration, for example that a Certificate of Registration must be carried onboard, and that an aircraft cannot be registered in more than one State but registration may shift from one State to another (Article 18). However, Annexes 7 and 10 to the Chicago Convention have been subsequently adopted to formalise international standards for aircraft nationality and registration marks and aeronautical telecommunication, respectively, as described below.

Efforts were begun in 1961 to provide a common format and repository for national aircraft registry data which is today known as the International Register of Civil Aircraft (IRCA). The IRCA is a joint effort between the national civil aviation authorities of the United Kingdom and Italy, along with Bureau Veritas, an international certification services body (IRCA 2010). With the formalisation of cooperation between ICAO and IRCA in 2001, ICAO has pledged to work toward encouraging all contracting parties to use the IRCA as a centralised data platform (IRCA 2010).

Operational Aspects

Annex 7 to the Chicago Convention, first adopted in 1949 and last amended in 2003, sets out specific procedures for ICAO contracting parties to use ITU[28] radio call sign letters to designate national registration numbers. Contracting parties are required to designate the first, or first and second, character(s) of one of ITU call signs assigned to them as the prefix for their aircraft registration numbers (ICAO 2010a). For example, Spain is assigned ITU radio call signs EA through EH and uses EC as the prefix for its aircraft registrations. Some countries opt to place a hyphen after the prefix, which is in any case followed by a 3 to 5 digit alphanumeric registration mark unique to the aircraft within its national registration system.

While some contracting parties, such as the United Kingdom, will not re-assign registration marks if the original aircraft has been de-registered, other contracting parties, such as the United States, will do so. Furthermore, some contracting parties, such as the United States, will allow an aircraft to change its registration mark without changing its nationality (FAA 2010). Under the system prescribed by the Convention, the aircraft's registration mark will necessarily change if the registration shifts from one State to another, i.e. at a minimum the national prefix will change, and there are no international provisions for the non-national digits of the identifier to remain constant. Since Annex 7 of the Chicago Convention requires that the national and registration mark be inscribed and displayed on a fireproof metal plate, changes in the registration mark will require changing the plate.

In addition to the registration mark, Annex 10 of the Chicago Convention (ICAO 2010b) provides for the assignment of aircraft addresses which are 24-digit binary numbers (also represented by 6-digit hexadecimal numbers[29]). These codes which are used in global communication, navigation and surveillance systems are also known as Mode S codes after the transponders that use them. The ICAO manages the system by allocating blocks of addresses to States which then assign them to their registered aircraft. One of the key principles of the ICAO 24-bit address is that no two aircraft should

[28] The International Telecommunication Union (ITU) is the specialized UN agency responsible for developing international standards for global telecommunication networks and for managing radio frequencies.

[29] The hexadecimal system uses 16 characters (0 through 9 plus the letters A through F) and can thus represent over 16 million unique base-10 numbers in only six alphanumeric characters.

ever use the same address simultaneously as this could cause air traffic control and tracking failures. While the aircraft address system is more universal than the registration mark system because all aircraft addresses can be represented by a code of exactly the same format, aircraft which shift their registration to another State will change both their registration mark and their 24-bit aircraft address, thus neither identifier remains attached to the aircraft throughout its lifespan.

Both the registration mark system based on the ITU radio call signs and the 24-bit aircraft address system accommodate Taiwan Province of China with a special series of codes allocated within the set assigned to the People's Republic of China (PRC). In the case of ITU radio call signs, the prefix B is used by the PRC whereas BV is used by aircraft registered to Taiwan Province of China. In the case of 24-bit aircraft addresses, the PRC uses the range 780000 to 7BFFFF (in hexadecimal format) whereas Taiwan Province of China uses the range 899000 to 8993FF.

Coverage and Uptake

The IRCA database uses the aircraft registration mark, as provided for under Annex 7 of the Convention, as its unique identifier. It also contains Mode S codes (24-bit aircraft addresses) for those aircraft which submit them (i.e. 463,000 or about 90% of the database entries[30]). In order to overcome problems encountered when merging data from different national registries, the IRCA, in conjunction with ICAO and the Commercial Aviation Safety Team (CAST), recently produced nomenclatural standards which are designed to be phased in by Contracting Parties over time on a voluntary basis (ICAO 2006b). Implementation of the standards is expected to facilitate data merging, reduce costs, and minimise duplicate or multiple identifiers (ICAO 2006b).

IRCA only maintains the current information associated with each registration mark, or the information last associated with a registration mark which has been deleted. It does not function to link old registration marks with new ones when re-registration occurs within or between Contracting Parties[31]. It is noted that some national databases, namely the UK Civil Aviation Authority's G-INFO database, do track aircraft histories when re-registration occurs within the national system.

At present more than 47 national aviation authorities provide aircraft registry data to the IRCA on a voluntary basis. The frequency with which the data are updated depends on the frequency of data provision by the Contracting Parties. In total, slightly over 520,000 aircraft are contained in the IRCA. Of these, 72% are registered in the United States, 7% in Canada, and 4% in Germany and the United Kingdom, respectively. Over 98% of the IRCA entries are registered in North America, Europe or Oceania.

[30] T. Prevot, Bureau Veritas, personal communication.

[31] ibid

Summary of the International Register of Civil Aircraft

- **Mechanism**: The identifier is mandatory under a widely ratified international convention. Provision of registration data to the authorised database is voluntary.
- **Degree of Uniqueness and Permanency**: The identifiers (registration mark and aircraft address) are unique at any given point in time. However, they are not permanent as changes between, or sometimes even within, national registers will result in changes in the identifiers.
- **Origin of Data**: National registers issue identifiers based on codes allotted by a global centre.
- **Verification**: The registration mark must be carved into a fireproof metal on the aircraft. Participating States are relied upon for the provision and updating of the data. The database only displays current data; it does not provide for aircraft histories to be kept.
- **Comprehensiveness:** The identifiers are universally applied, but the national datasets have proven difficult to merge into a common format. The current database is heavily focused (98%) on the US, the EU and Oceania.
- **Hosting:** The database is hosted by a bilateral governmental consortium with the assistance of a private entity. Access to the database is publicly available for a fee.

2.2.2 Universal Equine Life Number

Development and Background

The Universal Equine Life Number (UELN) system is another example of an effort to combine national registries into a global database of uniquely identified objects, in this case horses. However, the UELN specifically aims to identify and track an individual's history, not just its current attributes. A number of motivations exist for such a traceability system for horses including verifying genealogy, maintaining competition records, and controlling disease.

Many countries have established horse identification schemes through issuance of national passports, and the Fédération Equestre Internationale (FEI) international passport system recognises 46 national horse passport issuing schemes in 39 countries across five continents (FEI 2010). However, the variety of formats used in the national passport systems make it difficult to track horses which travel, change names or owners, or register in a new country (HorseTalk 2007). The UELN system is designed to promote compatibility between national passport schemes by assigning each horse a unique identification number that remains attached to it throughout its lifetime. While the FEI encourages and supports the UELN, it does not currently require a UELN for recognition of national passports. The UELN is financially supported by the World Breeding Federation of Sport Horses which actively promotes its use around the world (UELN 2010).

Operational Aspects

Only horse registration organisations which have been given UELN codes can issue UELNs (UELN 2010). The 15-digit UELN is created by adding a 6-digit prefix to the original national register number which is

allowed to be up to 9 digits in length. The prefix is comprised of the 3-digit International Standards Organization (ISO) country code (ISO 2010c) for the country which first registers the horse, and a 3-digit code for the identity of the register ("stud book") within that country (i.e. to handle cases in which there is more than one registry per country). If the original national registration number is less than 9 digits in length, zeros are added to the left of the number to form a 9-digit number. If the national register number contains non-alphanumeric characters, the national authorities are requested to designate a standard convention by which to translate the non-alphanumeric characters into numeric characters without creating duplicate numbers (UELN 2010).

A key feature of the UELN is that the UELN assigned to a horse does not change when that horse is imported to a new country and entered onto a new register. Horses which are imported and which do not have a UELN need to apply for a UELN in the country of birth (UELN 2010).

Coverage and Uptake

The UELN began, and finds its strongest support, in Europe. Under EU regulation 504/2008 all Equidae (horses, asses and zebras) born in or imported to the EU must be identified by a single identification document (EU 2008). According to the World Horse Identification, Registration and Data Exchange Committee (WHIRDEC), the EU regulation mandates UELNs, as well as microchips or a suitable alternative, for all horses born in EU member States on or after 1 January 2009. (Each member state is free to decide its own policies for horses born before that date (UELN 2010)). Although the EU regulation thus requires both a unique number and a permanent "label" (the microchip or alternative), it is not necessarily the case that the UELN and the microchip number are the same, therefore the passport should record both numbers to allow cross validation (UELN 2010).

Other countries with large numbers of horses, such as the United States, have not implemented the UELN (Mann 2005, Anon. 2010). One of the major concerns in the United States appears to be the scope of application of the UELN. According to some sources there are as many of 32 million horses and if all of them are required to have a unique number and if that unique number is a UELN, the UELN system could potentially be overwhelmed (Mann 2005). Based on this and other concerns, including the need to standardise values in key data fields, uptake of the UELN outside of the EU is limited thus far. As of 2006, of nearly 50,000 horses registered in the FEI international passport system, only 4,000 have UELNs (UELN 2010). As of 2010, there are UELN-granting horse registration organisations in over 85 countries[32].

[32] Personal communication and data from B. LaCroix, UELN Project Coordinator.

Summary of the Universal Equine Life Number

- **Mechanism**: The identifier is mandatory in the EU since January 2009 but is voluntary elsewhere.
- **Degree of Uniqueness and Permanency**: Identifiers are unique (based on national codes plus a country prefix) and permanent as they don't change when a horse is re-registered.
- **Origin of Data**: National organizations are allocated UELN prefixes by a central authority and then issue UELNs. Data is uploaded to the international database.
- **Verification**: In the EU, where UELNs are now mandatory, microchips or the equivalent are also required for verification.
- **Comprehensiveness:** Uptake has been limited thus far but is expected to increase under the EU mandate.
- **Hosting:** The UELN system and database are sponsored by a leading non-governmental organization in the sector. The database is not publicly accessible at this time.

2.2.3 International Mobile Equipment Identity Number

Development and Background

A global unique identifier system exists for mobile phones in the form of the International Mobile Equipment Identity number (IMEI). One of the objectives of the IMEI is to provide a global system to counteract mobile theft and fraud given the number of stolen handsets which cross international borders (GSM Europe 2003). It is also thought that IMEIs make it more difficult for terrorists to access mobile networks without revealing details about themselves (Bushell-Embling 2009).

The system was initiated by the Global System for Mobile communications (GSM) Association in 1992 and offers IMEI numbers only to approved manufacturers (BABT 2010). Industry standards developed by the European Telecommunications Standards Institute (ETSI) in 2002 call for a valid and tamper-proof IMEI to be attached to each device accessing the GSM network. However, these standards are voluntary and the degree of compliance varies by country and manufacturer (GSM Europe 2003). In fact, the only country in which IMEIs are a legal requirement is India[33]. This situation was highlighted in November 2009 when Indian authorities suddenly banned mobiles without IMEIs from accessing GSM networks, and it was estimated that as many as 25 million devices were affected (Bushell-Embling 2009). As many of these blocked devices have subsequently migrated to other countries in the region, these countries are reportedly considering similar bans[34].

[33] P. Gosden, GSM Association, personal communication

[34] *ibid*

Operational Aspects

The IMEI is assigned to the mobile by the manufacturer using code series allocated to each manufacturer by authorised private entities on behalf of the GSM Association (BABT 2010). Each IMEI is a 15-digit number composed of an 8-digit prefix assigned to a given manufacturer and model, a 6-digit unique serial number per device, and a 1-digit check number (a calculated function of all the other digits)(BABT 2010). The number is inscribed on the mobile itself as well as programmed into the operating system and is transmitted via the network when the device is switched on (Alva 2009).

Although IMEI numbers are designed to be permanently assigned to a unique, individual device, methods exist to program new IMEI numbers into handsets. This type of re-programming is illegal in many countries, including the United Kingdom, where it has been estimated that 10% of IMEIs are not unique (BBC 2002). In addition to re-programming, other weaknesses in the global IMEI system arise from unauthorised providers of IMEIs, and mobile devices being sold without IMEIs in countries where the IMEI requirement is not enforced (GroundReport 2009).

The IMEI is specific to the device only and therefore differs from the information associated with the SIM card which identifies the subscriber to the mobile service. A key purpose of the IMEI is to prevent unauthorised equipment being used on mobile service networks. For example, in the case of lost or stolen mobile phones, upon notification the network service provider can block the equipment using that IMEI from the network, thereby disabling it even if the SIM card is changed (BABT 2010).

Individual databases of IMEIs assigned by each manufacturer are known as Equipment Identity Registers (EIRs). When a mobile is reported lost or stolen it is blacklisted on the EIR of the network provider for that device. The EIRs also maintain gray lists of devices to be tracked rather than banned. Since 1996, all cooperating EIRs upload their individual blacklists to the global IMEI database daily. The IMEI database consolidates the individual blacklists into a global blacklist which is then downloaded by the EIRs so that blacklisted devices are blocked across all cooperating EIR operators. Not all manufacturers and networks operate an EIR and cooperation between the EIRs and the IMEI database is voluntary (GSM Europe 2003).

Coverage and Uptake

Of the estimated 34 billion IMEIs in the IMEI database approximately 53,000 are blacklisted[35]. The GSM Association stated in 2010 that of its 773 GSM mobile phone operators in over 200 countries, only 62 operators in 23 countries are compliant with the IMEI database and can block unauthorised devices from accessing the network using EIRs[36]. Most of these compliant operators are European (ITRealms Online 2007). Operators in Chile, China, Costa Rica, Ghana, India, Kenya, Russia and South Africa are also connected to the IMEI database[37] but have not necessarily developed EIRs.

[35] P. Gosden, GSM Association, personal communication

[36] *ibid*

[37] *ibid*

Summary of the International Mobile Equipment Identity Number

- **Mechanism**: The identifier (and the database) is an industry code of practice which has been reinforced by a voluntary EU standard and mandatory application in India.
- **Degree of Uniqueness and Permanency**: Identifiers are intended to be unique and permanent but there are some problems with tampering and assignment of false or unauthorized identifiers.
- **Origin of Data**: A private entity assigns code series to manufacturers on behalf of an international industry organization. Manufacturers assign identifiers. Individual local operators blacklist identifiers and upload them to the global database where they are compiled and downloaded to all participating local operators.
- **Verification**: The validity of the identifier is verified each time the unit is used. Blacklisted identifiers are blocked from accessing the network.
- **Comprehensiveness:** Eight percent of operator networks are able to block blacklisted units; a higher percentage of networks participate in the system to a lesser degree.
- **Hosting:** The global industry association and the participating local operators support the cost of the system. The data are only made available to participating local operators.

2.3 Discussion of Key Features of Maritime Vessel and Other Sector Identifiers

The objectives of the UVI for fishing vessels require that the identifier be unique and permanent. These criteria thus provide a straightforward means for initial classification of the schemes reviewed above. Those schemes based on ITU codes, i.e. the IRCS, the MMSI and the aircraft registration mark, do not fulfill this requirement because they are only unique for a given moment in time and can be reassigned, in some cases even if the vessel or aircraft does not change national registers. While such impermanency does not necessarily preclude keeping an historical record of a vessel or craft as it changes identifiers, it appears that the existing databases which use these identifiers (e.g. the International Registry of Civil Aircraft, the WCPFC Record of Fishing Vessels) are not designed to make these linkages. For these reasons the schemes based on ITU codes are not considered further.

The remaining schemes, which can all be considered to use unique and permanent identifiers, can be categorised on the basis of whether the identifiers are:

- assigned directly by a single, centralised entity;
- assigned by intermediaries using code blocks allocated by a single, centralised entity;
- assigned by local authorities, adjusted if necessary, and uploaded to a centralised database.

These three categories are described and discussed individually below.

2.3.1 Identifiers Assigned by a Single, Centralised Entity

The identifiers in the first group are exemplified by the IMO/LR number which forms the basis for the IMO/LR scheme (also used by Equasis, T-RFMOs and HSVAR (to the extent that it has been implemented)); and by the United States's official number assigned by the National Vessel Documentation Center. In the former case, the scheme applies to certain types of vessels flagged to all countries which have ratified the SOLAS Convention of 1974 (159 contracting parties). The scope of the United States identifier is much narrower as it applies to certain types of vessels only within a single, albeit large and diverse, national system. Nevertheless, both schemes can be considered mandatory either through ratification of an international treaty (SOLAS) or through national regulations (e.g. USCFR 2010).

In both of these top-down systems, the numbers are unique, permanent and validated/updated by the assigning entities. While this feature comes at a cost, it results in a high degree of system integrity. In the case of the United State's official number, this service is provided by the national government. In the case of the IMO/LR number the system is managed by a private entity on behalf of an intergovernmental organisation and the private entity is given a proprietary right to some of the data to partially compensate it for its ongoing management of the database. In neither case is the dataset fully and freely available to the public, but both systems are partially open-access on a vessel-by-vessel basis (the United States system through a NMFS website; the IMO/LR through purchase and display by Equasis). It should be noted that the IMO/LR system is much stricter in terms of the vessel data requirements to be provided when requesting the identifier (compare details in Sections 2.1.1 and 2.1.7), perhaps because it is explicitly designed to be able to trace vessels even if they change national registries.

Group 1: Identifiers Assigned by a Single, Centralised Entity	
Strengths:	Strong legal mechanisms lead to broad comprehensiveness and compliance; central management of the identifier databases ensures high data integrity.
Weaknesses:	Management costs are high relative to less intensively managed schemes; public access to data is partial and may incur costs.

2.3.2 Identifiers Assigned by Intermediaries using Allocated Code Blocks

Like the identifiers in the first group, the identifiers in this second group are centrally managed, however, their assignment and updating is delegated to local or regional bodies. Examples of this type of identifier include the CaribShip scheme, the ISO standard for hull numbering as applied to United States HINs, and the IMEI for mobile phones.

Allocation of code blocks is most easily and effectively accomplished when the structure of the system (e.g. the number of intermediary bodies and the number of identifiers each is likely to assign) is known in advance. This may suggest that this kind of scheme would be difficult to apply to the global fishing fleet unless a mechanism for participation and structure can be established at an early stage. Nevertheless, the IMEI system operates dynamically on a global scale, and an identifier like the ISO standard could conceivably apply globally if manufacturer identification codes (or similar) could be appropriately

assigned by a centralised body. This type of scheme would appear to be advantageous when dealing with numbers of units that would overburden a centralised authority acting alone (e.g. 34 billion IMEIs).

Delegation of identifier assignment and attribute data updating responsibilities to local/regional bodies does not necessarily imply weaker control and uptake. However, such delegation does make the scheme vulnerable to each intermediaries' ability to apply the scheme to the subset for which it is responsible. For example, difficulties may arise in terms of varying regulatory authority (e.g. only in India is the IMEI mandatory) or varying interest in the scheme (e.g. only some of the Caribbean MOU countries assign the allocated CaribShip codes to their vessels). Furthermore, de-centralised systems imply delegation of costs to local/regional authorities. While this may be attractive to the centralised authority, it may also lead to a lack of participation or under-performance by local/regional bodies due to cost (e.g. only some of the IMEI operators have invested in EIRs to block handsets (Mobile News 2009), some CaribShip participants fail to update their fleet data regularly). Therefore, while not necessarily the case, the opportunities for lower performance under a delegated, code-allocation system are greater than under a centralised system.

Finally, none of the reviewed schemes contained provisions for migration or export of a unit from the authority of one local/regional body to another. It is expected that such a situation would be commonly encountered with fishing vessels through re-flagging, and if not accounted for, could result in discontinuous vessel histories and/or multiple identifiers for a single vessel.

Group 2: Identifiers Assigned by Intermediaries using Allocated Code Blocks	
Strengths:	Useful for very large sets; management effort and costs are decentralised/shared
Weaknesses:	May show relatively weaker verification or comprehensiveness if intermediaries underperform; may not easily handle movements between intermediaries

2.3.3 Identifiers Assigned by Local Authorities

The final category consists of locally assigned identifiers, often in the form of national identifiers, which are consolidated into a common, often global, format while still retaining their uniqueness. Examples of such schemes include the EU Fleet Register and the UELN horse passport system. Both schemes are premised on nationally assigned, unique and permanent prefixes (based on the ISO country code) and serial numbers which are assigned at first registration and do not change even if the country of registration changes.

A particular strength of fully devolved schemes is that instead of working with centrally defined identifiers, under the fully devolved schemes, the national authorities can continue to use their existing systems for assigning the serial numbers. One concern is that this scheme necessitates a greater effort than the allocated code schemes in achieving a standardised format since the formats of the serial numbers may vary considerably in length and format from country to country. For example, the length of the serial number may require the addition of zeros to reach the required number of digits, and

special characters may need to be converted. As a result of these issues, uploading to a centralised database requires robust data verification procedures.

In several respects fully devolved schemes are similar to the allocated code schemes above in terms of the sharing of responsibilities and costs, and the associated benefits and disbenefits. Fully devolved schemes also have similar advantages when dealing with large sets (e.g. 84,728 vessels in the EU Fleet Register). While both types of schemes may encounter problems when a unit migrates, or is exported, out of its original register, the fully devolved schemes have developed procedures to address this. In the EU scheme when a vessel re-flags the identifier remains the same but the new flag State adopts the responsibility for maintaining and updating the vessel data. In the horse passport UELN the original register retains responsibility for verifying the identity of the horse. This approach is simple and straightforward but implies a continuing responsibility for verification on the part of the original register which is not necessarily appropriate for fishing vessels.

Group 3: Identifiers Assigned by Local Authorities

Strengths:	Existing national identifiers can be maintained; useful for very large sets; management effort and costs are decentralised/shared
Weaknesses:	Difficulties in converting to a standard format; potentially weaker verification or comprehensiveness (see Group 2); may not easily handle movements between intermediaries

3 National Vessel Registration and Re-flagging

Large quantities of information on individual fishing vessels are currently held in national vessel registers and in national records of fishing vessels (i.e. specific "registers" for fishing vessels which are often separate from the national vessel registers)[38]. Analysis of these registers and records can thus provide insight into what data are and are not routinely collected, as well as assess whether national registers and records can be used as platforms for large-scale data exchanges supporting a UVI scheme. This section presents a summary of an analysis of 20 national systems, and additional information on two others, covering regulatory structure, registration validity periods, small-size exemptions, numbering systems and digitisation. The ability of these national systems to provide the information likely to be required to support a UVI scheme is then assessed. The section concludes with an analysis of the extent to which vessels move between national registers.

3.1 Analysis of National Vessel Registers

This study attempted to assess a sample of national vessel registers and records of fishing vessels chosen on the basis of size and importance of their fishing fleets, geographic representativeness, potential for attracting new registrations, and the possibility of obtaining relevant information during the short course of this study. The approach involved one or more of the following for each national register: obtaining copies of the forms used to register a vessel; personal communication with officers of the relevant authorities; and collection of information from publicly available literature, RFMO documentation and reputable websites.

National vessel registers and/or records of fishing vessels were surveyed for Australia, Belize, Cambodia, Chile, China, Denmark, Indonesia, Japan, New Zealand, Norway, Panama, Papua New Guinea, Russia, Seychelles, South Africa, Spain, Thailand, the United Kingdom, the United States of America and Vanuatu (Figure 1). Of the surveyed countries, only Belize's, Cambodia's, Panama's and the Seychelles' records of fishing vessels were not able to be assessed. It should be noted that in Indonesia, Papua New Guinea, Russia and Thailand (since 2008) all fishing vessels are included in the national vessel registers. Due to data availability, the national vessel registers/records of fishing vessels for Morocco and Ghana are described in a lesser amount of detail. The results of the analysis are summarised below and provided in detail for each of the 22 countries in Annexes A1-A22. The fishing vessel registers of India, Namibia, Oman, Portugal, Sri Lanka and Togo were originally selected for analysis but sufficient information could not be obtained within the course of this study.

[38] Under the FAO Compliance Agreement (FAO 1993) each ratifying State is required to "maintain a record of fishing vessels entitled to fly its flag and authorized to be used for fishing on the high seas". The Compliance Agreement defines "record of fishing vessels" to mean a record of fishing vessels in which is recorded pertinent details of the fishing vessel. It may constitute a separate record for fishing vessels or form part of a general record of vessels. Similar records are also required under the United Nations Fish Stocks Agreement, the FAO Code of Conduct for Responsible Fisheries, and the FAO International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing.

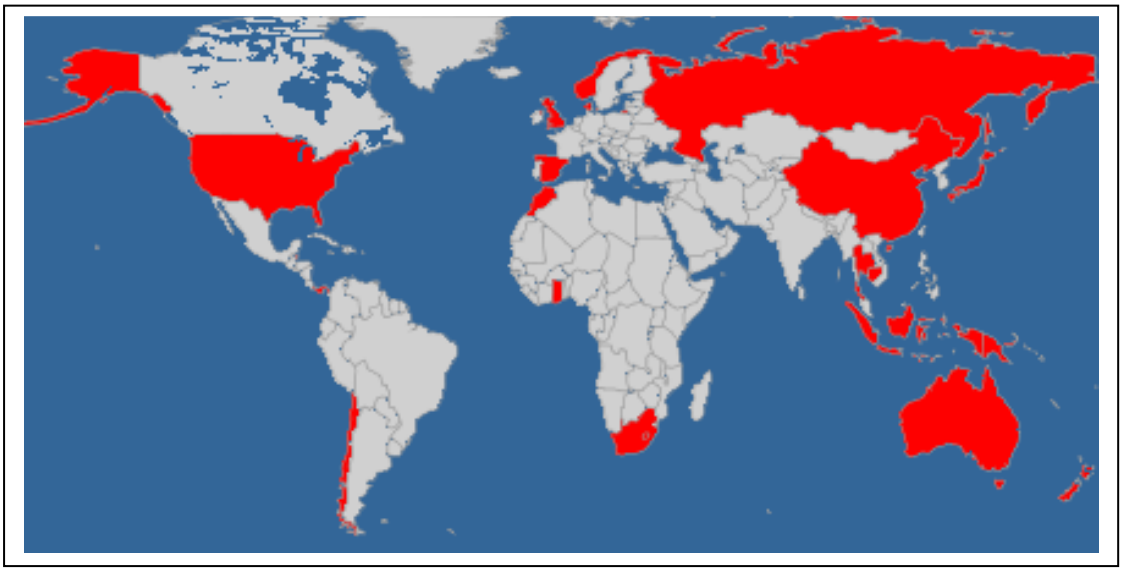

Figure 1. Countries included in the national vessel register analysis. Note that Belize, the Seychelles and Vanuatu are not visible due to scale**.**

In terms of survey coverage, the national vessel registers included in the analysis comprise substantially more than half of the global fishing fleet both in terms of numbers (76%) and tonnage (66%) (Table 3). This is largely due to the fact that the survey included China, since China alone is believed to have at least 300,000 (Annex A5) motorised fishing vessels. Using ratios, since the available data are quite dated, if China is excluded from the calculations, the surveyed countries comprise 62% of the fleet by number and 26% by tonnage. The difference in the figures with and without China can be attributed to China's larger proportional share of the global fishing fleet's tonnage (55% share of tonnage versus 36% share of number).

Table 3. Percentage of the global fleet by number of vessels and tonnage included in the surveyed countries (with and without including China). (Source: FIGIS, 2010 (data for 1998)).

	Number	**Tonnage**
Global Total	100%	100%
22 Surveyed Countries	76%	66%
China	36%	55%
Percentage Surveyed (excluding China)	62%	26%

3.1.1 Regulatory Structures for Fishing Vessel Registration and Authorisation to Fish

The authorities responsible for the registration and recording of fishing vessels varied widely across the surveyed countries (Table 4). There are also important distinctions between the procedures employed by different national agencies within the same category in Table 4. For example, several countries (Chile, China, Denmark, Japan, Morocco, New Zealand and Norway) require that all fishing vessels be listed on a record managed by the fisheries administration, but in some of these countries fishing vessels may also appear in the national vessel register. In the case of Norway, fishing vessel owners may voluntarily register in the national vessel register. In the case of Chile, Denmark and New Zealand, fishing vessels

over a certain size are required to register in the national vessel register. In China and Japan, registration of fishing vessels is handled by regional offices responsible for fisheries management, in China by the Port Supervisory Authority under the Bureau of Fisheries, and in Japan by prefectural government fisheries offices. These registration processes appear to be completely separate from national vessel registration processes.

In the remainder of the surveyed countries, the authority for registering fishing vessels lies outside of fisheries authorities. The survey included four open registries (Belize, Cambodia, Panama and Vanuatu) which are independently operated by private entities, often located overseas, on behalf of the government. In the United States and the United Kingdom, the Coast Guard is granted authority for fishing vessel registration. In Russia, under a highly de-centralised system like China and Japan, the harbour master of the vessel's home port is responsible for the registration of the fishing vessel. Russian vessels ≥80 GT are registered on the national vessel register, and vessels <80 GT are recorded in a record called the "Ship's Book". For the other surveyed flag states, i.e. Australia, Ghana, New Zealand, Papua New Guinea, the Seychelles, South Africa and Thailand, fishing vessels are registered with the maritime safety authorities or other marine department. Smaller vessels which are not required to register are licenced and kept on separate lists, either centrally or locally. Spain is the only one of the surveyed countries in which fishing vessel registration is the responsibility of the Ministry of Development.

Table 4. Agencies responsible for fishing vessel registration in each of the surveyed countries.

Responsible Agency	**Countries**
Directorate of Fisheries (7)	Chile, China, Denmark, Japan, Morocco, New Zealand, Norway
International Registers/Commercial Registers (4)	Belize, Cambodia, Panama, Vanuatu
National Maritime Safety Authority/Marine Department (6)	Australia, Ghana, Papua New Guinea, Seychelles, South Africa, Thailand
Coast Guard (1)	United States
Harbour Master (1)	Russia
Ministry of Transport (2)	Indonesia, United Kingdom[39]
Ministry of Development (1)	Spain

Fishing authorisations and licences are in some cases administered by the same agency that registers the vessels (e.g. Chile, Denmark, Morocco and Norway). In most of these cases (i.e. Chile, Morocco and Norway), the two systems are linked: a fishing vessel cannot be registered without an existing fishing authorisation or licence, and a fishing authorisation or licence cannot be held without possession of a registered fishing vessel. In China and Japan, both vessel registration and authorisation to fish are handled by local fisheries officials as separate processes. However, some vessels which wish to fish in distant waters also need an authorisation to fish from the central government.

In other cases, registering fishing vessels and granting them an authorisation to fish are handled by different agencies. In the United Kingdom, fishing vessels are first registered with the Registry of Shipping and Seamen (RSS) under the Maritime and Coast Guard Agency. A fishing authorisation is then issued by the Department of Environment, Food and Rural Affairs through its Marine Fisheries Agency executive. Similar systems which grant fishing authorisations through centralised fisheries authorities

[39] The United Kingdom Ship Register is affiliated to both the Department of Transport and the Maritime and Coast Guard Agency.

separate from fishing vessel registration authorities are found in the Indonesia, Russia, South Africa and the United States.

In New Zealand and Australia, both of which have individually transferable quota fisheries, direct administrative links must be established between quota owners and the vessel that will be employed to operate under the quota before the quota can be activated. This takes the form of a Boat Nomination form submitted to the national fisheries management authority in Australia, and a certificate and registration number assigned by the Ministry of Fisheries in New Zealand.

In the open registers (Belize, Cambodia, Panama and Vanuatu), authorisations to fish are more loosely linked to fishing vessel registration. In Cambodia and Panama, a fishing vessel licence is required in addition to registration. Both states have conditions for these licences. In Panama there must be no fishing in certain areas and for certain species, including areas that are under the jurisdiction of RFMOs where Panama is not a contracting party. In Cambodia, there must be no fishing for tuna.

3.1.2 Registration Validity Periods

Updating of registers and other lists of licenced vessels is achieved through various systems in the surveyed countries. In some flag states, vessels are required to renew their registration and/or licence at regular intervals (e.g. every year in Thailand and the United States; every five years in China and South Africa). In other countries, such as Japan and Vanuatu, the licence is permanent. In Norway the vessel licence is permanent, but the owner's eligibility to own the vessel must be renewed every year.

3.1.3 Registration of Small-Sized Vessels

Licensing of decked/motorised fishing vessels is obligatory in most countries. However, as explained in Section 3.1.1, in many countries some vessels registered as fishing vessels (i.e. on the fishing vessel record) will not appear in the national vessel registry due to size limits (e.g. too small) or other factors (e.g. operation in local waters only or registration in the national vessel register is voluntary). In other words, due to size limits or other factors, the fishing vessels contained in the national vessel register and those contained on the record of fishing vessels may differ.

Size limits relating to registration requirements vary considerably from country to country even within EU member States. For example, registration in the national vessel register is voluntary for all fishing vessels in the United Kingdom, but required for all fishing vessels over 20 GT in Denmark. In the United States all vessels over 5 net tonnes conducting fishing activities in national waters require national vessel registration involving assignment of a unique vessel identifier (see Section 2.1.7 for details). In New Zealand, all fishing vessels, regardless of size, must be registered with the New Zealand Ministry of Fisheries, but only those vessels >24 m must be placed on the national vessel register hosted by Maritime New Zealand.

While many countries exercise a lesser degree of control over small vessels, this is beginning to change in some areas. Morocco maintains a national record of all authorised fishing vessels including artisanal vessels, with placement on the record a prerequisite to obtaining a licence to fish. Ghana has recently begun a pilot program to improve the registration system for artisanal fishing craft. As registration requirements for these small craft have previously been neglected in comparison to industrial and semi-

industrial fleets, the goal of the project is to improve data quality for this sector and help build a national vessel register. The pilot program will assign number plates with identification numbers to 1,000 canoes out of a total fleet of 12,000.

3.1.4 Identification Numbering Systems

The results of the national vessel register and fishing vessel record survey demonstrate that there are a variety of identification numbers attached to fishing vessels. In general there are two types of numbering systems: one type identifies the vessel (hull) and another type identifies the fishing authorisation or licence. The former type is often permanent and required to be marked internal to the vessel. The latter is often linked to the region or home port of the vessel and may be displayed externally, but is not permanent.

Hull numbers, or similar, are often used as the basis for official numbers in national vessel registers. These numbers are usually generated through a combination of vessel class and/or size and year of registration, and may follow the ISO 10087 standard (see Section 2.1.8). An alternative identifier of this type is the vessel's IRCS (e.g. in Norway), although as explained in Section 2.1.9 these numbers are not necessarily permanent. The United States applies yet another format consisting of a six or seven digit permanent identification number assigned to each vessel.

Fishing authorisation numbering systems vary from country to country and even from region to region within a single country. Most countries use a combination of letters and numbers, where the letters often signify a region, port or county. One exception to this general rule may be China where a wide variety of numbering formats are shown in available Chinese vessel lists (e.g. RFMO records of fishing vessels). The explanation for this may lie in one or more of the following: different systems used in different fishing ports or prefectures; formats changing over time; or confusion between standardised vessel names (often letters plus a number), assigned vessel registration numbers and registration certificate numbers. Perhaps in response to this situation, authorities in China implemented a new national database with automatically assigned 16-digit vessel numbers (6 digits for area of registration, 6 digits for construction date and 4 digits for vessel serial number) in January 2009.

China's move toward creating its own national UVI follows that of other countries. In New Zealand and the United States vessels are allocated unique and permanent official numbers which remain with the vessel as long as it continues its commercial activities. Some systems, like the United Kingdom (and perhaps many of the other EU member States, see Section 3.3.3) also reserve previously allocated official numbers and re-allocate them to vessels that leave the register and return at a later date. However, the existence of a unique and permanent identifier could not be confirmed for many of the surveyed countries.

3.1.5 Extent of Centralisation and Digitisation of Databases

This survey of national registers and records considered whether digitised records are available for nationally registered vessels as well as for recorded fishing vessels. Seven of the 21 surveyed countries (Morocco was not included due to insufficient information) maintained digitised records for both the national vessel register and the record of fishing vessels: Chile, Norway, South Africa, the United States and the three EU member States (Denmark, Spain and the United Kingdom). Four countries (Australia,

Cambodia, Russia and Vanuatu) maintain electronic databases of national vessel registers but do not maintain digitised information on fishing authorisations (record of fishing vessels). Two of the surveyed countries do not maintain centralised and digitised national vessel registers or records of fishing vessels (Japan and Indonesia). In New Zealand the national vessel register is not fully digitised, but the National Record of Fishing Vessels is digitised and available online for a fee. The situation in the seven remaining countries could not be confirmed.

3.2 Ability of National Vessel Registers to Support a UVI Scheme

3.2.1 Comparison of Surveyed National Registers with LRF Requirements

To assess the degree to which the national register information would satisfy the requirements for a UVI scheme, this information was compared to the information required by LRF to assign an IMO/LR number to fishing vessels under the Joint Tuna RFMOs proposal (see Section 2.1.4). At present LRF will voluntarily assign IMO/LR numbers to individual fishing vessels ≥100 GT which meet the IMO requirements (LRF 2010a). However, in extending this service to fishing vessels <100 GT LRF will impose stricter conditions than it currently applies to fishing vessels ≥100 GT under the IMO scheme. These conditions, which are outlined in Section 2.1.4 were used as the basis of the comparison in this section as they are designed to encompass all vessels (i.e. ≥100 GT as well as <100 GT) under the Joint Tuna RFMOs proposal for assigning IMO/LR numbers. While it is acknowledged that the fishing vessel UVI scheme to be adopted may not be based on the IMO/LR numbering scheme, the Joint Tuna RFMOs proposal requirements provide a well-defined, robust and consistent standard against which to compare and contrast the information content of national registers.

The first requirement of the LRF proposal to the Joint Tuna RFMOs is that 22 types of information must be provided immediately. (One of these fields is the RFMO vessel identifier which is not considered further in this analysis). A comparison of the 21 types of information immediately required by LRF with the information content of the national registers/records surveyed by this study is presented in Table 5.

Table 5. Comparison of surveyed national vessel registers/records of fishing vessels against immediate LRF requirements for assigning an IMO/LR number to fishing vessels under the Joint Tuna RFMOs proposal. Morocco is not included due to insufficient information. Green shading indicates that the national system(s) contain the required data.

	LR-F	Australia	Belize	Cambodia	Chile	China	Denmark	Ghana	Indonesia	Japan	New Zealand	Norway	Panama	Papua NG	Russia	Seychelles	South Africa	Spain	Thailand	UK	USA	Vanuatu	Total
Registered Owner	X																						21
Address of Owner	X																						21
Operator	X																						2
Address of Operator	X																						2
Flag	X																						21
Previous Flag	X																						12
Fishing Number (national registration number)	X																						20
Vessel Name	X																						21
Previous Vessel Name	X																						16
Port of Registry	X																						17
Call Sign	X																						20
Ship Builder	X																						18
Nationality of Shipbuilder	X																						16
Year of Build	X																						19
Type of Vessel	X																						21
Length	X																						20
Moulded Depth	X																						14
Beam	X																						12
GRT (if applicable)	X																						15
GT (if applicable)	X																						15
Power of main engines	X																						19
Total	(21)	16	15	20	17	16	16	17	12	15	17	18	20	19	18	18	15	14	8	16	17	18	

Of the 21 surveyed registers for which data were available (i.e. Morocco was not assessed):

- All (21) provide information on owner, address of owner, flag, vessel name, and type of vessel;
- Twenty provide tonnage information, either in GT (15), GRT (15), or both. New Zealand requires tonnage data only for vessels >24 m (see Annex A11);
- Most provide information on fishing number (20), previous name (16), port of registry (17), call sign (20), ship builder (18), nationality of shipbuilder (16), year of build (19), length (20) and power of main engine (19).
- Only two registers (Cambodia and Panama) provide information on operator and address of operator.

Information on previous flag was found in some vessel databases which included information on fishing authorisations (n=10), but was not generally found in national vessel registers per se. Additional vessel measurements such as moulded depth and beam were found on slightly more than half of the surveyed registers (n=14 and n=11, respectively).

In terms of meeting the immediate LRF requirements the most significant item missing from the national registers is data on the vessel operator. Fishing vessel registers are based on a tradition of owner-operated vessels and the splitting of owner and operator is a relatively new phenomenon. Registration of operator information is most common in registers that allow bareboat chartering and foreign vessel owners. The FAO Expert Consultation on the GRFV highlighted the importance of compiling operator information particularly as reliable information on beneficial owners may be difficult to obtain (FAO 2008a).

The LRF requirements also specify that a second group of data types be provided within five years. These eleven fields were compared against the surveyed national registers with the following results:

- Few to no registers/records collect data related to the beneficial owner of the vessel (parent ship company(1)), or the management of the ship (ship manager(4), bareboat charter (3), parallel in and parallel out[40](0));
- Few registers/records collect data related to additional dimensions(dead weight tonnage (2) and net tonnage(6));
- Approximately half provide data on the date the vessel entered the registry/record (11), but only one provides data on the date the ship was removed from the register/record (1); and
- Several registers/records provided information on the vessel's official number(6) and MMSI number (4) (though it should be noted that these may be assigned after registration/listing and thus a survey of application forms would not necessarily indicate whether these data are actually held in the register).

[40] These fields are used to record when a vessel leaves or enters a national register on a temporary basis for the purposes of chartering.

3.2.2 Other Assessments of the Content of National Registers/Records

Examining vessel registration requirements, the method used in this study's survey 22 national registers/records, is merely one way of assessing what vessel attribute data may be held by national authorities of the flag State. As noted in Section 3.1, the application forms for authorisations to fish may require information for the record of fishing vessels which is beyond that required for vessel registration per se. This may mean that other fishing vessel data, which could not be accessed for these study, are actually available for potential UVI data exchanges.

A previous assessment of national registers (Grainger 2000) indicated that the following fields should be available in most vessel registers worldwide: length overall, registered length, breadth, depth, gross tonnage, net tonnage, power, type of vessel, material of construction, vessel name and number, port of registry, IRCS, particulars of owners or managers, where built and when built. This list generally conforms to the findings of the survey conducted for this study, i.e. that most of the LRF data fields are collected with the conspicuous absence of operator information.

A recent assessment of the compliance of contracting parties to the WCPFC in providing information for the WCPFC Record of Fishing Vessels is also instructive. The list of data fields specified for the WCPFC Record of Fishing Vessels is similar to that required by LRF for assignment of an IMO/LR number under the T-RFMO proposal except for the absence of operator address, national registration number, ship builder and nationality of ship builder, and gross tonnage (WCPFC 2009c). As of December 2009, 13 contracting parties including Belize, the Cook Islands, Chinese Taipei, the European Union, El Salvador, Fiji, Japan, Korea, Marshall Islands, the Federated States of Micronesia, New Caledonia, New Zealand and Vanuatu, had average compliance rates (the mean percentage of vessels compliant for each data field) of over 90%. The remaining 13 contracting parties had compliance rates of 36-89%.

3.2.3 Conclusions

The analyses described in this section have shown that most national registers/records can meet the immediate LRF data requirements for assignment of an IMO/LR number to fishing vessels with the addition of a small number of data fields (i.e. mainly operator-related information). Meeting the LRF requirements for additional data fields required within five years will require greater effort, but should not delay commencement of a UVI scheme, even one as comprehensive as the one proposed by LRF.

Beyond the data content itself, meeting the LRF requirements will require standardisation of language, units and data formats. Given that access to most of the national vessel registers/records was not available to this study, it was not possible to quantitatively assess this aspect of the issue. It is very likely, however, that national registers/records would need to make at least minor adjustments to current national data formats in order to achieve the standardised format required by LRF. Issues relating to a lack of standardisation of vessel tonnage and length measurements are longstanding (see Section 5.2.1), and will undoubtedly be raised again in this context.

The finding that only one-third of the surveyed countries maintained consolidated vessel registers in electronic format (Section 3.1.5) suggests further work toward record centralisation and digitisation will be required. Of particular concern is that the existence of a national central register was either refuted or could not be confirmed for major fleets flagged to Japan and Indonesia. Mitigating this to some

extent is that fact that Japan has shown a high level of compliance with vessel reporting requirements to the WCPFC (82% and 100%, respectively), demonstrating that data can be compiled and provided when necessary even if it is not held in a centralised electronic register.

This analysis of national vessel registers has highlighted that vessel histories are not routinely kept by most countries. Therefore it is likely that a vessel's history within the GRFV will begin with the registration details current at the time of assignment of the UVI and will carry forward. The following section discusses re-flagging and its influence on vessel histories.

This analysis also found wide variation between the types and sizes of vessels held within national ship registers and records of fishing vessels. This suggests that rather than mandating that all vessels of certain types and sizes be included in the UVI, the requirements may need to maintain flexibility to respect national thresholds for registration exemptions on the basis of small size or other factors.

In many cases, flag States are already working to improve their records of fishing vessels. For example, such efforts are already underway in China, Ghana and Russia. There are two types of assistance which may be necessary for flag States in order to prepare for the implementation of a UVI scheme. The first type is individual assistance aimed at organising a comprehensive centralised, electronic vessel register including reconciling active/inactive and duplicate records. The priority for this assistance should be those countries which indicate a willingness to participate in the UVI scheme, do not have centralised registers, and have the largest fleets of fishing vessels. The second type of assistance would be specification and/or negotiation of agreed data formats that each national register could work toward. As described in Section 2.2.1 for aircraft, standardisation of terminology has been a long-term but vital effort. For fishing vessels, this could involve either adopting or adapting current LRF data field definitions, resolving current issues with tonnage and length measurements (or agreeing conversion factors), and defining categories or codes for multiple choice fields.

3.3 Extent and frequency of name and flag changes

One of the key objectives of a UVI for fishing vessels is to provide a system to document the continuous history of the vessel regardless of whether it changes its flag. As confirmed by the preceding national vessel register analysis, many of the registers do not record the incoming flag of a previously registered vessel, or the register to which the vessel flags when it leaves the current register. It is thus clear that simply linking together national registers will not achieve a continuous vessel record.

If a UVI for fishing vessels operates similarly to the IMO/LR numbering scheme for merchant ships, the system would provide a link between the information from past and current registers for a given vessel. However this task will be complicated by a 25% increase since 2003 of fishing vessels registered to unknown flags[41], since under such circumstances there is thus a higher risk that vessels will disappear temporarily or permanently from the data sources that supply the UVI system. This is of particular concern given that at present the number of fishing vessels of unknown flag in the IMO/LR database stands at 2,049 (approximately 9%) (LRF 2010b).

[41] Comparison of figures in FAO (2004) and LRF (2010b) excluding vessels built before 1970.

As re-flagging may thus influence the integrity of a UVI system, a variety of data sources were compiled and analysed to assess its frequency among fishing vessels. These sources included the results of a recent study of IUU blacklists (Pew 2009), a sample of the LRF SeaWeb database (LRF 2010b), and an analysis of the EU Fleet Register (EU 2010a), each described below.

3.3.1 Flag changes in Blacklisted Vessels

A recent analysis of IUU-blacklisted vessels confirmed that such vessels change their names and flags frequently (Pew 2009). Of 178 vessels blacklisted in the past or at present by RFMOs[42], and of those with an IMO number (n=102), and thus information on vessel history, 28% (n=29) have had five or more names, and 35% (n=36) have had five or more flags. The average number of years between name and flag changes for blacklisted vessels was six and five, respectively.

However, even among vessels with histories of IUU fishing, these average frequencies of name and flag changes are not typical of the entire lifespan of the vessel. In fact, the histories of these blacklisted vessels often show long periods of initial flag and name stability, followed by a period of frequent changes. Two specific examples are as follows:

- Ten vessels on the Pew (2009) IUU blacklist began fishing under the USSR/Russian flag in 1984-1986 and remained on that registry for at least ten years before re-flagging four or five times in the next 5-13 years.
- Another four vessels on the Pew (2009) blacklist, built between 1973 and 1984, fished under their original flag for 12-31 years before beginning a period of 'flag-hopping' between up to seven different national registers.

This pattern may arise because the building of new vessels can only be financed when there is guaranteed access to a fishing licence or quota. Vessels thus begin their operations by fishing legally in a coastal state for which fishing rights are obtainable, but are subsequently displaced by newer vessels or as a result of capacity reduction schemes. For example, either the USSR or Japan is the original flag State for at least 13 of the vessels on the Pew (2009) IUU blacklist. When these vessels lose their fishing rights, they begin to fish illegally and use changes in flag, name and/or IRCS (see Section 2.1.9) as a means of avoiding sanctions.

In the periods in which these vessels change flag frequently, they are often moving between the registers of countries which are not members of the RFMOs in whose waters they fish. Flag States with more than five vessels on the Pew (2009) IUU list include Panama, Belize, Equatorial Guinea, Georgia and Togo. It should be noted that vessels flagged to non-members are often disproportionately represented on RFMO blacklists due to a lack of control mechanisms in the non-member States (thereby necessitating action by the RFMO) and/or consensus-based listing procedures in RFMOs which make listing of members' vessels less likely.

Despite re-flagging to RFMO non-members during periods of IUU fishing activities, vessel ownership is often retained by a national in the original flag State, i.e. usually a coastal state with a longstanding

[42] Characteristics of these vessels are discussed further in Section 5.3.

history of fishing on the high seas and of participation in RFMOs. Therefore, while the flag State of the IUU vessel may not be a party to the RFMO, the country in which the owner resides often is. This de-coupling of the nationality of the vessel registration and the nationality of the vessel owner is an issue which lies at the heart of the ongoing debate surrounding the concept of 'genuine link' (D'Andrea 2006).

3.3.2 Flag changes in the Global Fishing Fleet based on a sample from SeaWeb

Although vessels on IUU blacklists show a high frequency of name and flag changes, it is important to consider whether this is representative of the global fishing fleet as a whole. For this purpose SeaWeb, the LRF commercially-available database of maritime vessels, was used to survey a small sample of fishing vessels (LRF 2010b). The sampling approach involved drawing the first five fishing vessels under each letter of the alphabet. Individual vessel records were skipped if the preceding draw and the current draw were vessels owned by the same company. In this way, data were recorded for 130 vessels ranging from 101 to 5,768 tonnes.

Analysis of the sample data revealed that re-naming of fishing vessels is considerably more common than re-flagging. A total of 45% of the sampled vessels changed their name at least once during their history while 16% of the sampled vessels re-flagged at least once. Although these percentages may appear high, the frequency of the name and flag changes in the SeaWeb sample were considerably less common than in the blacklist data presented above. In the SeaWeb sample as a whole, fishing vessels changed their names once every 20 years and their flags once every 67 years (as compared to every six and five years, respectively, for the blacklist vessels). In the subset of the SeaWeb samples which contained only those vessels showing more than one name (n=58), name changes occurred on average every 12 years, and in the subset of those vessels showing more than one flag (n=21), flag changes occurred on average every 16 years.

The SeaWeb sampling results for vessels with frequent re-flagging showed similar patterns to those identified in the Pew (2009) analysis. Of those vessels with more than two recorded flag changes[43], six out of seven showed an original flag in Canada, Iceland, Japan or the United States with subsequent flags in Belize, Cambodia, the Dominican Republic, Georgia, Panama, Russia or St. Vincent & the Grenadines. The tonnages of these vessels ranged from approximately 120-1,600 tonnes.

3.3.3 Flag changes observable in the EU Fleet Register

The review of the CaribShip database which contains only fishing vessels <100 GT indicated a low incidence of re-flagging (Section 2.1.3). To test the assumption that re-flagging may occur less frequently for smaller fishing vessels (i.e. <100 GT), the EU Fleet Register (EU 2010a) was examined specifically in terms of available information on re-flagging activities. (Please see Section 2.1.6 for an introduction to the EU Fleet Register).

The EU Fleet Register was chosen for this analysis because it contains a large number of small fishing vessels and because re-flagging activities are meticulously recorded. However, one of the limitations of this database, particularly in terms of this analysis, is that it does not record the flag State to which, or

[43] Excluding flag changes from the USSR to Russia

from which, re-flagging occurs unless those flag States are EU member States. Specifically, the web-based version of the register uses event codes to track modifications of individual vessel records[44]. These codes can be viewed in each individual vessel's record, and there are some vessels which show "RET" (retired) as their final activity code. These vessels may have been re-flagged to non-EU member States or they may have left the fleet for other reasons. Other vessels which show "EXP" (export) as an activity code are always followed by an "IMP" (import) activity by another EU member State, confirming that only re-flagging within the EU is considered an export. In order to perform an analysis of the number of retired and exported vessels by flag, the downloadable version of the database was acquired, but this version contains only the most recent record for each vessel and does not contain any records with activity codes corresponding to retired, exported or destroyed.

Given the mechanics of the database, it was therefore possible to assess re-flagging activities only for those vessels which remain within the EU and thus remain on the EU Fleet Register. Of the total number of vessels on the current register (n= 84,728), 504 vessels (0.6%) show a current EU member flag State which is different from their original EU member flag State[45]. There may be other, unidentified re-flagged vessels in the database (i.e. those which left the EU Fleet Register for a non-member State and subsequently (and improperly) re-entered the register under a new CFR (identification number)) but these cannot be identified on the basis of existing information.

With regard to the notion that smaller vessels do not re-flag as often as those ≥100 GT, analysis of the EU Fleet Register suggests this may not be a safe assumption. Of the vessels identified in the EU register as having re-flagged (i.e. only those re-flagging to other EU member States could be accounted for), approximately 70% were <100 GT, and the average size of such vessels was 24 GT.

3.3.4 Summary of Re-flagging Analyses

FAO (2006) reported that most fishing vessels (78%) in operation at the end of 2005 had not changed flag since being launched, and more than two-thirds were built in the country in which they are currently registered. A sample of fishing vessels from SeaWeb (LRF 2010b) supported this by indicating that 84% of the sampled vessels recorded no flag changes. Of those fishing vessels in the SeaWeb sample which did re-flag, the average time between flag changes was 16 years. Despite the relatively low incidence of re-flagging in the global fishing fleet as a whole, an analysis of RFMO blacklists (Pew 2009) indicates that re-flagging occurs frequently, on average every five years, in vessels which have been documented as being involved in IUU fishing activities.

Larger vessels, i.e. those on the RFMO blacklists and those listed in SeaWeb, which were observed to change flags, often showed a pattern of initial listing on the register of major fishing countries, sometimes remaining there for a considerable period of time, before beginning to shift between flags of countries which are not now, or have not been in the past, members of RFMOs. The perception that

[44] Entry to Fleet: census (CEN), new construction (CST), change of activity (CHA), Intra-Community import/transfer (IMP); Within Fleet: modification (MOD); Exit from Fleet: break-up/shipwreck (DES), change of activity (RET), or Intra-Community export/transfer (EXP) (EU 2003).

[45] The following member States recorded more than 30 vessels in their registers which were originally flagged to other member States: Denmark (45), Germany (46), Ireland (253), the Netherlands (38) and Sweden (54).

small vessels (<100 GT) change flags less frequently may hold true if small vessels do not adhere to this pattern as strongly as larger vessels. However, analysis of the EU Fleet Register (EU 2010a) suggests that flag changes within EU member states are predominantly (70%) composed of vessels well under 100 GT (average of 24 GT).

4 Analysis of UVI Options

The purpose of this study is to investigate and document options for the use of a UVI within the GRFV, including options for its phased implementation. Although there are a wide array of factors which may influence selection of the UVI, it is important to distinguish between those factors which classify UVI options as workable or unworkable, and those factors which may lead to preferences among workable UVI options.

As a starting point, in order to be considered workable all UVI options must provide for an identifier which is unique and permanent. Other primary considerations include whether the option is feasible in terms of including the full range of vessels envisaged by the GRFV; practical and effective in terms of the data requirements and the likelihood these requirements can be met; and viable in terms of management structure and cost. Furthermore, the simplest and most straightforward option that achieves the purpose is preferred over multiple or complex schemes.

Other, broader issues for the GRFV may influence the expected success of each of the options to varying degrees. For example, if participation in the GRFV is supported by a broadly applicable legal instrument, e.g. one which imposes requirements on contracting parties, and if this legal instrument is widely ratified, this would be expected to increase the number of vessels incorporated into any of the UVI schemes. While the effect would thus be universally positive, such an instrument might be expected to confer a greater benefit on those schemes which, although workable, require a relatively greater amount of data to be supplied and which might otherwise be resisted by some parties. Similarly, decisions regarding whether the GRFV is managed by a public or private entity, and the degree to which information contained in the GRFV is made publicly available, may influence the number of vessels participating in the scheme. To the extent that hosting and data access issues influence the desirability of various UVI options, they are noted in the following analysis. However, as the influence of such issues is generally comparable across all UVI options and a variety of possibilities can be accommodated by any of the options, these factors do not provide a strong basis for discrimination at this stage.

Based on the framework of primary criteria outlined above, and the analysis of existing identifier schemes in maritime and other sectors (Section 2), the following UVI options are proposed for further evaluation:

- Option 1: IMO/LR numbers for fishing vessels both ≥100 GT and <100 GT.
- Option 2: IMO/LR numbers for fishing vessels ≥100 GT, and a separate UVI system based on allocated code blocks for fishing vessels <100 GT.
- Option 3: IMO/LR numbers for fishing vessels ≥100 GT, and a separate UVI system based on nationally-assigned registration numbers standardised into a common format for fishing vessels <100 GT.
- Option 4: A new UVI, loosely based on the ISO 10087 standard (or similar globally agreed format), assigned by one or more centralised entities, for fishing vessels both ≥100 GT and <100 GT.

4.1 Option 1: IMO/LR numbers for Vessels Above and Below 100 GT

This option proposes that the existing IMO/LR unique and permanent vessel identification numbering scheme be applied for all fishing vessels to be incorporated into the GRFV.

The IMO/LR numbering scheme has been widely adopted under the International Convention on Safety of Life at Sea (SOLAS) and is administered by Lloyd's Register-Fairplay (LRF) on behalf of the IMO. It is the only existing global system of unique and permanent vessel identifiers and while not infallible (see Section 2.1.1), it has proven effective in tracing vessel histories through multiple flag changes (see Section 3.3). The IMO/LR number is the UVI used in the publicly accessible Equasis database to link numerous shipping information sources from around the world. Although IMO/LR numbers are not required under SOLAS for fishing vessels, approximately 23,000 fishing vessels ≥100 GT, as well as some fishing vessels <100 GT, have voluntarily applied for and received IMO/LR numbers. Under a proposal to the Joint T-RFMOs, LRF has offered to assign IMO/LR numbers free of charge to fishing vessels on the T-RFMO's lists of authorised vessels regardless of size, including up to 14,500 vessels <100 GT, on the condition that data standards and supply requirements are met (Section 2.1.4).

4.1.1 Feasibility for the Full Range of Vessels

One of the most common concerns regarding application of the IMO/LR numbering scheme as a UVI for fishing vessels is that this scheme cannot accommodate the large number of fishing vessels that would need to be incorporated. In fact, the six-digit-plus-check-digit format of the IMO/LR numbering scheme can, at present, accommodate hundreds of thousands of new UVIs[46]. Furthermore, LRF has stated that the scheme can easily be modified to accept alphabetic characters as well as numbers[47] and thus allow, for example under a hexadecimal system, for up to 16 million unique identifiers in a six-digit format. Conversion to an alphanumeric format is thus feasible from the point of view of the scheme itself, but may have implications for other databases which currently use the IMO/LR numbers.

While the range of vessels which can be accommodated is thus not limited by the numbering scheme per se, the larger concern is whether LRF's rigorous verification process for new applications is feasible for fishing vessels for which much less data exist. LRF has cautioned that its working practices would not be applicable to the full number of fishing vessels <100 GT identified by the FAO Expert Consultation on the GRFV (i.e. up to 4 million such vessels). However, LRF's offer to supply IMO/LR numbers for up to 14,500 T-RFMO fishing vessels <100 GT indicates that the working practices can apply to a substantial number of smaller fishing vessels. It remains clear, though, that it will be necessary to limit the number of vessels to be incorporated into the system to a workable number under this option (see Section 5 for further discussion). If the number of small vessels to be incorporated is larger than deemed practical by LRF, either a more streamlined system for small vessels could be designed by LRF under this option, or a more flexible system for all vessels <100 GT could be designed under Option 2.

Assuming the requisite number of small vessels can be incorporated, the greatest advantages of this option are that the scheme would provide a single, coherent UVI system and would capitalise on the

[46] T. Downing, LRF, personal communication

[47] *ibid*

more than 23,000 UVI records which already exist for fishing vessels ≥100 GT. This option would also seamlessly integrate into the existing global scheme for merchant ships and circumvent any issues arising from conflicting definitions of fishery support vessels (i.e. by assigning numbers from the same system regardless of whether the support vessel is considered a fishing vessel or a merchant ship).

4.1.2 Practical and Effective Data Requirements

The minimum data requirements for implementing the IMO/LR numbering scheme under SOLAS have been identified by LRF and fixed by IMO circulars (IMO 2006). These requirements have been proven to deliver a high level of system integrity. Under the T-RFMOs proposal these requirements have been re-examined with a view toward maximum flexibility and accommodation of existing data limitations for fishing vessels both above and below 100 GT (Section 2.1.4). LRF has re-confirmed for this study that all of the data fields listed under the T-RFMOs proposal are necessary to verify each UVI application for fishing vessels and to avoid jeopardising the integrity of the scheme. As discussed in Section 2.1.1, without undertaking an independent vessel identity verification trial under this study, it is not possible to challenge LRF's assertion, or to assess whether organisations other than LRF could perform to a similar standard of verification.

It should be noted that while fishing vessels ≥100 GT are able, at present, to apply to LRF for an IMO/LR number on the basis of the current IMO data requirements (IMO 2006), LRF believes that the data quality standards for its records of fishing vessels need to be improved to meet the objectives of a GRFV. It would thus undertake to incorporate additional fishing vessels into its database only under the conditions outlined in the T-RFMOs proposal, regardless of vessel size[48].

One of the key considerations for the UVI is therefore whether it is practical to expect that applicants can meet the data standards and supply requirements set by LRF in the T-RFMOs proposal. As the analysis in Section 3.2 has shown, many of the surveyed national registers/records already contain the majority of the information necessary for an IMO/LR number application. The most important data shortfall identified in this analysis with regard to the immediate requirements for an IMO/LR number for fishing vessels is the provision of information about the vessel operator (i.e. name and address). While this information is not routinely provided during the application for fishing vessel registration in many countries, there do not appear to be any insurmountable issues with adopting it as one of the required data fields, particularly since it is required by most, if not all, of the T-RFMOs (Joint Tuna RFMOs 2009a, WCPFC 2009c).

4.1.3 Viable Management Structure and Cost

The final consideration is whether the management structure and cost of assigning an IMO/LR number to fishing vessels is viable. Although the administration of this scheme has been proven viable through its application to the shipping industry, LRF is convinced that a similar model for fishing vessels is impossible due to a lack of commercial interest in the vessel database[49]. On the basis of this position, and the fact

[48] T. Downing, LRF, personal communication

[49] *ibid*

that IMO/LR numbers can only be issued by LRF, it is clear that funding will need to be provided to LRF for both the incorporation of vessels <100 GT into the IMO/LR scheme, as well as for upgrading the existing IMO/LR records for fishing vessels ≥100 GT. As it was not the role of this study to negotiate these costs with LRF, the amount of funding required under this option cannot be specified at this time. However, it is noted that this option is no different from the other options in assuming that costs will be incurred. This option is furthermore likely to confer a cost savings in comparison to other options for which data standards, working practices, and the database itself would need to be developed *de novo*.

Another element of the cost for the UVI scheme and its database may involve development of a public access hosting system. Since LRF believes there is a very limited market for the data, and funding will need to be provided to LRF to develop the database, the data access limitations to the IMO/LR database vis-á-vis Equasis (i.e. data must be purchased by Equasis and Equasis can only allow vessel-by-vessel record viewing) may not apply. On the other hand, there is also the potential to explore whether some costs can be offset by granting LRF preferential rights to some aspects of data. The outcome of these negotiations will reflect both the desired degree of public access and the available funding. As for the cost of public hosting per se, should this be desirable, costs associated with Equasis may provide an indication. Communication with the Equasis Management Unit for this study did not result in specific figures but suggested that the annual budget figure of €700,000 (see Section 2.1.2) has been reduced "significantly" and that both data and administration costs for fishing vessels could be somewhat lower than for merchant vessels[50].

Beyond the issue of costs per se, uptake of the T-RFMOs offer requires electronic data submissions and updates coordinated by the flag States and the T-RFMOs (Section 2.4.1). Under this option the T-RFMOs could handle some of the vessels but flag States would need to fulfil this role themselves for the non T-RFMO vessels. While many national registers do not maintain centralised, electronic vessel databases, many of these same countries do manage a high level of compliance with the vessel data requirements of the T-RFMOs when placing their fishing vessels on T-RFMO authorised vessel lists (Section 3.2). While this option would thus require some improvement and standardisation of flag State vessel registers, similar efforts would almost certainly be required for any global UVI scheme to be effective. It should be acknowledged that any loosening of the data standards and supply requirements set by LRF in the T-RFMOs proposal would be likely to result in an associated weakening of the integrity of the UVI scheme and database.

4.1.4 Summary

The responsible parties and operational structure of Option 1 are summarised in Figure 2.

[50] H. Ringbom, Equasis Management Unit, personal communication

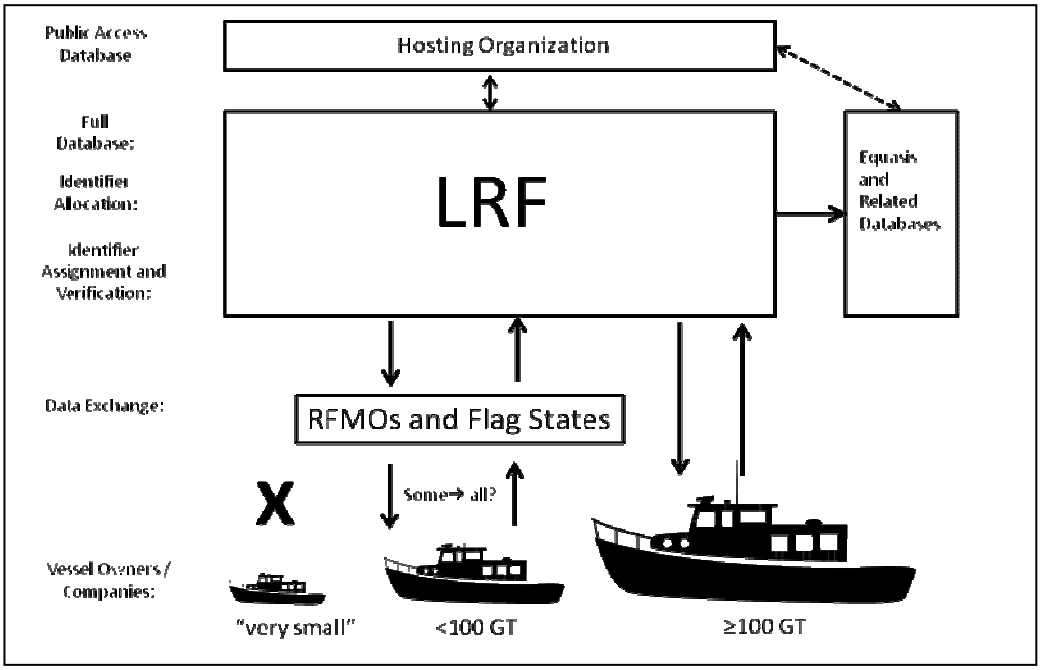

Figure 2. Diagram of responsibilities under Option 1 involving IMO/LR numbers for vessels above and below 100 GT.

4.2 Option 2: IMO/LR numbers plus Allocated Code Blocks

This option proposes IMO/LR numbers for fishing vessels ≥100 GT, and a separate UVI system based on allocated code blocks for fishing vessels <100 GT.

On the understanding that approximately half of the global fishing fleet ≥100GT already possess IMO/LR numbers (Section 2.1.1), this option like Option 1 would capitalise on this progress and encourage all fishing vessels ≥100 GT without IMO/LR numbers to obtain them. Fishing vessels <100GT would be given UVIs under a separate system which could either emulate the IMO/LR numbers or take a different format and database structure. Blocks of codes (identifiers) would be issued by a centralised body such as FAO, IMO, another intergovernmental organisation, or a contracted private entity, to one or more intermediaries which would assign the codes. The intermediary(ies) could be regional fisheries management organisations, other regional organisations, national vessel registration authorities or contracted private entity(ies). The responsibility for updating the vessel attribute data would lie with the code-assigning intermediary(ies).

The strengths and weaknesses of IMO/LR numbers as UVIs for fishing vessels ≥100 GT are evaluated in the preceding section (Section 4.1). The remainder of this section focuses on the application of Option 2 to fishing vessels <100 GT.

4.2.1 Feasibility for the Full Range of Vessels

Since this option uses a separate UVI system for fishing vessels <100 GT, it could be easily designed to incorporate all medium- and small-sized fishing vessels without a minimum vessel size limit (i.e. as may be necessary for Option 1). Therefore, if the number of fishing vessels <100 GT to be incorporated into the GRFV is very large (e.g. 4 million) this option may be preferred. If, however, the number of fishing

vessels <100 GT to be incorporated into the GRFV is on the order of hundreds of thousands rather than millions, the difference in the ability of Options 1 and 2 to accommodate this number becomes negligible.

4.2.2 Practical and Effective Data Requirements

A potential advantage of this option is in the flexibility of its data requirements for vessels <100 GT. At one end of the spectrum, this option could formulate data requirements and verification procedures which are similar (or identical) in rigour and information integrity to those of the IMO/LR numbering scheme. While the effect of the IMO/LR requirements and procedures is to maintain a high level of integrity for the scheme, it might be deemed better to trade off some of this rigour for the sake of broadening the number of vessels which can meet the requirements. This option would also allow the data requirements to deviate from those of the IMO/LR scheme to include data fields which may be more specifically relevant to fishing vessels (e.g. fish hold or freezer data).

Another key feature of this option is that the allocation of code blocks is handled centrally to ensure that all UVIs are unique. While this approach has the advantage of preventing coordination problems when compiling regional data into a centralised database, it is best applied to structures in which the number of intermediaries, and the number of codes each will need, can be mapped in advance. In similar schemes (e.g. CaribShip (Section 2.1.3) and IMEI (Section 2.2.3)), the code allocation body also manages a central database composed of uploaded datasets from each intermediary. This has the advantage of allowing for oversight and feedback to the code allocation process.

Another point to consider for this option, if it involves multiple intermediaries, is the potential risk to data quality. Unlike Option 1 in which the scheme is wholly managed within a single entity (LRF), this option may devolve code assignment and verification to intermediaries (unless a private entity performs both code allocation and assignment functions). As discussed for the existing schemes with this structure in Section 2.3, devolved systems sometime under-perform when some intermediaries lack the authority to implement the procedures, or fail to fulfil their responsibilities.

4.2.3 Viable Management Structure and Cost

The management structures and costs of this option are, like its data requirements, highly flexible. If the system mirrors the IMO/LR numbering system, if code-allocation and database hosting is undertaken within an intergovernmental organisation, and if code assignment and management can be devolved to competent bodies which are willing to absorb the costs, management efficiency will be high and externalised costs will be low. However, in addition to the advantages of distributing the management burden and costs throughout the system, it should be noted that these burdens and costs may weigh more heavily on some intermediaries than on others and can lead to under-performance of the scheme (Section 2.3).

This option could be selected as a means of creating an alternate IMO/LR numbering scheme for fishing vessels <100 GT, either because a separate scheme is desirable or because LRF decides not to participate under Option 1. Under this option in addition to the establishment costs for new data requirements, verification procedures and code formulation, there may also be costs associated with establishing the code-allocating and code-assigning bodies (potentially a single entity). Costs will vary considerably depending on whether these bodies can perform the services either as part of their institutional

mandate or are willing to discount their services for the opportunity to market the data commercially. Data hosting costs would be expected to be similar to those discussed above under Option 1.

4.2.4 Summary

The responsible parties and operational structure of Option 2 are summarised in Figure 3.

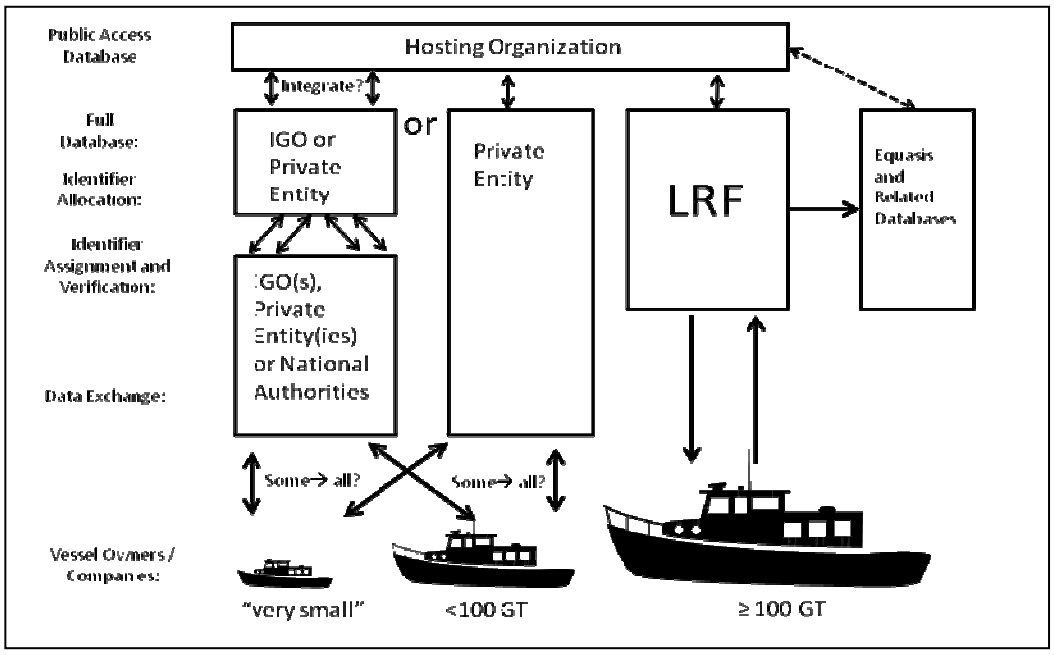

Figure 3. Diagram of responsibilities under Option 2 involving IMO/LR numbers for vessels ≥100 GT and centrally allocated codes for vessels <100 GT.

4.3 Option 3: IMO/LR numbers plus Standardised National Registration Numbers

This option proposes IMO/LR numbers for fishing vessels ≥100 GT, and a separate UVI system based on national registration numbers standardised into a common format for fishing vessels <100 GT.

Option 3 is similar to Option 2 in that the IMO/LR numbering scheme handles fishing vessels ≥100 GT and a separate scheme is proposed for fishing vessels <100 GT. Unlike Option 2, however, Option 3 does not control the assignment of identifiers. Instead, identifiers are created from national vessel register identification numbers by standardising these numbers into a common format. This option assumes that all national vessel registers assign a unique identifier in some form, that the format of these identifiers can be standardised to form the basis for a global UVI, and that the data and the identifiers can be provided in digital form. Since the national vessel authorities are responsible for assigning the identifier, these national authorities are also responsible for updating the vessel attribute data and uploading these data to a host database. The EU Fleet Register (EU 2010a) is one example of scheme operating in accordance with Option 3.

The strengths and weaknesses of IMO/LR numbers as UVIs for fishing vessels ≥100 GT are evaluated under Option 1. The remainder of this section focuses on the application of Option 3 to fishing vessels <100 GT.

4.3.1 Feasibility for the Full Range of Vessels

This option assumes that the UVI scheme for fishing vessels will capture all vessels which are already given unique registration numbers in national vessel registries. Therefore, to the extent that the scope of vessels to be included in the GRFV intersects with the sets of vessels which are already uniquely registered in their flag States, this option should pose no difficulties in incorporating the full range of vessels. It should be noted that some States do not register vessels below certain sizes or tonnages and these vessels would not be included in the GRFV under this option (Section 3.1.3).

It is also important to consider the extent to which national fishing vessel registration numbers are unique and permanent within their own system. From the analysis presented in Section 3, unique and permanent identifiers could not be confirmed in all cases. In some instances, it was not clear that the identifiers were assigned under a coordinated system (e.g. when assigned by regional bodies), whereas in other cases it was not clear that procedures for tracking vessel histories by maintaining a permanent identifier were being implemented. Achieving a standard of uniqueness and permanence for vessel identifiers in all countries that need to participate in the UVI scheme would likely be a major undertaking.

Practical and Effective Data Requirements

As this option opportunistically compiles available registration data from each national register, the consolidated database structure would most likely be based on a global master list of existing data fields from national registries. While some national registries may provide data similar in robustness to that required under the IMO/LR numbering scheme, it is likely that many will not (see Section 3). Unless a common data field list can be imposed on each national register, e.g. through an overarching legal instrument, the consolidated database will reflect the patchwork of data requirements from State to State and will likely have a substantial amount of data missing. Furthermore, as experience with CaribShip has shown, even when States are committed to data sharing under an MOU and a data exchange system is created, some States will choose not to participate in the system and others will participate but only infrequently update the central database. As a result, unless data exchange procedures can be strictly enforced, the integrity of the database is likely to be considerably lower than expected for Options 1 or 2.

A particular challenge associated with Option 3 is the combination of unique identifiers in national registers into a global UVI. Some of the schemes reviewed in Section 2, such as the EU Fleet Register, achieve this by assigning the identifier at the vessel's first registration and not allowing it to change if or when the vessel re-flags to another EU member State. However, if the vessel re-flags to a non EU member State its record is suspended. Furthermore, it is not clear whether vessels returning to an EU member State flag from a non EU member State flag can be linked to their original identifier and vessel history. While the EU system appears to function effectively for vessels remaining within the EU, the potential issues arising from a global system with a far greater number of participating, but not necessarily effectively coordinated, national registries are considerably more complex.

Most critically, it is not clear that a global UVI scheme can or will be supported by a mechanism such as the EU's Common Fisheries Policy which underpins the EU Fleet Register. This strict level of control imposes data formats and verification procedures, and mandates quarterly updates of the system by all EU member States. It is highly doubtful that a scheme like Option 3, which is premised so heavily on

cooperation and consistency between participants, can function effectively without such a mechanism. Even if a mechanism can be created, the example of the HSVAR (Section 2.1.5) typifies many of the problems which are likely to be encountered.

4.3.2 Viable Management Structure and Cost

The management structure under the fully devolved scheme proposed in Option 3 makes full use of existing national vessel registration resources. As noted above, though, this situation makes the scheme vulnerable to under-performance by any of the flag States. Although the cost of obtaining unique identifiers from the national registries and adding a national prefix may seem appealingly low, substantial initial and ongoing costs are likely to be incurred by the party responsible for data consolidation. These costs will arise from managing identifiers to detect and correct duplicates, and when uploading vessel attribute data from a wide variety of languages, data fields, and electronic formats. The EU Fleet Register (Section 2.1.6) and the United States Vessel Information System (Section 2.1.7), both of which sought to compile information from State registries into a common format, each required well over a decade of consistent effort to achieve their current level of functionality.

Data hosting costs would be similar to those discussed under Option 1.

4.3.3 Summary

The responsible parties and operational structure of Option 3 are summarised in Figure 4.

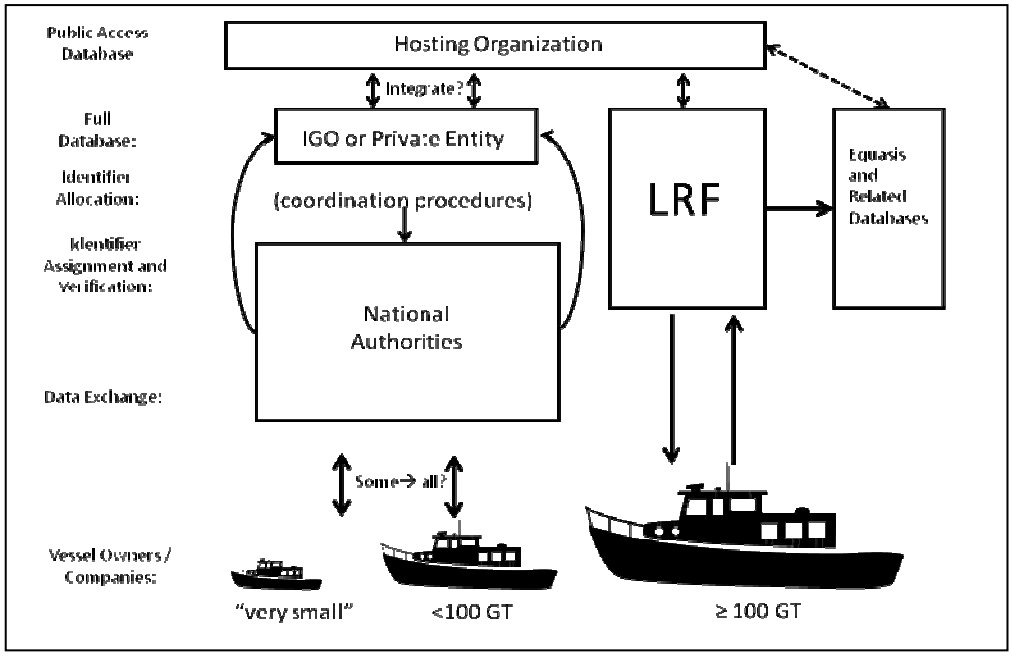

Figure 4. Diagram of responsibilities under Option 3 involving IMO/LR numbers for vessels ≥100 GT and standardised national registration numbers for vessels <100 GT.

4.4 Option 4: New UVI Scheme for Vessels Above and Below 100 GT

This option proposes a new UVI, loosely based on the ISO 10087 standard (or similar globally agreed format), assigned by one or more centralised entities, for fishing vessels both ≥100 GT and <100 GT.

Option 4 offers the maximum amount of flexibility as a UVI because it applies an entirely new scheme to vessels both above and below 100 GT. The basis for this scheme would be a universally agreed UVI format, which could be based on the ISO 10087 standard for hull numbering (or similar, see Section 2.1.8), and on an accompanying set of vessel attributes to be determined. The ISO 10087 standard is proposed for consideration because it is currently accepted in several countries as a basis for vessel identification, and even though it is designed to be applied at manufacture, it could be assigned at other times. Similarly, it is designed to apply to vessels <24 m but there is no reason why it could not be adopted for other vessels. If this standard or similar is chosen as the basis for the identifier, Option 4 will resemble Option 2 because both use centrally allocated codes (i.e. for ISO 10087, the three-character manufacturer's code), but a major difference is that Option 4 does not use the IMO/LR numbers as identifiers for vessels ≥100 GT.

4.4.1 Feasibility for the Full Range of Vessels

As discussed under Option 2, a new UVI scheme for vessels <100 GT could be designed to accommodate, if desirable, the full number of small- and medium-sized vessels. Therefore, Option 4 like Option 2 is fully feasible in this regard. While it is also fully feasible to implement Option 4 for fishing vessels ≥100 GT, this would create a duplicative scheme for the approximately 23,000 vessels ≥100 GT which already possess IMO/LR numbers. In this respect, Option 4 differs substantially from all of the other options which rely on the existing IMO/LR numbering scheme for larger fishing vessels.

4.4.2 Practical and Effective Data Requirements

The vessel data to be supplied when requesting a UVI under Option 4 are yet to be determined, and in this respect Option 4 resembles Option 2. One possibility is to mirror the IMO/LR numbering system which is known to deliver identifiers and an associated vessel attribute database of high integrity. Another possibility is to design a different vessel attribute database to perhaps encourage broader participation or capture features particular to fishing vessels.

Both Options 4 and 2 rely on a central authority to coordinate the identifier codes to ensure they are unique from the outset. Both options also have the possibility of devolving the responsibility for assigning and verifying the identifiers to intermediaries. The strengths and weaknesses of this scenario are discussed above under Option 2.

4.4.3 Viable Management Structure and Cost

The main feature distinguishing Option 4 from the other options is that Option 4 is completely independent of LRF and the existing IMO/LR numbering scheme. While the system developed under Option 4 could be designed to mirror the IMO/LR scheme, with all of the associated data validation procedures, it would do so for vessels both above and below 100 GT under a separate management

regime. Option 4 would cover the greatest number of vessels and thus probably incur the highest costs, even if per vessel costs could be reduced relative to other options, because the system would have to be designed *de novo*. It is therefore likely that this option would be preferred only if a premium was placed on creating a UVI scheme for fishing vessels which is completely independent of the existing IMO/LR numbering scheme. Data hosting costs would be similar to those discussed above for the other options.

4.4.4 Summary

The responsible parties and operational structure of Option 4 are summarised in Figure 5.

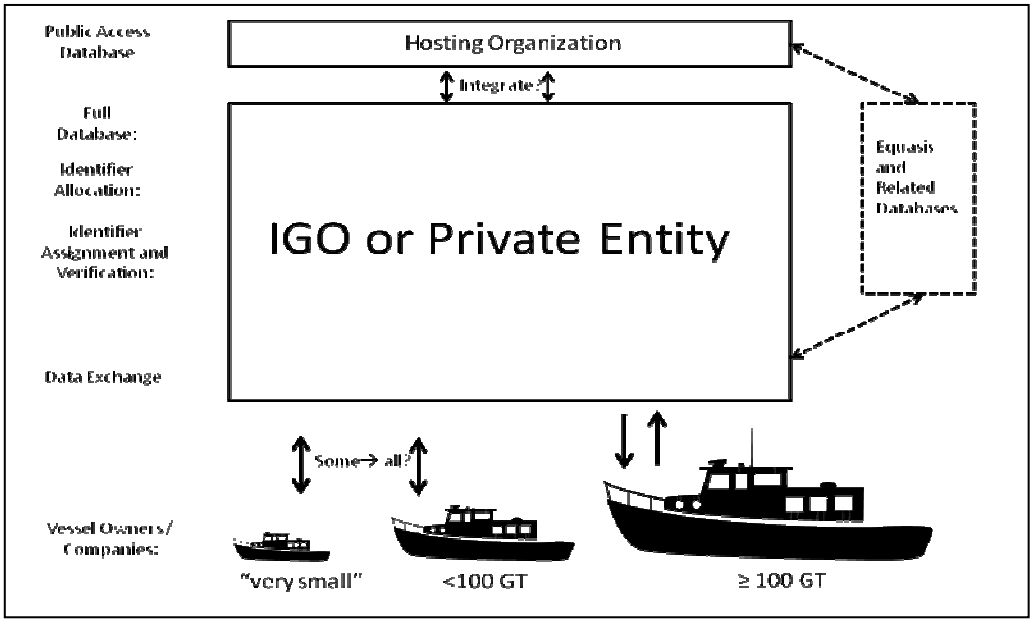

Figure 5. Diagram of responsibilities under Option 4 involving a new UVI scheme for vessels above and below 100 GT.

4.5 Summary and Evaluation of UVI Options

The key features of the four options are highlighted in Table 6.

Table 6. Options for design of a fishing vessel UVI evaluated against feasibility of incorporating the full range of vessels, practicality and effectiveness of data requirements, and viability of management structure and costs.

Option	Description	Range of Vessels[51]	Data Requirements	Management Structure and Costs
1	IMO/LR Scheme	≥100 GT: fully feasible <100 GT: feasible if minimum size criteria limit the number of vessels; LRF would need to agree to participate.	High level of system integrity Immediate data requirements are strict but with the exception of operator information can be supplied by most national registers.	Only LRF can assign UVIs Costs for incorporating vessels <100 GT into the database, and for upgrading records for vessels ≥100 GT which already have IMO/LR numbers, would need to be agreed with LRF.
2	IMO/LR + Allocated Codes Scheme for <100 GT	≥100 GT: fully feasible <100 GT: fully feasible	Highly flexible: could mirror IMO/LR or design *de novo* –level of integrity will likely vary Central code allocation will ensure uniqueness Use of intermediaries to assign codes may place data integrity at risk	Costs vary with code and database format chosen Costs for vessels <100 GT will be higher than Option 1 in the short- and mid-term and potentially similar in the long-term. Costs for upgrading records for vessels ≥100 GT which already have IMO/LR numbers would need to be agreed with LRF.
3	IMO/LR + Fully Devolved Scheme for <100 GT	≥100 GT: fully feasible <100 GT: feasible to the lower limit of vessels registered in national databases	Unless a globally standardised format is imposed, database will be a patchwork There will be major challenges to data integrity requiring a high degree of coordination	Vulnerable to under-performance of participants In-kind contributions from flag States may be outweighed by coordination costs. Costs for upgrading records for vessels ≥100 GT which already have IMO/LR numbers would need to be agreed with LRF.
4	New Scheme	≥100 GT: fully feasible, but duplicative for ~23,000 vessels <100 GT: fully feasible	Highly flexible: could mirror IMO/LR or design *de novo* –level of integrity will likely vary Central code allocation will ensure uniqueness Use of intermediaries to assign codes may place data integrity at risk	Completely independent of LRF Highest costs because all systems would need to be designed *de novo*.

[51] Whether all fishing vessels <100 GT are included in the scheme depends on whether minimum size criteria can be agreed (see Section 5).

The advantages and disadvantages of each option can be summarised as followed:

- **Option 1** utilises an existing, highly robust UVI and verification scheme which will allow rapid start-up, avoid duplication and facilitate links with existing vessel databases. The major weakness is that it may not cover millions of very small fishing vessels. (Whether such coverage is necessary is discussed in Section 5). Although the cost of the scheme cannot be confirmed at this time, building on existing systems is likely to be the most cost-effective way forward.

- **Option 2** capitalises on the existing scheme for vessels ≥100 GT and allows maximum flexibility in designing a database for vessels <100 GT. The major weaknesses are the risk to system integrity associated with potentially loosening data requirements and allowing intermediaries to assign UVIs; and higher short- and mid-term costs as compared to Option 1 due to *de novo* development of the system.

- **Option 3** capitalises on the existing scheme for vessels ≥100 GT and bases UVIs for smaller vessels on existing national identifiers, thereby reducing initial assignment and verification costs. The major weaknesses are that coordination of a global system will be extremely challenging and costly in the long-term, and system integrity will likely be reduced compared to other options.

- **Option 4** offers maximum flexibility in the design and implementation of a UVI scheme for all sizes of vessels because it is wholly independent of the IMO/LR scheme. The major weaknesses are duplication of existing identifiers for a large number of vessels ≥100 GT which already have IMO/LR numbers, and the longest start-up time and highest costs of all options.

On the basis of this analysis, Option 1 is clearly the preferred option: it represents the highest system integrity, the minimum amount of duplication, the maximum amount of compatibility with existing maritime vessel systems, the most rapid start-up, and probably the lowest costs. The only circumstances under which Option 1 would be disadvantaged are if it is considered necessary to assign UVIs to all of the smallest classes of fishing vessels (see Section 5), or if cost negotiations with LRF cannot be satisfactorily concluded. If extensive coverage of small vessels is deemed desirable, Option 1 could still be implemented with an associated streamlined system developed to cater for those small vessels which cannot be accommodated under existing LRF standards and procedures. Alternatively, Option 2 could become the preferred option. The preferred form of Option 2 would be to emulate the IMO/LR numbering scheme (as represented by the current T-RFMOs proposal) for vessels <100 GT while still incorporating the desired level of coverage for small vessels. This option would achieve many of the same goals as Option 1 but would likely incur a higher cost and require more time to establish. Variations on Option 2 involving even greater relaxation of data requirements could be further explored but cannot be recommended at this time given that they would pose a substantial risk of damaging the integrity of the identifier and databases.

Options 3 and 4 cannot be recommended in any form. Option 3 may be the most appealing to flag States as it requires little change from the status quo, however, it has a high probability of failure because more than the other options it is dependent on the ongoing cooperation of all participants. In comparison to the other options, Option 4 provides no unique benefits besides its independence of all existing systems, and it would likely incur the highest costs. Option 4's duplication of the IMO/LR numbers for 23,000 fishing vessels ≥100 GT is impossible to justify on technical or financial grounds.

5 Vessel Categorisation and Risk Criteria for the Purpose of Phased Implementation of a UVI

5.1 Introduction

Implementation of a UVI for fishing vessels will require the cooperation of many parties of varying capacity and interest and cannot be expected to be achieved instantaneously. In recognition of these constraints, it is important to prioritise those vessels, from among the large number to which a UVI may apply, whose incorporation into a database such as the GRFV would result in the greatest benefit. This section describes and tests a number of criteria designed to define prioritisation categories for vessels which can serve as a series of steps for phased implementation of the UVI.

One of the purposes of the UVI is to provide an ongoing record of the activities of fishing vessels as means of detecting and preventing IUU fishing. In order for such a system to be effective, it must be able to capture those fishing vessels with the greatest potential for fishery impact and the highest risk of engaging in IUU fishing activities. While both concepts are intuitively obvious, formulating a definition of either to apply across the entire range of world fisheries is challenging. For example, estimation of fishing capacity may involve physical characteristics of the vessel including its dimensions, engine power, gear configuration and storage capacity, as well as tangible and intangible measures of its ability to locate and capture fish (e.g. technology and human knowledge/skill). With regard to the risk of IUU fishing, although several risk factors can be identified (e.g. le Gallic and Cox 2006), individual vessels whose profiles contain these risk factors may in fact never engage in IUU activities and may resist such "profiling". Beyond defining fishing capacity and risk of IUU fishing, obtaining sufficient, accurate data to categorise the world fleet against these risk factors would be even more problematic.

For these reasons, this study adopts a pragmatic approach to prioritising vessels in terms of these two issues. First, a series of vessel size criteria are considered as proxies for fishing capacity. Vessel size criteria are commonly used to categorise maritime vessels under international treaties and national laws and regulations, and data on vessel size are frequently compiled. Existing criteria and data are then used to propose size categories for the global fishing fleet that can be used as the basis for phased implementation of a UVI scheme (Section 5.2). For the second issue, risk of IUU fishing, the analysis examines existing studies and examples of IUU fishing incidents to determine which types of vessels are most commonly involved (Section 5.3). This section concludes with a comparison of the size categories and risk factors to assess similarities and propose a framework for the UVI scheme phasing plan (Section 5.4).

5.2 Categorisation by Vessel Size as a Proxy for Fishing Capacity

5.2.1 Selection of Parameters and Units

The most straightforward and easily measured means of assessing the fishing capacity of a fishing vessel is its size. Surveys of major fishing vessel databases, and well as international requirements and guidelines for vessels (Annex B1), show that both tonnage and length are frequently used as indicators of

vessel size[52]. While both indicators are thus relevant to assessing fishing capacity, both suffer from continuing debate regarding which units are most appropriate, and from data holdings comprising a mixture of units.

In the case of tonnage, units of gross tonnage (GT) and gross register tonnage (GRT) are common. The relationship between these units is complex, with tonnage expressed in GT units potentially two to four times higher than the corresponding GRT figures (FAO 2010b). Vessels >24 m on international voyages flagged to contracting parties of the International Convention on Tonnage Measurement of Ships of 1969, of which there are 150 (IMO 2010f), have been obliged to use GT units since July 1994 but a variety of national registers, and several of the T-RFMOs (IATTC and IOTC are exceptions), currently record tonnage in GRT. In contrast, the EU Fleet Register uses GT and it is one of the few databases which rigorously enforces use of this tonnage unit.

Units of length may also vary. The International Regulations for Avoiding Collisions at Sea (COLREGS) use "length overall" (LOA) and this is the required unit for vessel length measurement when applying for an IMO/LR number. However, the Torremolinos Protocol, the Code of Safety for Fishermen and Fishing Vessels, the Voluntary Guidelines for Small Fishing Vessels and the FAO Compliance Agreement apply a different definition of length, sometimes referred to as "Torremolinos length" or "registered length" which would give a smaller value for a given vessel than its LOA (FAO 2008b (Annex VI)). Despite its common use in these instruments, a study by IMO concluded that the "Torremolinos/registered length" measurement is rarely used (FAO 2008b (Annex II)). Another measurement type is "length between perpendiculars" or LBP (Figure 6) which is an optional format for reporting vessel length on the application for IMO/LR numbers (IMO 2006). The use of LBP was debated by IATTC but was not adopted (IATTC 2008). In fact, while some of the T-RFMOs do not specify length units in their conservation and management measures, ICCAT and IOTC either already use or are moving toward using LOA (FAO 2008b (Annex II); Annex B2 (this study)). The EU Fleet Register also uses LOA (EU 2010a). Finally, an analysis by the Australian Fisheries Management Authority (AFMA) concluded that "*the use of [LOA] minimises the scope for manipulation by operators to increase vessel capacity through exaggerating design features and if any changes in length are made they are readily visible. This is not necessarily the case with other [length measurement] methods*" (AFMA 2005). On this basis LOA was adopted for use in this study.

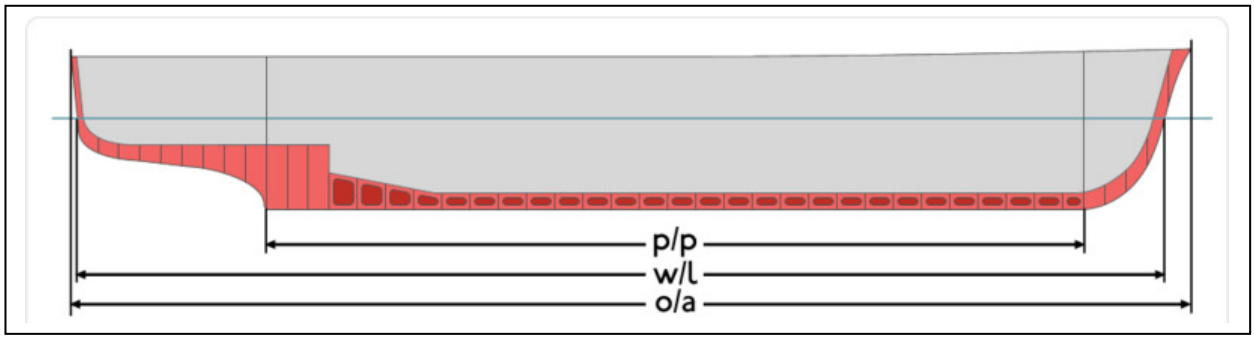

Figure 6. Diagram of various methods for measuring vessel length. p/p = length between perpendiculars; w/l = length at waterline; o/a = length overall (Emoscopes 2010). "Torremolinos length" is generally considered to be equal to 1.04 x length between perpendiculars (FAO 2008b (Annex VI)).

[52] Engine power is another possible indicator of fishing capacity but such data are not always available for fishing vessels (see for example Joint Tuna RFMOs (2009a)).

5.2.2 Size Category 1

Definition of the first size category requires selection of only one size criterion so that all vessels larger than the criterion will be considered Size Category 1. An existing UVI scheme for maritime vessels other than fishing vessels, the IMO/LR numbering scheme under the SOLAS Convention, applies to craft ≥100 GT. Given that approximately 23,000 large fishing vessels already voluntarily participate in the IMO/LR scheme, it seems prudent to incorporate this scheme's criterion into the structure of a UVI for fishing vessels. On this basis Size Category 1 is defined as all fishing vessels ≥100 GT.

5.2.3 Definition of Size Categories 2 and 3 and a Minimum Size Limit

Having thus defined Size Category 1, the remaining issue is then how to categorise vessels <100 GT. The lower end of the range of vessels <100 GT consists of numerous very small fishing vessels, including non-motorised craft, many of which would not be expected to leave their own national waters except perhaps when crossing a national boundary lying in close proximity to their home port. This does not suggest that local IUU fishing activities by very small vessels can be presumed to be negligible or otherwise acceptable. However, effectively combating such activities will necessarily rely heavily on local intelligence and coordination. From both global and local perspectives, devoting limited resources to assigning UVIs and capturing register information about these very small vessels in a global database may not be the most effective means of addressing the situation. Given that the scale of the UVI scheme and the GRFV will be global and open to all States which wish to participate, the system will arguably be most valuable in facilitating the exchange of information about vessels which are fishing outside of areas where information about them might be expected to be held (i.e. outside of national waters and adjoining areas). In other words, the UVI scheme and the GRFV should aim to link and synergise national and regional information holdings through a compatible format and platform. UVIs may be assigned to very small vessels if such vessels wish to participate in the scheme, but designing the system to target these vessels given the sheer numbers involved[53] would risk overwhelming available resources, and at the same time distract attention from the risks posed by larger, high capacity vessels fishing in foreign EEZs or on the high seas.

With these considerations in mind, potential minimum criteria below which vessels need not be targeted for assigning a UVI, at least not under the current conceptualisation of the UVI system, were examined. At the same time, intermediate criteria to categorise mid-size vessels <100 GT (i.e. below Size Category 1) were investigated.

Two of the largest existing fishing vessel databases were examined in order to explore definitions for the minimum and mid-range criteria: the EU Fleet Database (EU 2010a) and the Global Vessel Record of the Joint T-RFMOs (Joint Tuna RFMOs 2009c). The EU Fleet Database contains records for all fishing vessels in EU member States, regardless of size and fishing grounds, measured in GT and LOA (see Sections 2.1.6 and 3.3.3 for more details). The Global Vessel Record of the Joint Tuna RFMOs merges the five RFMOs'

[53] According to the most recent available statistics from FAO (FIGIS 2010, data as of 1998), vessels in the smallest size category (< 12 m) comprise 48% of all decked fishing vessels. Multiplying this percentage by the estimate presented at the FAO Expert Consultation on the GRFV (FAO 2008a) of 4 million fishing vessels <100 GT results in potentially 2 million vessels <12 m.

records of fishing vessels and is, by design, composed of a subset of fishing vessels, i.e. those vessels capable of fishing for tuna. Some of the RFMOs include all such vessels, regardless of size and fishing grounds, while others specify vessel size limits or are limited to those fishing outside of national waters (Annex B2). Although most RFMOs specify the unit of tonnage as GRT, communication with those who tabulated the T-RFMO database indicates that a mixture of GT and GRT units are included. This was the result of the RFMOs' own reporting policies as well as potentially inconsistent or incorrect reporting by flag States [54]. Length units in the T-RFMO database are not specified but are understood to be LOA (Annex B2).

The inconsistent use of tonnage and length units in the T-RFMO database is undoubtedly typical of the situation to be faced by a UVI system. It is also important to consider that some vessels have been deliberately constructed to be just below tonnage or length criteria commonly used to delineate when certain vessel requirements apply (e.g. just below 100 GT or slightly less than 24 m; see ICCAT 2009). Incidents of under-reported tonnage figures may also be widespread (Kelleher 2002).

Given this expected variability in the data, minimum and mid-range size categories are defined with reference to both tonnage and length in order to provide a robust categorisation framework. This minimises opportunities for exempting vessels of the targeted size range based on small changes in measurement parameters or different units. While it may be debated whether the pair of criteria defining each end of each range are equivalent, such debate would only be meaningful if each vessel being categorised was measured in consistent units for both tonnage and length. In reality, both measurements may not be available or if available, may be presented in a variety of units. The extent to which vessels at the margins are categorised differently based on tonnage or length may be of interest, and is discussed in the following analysis.

A minimum size limit, below which fishing vessels would not require a UVI, was investigated first. The Voluntary Guidelines for the Design, Construction and Equipment of Small Fishing Vessels, prepared by the FAO, IMO and International Labour Organization (ILO), is based on a lower limit of 12m and was taken as a starting point. The FAO Expert Consultation on the GRFV (FAO 2008a, 2008b) considered a lower threshold of 10 GT without elaborating on the rationale. Further supporting information for a lower threshold in this range was identified as:

- A lower limit of 5 net tonnes (generally converted to length as 25 feet (8 m) is used by the United States to determine which vessels require unique identifiers in their national system (USCG 2010b)).
- Japan categorises small fishing vessels as those below 10 GRT (Annexes A9 and B1).
- Canada considers small vessels to be those up to 15 GT or 12 m (Canadian Government 2010b).

Given the variation in definitions (both in numbers and units), and the need to be practical yet conservative, it is proposed that the smallest size category begin with vessels which are both <12 m in length and <10 tonnes. The tonnage criterion is proposed to be applied to values reported in GT, or if unavailable, to values reported in GRT. While discrepancies between exclusion based on GT versus GRT

[54] M. Herrera, IOTC, personal communication.

units may arise, the use of both tonnage and length criteria simultaneously will mitigate against exemption of a vessel which would otherwise require a UVI (i.e. a vessel which is >10 GT but <10 GRT would only qualify for the exemption if it was also <12 m). The length criterion is proposed to be applied in units of LOA as it is much more commonly used than the Torremolinos definition of length.

The result of applying these minimum size limit criteria to the two databases is shown in Table 7. Differences in the number of vessels exempted in the two databases are expected since the T-RFMO database should contain comparatively larger vessels (i.e. those targeting tunas) than the EU fleet register (i.e. all EU vessels). For example, under application of the two minimum size limit criteria, 80% of the vessels in the EU Fleet Database would be exempted. This reflects the very large number of vessels <10 m on the register (e.g. 15,514 vessels in this size class from Greece alone). In contrast, when applied to the entire T-RFMO database these two criteria exempt only 10% of the vessels, and a large proportion of these (43%) are New Zealand vessels on the CCSBT record which are most likely fishing in New Zealand waters. The relatively low proportion of vessels which are exempted under one but not the other criterion (4% and 15% for the EU Fleet Register and the T-RFMO database, respectively) indicates that the two criteria are reasonably consistent. (As noted above the T-RFMO database is likely to contain a mixture of GT and GRT values which is probably responsible in part for the discrepancy).

Table 7. Numbers of vessels by tonnage and length in the EU Fleet Register and T-RFMO databases.

	EU Fleet Register	T-RFMOs Global Vessel Record
Total Vessels	84,728	15,844[a]
Vessels <12 m AND <10 tonnes	68,062 (80%)	1,535 (10%)
Vessels <12 m XOR[b]<10 tonnes	3,027 (4%)	2,455 (15%)
Vessels >12 m AND > 10 tonnes[c]	13,639 (16%)	11,854 (75%)

Notes:

[a] The total number of vessels in this database is 18,086 but 2,242 vessels were excluded from the analysis because they lacked either tonnage and/or length data.

[b] The notation 'XOR' refers to the 'exclusive OR' condition, i.e. the vessel meets either one of the criteria but not both.

[c] Includes vessels ≥100 GT

Application of the Size Category 1 criterion (≥100 GT) and the minimum size limit criteria described above result in a subset of fishing vessels which are between 10-100 tonnes and at least 12 m in length. Existing legal instruments and guidelines were surveyed to identify any relevant criteria within this size range (Annex B1).

For small fishing vessels, length is more often used than tonnage for categorisation (FAO 2008b (Annex VI)). Provisions of the Torremolinos Protocol; the International Convention on Standards of Training, Certification and Watchkeeping for Fishing Vessel Personnel (STCW-F); the Code of Safety for Fishermen and Fishing Vessels; and the Code on Intact Stability for all Types of Ships (ISC) all refer to vessels ≥24 m in length. The IMO/FAO/International Labour Organization (ILO)'s Voluntary Guidelines for the Design, Construction and Equipment of Small Fishing Vessels uses a length of 24 m as its upper limit of applicability. The FAO Compliance Agreement requires fishing vessels above 24 m to be included in the HSVAR database but vessels below this size may also be included at the flag States' discretion. The FAO Expert Consultation on the GRFV noted that many of the preceding length definitions are based on the "Torremolinos length" (see above) which would equate to approximately 26.5 m LOA (FAO 2008b (Annex VI). Notwithstanding this adjustment, many of the T-RFMOs require placement on their record of fishing vessels if the vessel exceeds 24 m LOA. (ICCAT has recently revised its requirements to include vessels of ≥20 m LOA but this provision is not yet in effect (ICCAT 2009)).

There are also a limited number of categorisation criteria for smaller fishing vessels in tonnage. The FAO Expert Consultation on the GRFV considered a criterion of 55 GT as a midrange criterion for categorising vessels for the UVI on the grounds that it equates to an LOA of 16.5 m and was being discussed by ILO as category for work in the fishing sector (FAO 2008b (Annex VI)). The Northwest Atlantic Fisheries Organization (NAFO) requires flag State authorisations for any vessels >50 GT.

The two major fishing vessel databases were examined to determine whether any apparent categories formed at or near these criteria. While it is difficult to identify any groups from the distribution of vessel tonnages and lengths in the EU Fleet Register database (Figures 7 and 9), there appear to be modes in the data on either side of approximately 50 GT and 18 m in the T-RFMO database (Figures 8 and 10). This tonnage criterion is identical to the figure used by NAFO (50 GT) and corresponds closely to the tonnage criteria (55 GT) presented at the FAO Expert Consultation on the GRFV. It also corresponds with endpoints of categories defined by the International Standard Statistical Classification of Fishery Vessels (ISSCFV) by GRT Category (FAO 1977). A length criterion at 18 m would be slightly lower than that agreed recently by ICCAT (i.e. 20m) but would be equally effective in reflecting ICCAT's concern with a growing trend toward constructing vessels of slightly less than 24 meters (ICCAT 2009). In fact, in dealing with a similar issue, IATTC explicitly considered 18 m as an alternative to 24m in designating the fishing vessel size category to which regulations should apply (IATTC 2008). A criterion of 18 m would also correspond with an endpoint in the International Standard Statistical Classification of Fishery Vessels ISSCFV by length (FAO 1982). It is thus considered that a criterion of 18 m would address the primary concern of capturing vessels just under 24 meters, and is well-supported by the data (Figure 10, IATTC 2008).

Unlike the minimum criteria, these two mid-range criteria were applied to the two datasets as a double trigger, i.e. if a vessel is either ≥50 GT or ≥18 m, it is categorised as Size Category 2. This formulation was designed to be conservative, i.e. to select rather than exclude vessels at the margins of the category thus defined. As the criteria were somewhat similar to the tonnage-length relationship noted by ILO at the FAO Expert Consultation on the GRFV (February 2008) (i.e. 55 GT and 16.5 m), both EU and T-RFMO datasets were expected to show generally consistent results for both the length and tonnage criteria. Application of the length criterion (≥18 m) alone selected 26% of the EU Fleet Register's vessels mid-sized vessels (i.e. those <100 GT, and ≥10 GT and ≥12 m) whereas the tonnage criterion (>50 GT) alone selected 21%. Application of both criteria as a double trigger (under an "or" condition) selected 29% of the EU Fleet Register's mid-sized vessels. In the T-RFMO database, the length criterion alone selected 46% of the T-RFMO vessels and the tonnage criterion alone selected 35%. Application of both criteria as a double trigger (i.e. an "or" condition) selected 50% of the T-RMFO mid-range vessels.

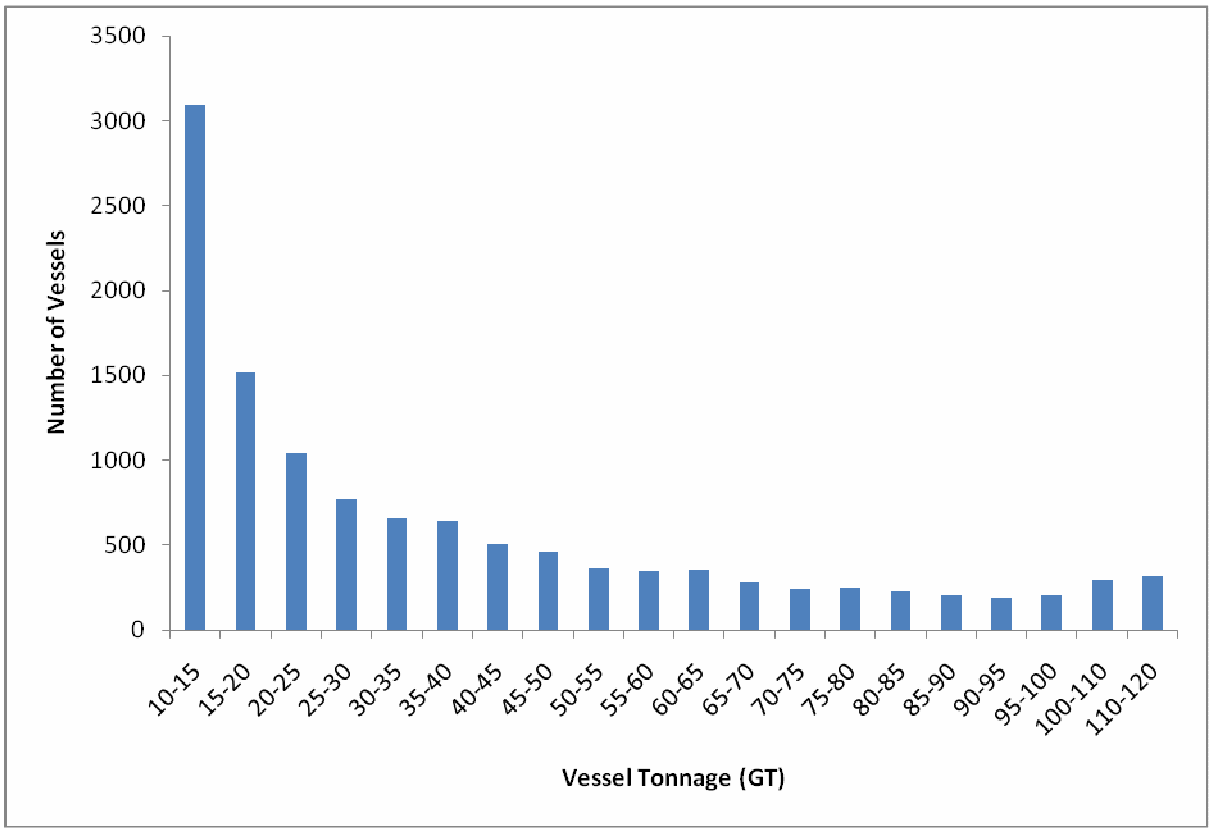

Figure 7. Tonnage frequency distribution for EU Fleet Register vessels of 10-120 GT (inclusive) as of January 2010 (n =11,973) (EU 2010a).

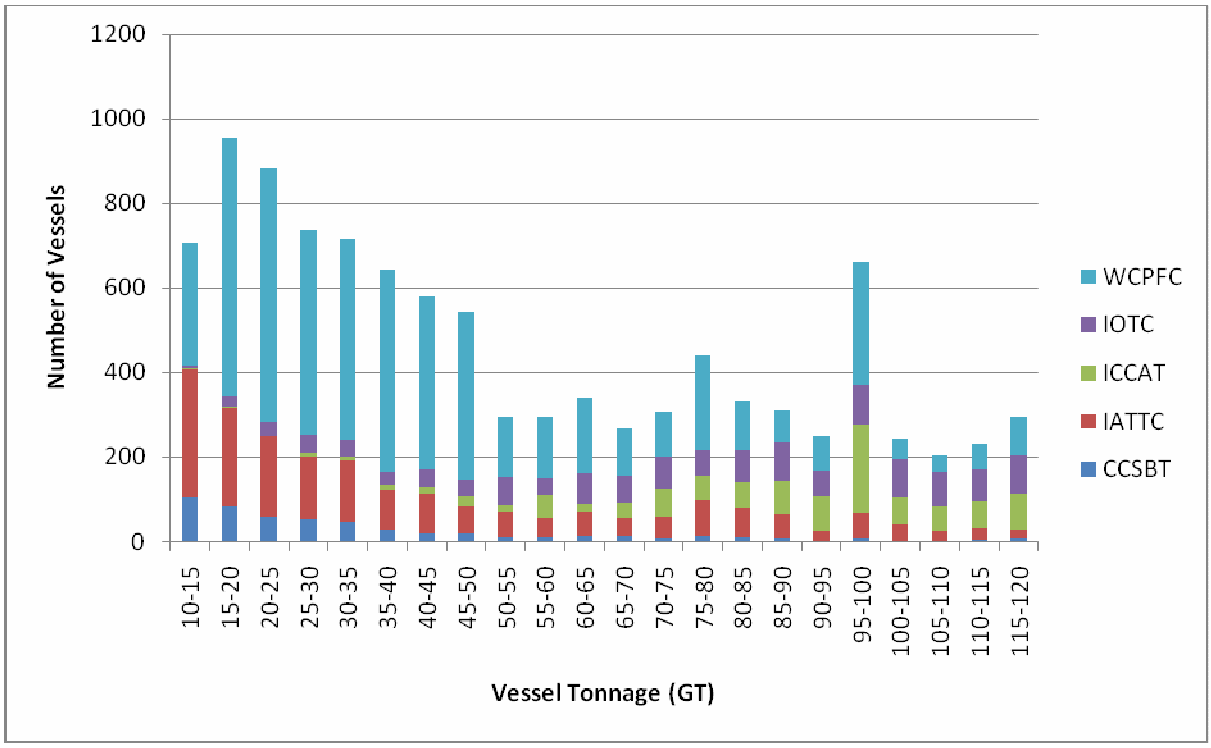

Figure 8. Tonnage frequency distribution for T-RFMO vessels 10-120 GT (n = 10,228) (Joint Tuna RFMOs 2009c)

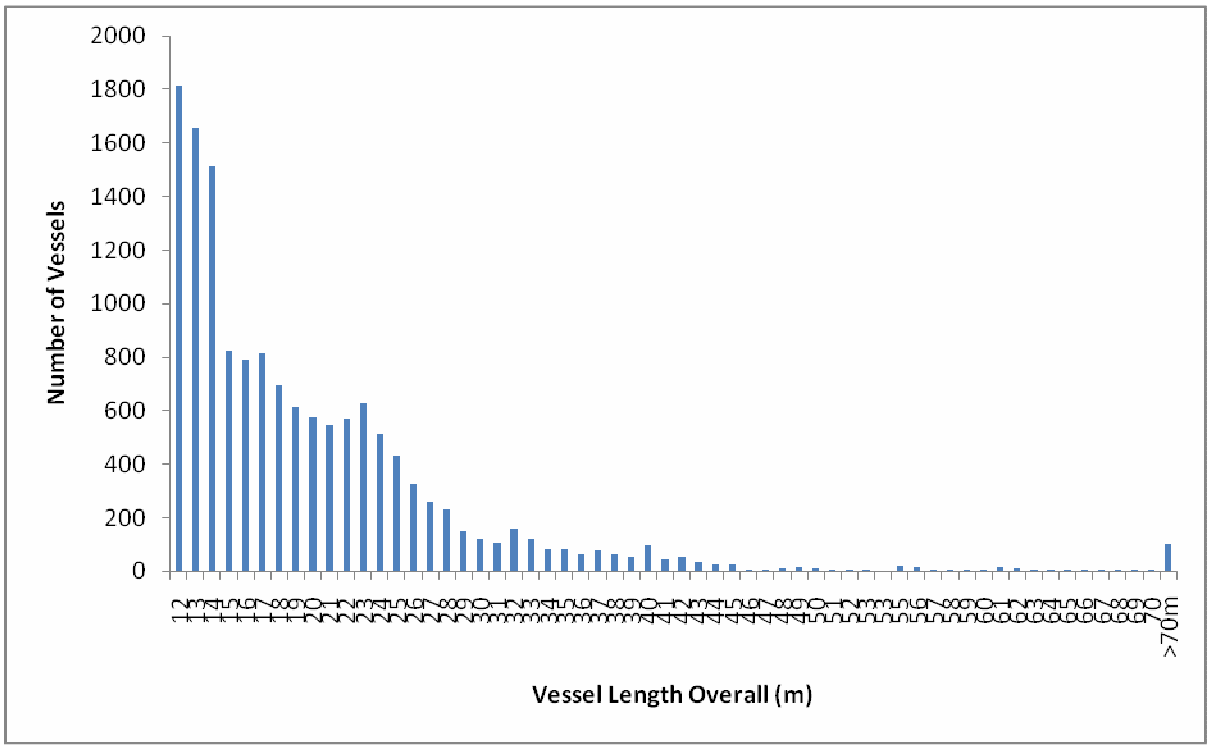

Figure 9. Length frequency distribution for EU Fleet Register vessels 12 m—>70 m (n = 14,448) (EU 2010a).

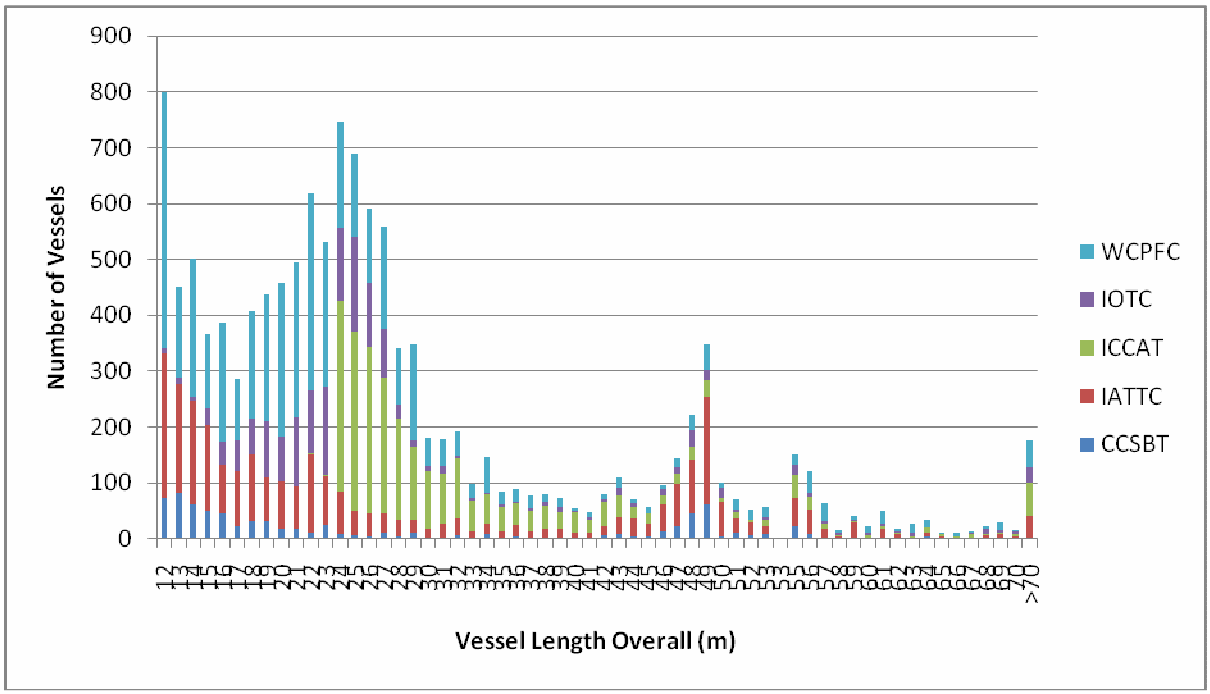

Figure 10. Length frequency distribution for T-RFMO vessels 12 m – >70 m length (n=12,544) (Joint Tuna RFMOs 2009c).

It is proposed that vessels ≥50 GT or ≥18 meters in length be designated as Size Category 2, and vessels from 10 up to 50 GT and from 12 up to 18 meters in length be designed Size Category 3. The resulting partitioning of the EU Fleet Register, which is likely to be representative of comprehensive national vessels registers, and the T-RFMO database, which is likely to be representative of foreign EEZ and/or high seas fishing vessels, is shown in Figure 11.

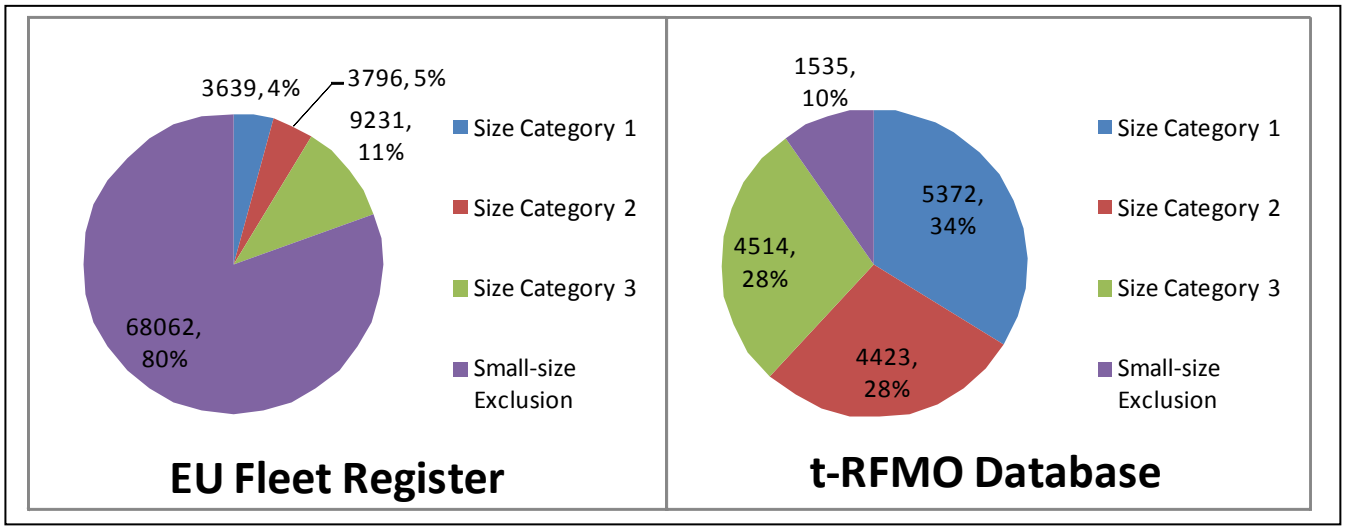

Figure 11. Application of proposed vessel size criteria to EU Fleet Register and T-RFMO databases in number of vessels and percent. Size Category 1 vessels are those ≥100 tonnes; Size Category 2 vessels are those remaining which are ≥50 tonnes or ≥18 m length; Size Category 3 vessels are those remaining which are ≥10 tonnes or ≥12 m length; small-sized exclusion vessels are those which are both <10 tonnes and <12 m length.

While this analysis provides useful insights by proportion, the numbers of vessels shown in Figure 11 do not represent the global fishing fleet. Existing statistics on the global fleet are limited but a rough estimate of the total number of vessels encompassed by the Size Categories 1, 2 and 3 can be produced using the FAO's FIGIS vessel database (FIGIS 2010 (data as of 1998)). This database indicates numbers of vessels worldwide in a series of fixed vessel length ranges as shown in Table 8.

Scaling the FIGIS figures to a global fleet of 4 million vessels, and assuming that all vessels >24 m are also ≥100 GT, suggests that 140,740 vessels would fall within Size Category 1 (i.e. ≥100 tonnes); 119,759 vessels would fall within Size Category 2 (i.e. <100 tonnes, but >50 tonnes or >18 m); and 446,209 vessels would fall within Size Category 3 (i.e. not Size Category 1 or 2, but >12 m or >10 tonnes). Based on these estimates, slightly more than 700,000 vessels would need UVIs.

Table 8. Number of fishing vessel by length category in FAO's FIGIS database scaled to an estimate of 4 million fishing vessels worldwide. For the purposes of this analysis, vessels of >24 m length are assumed to be ≥100 GT.

FIGIS Vessel Length Range	FIGIS Number of Vessels	FIGIS Percentage by Category	Scaled to total global fleet size of 4 million	Proposed Size Category
<12 m	628,665	0.82	3,293,293	na
12m up to 18m	85,178	0.11	446,209	3
18m up to 24m	22,861	0.03	119,759	2
24m up to 30m	16,214	0.02	84,938	2
30m up to 36m	3,767	<0.01	19,734	1
36m up to 45m	3,157	<0.01	16,538	1
45m up to 60m	2,400	<0.01	12,573	1
60m up to 75m	574	<0.01	3,007	1
75m and over	754	<0.01	3,950	1

5.3 Risk-based Criteria

This section explores whether there are factors beyond vessel size which can and should be used to prioritise which fishing vessels should be assigned UVIs. One of the key factors for prioritisation has been identified as the risk of engaging in IUU fishing. While there are many reports detailing IUU activities in specific areas (e.g. Greenpeace 2006, WWF 2008, Meere and Lack 2008, and case studies supporting Agnew et al. 2009), and several studies which have attempted to characterise IUU fishing activities on a global scale (e.g. MRAG 2005, Le Gallic and Cox 2006, Agnew et al. 2009), there is no existing risk model for fishing vessels and the probability of engaging in IUU fishing.

To illustrate the issue, consider the analysis of factors which contribute to IUU fishing by Le Gallic and Cox (2006). After identifying that the propensity to engage in IUU fishing is directly related to the expected economic profit to be gained, these authors proceed to suggest that overcapacity, ineffective management, subsidies, lack of mechanisms to enforce compliance of non-contracting parties, an ample supply of inexpensive labour, and the linking of vessels into groups under complex ownership structures create conditions which may lead to IUU fishing activities. In all but the last case, these factors are helpful in designing strategies to combat IUU fishing but they are difficult to apply as risk criteria to particular vessels because they would often apply across an entire fleet. It might be possible to identify or rank flag States against some or all of these factors (e.g. see Pitcher et al. 2008), just as it might be possible to identify or rank flag States according to their maritime safety record. However, if the UVI scheme for fishing vessels is to be conceptualised like the IMO/LR numbering scheme for merchant ships, it is most appropriately aimed at those types and sizes of vessels for which the risk is greatest, rather than at individual flag States. A nationally-based approach is particularly problematic given the frequency with which some vessels may change flag in both fishing and maritime transport sectors (see Section 3.3). With regard to the risk factor relating to fleets with complex ownership structures, while such ownership structures may be known to exist in some cases, conducting a sufficiently broad and

deep investigation of fleets to allow classification of vessels in terms of this type of risk appears unrealistic given the lack of ownership information available at this time.

On the basis of these constraints, rather than attempting to predict which vessels may pose a risk for IUU fishing, this study examined existing databases on actual incidents of IUU (mostly illegal) fishing to identify the characteristics of the vessels involved. The first set of data derives from the vessel blacklists of eight regional fisheries management organisations during the period 2004-2008 (Pew 2009, see also Section 3.3.1). This dataset includes incidents occurring on the high seas, as well as those which occurred in national EEZs but were not handled to the satisfaction of the coastal state. In total 178 vessels were listed although just over half of these have subsequently been de-listed (e.g. after settlement of penalties). Of this total, six were purse seiners, ten were fishery support vessels, 32 were trawlers, and 73 were longline vessels. An additional 57 vessels were using fishing gear which was not a trawl[55] but was otherwise unspecified. Given that many of the vessels listed by the RFMOs which recorded the incidents of unspecified gear type are longliners, it is believed that many of the vessels of unspecified type may also be longliners.

Tonnage measurements were available for 140 of the RFMO black-listed vessels and ranged from 55 to 6,127 tonnes (Figure 12, left). Among these vessels, 108 (77%) were ≥100 tonnes and all of the remainder were between 55-100 tonnes. Of the vessels which are ≥100 tonnes, 91% (n=98) have IMO numbers, including all of the trawlers and all but one of the fishery support vessels. Six percent (n=2) of the vessels <100 tonnes have IMO numbers.

In terms of vessel length, data were available for 133 of the RFMO black-listed vessels, including 30 trawlers, 46 longliners, 5 purse seiners, 40 fishing vessels with unspecified gear types and 12 vessels of other types including fishery support vessels (Figure 12, right). Lengths ranged from 22 to 146 meters with the largest numbers of vessels observed in the ranges between 20-32 m and 48-64 m.

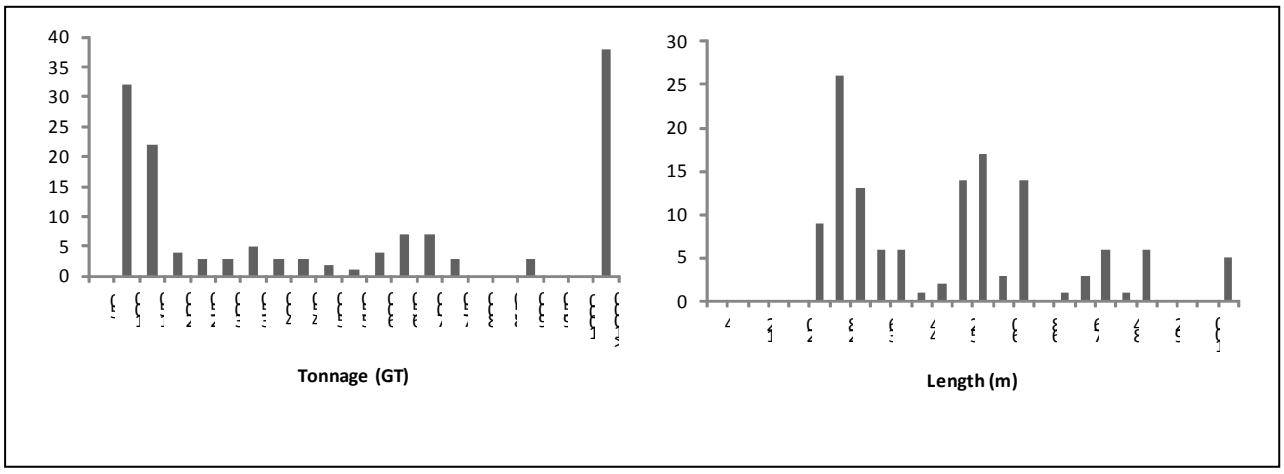

Figure 12. Histograms of vessel tonnage (in GT) and vessel length (in m) for vessels listed on RFMO blacklists (past or present), 2004-2008 (Pew 2009). Vessels ≥1,000 tonnes (n=38) and ≥100 m (n=5) are combined in the final bin of each panel, respectively.

The second dataset consisted of a record of IUU fishing incidents reported by the 17 member countries of the Forum Fisheries Agency in the Western and Central Pacific Ocean (FFA 2010). This Violations and

[55] Trawls are designated as a separate vessel type in the IMO/LR database.

Prosecutions Database consists of 349 incidents during the period 1978 to 2007, 266 of which recorded vessel tonnage and 257 of which recorded vessel length. None of these incidents are reflected in the RFMO blacklist analysis presented above. The majority of incidents involved longliners (61%). Purse seiners were implicated in 24% of the incidents, and fishery support vessels and trawls were involved in only 8% and 4%, respectively.

The size ranges of the vessels in the FFA database are smaller than those in the RFMO blacklist database reflecting a relatively greater number of nearshore IUU fishing incidents. Of the 266 vessels with tonnage recorded, 62% were ≥100 tonnes, 24% were between 50 and 100 tonnes, and 14% were <50 tonnes (Figure 13, left). With regard to length, in contrast to the RFMO blacklist dataset which contained only nine vessels with lengths <24 m, in the FFA IUU dataset (n=257) 28% (n=71) of the vessels were <24 m (Figure 13, right). Most of these vessels were between 18 and 24 m (n=46).

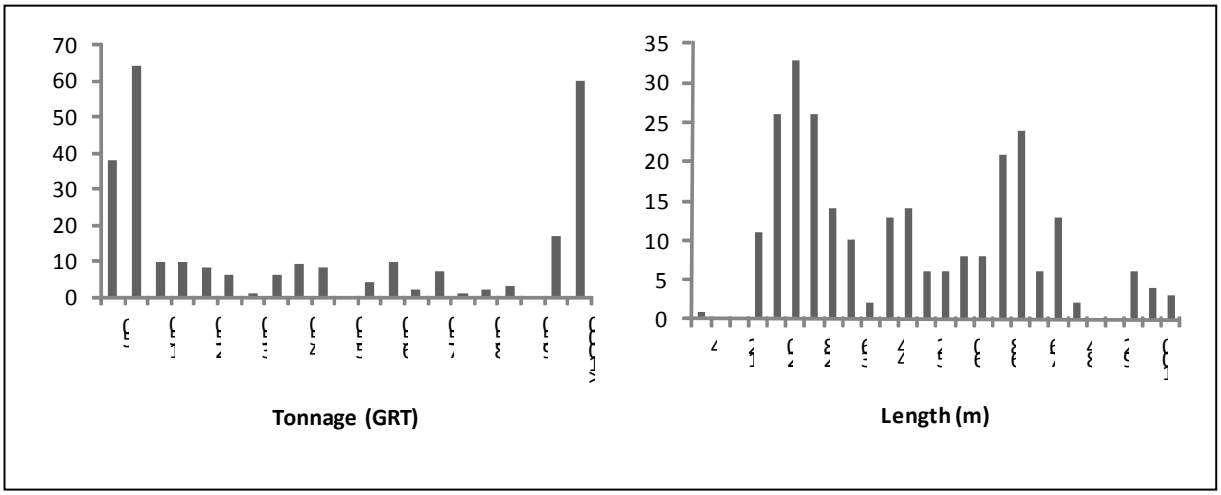

Figure 13. Histograms of vessel tonnage (in GRT) and vessel length (in m) for vessels involved in IUU fishing incidents listed in the Forum Fisheries Agency Violations and Prosecutions database, 1978-2007 (FFA 2010). Vessels ≥1,000 tonnes (n=60) and ≥100 m (n=3) are combined in the final bin of each panel. respectively.

In summary, this analysis based on RFMO blacklists and FFA IUU incidents suggests that a large proportion of IUU fishing involves longliners. This finding may reflect the nature of the fisheries managed by these organisations, i.e. primarily tuna fisheries in which the majority of vessels by number are longliners, and thus does not necessary suggest that IUU fishing worldwide is dominated by longliners. However, the overall findings with regard to vessel tonnage and length are based on a variety of gear types and are probably representative of the range of vessel sizes involved in commercial (i.e. non-artisanal) fishing activities. Comparison of the vessel size categories proposed above (Section 5.2) with these results suggests that the majority of vessels which have been implicated in IUU fishing activities are ≥100 tonnes (77% in the RFMO blacklist dataset; 62% in the FFA IUU dataset) and would be included in Size Category 1. Size Category 2 would capture a large proportion of the other listed vessels including the remaining 33% of the RFMO blacklist database (i.e. those over 50 tonnes) and 30% of the remaining FFA IUU dataset (i.e. those over 50 tonnes or >=18 m). The remaining 8% of the FFA IUU dataset would fall within Size Category 3.

5.4 Phased Implementation of the Recommended UVI Scheme

Phased implementation of a UVI scheme for fishing vessels must consider the type of scheme being implemented (Section 4) as well as the means of categorising fishing vessels so that those of interest are preferentially incorporated into the scheme (Sections 5.1-5.3). The phasing programme also must be cognisant of existing international, regional and national efforts to compile information on fishing vessels and work in synergy with them as much as possible. Taking account of these factors, the following three phases are proposed.

5.4.1 Phase 1

Vessels in Size Category 1 (i.e. ≥100 GT) feature prominently in the IUU fishing analysis (Section 5.3) and should be incorporated into the UVI scheme as a matter of priority. While not aimed specifically at fishery support vessels, this category would likely include all of these vessels as they would almost certainly all be ≥100 GT. It is estimated that approximately 140,740 fishing vessels are contained in Size Category 1 and would thus be targeted in Phase 1. Approximately 16% (23,000) of these vessels should already possess IMO/LR numbers (Section 2.1.1).

Under the preferred fishing vessel UVI option (Option 1, Section 4.4), the UVI scheme for fishing vessels ≥100 GT would be identical to the IMO/LR numbering scheme, therefore Phase 1 is already partially implemented. Targeting the remaining large fishing vessels which do not already have IMO/LR numbers under Phase 1 of the implementation may be facilitated by the fact that vessels ≥100 GT can currently apply for and be assigned IMO/LR numbers free of charge. Under these circumstances Phase 1 implementation can progress immediately while discussions are underway with LRF regarding upgrading the standards and procedures for fishing vessels within the IMO/LR database.

5.4.2 Phase 2

Vessels in Size Category 2 (i.e. vessels not in Size Category 1 but ≥50 tonnes or ≥18 m length) as well as all fishing vessels on T-RFMO lists of authorised fishing vessels should be targeted in Phase 2 of the UVI implementation. This objective of this phase would be to expand the UVI scheme to slightly smaller fishing vessels which are, or are likely to be, fishing in waters managed by RFMOs. Following on from Phase 1, Phase 2 would capture the majority of the remaining vessel sizes and types that appear frequently in IUU fishing activity databases (Section 5.3) and have been noted as being of concern in some RFMOs (e.g. longliners of 20-24 m; ICCAT 2009). Phase 2 is designed to target the approximately 120,000 fishing vessels in Size Category 2, plus an additional ~6,000 fishing vessels on T-RFMO lists which are smaller than Size Category 2.

Under an existing offer to the T-RFMOs (Section 2.1.4), IMO/LR numbers can be provided to vessels on the T-RFMO authorised fishing vessel lists free of charge provided that data exchange requirements are met. Full implementation of Phase 2 under the preferred UVI scheme option (Option 1) will require the agreement of LRF for the inclusion of all Size Category 2 vessels. If this proves infeasible, UVI scheme Option 2 could be triggered.

5.4.3 Phase 3

Vessels in Size Category 3 (i.e. vessels smaller than Size Categories 1 and 2, but ≥10 tonnes or ≥12 m length) which are not part of the T-RFMO proposal for UVIs will comprise the third phase of implementation. These vessels have not often been implicated in the type of IUU fishing activities assessed in this study (Section 5.3), but may be implicated in local, cross-boundary IUU incidents which are not often reported in the global media. Size Category 3 vessels are usually registered on national vessel databases and for the sake of a comprehensive system could be incorporated into the UVI scheme. The number of vessels involved in Phase 3 is estimated to be approximately 440,000 (i.e. Size Category 3 minus T-RFMO vessels in Size Category 3 incorporated under Phase 2).

Under the preferred UVI scheme option (Option 1), it will be necessary to secure the agreement of LRF for all vessels to be incorporated under Phase 3. This may require modification of the UVI format from the current six-digit-plus-check-digit format either by adding a digit, by converting to hexadecimal, or another option. If these issues are insurmountable, a streamlined UVI scheme for small fishing vessels under Option 1, or Option 2 could be pursued. In order not to divert resources away from Phase 2 targeted vessels of higher priority, it is recommended that Phase 3 not begin until Phase 2 is reasonably complete.

5.4.4 Summary of Proposed Phases of Implementation

A summary of the key features of the three proposed phases is provided in Table 9.

Table 9. Proposed phases of implementation for the fishing vessel UVI scheme.

	Description	**Rationale**	**Number of Vessels**	**Timing**	**Special Considerations**
Phase 1	Size Category 1 (≥100 GT)	• Likely includes all fishery support vessels • Most reported IUU fishing is by vessels in this size range • Already partially implemented	~140,000 (~23,000 with UVIs already assigned)	Immediate	• Requires agreement of LRF to upgrade standards and procedures for fishing vessels under Option 1 (see Section 4); if not use Option 2
Phase 2	Size Category 2 (<100 GT and ≥50 GT or ≥18 m) and T-RFMO listed vessels	• Would include the remaining vessel types often implicated in IUU fishing	126,000	Immediate for T-RFMO vessels; the remainder following on from Phase 1	• Requires agreement of LRF under Option 1 (see Section 4); if not use Option 2
Phase 3	Size Category 3 (<100 GT and ≥10 GT or ≥12 m) excluding T-RFMO listed vessels	• Includes the remaining vessels of a size large enough to be centrally registered by the flag State	440,000	Following on from Phase 2	• Requires agreement of LRF under Option 1 (see Section 4); if not use Option 2 • May require expansion of number format

6 Findings and Practical Guidance

6.1 Summary of the Recommended UVI Scheme

The preceding analyses have resulted in a recommended option for the structure of the UVI scheme (Section 4), and a phased implementation programme based on vessel size (as a proxy for fishing capacity) and risk (Section 5). In synopsis, the recommendation is to utilise the IMO/LR numbering scheme as the UVI for all fishing vessels above a minimum size threshold. This option was chosen on the basis of efficiency (i.e. no need to develop a new and potentially duplicative system), compatibility (i.e. with the merchant fleet system which already includes many fishing vessels), and technical considerations (i.e. data requirements ensure the integrity of the system yet can be met by most national registers with small modifications). Please refer to the preceding sections for further elaboration of these arguments.

Phase 1 of implementation would consist of incorporating all fishing vessels ≥100 tonnes into the UVI scheme. Phase 2 would extend the scheme to vessels >50 tonnes or > 18 m, and to all vessels on T-RFMO authorised vessel lists. The final Phase 3 would extend the system to all vessels above the minimum size limit (≥10 tonnes or ≥12 m) which are not included in Phases 1 and 2. The total number of vessels to be incorporated is estimated at approximately 700,000.

LRF has already assigned some (~16%) of the necessary UVIs under Phase 1. Further implementation of Phase 1 can be progressed immediately as fishing vessels ≥100 GT can apply under current IMO procedures. However, LRF has indicated that the data standards for fishing vessel records in the IMO/LR would require improvement in order to meet the objectives of the GRFV and that costs would be incurred for this work.

LRF has proposed to extend the IMO/LR numbering scheme to smaller fishing vessels by assigning IMO/LR numbers to T-RFMO vessels if data standards and supply requirements can be met. Similar efforts are proposed to be undertaken as Phase 2, and then eventually progressed as Phase 3 for the remaining fishing vessels above the minimum size limit. The participation of LRF, including an appropriate cost structure, will need to be agreed with LRF. If these negotiations cannot be satisfactorily concluded, a separate scheme can be initiated but it is recommended that this scheme parallel the IMO/LR scheme as closely as possible. The detailed justification for these phases is provided in Sections 4 and 5.

6.2 Additional Elements of Practical Implementation Guidance

A discussion of other issues relating to implementation of the fishing vessel UVI scheme including ensuring broad uptake, scheme integrity and appropriate division of responsibilities for management is provided below.

6.2.1 Ensuring Broad Uptake of the Scheme

It is easy to foresee that a UVI scheme for fishing vessels which lacks broad-based support and participation will not be effective. It is more difficult to suggest how the barriers to participation can be

overcome. This is particularly true given the inherent trade-off between creating strict, mandatory standards in international agreements and attracting a large number of signatories. A pertinent example of this trade-off can be found in the history of the FAO Compliance Agreement and the HSVAR (see Section 2.1.5). The experience of the HSVAR also cautions that even States which become contracting parties may not always provide the required data, and the confidentiality conditions which often accompany these data may work against the system's goal of transparency.

Other schemes discussed in this study provide other examples of the need for comprehensive coverage. It was shown that while the EU Fleet Register maintains strict oversight for vessels flagged within its own system, it is vulnerable to a loss of control and traceability when a vessel leaves or enters the system by way of a non-EU member State (Section 3.3.3). This situation is similar to that in the Northeast Atlantic Fisheries Commission (NEAFC) which adopted a conservation and management measure requiring contracting parties to deny port access to vessels on the NEAFC blacklist, but found this led to an increase in port calls for blacklisted vessels in non-party States (Pew 2009). Fishing vessels which seek to avoid regulations and sanctions will continue to register with countries which have either fewer international responsibilities and/or a lesser ability to enforce them as long as this option exists. The need to, and the mechanism for, creating a fully participatory control system for fishing vessels from all flag States is a critical issue which is much broader than the considerations associated with selecting a UVI scheme.

Despite this problematic policy context, it is important to note that approximately 23,000 fishing vessels ≥100 tonnes have already obtained IMO/LR numbers on a voluntary basis. The reasons behind these applications are likely varied and may include owner preference; flag State incentive; or facilitation of inspections, insurance or other business concerns. The T-RFMOs proposal to initiate assignment of IMO/LR numbers to vessels on their authorised vessel lists would further expand the number of fishing vessels in the system and should be encouraged.

The ongoing drive toward greater traceability in fish product provenance has already begun to expand the potential for cross-referencing fishing vessel characteristics with IMO/LR numbers. For example the FAO Agreement on Port State Measures (FAO 2009b) and the EU Regulation on IUU Fishing (EU 2009) both suggest recording the IMO/LR number on applications for port entry and fish imports. Since the IMO/LR already provides the most robust system of unique vessel identifiers and vessel histories, it is to be expected that its incorporation into fish traceability systems will only grow over time. Two immediate targets for uptake of IMO/LR numbering data would be the EU Directorate-General for Health and Consumer Protection (DG SANCO) Third Country Establishments Lists (e.g. list the IMO/LR number alongside the name of the vessel on the lists) and the Marine Stewardship Council's Fisheries Assessment Methodology and Chain of Custody Standard (e.g. incorporate the use of IMO/LR numbers as an element of best practice in traceability). Encouragement of such market mechanisms may in fact be less intensive and more effective than an attempt to negotiate a new, binding agreement on a UVI scheme for fishing vessels.

6.2.2 Ensuring the Integrity of the Scheme

Even with broad participation, as discussed above, a UVI scheme for fishing vessels will not be effective if the numbers can be falsified and the database is unreliable. One of the most important means of guarding against this risk is to design the data requirements so that the data can be matched against an

individual vessel to validate its identity. The recommended option of using the IMO/LR scheme as the basis for a fishing vessel UVI has the distinct benefit of a long history of use for the merchant fleet and a high standard for integrity. As was demonstrated in the survey of national registers (Section 3.2), the only potentially problematic issue with LRF's immediately required data provision list is associated with the information on vessel operator. While the importance of this information was highlighted by the FAO Expert Consultation on the GRFV (FAO 2008a), and it is collected by four of the five tuna RFMOs (Joint Tuna RFMOs 2009a), it is not required under either the IMO Ship or Company and Registered Owner schemes. Therefore, it is possible that there may be some further flexibility in this LRF requirement.

Beyond the database itself, the IMO/LR numbers are already integrated into existing Port State Control (PSC) inspection procedures for merchant vessels. For example, although marking of IMO numbers on the ship has been required since 2004, this marking is not tamper-proof and PSC inspection authorities are increasingly relying on documents carried onboard to cross-check the vessel's identity. LRF already supplies its data to all PSC authorities. It is likely that document requirements and PSC inspections procedures for fishing vessels are very similar to those for merchant vessels. To the extent that procedures differ, those for fishing vessels should be modified to conform more closely to those for merchant ships so that full use can be made of the IMO/LR numbering scheme's cross-referencing potential.

Even with full implementation, it needs to be acknowledged that no UVI system will be infallible. As shown in the comparison of national vessel registers with the LRF SeaWeb database (Section 2.1.1), there are a number of discrepancies which may reflect a lack of updating in the LRF system. Expectations for system performance need to be set at a reasonable level, particularly given that the sources for triangulating data on fishing vessels are considerably less than those available for the merchant fleet. As recommended above, if existing traceability systems can be encouraged to incorporate the IMO/LR numbering scheme this would have a reinforcing effect on UVI scheme's data quality.

6.2.3 Ensuring Coordination of Responsibilities between Owners, Flag States and Scheme Managers

The number of national vessel registration systems which will potentially interact with the UVI scheme is enormous. It is therefore difficult to generalise about how these interactions can or should take place. As has been suggested above, it may not be practical or even necessary to attempt to impose the fishing vessel UVI scheme as a mandatory measure. The fact that 23,000 fishing vessels already have an IMO/LR number suggests there is considerable interest on the part of individual vessel owners in voluntarily acquiring a UVI. While this is encouraging from the perspective of system uptake, applications for IMO/LR numbers by individual owners and companies create, according to LRF, an unworkable scenario for maintaining and updating the data. For this reason the LRF offer to the T-RFMOs was conditional upon an intermediary role for both the flag States and the RFMOs, as means of providing an initial quality assurance check of applicant data and establishing centralised conduits for periodic data updates.

Although there are several potential pitfalls to an approach based on intermediaries for UVI applications for fishing vessels, none of these appear insurmountable. For example, in order to support the entry of their national fisheries products into EU markets since 1 January 2010, all countries have had to adopt procedures for issuing catch certificates documenting that the fishing vessel catching the fish was

operating legally. The authority designated in each country as responsible for the catch certificates, which is usually the fishing licence authority, could play a similar role in assisting national vessels in obtaining and maintaining IMO/LR numbers. It is also possible that the vessel registration authority or the authority responsible for the record of fishing vessels, in those countries where this is different from the agency with authority for the catch certificate, could take the lead on UVI coordination. This might be advantageous in that these agencies probably already deal with LRF on issues relating to the merchant fleet. In some cases, concerns about data privacy laws have been raised with regard to national authorities providing certain data types to LRF. On the assumption that the vessel owner has an independent interest in obtaining the UVI and that the national authority is merely the facilitator, special data access and release procedures could be implemented where necessary (e.g. the owner applies to the national authority for release of the vessel data to LRF via the national authority's next round of data exchanges). There would also be expected benefits to the national register itself by establishing an improved network for keeping their national vessel data up to date, including feedback from LRF.

Although 22 national registers were surveyed for this study, it is clearly not possible to anticipate every permutation of the division of responsibilities that may result from implementation of the UVI scheme. It should be possible to explore different models through the initiation of trials, perhaps for vessels ≥100 GT in Phase 1. This could help identify national registers which wish to accelerate their participation in the UVI scheme but first require assistance to improve their national systems. Since the recommended UVI option (i.e. the IMO/LR number) is not premised on a unique national identifier, nor even necessarily on having a centralised or fully digitised register (though that would be highly beneficial), the IMO/LR number does not discriminate against less-well organised registers as long as those registers are willing to act as intermediaries for their vessels and can supply the required information.

6.3 Conclusion

This study has reviewed a large volume of information and provided a clear recommendation for development of a UVI scheme for fishing vessels. While there is still much work to be done, the most sanguine result is that the question is not when the UVI scheme can be built and implemented. It is already in operation. The challenge is to broaden the use of existing tools while simultaneously improving their effectiveness, and to engage the broadest possible range of participation through mutually beneficial data exchanges supporting greater traceability of fisheries products.

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ANNEXES

Development of a Comprehensive Global Record of Fishing Vessels, Refrigerated Transport Vessels and Supply Vessels

Investigation of Unique Vessel Identifier (UVI) and Phasing Options

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ANNEX A1

AUSTRALIA

Australia

In total, just over 7,000 commercial fishing boats are registered in Australia (in national and State registers), with the majority of these under 10m, although larger vessels are employed in some trawl and tuna longline fisheries[56]. The number of vessels dually registered on Australia's national vessel register is however much smaller[57]: the national online Australian fishing fleet consisted of approximately 2,195 vessels[58]. A total of 114 of these have an IMO/LR number recorded in the register. Of the 121 vessels ≥24 meters, 47 have an IMO/LR number, leaving 74 vessels ≥24 meters long without an IMO/LR number in the Australian register. Table A1a below provides a broad size profile of the Australian fishing fleet.

Table A1a. Size profile of Australian fishing vessels listed on the national vessel register.

Length group	Number of Vessels
≥24 m length	121
≥18 m length	466
≥12 m length	1208
<12 m length	400
TOTAL	2195

As of November 2009, 266 Australian flagged fishing vessels were active in the LRF SeaWeb database, including 6 support vessels, 90 fishing vessels and 170 trawlers[59].

Responsible national authorities

The Australian Maritime Safety Authority (AMSA)[60] under the Department of Infrastructure, Transport, Regional Development and Local Government is responsible for fishing vessel registration at a national level in Australia. State-based agencies (typically transport departments) handle the

[56] FAO Fisheries and Aquaculture Country Profile - Australia

[57] Australian Maritime Safety Authority, personal communication

[58] Taken from Australia's List of Registered ships (www.amsa.gov.au) including "Whaling Catcher", "Fishing Charter" and "Fishing Ferry".

[59] Driscoll, S. 2010. LRF Fleet Analysis – 30 November 2009. FAO.

[60] http://www.amsa.gov.au/

registration of vessels operating within national waters. All motorised vessels (commercial and recreational) with a motor >6hp must be registered in Australia.

A ship may be registered if more than half the shares in it are owned by Australian nationals; or if it is less than 12 metres in length overall and wholly owned or operated by Australian residents or by Australian nationals and residents together; or it is on demise (bare boat) charter to an Australian based operator.

An application for registration comprises the following forms/documents and a lodgement fee:

1. Application*
2. Declaration of ownership and nationality*
3. Notice of appointment of registered agent*
4. Document describing the ship
5. Documents giving evidence of ownership
6. Demise charter party (if applicable)
7. Tonnage certificate (if applicable)
8. Call sign licence (if applicable)
9. Evidence of marking of ship

* If the ship is foreign-owned and under demise charter to an Australian, these forms must be signed by the demise charterer[61].

The following information is required to register a fishing vessel in the national register: registered owner and address, flag and previous flag, fishing number, vessel name, port of registry, IRCS, ship builder, nationality of ship builder, year of build, type of vessel, length, GT, power of main engine, ship manager, bareboat/demise charter, official number and the date the ship entered the registry.

At state level more information may be required, such as the vessels' breadth and depth which are required in the T-RFMOs proposal[62].

Link between register and fishing rights

Before a vessel may commence commercial fishing operations, owners/operators must acquire a statutory fishing right or a fishing permit issued by either the Australian Fisheries Management

[61] http://www.amsa.gov.au/Shipping_Registration/Guides/Registering_a_Ship.asp

[62] http://www.msq.qld.gov.au/Registration/Commercial-and-fishing-ships/Registration-procedures.aspx

Authority[63] or relevant State-based agency if operating within state waters (i.e. within 3nm of the coast).

Availability online and numbering

The entire Australian register of ships is available online[64], but provides limited information (name, official number, IMO/LR number where available, length, year completed, type and home port). All AMSA registered vessels have a unique Official Number consisting of five digits.

Compliance with RFMO Vessel Data Requirements

Australia, as a member of the WCPFC is required to provide information on all Australian vessels authorised to fish in the WCPFC Convention Area outside of Australia's waters of national jurisdiction. Australia nearly always (93-100%) supplies the following data when listing such vessels on the WCPFC Record of Fishing Vessels: vessel name, registration number, port of registry, name/address of owner, type of vessel, type of fishing method(s), length, GRT, valid time periods, and the number of days fished by each of its vessels in the previous year.

Australia sometimes supplies (2-88% compliance) information to the WCPFC on: name/nationality of master, IRCS, vessel communication types with contact numbers, where/when vessel built, normal crew complement, moulded depth, power of main engines, freezer type, form of fishing (FS) authorisation, specific area authorised to fish and the species vessels are authorised to fish for.

Australia has not provided (i.e. 0% compliance) colour photographs, details on carrying or fish hold capacity, or authorisation numbers for its vessels to WCPFC[65].

Marking and carving

The official number, net/register tonnage or length overall, name of ship and home port are to be permanently and conspicuously marked on the ship, in accordance with Regulation 20 of the Shipping Registration Regulations[66].

The name of the ship shall be marked on each of the ship's bows and the ship's name and the name of the home port must be marked on the stern, or as close to the stern as possible where stern markings are not possible. The letters shall be upright sans serif block capitals of a height of not less than 100mm and have a thickness of stroke from 20% to 25% of letter height.

The official number (ON), the number denoting the register tonnage (RT) or net tonnage (NT), or the length overall (LOA), where the ship is not measured for tonnage, shall be cut into the main beam, a main structural member or other integral part, under the upper deck of the ship as in this example –

[63] www.afma.gov.au

[64] http://www.amsa.gov.au/Shipping_Registration/List_of_Registered_Ships/

[65] WCPFC Secretariat. 2009. Compliance information requested by TCC5. WCPFC6-2009/IP06 (Rev.1)

[66] Marking note, Australian Maritime Safety Authority

O.N. 123456 N.T. 505 *or*

L.O.A. 24.50

ANNEX A2

BELIZE

Belize

As of 30 November 2009, 63 Belize flagged fishing vessels were listed as active on the LRF SeaWeb database, including 1 factory ship, 1 support vessel, 25 fishing vessels and 36 trawlers[67]. Belize is a member of OSPESCA (Organización del Sector Pesquero y Acuícola del Istmo Centroamericano) and has two vessels on the OSPESCA register[68].

Registration and licensing

The International Merchant Registry of Belize under the Ministry of Finance is responsible for fishing vessel registration. The Registry operates through a network of Designated Offices worldwide. These offices are empowered to process applications for registration and to issue the relevant documentation[69].

Link between vessel registration and fishing rights

The International Merchant Marine of Belize (IMMARBE) works independently from the management of fishing licences, which are managed by the Department of Health and the Department of Fisheries respectively. The Fisheries Department works in cooperation with the Directorate of Merchant Marine in order to facilitate the handling of applications for international fishery licences and thus expedite the process[70]. When registering a fishing vessel, information on type of fishing vessel (freezer, fish carrier, fish factory or fishing only), area of fishing, species, type of fishing gear and the carrying capacity of the vessel is recorded.

Inspections

Recognised organisations and class societies are required to verify compliance with their regulations during the renewal process. Additional or periodical surveys related to the Fishing Vessel Safety Certificate are also undertaken[71].

The basic documents required by a fishing vessel for registration in Belize are[72]:

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[67] Driscoll, S. 2010. LRF Fleet Analysis – 30 November 2009. FAO.

[68] http://www.sica.int/WSIRPAC/Paginas/Formularios/Form_IndicadorBarcos.aspx

[69] http://www.immarbe.com/intro.html

[70] http://registropesquero.blogspot.com/search?q=trg

[71] http://www.immarbe.com/IMMARBELIB/FISHING_VESSEL_CIRCULARS/FVC-08-02-Marking_of_Fishing_Vessels.pdf

[72] http://registropesquero.blogspot.com/search?q=trg

a) Certification of Registration
b) Radio Licence
c) Fishing Licence
d) Certification of Fishing Vessel Safety
e) International Tonnage Certificate
f) Hydro International Certificate of Carbides (greater than 300 GRT)
g) Certification of Air Pollution Prevention (greater than 300 GRT)
h) Certification of Waste Management (greater than 300 GRT)
i) Certification of Sewage Management (greater than 300 GRT)

Registration numbers

The Belize registration number consists of 9 numbers designating the following[73]:

- First two: designated office number (designated office Hong Kong #3 – 03)
- Second two: year of registration
- Fifth Number: Category of vessel where 1=less than 500 GRT, 2=501-5000 GRT, 3=more than 5000 GRT
- Last four: Serial number assigned and controlled by the Deputy Registrar.

Carving and marking

The external marking required is the IRCS which begins with the prefix V3 and is followed by two or three letters or a combination of numbers and letters[74].

The markings on the vessel shall be prominently displayed at all times, as follows:

- On the vessel's side or superstructure, port and starboard; fixtures inclined at an angle to the vessel's side or superstructure would be considered as suitable provided that the angle of inclination would not prevent sighting of the sign from another vessel or from the air;
- On the uppermost deck. Should an awning or other temporary cover be placed so as to obscure the mark on a deck, the awning or cover shall also be marked. These marks should be placed athwart ships with the top of the numbers or letters towards the bow.
- Shall be placed as high as possible above the waterline on both sides. Such parts of the hull as the flare of the bow and the stern shall be avoided.
- Shall be so placed that they are not obscured by the fishing gear whether it is stowed or in use.
- Shall be clear of flow from scuppers or overboard discharges including areas which might be prone to damage or discolouration from the catch of certain types of species; and

[73] Form provided by J. Bager, Deputy Registrar to IMARBE in Denmark

[74] http://www.immarbe.com/IMMARBELIB/FISHING_VESSEL_CIRCULARS/FVC-08-02-Marking_of_Fishing_Vessels.pdf

- Shall not extend below the waterline.
- Undecked vessels shall be required to fit a board on which the markings may be clearly seen from the air.
- Boats, skiffs and craft carried by the vessel for fishing operations shall bear the same mark as the vessel concerned.

Information required

The registration form for the International Merchant Marine Registry of Belize contains fields for all the information required by LRF under the T-RFMO proposal except operator information. In addition it asks for fishery specific information (see below) and additional details on the vessels, such as material of hull, number of decks, masts, bridges and funnels and engine details (type, name of makers and speed).

Applicants for a fishing licence for the high seas[75] must also provide the name and address details for the operator of the vessel, crew details (master, chief mate, watchkeeping officer, watchkeeping deck rating, deck rating, chief engineer, second engineer, watchkeeping engineer, watchkeeping engine rating) and the RFMO managing the fisheries in which the licensed applicant plans to participate.

[75] http://www.immarbe.com/IMMARBELIB/FISHING_FORMS/Application_Form_for_License_to_Fish_on_the_High_Seas-Revision7.pdf

ANNEX A3

CAMBODIA

Cambodia

In 2001, Cambodia was estimated to have a total of 5,934 commercial fishing vessels, comprising 623 boats without engines, 2,976 vessels with engines <10hp, 1710 vessels with engines <10-30hp, 127 vessels with engines <30-50 hp, and 498 vessels with engines >50hp engines[76]. According to Try (2003)[77], a proclamation of the Ministry of Agriculture, Forestry and Fisheries divides Cambodia's marine capture fisheries into the following two categories:

- *Middle-scale fisheries* that use relatively efficient fishing gear and have the capacity to fish offshore. Participants in these fisheries are required to pay a fishing tax to the Government.
- *Small-scale or artisanal fisheries* use traditional gear or those of relatively low efficiency and non-motorised or motorised boats of less than five horsepower.

As of 30 November 2009, 188 Cambodian flagged fishing vessels were listed as active on the LRF SeaWeb database, including 22 fish carriers, 3 support vessels, 121 fishing vessels and 42 trawlers[78].

Responsible national authorities

The International Ship Registry of Cambodia provides Flag State Administration for the Royal Government of Cambodia and is currently the sole agency in charge of operating the Cambodia Ship Registration System[79]. The operational head office of the International Ship Registry of Cambodia (ISROC) is located within the Consulate of the Royal Kingdom of Cambodia in the city of Busan, Korea[80]. The information below relates to the International Registry, not to registration of smaller vessels operating domestically for which very limited information was available.

Link between register and fishing rights

Local fishing licences are issued to commercial fishing vessels registered under Cambodian flag[81] [82]

[76] Cambodia Department of Fisheries. 2002. In: FAO. 2004 Based on work by Gillette, R. The Marine Fisheries of Cambodia. *FAO/FishCode Review No. 4*

[77] Try, I. .2003. Fish stocks and habitats of regional, global and transboundary significance in the South China Sea (Cambodia). *In:* Reversing environmental degradation trends in the South China Sea and Gulf of Thailand. UNEP and Global Environment Facility.

[78] Driscoll, S. 2010. LRF Fleet Analysis – 30 November 2009. FAO.

[79] C. Bach, Managing Director, ISROC, personal communication

[80] http://www.isrocam.com/include/contact.htm

[81] C. Bach, Managing Director, ISROC, personal communication

[82] This is interpreted by the authors to mean that for fishing outside Cambodia waters a foreign fishing licence has to be provided to obtain an ISROC licence.

Applicants seeking to register a fishing vessel on Cambodia's International Vessel Registry must state that "the vessel will not catch tuna & tuna-like species under Cambodia flag, and also will not be involved with any illegal fishing and illegal carriage of caught fish after ship registration under Cambodia"[83]. For refrigerated carrier vessels (reefers), there is no such requirement regarding the take of tuna and tuna-like species but they must state that they shall not be involved in any illegal fishing or illegal carriage of caught fish[84].

When applying for a fishing licence, the applicant in addition to vessel details is required to submit information on the areas of fishing, type of fishing gear, species targeted, carrying capacity, method of landing and processing, intended port of delivery of caught fish, and intended product condition. The form explicitly states that "Exact and specific information should be indicated". Vessels obtaining a fishing licence are given a fishing licence number and licences must be renewed annually[85].

Fishing vessels in the ISROC are required to submit monthly fishing reports, stating fishing period, area with latitude and longitude, species and quantity, discards (species and quantity) and port of delivery. These reports are a precondition for renewal of the licence[86].

Information required to register

There are no restrictions on the ownership of any ship registered on the Cambodian ship registry[87].

The information required to register a fishing vessel in the ISROC covers all information required by LRF under the T-RFMO proposal with the exception of port of registry. ISROC requires additional construction information (material of hull, number of decks, masts and funnels), additional engine information (maker, model, year made, number of shafts) and very detailed information on radio installations (manufacturer, type, power, emission and frequency band for all installations) type of voyage (international, coastal, other) and crew details[88].

Registration is not permanent[89] though it has not been possible to ascertain what the registration period is. Vessel owners or operators are required to apply to the ISROC to change vessel particulars[90].

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[83] "Declaration for fishing vessel" http://www.isrocam.com/include/download.htm

[84] "Declaration for fish carrier" ibid

[85] C. Bach, Managing Director, ISROC, personal communication

[86] ibid

[87] ibid

[88] http://www.isrocam.com/include/download.htm

[89] Form for application to change vessel particulars contains field for Valid reg. Cert. No Issue date and Expiry date.

[90] http://www.isrocam.com/include/download.htm

ANNEX A4

CHILE

Chile

The industrial sector of the Chilean fishing fleet, defined as vessels >50 GT consists of 222 vessels, 22 of which are <100 GT[91]. As 30 November 2009, 375 Chilean flagged fishing vessels were listed as active on the LRF SeaWeb database, including 1 factory ship, 2 support vessels, 261 fishing vessels and 111 trawlers[92].

The artisanal fisheries sector, comprised of vessels registered in the Artisanal Fisheries National Register consists of 12,552 vessels in 2005[93]. These are vessels with a length up to 18 m[94] and up to 50 GRT[95].

Responsible national authorities

Authorisation to register a vessel under Chilean flag requires vessels to carry a licence issued by the Naval Authority. Likewise, the Navigation Law provides that, in order to fly a Chilean flag the master or skipper of the vessel, its officers and its crew must be Chilean nationals. Nevertheless, the Navigation Law contains certain exceptions with relation to the recruitment of foreigners, not including the master of the vessel[96].

Industrial fishing vessels (>18 m or >50 GT)[97] are required to register in the National Industrial Fisheries Registry (Registro Pesquero Industrial) under Sernapesca (National Fisheries Service)[98] in order to exercise the rights granted through their Fishing Authorisation (Articles 41 and 42 of the Fisheries Law and S.D 218 of 1990, issued by MINECON).

Artisanal vessels (<18 m or <50 GT) are registered in the Licence Registry for Small Scale Vessels (Registro Pesquero Artesanal).

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[91] M. Zamorano, Directemar. Vessel numbers from vessel register of December 31st 2008, personal communication

[92] Driscoll, S. 2010. LRF Fleet Analysis – 30 November 2009. FAO.

[93] Sernapesca. 2005. quoted in http://journals.sfu.ca/coactionbks/index.php/Gallardo/article/viewArticle/37/123

[94] FAO gives the length criterion in addition to GT. From the registers, it seems the limit between artisanal and industrial vessels is 50 GT regardless of length.

[95] http://www.fao.org/fi/oldsite/FCP/en/CHL/profile.htm

[96] Ministry of Economy and Energy: National Plan of Action to Prevent, Deter and Eliminate IUU Fishing.

[97] http://www.fao.org/fi/oldsite/FCP/en/CHL/profile.htm

[98] http://www.chileclic.gob.cl/1481/article-47490.html

The Licence Registry contains the following information:

- Previous name of the vessel (where necessary);
- Details of the owner, address and nationality;
- Former nationality (where necessary);
- Intended use of vessel; and
- Geometric and functional dimensions of the vessel[99].

These data are recorded in the Licence Registry for larger vessels in respect of vessels intended for use on the high seas; otherwise these data are recorded in the Licence Registry of Small Scale Vessels. Industrial ship owners duly authorised to engage in extractive fishing activities must register their vessels before the National Fisheries Service will issue appropriate authorisations and permits, pursuant to the General Law on Fisheries and Aquaculture (Article 19 of the Fisheries Law) and its regulations (S.D. 218 of 1990). The National Fisheries Service, at the request of the interested party, records such vessels and issues a registration certificate.

Pursuant to the Regulations of the National Registry for Industrial Fishing Vessels (S.D. 218 of 1990, issued by MINECON), the registration must list:

- Details of the shipowner (name, identification number, address, telephone numbers, legal representative);
- Vessel Identification (name, call signal, licence number , port of registration);
- Geometric and functional features (length, beam, depth, hold capacity, GRT, net register tonnage (NRT), engine power); and
- Operational features (fishing gear, fishing systems, port of operation)[100].

Link between register and fishing rights

In order to carry out extractive fishing activities on a specific ocean resource, and in a particular area, Chilean vessels must have a Fishing Authorisation issued by the Fisheries Under-Secretariat (Article 19 of the Fisheries Law). This authorisation shall be required by the Enforcement Authorities (Sernapesca or Directemar), during inspections, at the time of departure, during fishing operation or upon return to port[101].

[99] Ministry of Economy and Energy: National Plan of Action to Prevent, Deter and Eliminate IUU Fishing.

[100] ibid

[101] Ministry of Economy and Energy: National Plan of Action to Prevent, Deter and Eliminate IUU Fishing.

To apply for a licence for a large-scale vessel[102], a certificate of registration for the ship must be issued by the Directorate General of Maritime Territory and Merchant Marine (DIRECTEMAR), or the yard (ships under construction). Industrial fishing vessels are required to register in the National Industrial Fisheries Registry in order to exercise the rights granted through the Fishing Authorisation (Articles 41 and 42 of the Fisheries Law and S.D 218 of 1990, issued by MINECON).

Only fishing vessels licensed in Chile are authorised to fly its flag. Therefore licensing and authorisation to fly its flag are two separate and consecutive actions.

The relationship requirements of a vessel flying the Chilean flag are established through the regulations of its licence, contained in Title II, Articles 10 to 21 of law No. 2.222, Navigation Law of Chile, which is strictly aimed at establishing the actual relationship between the vessel and its Chilean ship owner.

The Navigation Law sets forth as a condition to grant the licence that the owner of the vessel be a Chilean national. If the owner of the vessel is a joint venture, it shall be considered national, provided that its main and actual domicile is in Chile; and that its president, manager and majority of directors or managers are Chilean nationals; and the majority of capital stocks belong to a Chilean artificial person or legal entity.

Without prejudice of the above, the final provision of Article 11 of the Navigation Law of Chile sets forth that "special vessels owned by foreign artificial persons domiciled in Chile may be licensed in Chile, provided that the main headquarters of their businesses are located in Chile, or that they exercise their profession in Chile or install their industry in Chile in a permanent manner. These facts must be proven to the satisfaction of the Maritime Authority (DIRECTEMAR). DIRECTEMAR may, for reasons of national security, impose special rules that restrict their operations."

The nationalisation of the vessel only occurs once it is registered in the appropriate Licence Registry, managed by the General Direction of the Maritime Territory and Merchant Navy of Chile, which requires the submission of documents or certificates that demonstrate ownership. In the case of foreign vessels, it must be demonstrated that the previous flag has been discharged (Articles 12 and 13, Law No. 2.222).

Numbering

All Chilean vessels have an official number (No. Matrícula) unique to the vessel, consisting of four or five digits and used in combination with the name of the home port.

Artisanal vessels (<50 GT) are issued an RPA number (Registro Pesquero Artesanal) consisting of only numbers, with up to 6 digits. Call signs are used for identification in addition to the official number for industrial vessels. Industrial vessels (>50 GT) are issued an RPI (Registro Pesquero Industrial) number of four digits. Both the RPA and the RPI numbers are given in sequence of registration.

[102] Form: DOCUMENTACIÓN REQUERIDA PARA TRAMITACIÓN DE SOLICITUDES DE EXTRACCIÓN, http://www.sernapesca.cl/index.php?option=com_content&task=view&id=231&Itemid=423

Requisite fields

Nro de Registro	Region autorizada	Embarcacion	Nro y puerto de matricula	Armador	Rut

The information required to register a vessel or to record the vessel in the Registro Pesquero Industrial (RPI), includes all information required by the LRF under the T-RFMO proposal with the exception of operator details.

Digitisation and availability online

The RPI is digitised and online, but requires authorisation to access[103]. The register of vessels <50 GT is available online[104] and provides the information shown in Figure A4a below for individual vessels.

[103] https://webmail.sernapesca.cl/sernapesca

[104] https://webmail.sernapesca.cl/sistemas/consrpa/menu.asp

9374	10	CONSUELO	2471 - ANCUD	JUAN CARLOS AGUERO MIRANDA	8447775-3

Especie	Arte de Pesca
ANCHOVETA	CERCO
CORVINA	ENMALLE
JUREL	CERCO
JUREL	ESPINEL
JUREL	ENMALLE
JUREL	LINEA DE MANO
PEJERREY DE MAR	ENMALLE
PELILLO	ARAÑA
RAYA VOLANTIN	ESPINEL
RAYA VOLANTIN	ENMALLE
SARDINA COMUN	CERCO
SEGUN LO AUTORIZADO AL BUZO	BUCEO

Figure A4a. Information in the Chile register of vessels <50 GT.

ANNEX A5

PEOPLE'S REPUBLIC OF CHINA

China

Size of China's Fishing Fleet

There are a variety of sources of information about the number of China-flagged fishing vessels and these sources may appear to be contradictory unless close attention is paid to the definitions associated with each figure. Overall, China reports that it has registered approximately 1.05 million fishing vessels but this figure includes both motorised and unmotorised, marine and freshwater, and commercial and recreational vessels[105]. With regard to the number of marine, motorised Chinese fishing vessels, some sources reported approximately 280,000 in 2004 with an intention to reduce this number by 13% before 2010[106]. Information from the Bureau of Fisheries obtained during the course of this study indicates there may now be as many as 350,000 Chinese marine fishing vessels. It was clarified, however, that this figure includes both capture and culture vessels, and that marine capture vessels comprise approximately 220,000 vessels among this number[107].

China categorises marine capture fisheries vessels into large (>24 m), medium (12-24 m) and small categories (<12 m). "Small" motorised marine capture vessels are reported to number approximately 70,000[108].

In terms of large vessels, information presented at the February 2008 FAO Expert Consultation on the GRFV indicated there are a total of 56,000 fishing vessels >100 GT worldwide and of these about 30,000 (54%) are Chinese[109]. This information corresponds to information dating from 2004 that China had registered 28,679 "large-size" vessels, i.e. >24 meters[110]. More recent figures obtained during this study indicate that there are currently about 30,000 China-flagged vessels >24 m[111].

With regard to large, distant water fishing vessels specifically, both FAO[112] and a recent analysis[113] place the number of China-flagged or China-owned distant water vessels at around 2,000. The Bureau of Fisheries informed this study that there are currently about 1,500 distant water fishing

[105] China Bureau of Fisheries, personal communication

[106] http://www.fao.org/fishery/countrysector/FI-CP_CN/en

[107] China Bureau of Fisheries, personal communication

[108] ibid

[109] LRF (2008)

[110] http://www.sigling.is/lisalib/getfile.aspx?itemid=4843

[111] China Bureau of Fisheries, personal communication

[112] http://www.fao.org/fishery/countrysector/FI-CP_CN/en

[113] Clarke, S. (in press). Understanding China's Distant Water Fishing Activities. TRAFFIC East Asia, Hong Kong.

vessels[114]. Differences between the number of vessels >100 GT (~30,000) and the number of distant water vessels (~1,500 to 2,000) are due to large numbers of vessels fishing under bilateral agreements in adjacent EEZs jointly claimed by China and Japan, Korea and Vietnam, respectively, which are not considered "distant water vessels"[115].

Of the nearly 2,000 distant water vessels identified in the recent analysis[116], IMO/LR numbers could be found for less than half (n=857)[117]. As of 30 November 2009, 462 China-flagged fishing vessels were listed as active on the LRF SeaWeb database, including 67 fish carriers, 2 factory ships, 4 support vessels, 333 fishing vessels and 56 trawlers[118].

Fishing Vessel Registration Procedures

China's procedures for fishing vessel registration are described in the "Regulations of the PRC on the Registration of Fishing Vessels (1996)" as amended in 1997[119] and again in 2004[120]. This regulation is based on *inter alia* the Maritime Traffic Safety Law, the Maritime Code and the Fisheries Law[121]. The regulation applies to all vessels associated with fishing activities including those <12 m. According to the size categories defined above, medium- and large-sized vessels register with the Bureau of Fisheries, either through the Beijing headquarters or through one of the regional offices located in Guangzhou, Shanghai or Yantai (Shandong Province). Small-sized vessels register with provincial authorities who may, according to the Regulation, simplify the registration procedures. Vessels which register with provincial authorities have their details automatically loaded into a centralized vessel registration database managed by Beijing[122].

According to the Regulation, vessels eligible for registration include those owned by Chinese nationals, as well as those owned by foreign parties either wholly or as part of joint ventures which are approved by the Chinese government (Article 2). (However, the Bureau of Fisheries stated that

[114] ibid; the tightening of fishing restrictions in Indonesia has resulted in the displacement of about 500 Chinese vessels which are now reportedly tied up in port

[115] ibid; also the Bureau of Fisheries confirmed for this study that vessels in the waters of the South China Sea, the East China Sea, the Yellow Sea and a small area of Malaysian waters off Sarawak in which about 30 China-flagged vessels are fishing, are not considered distant water vessels.

[116] Clarke, S. op cit.

[117] Clarke, S. op cit.

[118] Driscoll, S. 2010. LRF Fleet Analysis – 30 November 2009. FAO.

[119] http://www.sxyy.gov.cn/Article/ShowArticle.asp?ArticleID=71

[120] http://www.agri.gov.cn/zcfg/qtbmgz/t20080606_1057120.htm

[121] http://www.agri.gov.cn/zcfg/nyfl/t20060123_541974.htm

[122] China Bureau of Fisheries, personal communication

registration of vessels owned by foreign interests is strongly discouraged[123]). After registration, all vessels will be treated as Chinese vessels and have the right to fly the Chinese flag (Article 5). Under this regulation, registration is the responsibility of the Bureau of Fishery Management and Fishing Port Superintendence[124] which consists of the central registration authorities in Beijing, their three regional offices and local bureaux in many different municipalities. Although owners are meant to register their large- and medium-sized vessels centrally, and their small-sized vessels in the local office closest to their residence or place of business, there are recent reports of problems arising from a lack of control and potential tax evasion due to vessels registering in locations which are different from the location of the owner or company[125].

In accordance with the de-centralised nature of registration, forms for registering fishing vessels were located on a number of municipal websites. Based on a survey of four municipal forms from major fishing provinces (Guangdong[126], Hainan[127], Shandong[128] and Zhejiang[129]) a standard format (i.e. common to the latter three; see Attachment A5a) contains the following information:

- Ship Name
- Former Ship Name
- Call Sign
- Former Call Sign
- Port of Registry
- Former Port of Registry
- Name and Address of Owner
- Name and Address of Former Owner
- Vessel Type
- Fishing Method
- Original Registration Expiry Date
- Fishing Grounds
- Vessel Speed and Engine Power
- Ship Origin/Source
- Hull Material
- Launch Date
- Shipyard Location
- Shipyard Name
- Fishing License Number
- Fishing License Issuing Authority
- Fishing License Expiry Date
- Length
- Breadth
- Depth
- Gross Tonnage
- Net Tonnage
- Model Number
- Hull Number
- Total Rated Power
- Engine Model Numbers and Power (list)
- Cabin number and size
- Cold storage(freezer) number and size
- Propellor Model and Number
- Communication Equip. (type & number)
- Life Saving Equipment (type & number)
- Fire Fighting Equipment (type & number)
- Mooring Equipment (type & number)
- Mast (type & number)

icy

[123] http://www.coi.gov.cn/oceannews/2004/hyb1304/18.htm

[126] http://www.szzw.gov.cn/zfgl/szsnyhyyj/sqbgxz/200912/P020091225608657803905.doc.

[127] dof.hainan.gov.cn/loaddown/2008714152267507.doc

[128] http://ocean.qingdao.gov.cn/upload/doc/shenqing8.doc

[129] www.zhejiang.gov.cn/ggfw/bgxz/.../P020091120373060857109.doc

In contrast to this standard form, the registration form for one municipality in Guangdong Province requested other information including more information about the owner(s), the value of the ship, the construction date and provision of colour photographs[130].

According to a local website in Fujian Province[131] vessel registration and processing fees for fishing vessels are low and range from 100-500 Yuan (15 to 75 USD) for motorised vessels. In contrast, the Bureau of Fisheries in Beijing reported that there are no fees charged for vessel registration[132].

[130] http://www.szzw.gov.cn/zfgl/szsnyhyyj/sqbgxz/200912/P020091225608657803905.doc.

[131] http://www.putian.gov.cn/a/20090602/00964.html

[132] China Bureau of Fisheries, personal communication

Vessel Numbering and Naming Formats

A review of the Chinese vessels contained in RFMO databases reveals many different formats for registration numbers, including:

- a series of numbers (e.g. 13-000093);
- a character followed by numbers (e.g. Z07-080677);
- the abbreviated form of the province followed by the word "distant" ("Yuan") and a series of numbers (e.g. Min Yuan (Ji) 060072); and
- numbers which appear to include the year of registration (e.g. YUE 2007 No. YD000025).

According to the Bureau of Fisheries, these fishing vessel registration numbers may reflect a diversity of old systems that were used in different provinces in the past.

Since January 2009 a new national database has operated to automatically assign unique and permanent 16-digit vessel identification numbers (six digits for area of registration, six digits for construction date and four digits for vessel serial number) to all vessels regardless of size and location of registration. Bureau of Fisheries officials report that the system is already fully implemented, with all registered vessels having 16-digit UVIs. The system is nationally integrated such that all vessel registrations in the provinces are automatically uploaded to a central system in Beijing. (These officials stated that RFMO vessel lists were compiled before the new system was implemented and although each vessel on the RFMO vessels lists will have its own Chinese UVI, these Chinese UVIs have not been provided to the RFMOs due to a combination of the workload involved and the lack of a dedicated data field in the RFMO databases to receive this information) In addition to the UVI system, in 2009 the Ministry of Agriculture issued a call to all provincial and municipal level fisheries management authorities to "clean up" old datasets on fishing vessels and begin using a new management system/database[133].

Vessels are required to mark their name and port of registry on the hull, but are not required to display the UVI[134]. Bureau of Fisheries officials explained that all fishing vessels operating in Chinese waters have a kind of identification microchip embedded in their hull which can be read by a sensor onboard an enforcement vessel up to 1 km away. This system was considered to be costly but very useful in enforcing fishing controls in domestic waters, particularly given China's recent efforts to control fishing capacity of its own fleets and prevent encroachment by Vietnam-flagged vessels in south-western waters[135].

[133] http://www.agri.gov.cn/zcfg/qtbmgz/t20090507_1268717.htm

[134] China Bureau of Fisheries, personal communication

[135] ibid

Registration numbers are designed to be permanent but the registration certificate should be renewed every five years[136]. Registration can be cancelled by returning the registration certificates to the proper authorities[137]. The Bureau of Fisheries does not have the legal authority to revoke a vessel registration or a fishing licence in the event the vessel is placed on an IUU vessel list[138].

In the event that vessel owners wish to change their port of registration within China, Article 30, Part 5 of the Regulation on the Registration of Fishing Vessels[139] requires local port authorities to transfer the registration file of the fishing vessel to the local port authority of the new port of registry. This provision appears to provide a legal mechanism for vessel histories to be kept, and presumably now occurs through the automated data update procedures. Bureau of Fisheries officials report that vessel name changes must also be reported and will be tracked in the registration database.

In addition to the UVI, there are also standard procedures for the naming of fishing vessels. A notice issued by the Fujian Provincial Department of Ocean and Fisheries in August 2009 stated that a standardised vessel name/number will be adopted in issuing fishing permits, fishing vessel registrations and fishing vessel inspection certificates so as to achieve effective management and avoid inconsistent information[140]. Although this notice does not provide the format, the Regulation concerning the Naming of Fishing Vessels states that the format of a vessel name is as follows: an abbreviated form of the province (one character) + an abbreviated form of the county or municipality (one character) + the category of vessel (one or two characters) + a five-digit serial number[141]. For example, in the vessel name 贛彭漁 12345 (transliterated as Gan Peng Yu 12345), 贛 (Gan), is the abbreviated form of Jiangxi Province; 彭 (Peng), is the country or vessel registration (Peng Ze County 彭澤縣); 漁 (yu, fishing), 漁養 (yu yang, fishing farming, 漁油 (yu you, oil supplier), 漁運 (yu yun, transport vessel); 漁冷 (yu leng, cold storage vessel), or 漁政 (yu zheng, government inspection vessels) denotes the vessel type; and 12345 is the serial number. A similar notice was posted by Jiangxi Provincial officials in October 2009 except that the serial number is designated as four digits[142].

Compliance with RFMO Vessel Data Requirements

As a practical test of the standardisation of information supplied in China's fishing vessel authorisation procedures, the WCPFC Record of Fishing Vessels was examined. China supplies the following required information in the majority of cases (i.e. for ≥80% of the 334 vessels listed):

[136] ibid

[137] ibid

[138] Stated by China at WCPFC6 in Papeete, French Polynesia, December 2009.

[139] http://www.agri.gov.cn/zcfg/qtbmgz/t20080606_1057120.htm

[140] http://www.fjof.gov.cn/_bsdt/bszn/article.htm1?id=43389.

[141] http://www.shipol.com.cn/jszl/fgyw/129546.htm

[142] http://www.jjyyw.gov.cn/ReadNews.asp?NewsID=2085

vessel name, registration number, name/nationality of master, radio call sign, vessel communication types and numbers, where/when vessel built, type of vessel, normal crew complement, type of fishing method, length, moulded depth, beam, GRT, power of engines, carrying capacity, freezer number, fish hold capacity, specific areas authorised, and species authorised. China less frequently (37-80%) provides information on: port of registry, name/address of owner, colour photo of vessel, freezer type, form of flag State authorisation, authorisation number, valid time periods and fishing status during the previous year. China failed to provide information for all vessels (i.e. 0% compliance) on whether the vessel actively fished in the previous year[143].

Fishing Licence Procedures

In order to receive a fishing licence in China, the applicant must hold a fishing vessel registration and a fishing vessel inspection certificate[144]. All fishing licences are granted at the provincial level, however, if the vessel intends to fish on the high seas, or in one of the areas covered by a bilateral agreement with Korea, Japan or Vietnam, central government permit is also required[145][146]. Vessels which are authorised to fish on the high seas are not authorised to fish inside China's EEZ[147]. Initially, far seas fishing licences were issued for a single ocean only. More recently, however, some fishing licences cover both Atlantic and Pacific Oceans. Most Indian Ocean licences are still issued solely for the Indian Ocean even though in recent years many vessels fishing there have transferred into the Pacific Ocean due to security concerns in the waters off Somalia[148].

The Regulation on Distant Water Fishing (2003) allows the central government to take a vessel's compliance record into account when deciding whether to issue a fishing licence. It also requires catch reporting, compliance with all international conservation and management measures and installation of VMS; and provides a penalty scheme for non-compliance[149].

An example of an application form for a fishing licence is shown in Attachment A5b. The following data fields are included on the fishing permit application form:

- Applicant Name
- Applicant Identification Number
- Applicant Address and Telephone
- Vessel Name
- Fishing Vessel Registration Number
- Fishing Vessel Classification
- Home Port of Registration
- Home Port Registration Number
- Call Sign
- Length (m)
- Breadth (m)
- Depth (m)
- Total Power of Engine
- Number, Type and Power of each Engine
- Fishing Gear Type and Number
- Tonnage (Total and Net)
- Fishing Gear Permit and Quota
- Fishing Gear Specifications
- Number of Fish Holds and Capacity
- Date of Construction
- Construction Material
- Vessel Inspection Certification Number
- Tender Vessels and Horsepower
- Type of Permit and Issuing Authority
- Type of Fishery
- Fishing Period
- Fishing Method
- Target Species
- Fishing Area
- Catch limits
- Reason for Application

at

China Bureau of Fisheries, personal communication

[149] Xue (2006), op cit

Attachment A5a. An example of a common format for local fishing vessel registration application forms in China. [150]

渔业船舶所有权、国籍登记申请表

申请人：（签章）_____

新船船名称		原船舶名称			
新船舶呼号		原船舶呼号			
新船籍港		原船籍港			
船舶所有人名称及地址		原船舶所有人名称及地址			
船舶▪类及作业方式		原登记注销日期			
航行(作业)海域		航速及续航力			
船舶来源					
船体材料		下水日期			
造船地点		造船厂名称			
捕捞许可（准造）证号		发证		发证	

[150] http://ocean.qingdao.gov.cn/upload/doc/shenqing8.doc

码		机▪		日期	
登记尺度	长：_____米； 宽：_____米；深：_____米				
登记吨位	总吨位：_____；净吨位：_____				
主机	型号：_____ 数目：_____ 总功率：_____千瓦				
发电机	型号：_____ 数目：_____ 总功率：_____千瓦				
舱数及舱容		冷藏舱数目及舱容			
推进器	型号：_____ 数目：_____				
航行及信号设备数目					
救生设备数目					
消防设备数目					
锚泊设备数目					
桅杆设备数目					
附送文件名称					
以下由管理机▪填写					
登记时期		经办人		审核人	

Attachment A5b. An example of an application for a fishing licence. [151]

样本

渔业捕捞许可证申请书

编号：（样本）船捕（2010）S-000001 号

申请人姓名	样本		申请人签字：（公章） 2009 年 01 月 01 日		
居民身份证号码/公司注册号	000000201001010001				
地　址	样本地址		邮政编码	000000	电话	010-88888888
船　名	样本		渔船编码	0000002010010001		
渔船类别	国内捕捞船		原渔业捕捞许可证编号	/		
船籍港	样本港	船舶呼号	YANGBEN	船体材质	钢质
船　长	28 米	型　宽	8 米	型　深	6 米
主机总功率	200 千瓦	主机数量	3 台	子船数量	1 艘
主机型号①	CQ4501	主机功率	80 千瓦		
主机型号②	CQ4502	主机功率	60 千瓦	子船总功率	20 千瓦
主机型号③	CQ4503	主机功率	60 千瓦		
渔具名称	1，样本 1 2，样本 2	渔具数量	1，6 2，8	渔具规格	1，≤50mm 2，≤50mm
总吨位、净吨位	348；300；		建造完工日期	2009 年 11 月 20 日	
渔业船网工具指标批准书编号	（样本）船网（2010）Y-000001 号		渔船检验证书编号	0000002010010001	
鱼舱数量和容积	1 个，30 立方米		国籍(登记)证书编号	样本（2010）YD-000001 号	
申请许可证（选择一项划圈）	类　型	① 海洋　2 公海　3 内陆　4 专项（特许）　5 临时　6 辅助			
	发放证书	① 首次　2 换发　3 补发　4 重新办理			
作业类型	1，刺网	2，钓具	作业时间	1，2010-01-01	2,2010-01-01
作业方式	1，流刺网	2，鱿钓	主要捕捞品种	1，鱼类	2，虾类
作业场所	1，A 类渔区	2，A 类渔区	捕捞限额	1，100KG	2，1000KG
申请理由	制造渔船				

省级渔业行政主管部门审核意见（上报农业部时填写）：

签发人：（签字）　　（公章）

年　月　日

审批机关审批意见

同意发给渔业捕捞许可证：

1.作业类型：_____；作业方式：_____

2.作业场所：_____

_____

3.作业时限：_____

4.主要捕捞品种：_____；限额：_____

5.渔业捕捞许可证类别：_____

6.渔业捕捞许可证编号：_____

签发人：（签字）　　（公章）

年　月　日

不同意发给渔业捕捞许可证。

原因：

签发人：（签字）　　（公章）

年　月　日

说明：①申请专项（特许）渔业捕捞许可证，将海洋（内陆、临时）渔业捕捞许可证号填在“原渔业捕捞许可证号”栏，许可证“发放证书”一栏不用填写。②申请书一式两份，经批准后，审批机关和申请人各留一份，申请人凭批准书原件领取渔业捕捞许可证。③申请理由可以另附。

[151] Sample provided by Bureau of Fisheries, March 2010

ANNEX A6

DENMARK

Denmark

In 2009, the Danish fishing fleet consisted of 2,862 vessels, 103 of which are ≥100 GT. All of these are registered with an International Radio Call Sign (IRCS) [152]. The EU register does not provide IMO/LR numbers, but the LRF SeaWeb database shows a total of 146 fishing vessels with Danish flag in their lists suggesting that a majority of the vessels over 24 meters and/or 100 GT have an IMO/LR number as shown in Table A6a below. Danish flagged vessels listed as active on the LRF SeaWeb database (as at 30 November 2009) included 65 fishing vessels and 81 trawlers, as well as 5 support vessels[153].

Table A6a. Danish Fishing vessels in EU register

Vessel Size	Total	LRF SeaWeb
≥100 tonnes	131	114
≥50 tonnes or ≥18 m length	106	
≥10 tonnes or ≥12 m length	427	
<10 tonnes and <12 m length	2198	
Total	2862	114

Responsible authorities

Danish fishing vessels are registered either with the Danish Ship Register, DAS (Skibsregisteret) or the vessel register of the Directorate of Fisheries (Fartøjsfortegnelsen) [154]. DAS is handled by the Directorate of Shipping (Søfartsstyrelsen)[155] under the Ministry of Finance and Commerce (Økonomi-

[152] EU Fleet Register (EU 2010a in Main Report)

[153] Driscoll, S. 2010. LRF Fleet Analysis – 30 November 2009. FAO. Denmark data included Denmark (DIS) records.

[154] http://www.sofartsstyrelsen.dk/SKIBE/REGISTRERINGAFSKIBE/FISKESKIBE/Sider/fiskeskibe1.aspx

[155] www.sofart.dk

og Erhvervsministeriet.)[156]. The Directorate of Fisheries operates within the Ministry of Food, Agriculture and Fisheries[157]. The Danish vessel register is digitalised and searchable online[158].

Denmark requires that:

- Vessels greater than or equal to 20 GT shall be registered with the Ship Register;
- Vessels between 5 and 20 GT can either be registered with the Ship Register or the vessel register of the Directorate of Fisheries (Note: 20GT generally corresponds to about 13m);
- Vessels of less than 5 GT shall be registered with the vessel register of the Directorate of Fisheries. (Note: 5 GT equals approximately 9 meters length)[159].

In 2005, there were 1,820 fishing vessels in DAS, 759 of them over 20 GT. In the vessel register there were 2,325 fishing vessels, all of them under 20 GT[160].

Link to fishing rights

Fishing capacity is managed as the capacity of the total fishing fleet. A vessel can only be used for commercial fishing when given permission by the Directorate of Fisheries. Changes in the capacity of the vessel (such as increased dimensions, power of the engines) can only occur when permission for capacity enhancement has been given by the Directorate.

At present no increase in the fishing capacity is permitted and new vessels are only allowed to register if one, or in many cases more than one vessel is/are taken permanently out of operation. A valid fishing permit is needed to register a fishing vessel.

Danish fishing vessels can either be registered with the Danish Register of Ships (DAS) or with the Vessel Register administered by the Directorate of Fisheries.

Numbering system

When a vessel is registered with the Directorate of Fisheries it is given a registration number (Havnekendingsnummer) consisting of a letter indicating the harbour and a number of up to three

[156] http://www.sofartsstyrelsen.dk/SiteCollectionDocuments/Publikationer/Fakta%20om%20sofart/FaktaomSoefart05.pdf

[157] http://fd.fvm.dk/Fartøjer-kapacitetstilladelse_og_registrering.aspx?ID=16837

[158] http://webfd.fd.dk/fdweb/app/vessel-find

[159] Average tonnage for vessels between 9 and 11.9 meters is 8.4 GT, the average for vessels between 12 and 15.9m is 22.4 GT. Source: http://webfd.fd.dk/stat/Faste%20tabeller/fartoejer-1aar/f08l.html

[160] http://www.sofartsstyrelsen.dk/SiteCollectionDocuments/Publikationer/Fakta%20om%20sofart/FaktaomSoefart05.pdf

digits[161]. The letters are the first, the two first, or first and last letter of the town where the district customs office that earlier registered fishing vessels is situated. This fishing number is to be painted on the hull.

When a ship is registered in DAS it is given a control number, consisting of a letter designating the category and a sequential number.

Information required

Information requirements are equivalent for vessels in the ship register and the vessel record (DAS). Denmark does not require information on operator, depth beam and length. However, the latter is registered for all Danish vessels in the EU register of fishing vessels. Sample registration forms used in Denmark are attached below (Attachment A6a).

[161] http://skibsregister.dma.dk/Help/SFSHelp.htm

Attachment A6a. Sample vessel registration forms used in Denmark.

Fartøjsoplysninger

IDENTIFIKATION	
Havnekendingsnr.	E349
Fartøjets navn	Cattleya
Radiokaldesignal	OYEC
FTJ-nr	
EU-identifikation	DNK000036587

BEMÆRKNING

KONTAKT	
Navn	Asger Flemming Pedersen
Adresse	Gudenåvænget 6 6710 Esbjerg V
Land	Danmark
Telefon	75155821
Mobiltelefon	
Fax	
E-mail	

FARTØJSOPLYSNINGER	
Fartøjstype	kombinationsfartøj (not/trawler)
Vigtigste redskab	travl, not
Byggeår	2006
Værft	Carstensens Skibs- Og Bådebyggeri
Basishavn	Esbjerg
Fiskeristartår	2006
Ophørt	

KAPACITET	
Tonnage	1,337.0 BT
Miljøtonnage	
Maksimal motorkraft	2,999 kW
Nedbremset motorkraft	2,999 kW
Registreringsdato	
Genanvendt tonnage	
Genanvendt motorkraft	

DIMENSIONER	
Længde overalt	62.60 m
Kendingslængde	
Bredde	12.80 m
Dybde	7.80 m

Fiskeridirektoratet Nyropsgade 30, 1780 København V
Tlf + 45 33 96 30 00 Fax + 45 33 96 39 03 Døgnvagt + 45 33 96 36 09 fd@fd.dk Webmaster

Fartøjsoplysninger

IDENTIFIKATION	
Havnekendingsnr.	SG426
Fartøjets navn	United
Radiokaldesignal	
FTJ-nr	6217
EU-identifikation	DNK000025837

BEMÆRKNING

KONTAKT	
Navn	Ib Hansen
Adresse	Østergade 38 5935 Bagenkop
Land	Danmark
Telefon	
Mobiltelefon	
Fax	
E-mail	

FARTØJSOPLYSNINGER	
Fartøjstype	jolle/robåd
Vigtigste redskab	garn, ruser, kroge
Byggeår	1982
Værft	Rudkøbing Joller
Basishavn	Bagenkop
Fiskeristartår	1994
Ophørt	

KAPACITET	
Tonnage	1.5 BT
Miljøtonnage	
Maksimal motorkraft	11 kW
Nedbremset motorkraft	11 kW
Registreringsdato	
Genanvendt tonnage	
Genanvendt motorkraft	

DIMENSIONER	
Længde overalt	5.20 m
Kendingslængde	
Bredde	2.00 m
Dybde	1.00 m

Fiskeridirektoratet Nyropsgade 30, 1780 København V
Tlf + 45 33 96 30 00 Fax + 45 33 96 39 03 Døgnvagt + 45 33 96 36 09 fd@fd.dk Webmaster

ANNEX A7

GHANA

Ghana

Ghana's artisanal fishing sector includes 10,000 small, mechanised wooden boats that harvest 60–70% of the country's marine catch. About 170 larger, semi-industrial ships with inboard motors are used for trawling in shallow waters during the off-season and purse seining during upwelling seasons. Approximately 90 industrial vessels are used for prawn trawling, tuna longlining, pole and line, purse seining and demersal pair trawling[162]. The 41 tuna vessels on ICCAT's Vessel Register are between 27 and 93 meters long, averaging 54.4 meters in length overall. As of 30 November 2009, 201 Ghana flagged fishing vessels were listed as active on the LRF SeaWeb database, including 5 fish carriers, 1 support vessel, 118 fishing vessels and 77 trawlers[163].

Information on Ghana's register of fishing vessels has been drawn from the Ghana Shipping Act (2003) and personal communication[164]. According to this law, vessel registration is the responsibility of the Ghana Maritime Authority.

The information needed to register a semi-industrial or industrial fishing vessel in Ghana includes the fields needed to obtain an IMO/LR number under the T-RFMO proposal, with the exception of operator, beam and power of engine[165].

According to the Ghana Shipping Act, the Registrar shall allocate to a fishing vessel a combination and sequence of letter and numbers, referred to as "identity mark" which shall be entered in the registry book. The vessel shall display the identity mark on both sides of the stem[166]. The ports of Tema and Takoradi are the ports of registry for Ghanaian ships[167]. There are 41 vessels flagged to Ghana on the ICCAT licensed vessel list. All of these have a registration number consisting of three letters followed by a one or two digit number, with either the letters AFT or CRV.

All ships equipped with a wireless radio transmitting station shall also possess an internationally registered code designation[168]. All the Ghana vessels on the ICCAT list have an IRCS. Of the Ghanaian fishing vessels on the LRF SeaWeb database, 109 have an IRCS.

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[162] USAID fact sheet. Information drawn from FAO available at: http://www.imcsnet.org/imcs/docs/ghana_fishery_profile_apr08.pdf

[163] Driscoll, S. 2010. LRF Fleet Analysis – 30 November 2009. FAO.

[164] Interviews performed by Noble Wadzah of FoE Ghana with Directorate of Fisheries officials.

[165] Ghana Shipping Act (2003)

[166] ibid, Para 17

[167] ibid, Para 12

[168] ibid, Para 18

No vessel shall be registered without a Certificate of Survey, specifying the ships tonnage and other particulars descriptive of the identity of the ship as the Registrar may require[169]. Ghana's tonnage regulations incorporate the International Convention on Tonnage Measurement of Ships, 1969[170]. If a ship is altered as not to correspond to the particulars relating to the vessel's recorded tonnage, notification shall be given within 30 days to the Registrar. Where the Director General is satisfied that the tonnage rules of a foreign country is substantially the same as the Tonnage Regulations of Ghana, the Director General may direct that the tonnage denoted be considered as the tonnage of that ship[171].

The Registrar of ships shall keep a register book of fishing vessels[172] and retain the certificate of survey, builder's certificate, carving notes[173], previous bills of sale and condemnation notes, if any[174]. It is not known if this register book is digitised.

Vessels under 24 meters or 15 GT shall not be registered, but must be licensed. The law provides for the Minister to make regulations for licensing in particular for safety and pollution prevention, certification of officers, surveys and inspections, the appointment of surveyors, the keeping of records, fees, discipline on board and operating permits[175].

Ghana has recently begun a pilot programme to improve the registration system for artisanal fishing craft for which data are lacking in comparison to industrial and semi-industrial fleets. The pilot programme will assign number plates with identification numbers to 1000 canoes out of a total fleet of 12,000 and the information will contribute to building a national fishing vessel register[176]. To support this programme, the Government of Ghana has now made it mandatory for all fishing vessels in Ghana to be registered and to bear their markings of identity in accordance with the Fisheries Act 625 of 2002[177].

[169] ibid, Para 20

[170] ibid, Para 21

[171] ibid, Para 23

[172] ibid, Para 13

[173] The registration number system is not known.

[174] Ghana Shipping Act (2003), Para 14

[175] Ghana Shipping Act (2003), Para 42

[176] http://www.fao.org/fishery/nems/39322/en

[177] http://www.worldfishingtoday.com/news/default.asp?nyId=4795

ANNEX A8

INDONESIA

Indonesia

The Indonesian vessel register is managed by the Indonesian Ministry of Transportation and contains about 36,000 vessels. The register is not held in electronic format, therefore available statistics are limited, however, 97% of the vessels are <10 GT. Table A8a below provides an outline of the Indonesian fleet profile by vessel tonnage. There are approximately 5,600 vessels which are classified in this register as fishing vessels and they are divided into three length categories: >24m, 12-24m and 7-12m (numbers in each length category are not available). In 2009, it was reported there were approximately 12,000 trawlers; 30,000 longliners (9,000 of which are targeting tuna; including 17 400-500 tonne superfreezers operating in the IOTC); 6,800 pole and line vessels, and a large but unknown number of purse and Danish seiners[178].

Table A8a. Tonnage profile of the Indonesian fishing fleet[179].

VESSEL TYPE	NUMBER	PERCENTAGE
Total non-powered:	249,955	42.34%
Outboard:	185,983	31.51%
<5 GT	106,609	18.06%
5-10 GT	29,899	5.06%
10-20 GT	8,190	1.39%
20-30 GT	5,037	0.85%
30-50 GT:	970	0.16%
50-100 GT	1,926	0.33%
100-200 GT	1,381	0.23%
200-300 GT	218	0.04%
300-500 GT	116	0.02%
500-1000 GT	32	0.01%
>1000 GT	1	0%

[178] Oceanic Développement and Megapesca. 2009. Analysis of Expected Consequences for Developing Countries of the IUU Fishing Proposed Regulation and Identification of Measures Needed to Implement the Regulation – Phase 2 (Final Report). Available online at http://ec.europa.eu/fisheries/publications/studies/iuu_consequences_annexes_2009_en.pdf

[179] Oceanic Développement and Megapesca. 2009. Op cit.

TOTAL	590,317	100%

As of 30 November 2009, 278 Indonesian flagged fishing vessels were listed as active on the LRF SeaWeb database, including 9 fish carriers, 6 support vessels, 213 fishing vessels and 50 trawlers[180].

Responsible Authority

For fishing vessels to be registered by the Ministry of Marine Affairs and Fisheries, the following information is required: proof of ownership, identity of the owner (must be Indonesian), certificate of measurement (in GT). In addition, if the vessel is coming from a foreign registry, a deletion certification from the foreign registry must be provided. For fishing vessel registration the following information is not required, however it is said to be required for annual fishing licences: type of vessel, method of fishing/fishing gear, length and engine particulars.

For foreign vessels entering the Indonesian register, the following are required[181]:

1. Tonnage certificate;
2. Bill of sale;
3. Protocol of delivery and acceptance;
4. Deletion certification (from foreign register);
5. Identity of Owner; and
6. Technical recommendation from the Fisheries Ministry.

Submitted documents are assumed to be valid. The registry deed is considered valid unless a counter claim is made. The basis of the registration is the registry deed. The registration number given to a vessel is a combination of the year of registration, a code for the registration office/venue; a number; the number of the registry deed; and "L" for fishing vessel[182].

Link to fishing rights

Fishing vessel licensing is a separate process handled by the Indonesian Ministry of Marine Affairs and Fisheries. The licensing authority is based on the tonnage of the vessel: vessels >60 GT are licensed by the Ministry (i.e. national government), vessels between 10 and 60 GT are licensed

[180] Driscoll, S. 2010. LRF Fleet Analysis – 30 November 2009. FAO.

[181] SIDA/SEAFDEC. 2008. Report of the Expert Meeting on Fishing Vessel Registration, Phuket, Thailand, 30 June-2 July 2008. Swedish International Development Cooperation and Development Agency and Southeast Asian Fisheries Development Center. Accessed online at: http://download.seafdec.net/index.php?act=category&id=11&start=2

[182] SIDA/SEAFDEC 2008, op cit.

provincially, vessels between 5 and 10 GT are registered at the district level, and vessels below 5 GT do not require a licence, but they must be registered at the district/provincial level[183].

Compliance with RFMO Vessel Data Requirements

Indonesia, as a cooperating non-member of the WCPFC is required to provide information on all Indonesian vessels authorised to fish in the WCPFC Convention Area outside of Indonesia's waters of national jurisdiction. Indonesia always supplies the following data when listing such vessels on the WCPFC Record of Fishing Vessels: vessel name, registration number, name/address of owner, radio call sign, type of vessel, fishing method, GRT, power of engines, area and time authorised to fish.

Indonesia almost never (≤1% of 496 vessels) supplies the following required information: port of registry, name/nationality of master, colour photo of vessel, normal crew complement, length[184], moulded depth, beam, carrying capacity, freezer type, freezer number, fish hold capacity, form of flag State authorisation, authorisation number, species authorisation, fishing status during 2008. Information on communication modes and numbers, and date and place of build is sometimes supplied.

[183] ftp://ftp.fao.org/docrep/fao/010/a1465e/a1465e17.pdf

[184] According to some sources length is required for fishing vessel registration in Indonesia, however, it is almost never supplied to the WCPFC Record of Fishing Vessels.

ANNEX A9

JAPAN

Japan[185]

The most recent available statistics on Japan's fishing fleet indicate a total of 308,810 vessels with a total tonnage of over 1.25 million tonnes[186] (Table A9a). As of 30 November 2009, 1,234 Japanese flagged fishing vessels were listed as active on the LRF SeaWeb database, including 69 fish carriers, 76 support vessels, 981 fishing vessels and 108 trawlers[187].

Table A9a. Japan's fishing fleet by size class in number and tonnage as of 2005 (t=tonnes) [188].

	0-5 t	5-9 t	10-14 t	15-19 t	20-29 t	30-49 t	50-99 t	100-199 t	>200 t
Number	278,056	18,025	5,875	4,755	38	142	514	582	823
Tonnage	479,028	140,456	73,502	86,391	1,087	5,583	40,107	85,925	357,050

Responsible Authority

Japan registers fishing vessels at the prefectural level under a highly devolved system. Nationwide, a total of 69 regional offices have the authority to register fishing vessels. These 69, as well as five other regional offices and the national Japan Fisheries Agency, can grant fishing licences[189]. The degree of coordination between these offices varies, but they operate with independent authority and cannot be considered an integrated system.

Information to be supplied

The owner of a fishing vessel must apply for registration in the prefecture of residence; foreign-owned ships cannot be registered. All of the following information must be supplied: applicant's name and address; vessel name; total tonnage (units not specified); vessel length, breadth & depth (units not specified); vessel quality/material; date of launch; shipyard name and address; engine type and power; wireless receiver type and transmission power; operator name and address; homeport; type of fishing operations or other use; fishing vessel construction certificates and their sources. A standard form is shown in Figure A9a, although the format of the form may vary based on whether the vessel is greater than or less than 20 tonnes.

[185] Unless otherwise noted, the source of this information is T. Fukuda, Japan Fisheries Agency, personal communication.

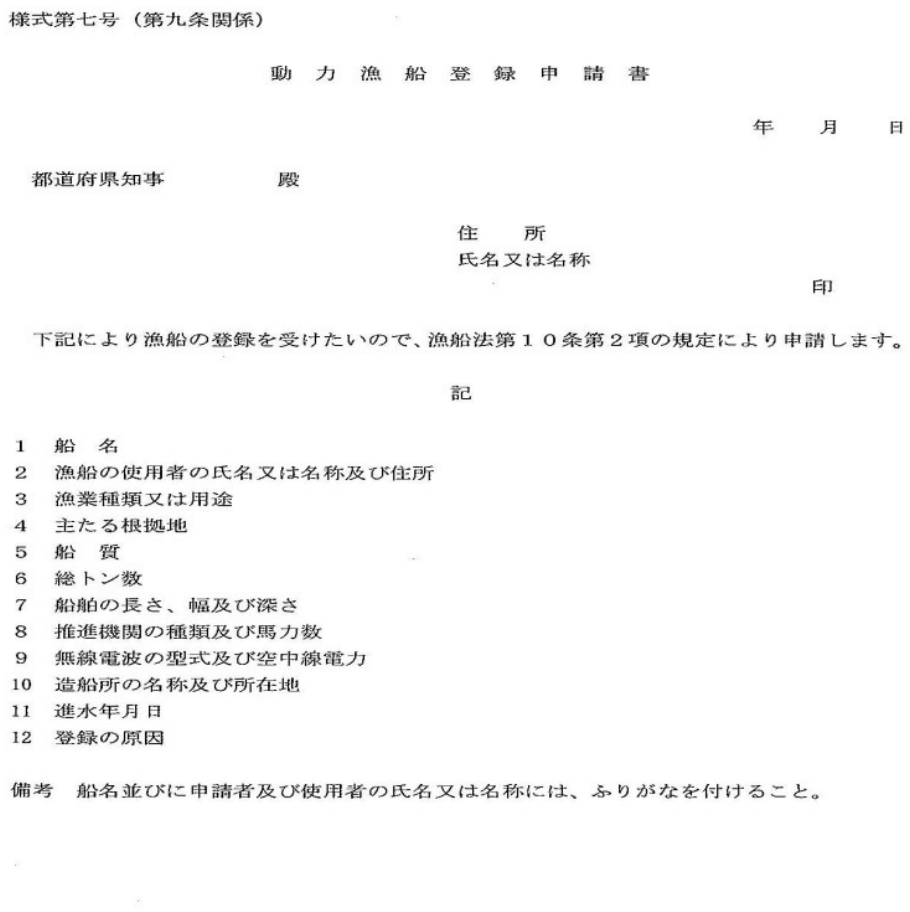
[186] Japan uses units of both GT and GRT, although some small vessels fishing exclusively in national waters do not provide figures in GT.

[187] Driscoll, S. 2010 LRF Fleet Analysis – 30 November 2009. FAO.

[188] Japan Fisheries Agency. 2010. http://www.tdb.maff.go.jp/toukei/a02smenu?TouID=V005)

[189] http://ec.europa.eu/fisheries/cfp/external_relations/illegal_fishing/pdf/flag_state_notifications.pdf

At the time of registration of a fishing vessel the applicant must show proof of an existing right to fish, such as a fishing licence or permit. Limits on the area of fishing, or other restrictions on fishing operations, are set through a separate process (i.e. not connected to the fishing vessel registration)[190]. The registration fees vary by prefecture but in general are low (i.e. not more than 10,000 yen (110 USD) for even the largest vessels).



様式第七号（第九条関係）

動　力　漁　船　登　録　申　請　書

年　　月　　日

都道府県知事　　殿

住　　所
氏名又は名称
印

下記により漁船の登録を受けたいので、漁船法第１０条第２項の規定により申請します。

記

1　船　名
2　漁船の使用者の氏名又は名称及び住所
3　漁業種類又は用途
4　主たる根拠地
5　船　質
6　総トン数
7　船舶の長さ、幅及び深さ
8　推進機関の種類及び馬力数
9　無線電波の型式及び空中線電力
10　造船所の名称及び所在地
11　進水年月日
12　登録の原因

備考　船名並びに申請者及び使用者の氏名又は名称には、ふりがなを付けること。

Figure A9a. Japan's Fishing Vessel Registration Application Form.

[190] If authorised, far seas longliners and skipjack pole and line vessels > 120 t are authorised for all oceans; smaller tuna longliners and skipjack pole and line vessels are permitted for the WCPFC area; all purse seiners are permitted for the WCPFC area and a portion of these are also permitted for the Indian Ocean.

Registration Number

Upon registration, prefectural authorities will provide a registration number. The number is composed of a prefectural identifier (two letters), a vessel class/grade identifier (for marine vessels a 1 denotes >100 tonnes, 2 denotes >5-≤100 tonnes and 3 denotes ≤5 tonnes), a dash, and the vessel number (e.g. TK2-1234). Although this format is consistent for all Japanese fishing vessels, review of the WCPFC Record of Fishing Vessels indicates that vessel numbers may vary from 1 to 6 digits, thus the registration number may vary from 4 to 9 digits. In general there is a requirement for the registration number to be painted onto the bridge of the vessel, but this requirement may vary from prefecture to prefecture.

Registration Renewal/Cancellation

The vessel registration does not have an expiry date, although there is a requirement for the particulars of the registration to be checked every five years through on-site inspection at moorage. If the owner wishes to move the vessel to a foreign register he/she must return the registration certificate to the prefectural authorities. If the owner fails to do so there are provisions for penalties of up to 300,000 yen (3,300 USD). If the vessel is listed on an RFMO blacklist and the owner does not return the vessel registration certificate to the prefectural authorities, there are no legal provisions for the authorities to revoke the registration.

Monitoring

With regard to maintaining vessel histories, the vessel registration authorities do not perform this function. If the fishing vessel remains within Japan but moves to a different prefectural register, there is no linkage between the previous and new registrations made by the two registration authorities. Certain ship documents/certificates (not specified) should show the previous and new vessel name, ownership, etc but this information is not kept on a database. If a vessel is exported, it is deleted from the Japan register and the register of destination is not recorded. Furthermore, the previous registration details, though contained in the ship documents/certificates are not provided to the new registration authorities.

Compliance with RFMO Vessel Data Requirements

As a member of the WCPFC, Japan is required to provide information on all Japanese vessels authorised to fish in the WCPFC Convention Area outside its waters of national jurisdiction. Japan always supplies all of the required information when listing such vessels on the WCPFC Record of Fishing Vessels (i.e. vessel name, registration number, port of registry, name/address of owner, name/nationality of master, radio call sign, vessel communication types and numbers, colour photo of vessel, where/when vessel built, type of vessel, normal crew complement, type of fishing method, length, moulded depth, beam, GRT, power of engines, carrying capacity, freezer type, freezer number, fish hold capacity, form of flag State authorisation, authorisation number, specific areas

authorised, species authorised, valid time periods and fishing status during the previous year) and has a 100% compliance record for the 1,574 vessels it lists[191].

[191] WCPFC. 2009. Compliance Information Requested by TCC5. WCPFC6-2009/IP06 (Rev. 1). Available at http://www.wcpfc.int

ANNEX A10

MOROCCO

Morocco

As of 30 November 2009, 425 Moroccan flagged fishing vessels were listed as active on the LRF SeaWeb database, including 2 support vessels, 71 fishing vessels and 352 trawlers[192]. Table A10a below outlines the basic structure of the Moroccan fishing fleet.

Table A10a. The three main categories of fishing vessels registered in Morocco[193].

Fleet	Approximate size class and main gear types	Average trip duration	Number of vessels registered in 2007
Artisanal	5-6 m	1 day	14 225
Coastal	15-25 m (trawl, purse seine, longline) <150 GT only some of which have freezers([194])	1-3 days	1,816 (504 bottom trawl; 497 purse seiners; 544 longliners, gillnetters, others; 264 mixed gear[195])
Industrial	>25 m (mostly trawlers) with average tonnage of 350 GRT >150 GT with onboard freezers([196])	Several weeks	329 active (449 total) (365 on FAO Website)

Responsible Authority

The Direction des Pêches Maritimes et de l'Aquaculture (DPMA) is the authority responsible for fisheries management and registration of fishing vessels in Morocco. The DPMA maintains a national

[192] Driscoll, S. 2010. LRF Fleet Analysis – 30 November 2009. FAO.

[193] Oceanic Développement and Megapesca (2009). Analysis of Expected Consequences for Developing Countries of the IUU Fishing Proposed Regulation and Identification of Measures Needed to Implement the Regulation – Phase 2 (Final Report). Available online at http://ec.europa.eu/fisheries/publications/studies/iuu_consequences_annexes_2009_en.pdf

[194] http://www.fao.org/fishery/countrysector/FI-CP_MA/fr

[195] http://www.fao.org/fishery/countrysector/FI-CP_MA/fr

[196] http://www.fao.org/fishery/countrysector/FI-CP_MA/fr

vessel register of all authorised fishing vessels (including artisanal vessels) with registration on the national registry a prerequisite for obtaining a licence to fish[197]. Whilst artisanal and coastal vessels may be registered by regional offices, all administration of industrial class vessels is handled by the DPMA's central office. Ships wishing to operate in international waters or waters under another jurisdiction must have a special licence issued by the DPMA's central office.

RFMO Requirements

Morocco is a contracting party of ICCAT and the GCFM (General Fisheries Commission for the Mediterranean) and must comply with those RFMO's requirements for the provision of information pertaining to vessels involved in fishing activities outside of the Moroccan EEZ. Until June 2010[198] ICCAT will require all licensed fishing vessels >24m to be listed on its regional vessel register. From June 2010, all vessels ≥20m in length and authorised to fish for tuna and tuna-like species in the Convention Area must be recorded on the ICCAT regional register.

[197] Oceanic Développement and Megapesca (2009), op cit.

[198] http://www.iccat.int/en/vesselsrecord.asp

ANNEX A11

NEW ZEALAND

New Zealand

Just over 1,500 commercial fishing vessels are registered in New Zealand. Most vessels fishing in inshore waters are less than 28 m and are mainly owned and crewed by New Zealanders. Around half of the large vessels (defined as > 42 m) fishing in New Zealand waters are owned by New Zealand companies; the other half are foreign-owned-and-crewed vessels that are hired by New Zealand companies to catch their fish[199]. As of 30 November 2009, 86 New Zealand-flagged fishing vessels were listed as active on the LRF SeaWeb database, including 4 support vessels, 28 fishing vessels and 52 trawlers[200].

Responsible Authority

Maritime New Zealand is the responsible agency for national vessel registration in New Zealand and maintains the national vessel register[201]. Maritime New Zealand's national vessel register consists of two parts (Part A and Part B) and includes details of those ships which must be registered under the Ship Registration Act 1992 (i.e. all New Zealand-owned ships >24 m) and those ships whose owners have voluntarily chosen to register their vessel. Part A registration is mainly for larger commercial vessels (>24 m) whilst Part B registration predominantly caters for pleasure vessels that require nationality for overseas journeys[202].

In addition to the national vessel register, in accordance with Section 103 of the New Zealand Fisheries Act 1996, all fishing vessels must be registered by the New Zealand Ministry of Fisheries (MFISH) in order to take fish, aquatic life or seaweed for sale in New Zealand waters[203]. Fishing vessels must be registered to the legal operator of the vessel (person who has lawful possession and control of the vessel because of ownership, lease, sublease, charter, subcharter, etc). Upon approval, a registration number is issued with a certificate by MFISH and vessel details are placed on a public register. Vessels retain their registration number as long as they continue to operate as commercial vessels[204].

Fishing vessels are registered under one of the following categories in the MFISH register[205]:

- Fishing Vessels ≤28 m;

[199] http://fs.fish.govt.nz/Page.aspx?pk=91

[200] Driscoll, S. 2010. LRF Fleet Analysis – 30 November 2009. FAO.

[201] http://www.maritimenz.govt.nz/default.asp

[202] http://www.maritimenz.govt.nz/default.asp

[203] http://fs.fish.govt.nz/Page.aspx?pk=81&tk=251

[204] http://www.fishserve.co.nz/information/vessels/index.aspx

[205] http://www.fishserve.co.nz/information/

- Fishing Vessel >28 m;
- Vessel owned or operated by an overseas person;
- Fish carriers;

Link between fishing rights and registration

Registration alone does not give a vessel the right to fish in New Zealand waters or overseas. To operate as a commercial fishing vessel, the vessel must also be approved and registered by MFISH for fishing purposes as noted above[206]. This registration system supports New Zealand's quota management system whereby owners/operators are granted individual transferable quota (ITQ) entitlements. The registration system establishes direct administrative links between quota entitlements and the vessel employed to harvest those entitlements.

Re-flagging

Under New Zealand law there are no requirements relating to re-flagging. When a New Zealand registration is closed, the Ship Registration Act is no longer applicable and there is no interaction with the new flag state[207]. A ship is no longer entitled to be registered if it has been sold to, or is owned by, someone who is not a New Zealand citizen or a New Zealand body corporate (company). Consequently the ship's registration must be closed.

When de-flagging and exporting a ship from New Zealand, the ship's registered owner must send Maritime New Zealand's Registrar of Ships the following:

- a copy of the Bill of Sale (form SR14) completed in full by the registered owner(s) containing the nationality of the purchaser(s);
- the Ship's Certificate of Registry ("the blue book").

Carving and marking

New Zealand vessels must be marked with the ships name on each side of the bow, and the ships name and port of registry on the stern or on each side of the hull as near the stern as practicable. The marking shall be permanent by either centre punching, cutting in or raised lettering[208].

The vessels official number allocated by the Registrar and the ships net tonnage (for vessels >24m) or the official number and registered length (for vessels <24 m) shall be cut in on an internal main structural member or other integral part of the ship where readily visible as shown in Figure A11a[209].

[206] http://fs.fish.govt.nz/Page.aspx?pk=81&tk=251

[207] A. Whiterod, Registrar of Ships, Maritime NZ, personal communication

[208] Maritime New Zealand. 2007. Marking of Ships. Advisory Circular No.48-5.

[209] ibid

O.N.123456	N.T.1234
>24m	
O.N.123456	R.L.18.34
≤24m	

Figure A11a. Style in which vessels >24 m and ≤24 m should be permanently marked in New Zealand.

Information Required

The information required for vessel registration in New Zealand fulfils the requirements of LRF under the T-RFMO proposal with the exception of operator information and tonnage. Operator information is required for chartered vessels. There is no field for tonnage information in the application forms, but for vessels exceeding 24 m, a surveyor's tonnage certificate and international tonnage certificate are required. Vessel tonnages may be taken from any acceptable certificates issued to the ship overseas or would have to be determined from the approved drawings of the ship. For vessels <24 m surveyor's certificate specifying the register length and descriptive particulars of the ship is sufficient[210].

As mentioned above, a vessel needs to register with Ministry of Fisheries to obtain a fishing right. Here, there are two categories; over and under 28 meters. In both categories the applicant is required to provide information on operator and tonnage[211].

The combined information required to register a vessel and to register with the Ministry of Fisheries includes information not required by LRF under the T-RFMO proposal such as crew information (master, first mate, second mate, factory manager, total number) communication equipment (VHF, cell phone, fax number and satellite communication details) construction details (hull material and colour, position of superstructure and maximum duration at sea) and details on the fishing operation (gear, vessel type and whether the vessel will target southern bluefin tuna).

Digitisation

Whilst Maritime New Zealand's vessel register is partially digitised, it remains paper-based in full, with certain information only retained on paper records[212]. The MFISH's register of fishing vessels is digital and available online through FishServe[213]. The FishServe website does not list the entire register, but does allow searches for individual vessels. The online register lists vessel number, vessel name, operator number, operator name, IMO/LR number where available and call sign.

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[210] Application form SR2

[211] http://www.fishserve.co.nz/services/forms/Application%20to%20Register%20a%20Vessel%2028m%20and%20under.pdf

[212] A. Whiterod, Vessel Registrar, Maritime New Zealand, personal communication

[213] http://www.fishserve.co.nz/services/findvessel/

ANNEX A12

NORWAY

Norway

Aggregated information on the fishing fleet is based on length and grouped according to the length to define fishing rights. The quota system is based on length, not tonnage. In 2008 there were 6,790 vessels listed on Norway's vessel register. Of these, 225 were ≥28 m and 422 were ≥21 m. IMO/LR numbers were not available in the register of fishing vessels, but there are 465 Norwegian flagged fishing vessels on the LRF SeaWeb database (3 fish carriers, 7 support vessels, 278 fishing vessels and 178 trawlers[214]), suggesting that a majority of the vessels over 21 meters and/or 100 GT have an IMO/LR number. 451 of Norway's vessels listed on LRF SeaWeb are registered with an IRCS.

Gross Tonnes (GT) and "other tonnage" are both recorded in Norway's register. In general, GT is recorded for newer and bigger vessels and "other tonnage" recorded for older and/or smaller boats[215]. Table A12a below provides an outline of the size distribution of 6,790 vessels listed on Norway's national vessel register.

Table A12a. Norwegian fishing vessels by length groups

Length Class	Number
<12 m	5,457
≥12 to < 17	779
≥17 to <21	132
≥21 to <28	197
≥28	225
Total	6,790

Registration and licensing

The Norwegian register of fishing vessels (merkeregisteret) is administered by the Directorate of Fisheries[216] under the Ministry of Fisheries and Coastal Affairs[217]. According to the Participation Act of 1972, revised 1999, an owner of a vessel in the register of fishing vessels has to be a fisherman[218].

[214] Driscoll, S. 2010. LRF Fleet Analysis – 30 November 2009. FAO. Norwegian data included 1 NIS record.

[215] Drawn from samples of the vessel register.

[216] www.fiskeridirektoratet.no

[217] http://www.regjeringen.no/nb/dep/fkd.html?id=257

[218] http://www.regjeringen.no/nn/dep/fkd/Dokument/NOU-ar/2002/NOU-2002-13/27.html?id=381071

Accordingly, to register a fishing vessel the owner first needs to get a permission to own a fishing vessel (erhvervstilatelse). Individuals need to earn a certain amount from fishing and less than a given amount from other activities to be defined as a fisher. Companies need to be owned more than 50% by a fisher to get permission to own a fishing vessel with some exceptions granted for larger vessels[219].

All vessels in the register of fishing vessels have the right to fish in Norwegian waters. One exception has been given for vessels fishing in RFMO waters where Norway is a member that do not have to have a fishing permit in Norwegian waters. For the owners of such vessels there is also an exception from the Participation Act, and the owners do not need to be fishers[220].

Control and renewal

Vessels can be inspected at any time by the Norwegian Maritime Directorate, responsible for safety issues and radio communication[221].

Registered details and online register

In combination, the information required to register a vessel and to obtain a permit to own a fishing vessel, includes all information required by LRF under the T-RFMO proposal (see Section 3.2), with the exception of operator and previous flag. The Directorate of Fisheries keeps online registers for all fishing vessels from 1920 until present.

The register of fishing vessels is available online with quota and owner information[222]. The online registers contains the fishing number (100%), call sign (100% >12 m), vessel name (100%), length, beam and building material (100%), GRT (~60%) year built (~100%), power of main engine and year engine built (>90%), year of tonnage certificate (<30%), registration certificate date, owner and owner postal code (100%).

Numbering system and permanent marking

The UVI in the Norwegian system is the call sign, issued by the Ship Register or the Norwegian Maritime Directorate. All decked vessels and open vessels with a wheelhouse are required to have a VHF radio[223]. The call sign is permanently marked on the vessel's hull.

The fishery numbers used in Norway consists of a letter designating the county, a one to three digit number and two letters designating the municipality. This number is painted visibly on the hull of all fishing vessels.

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[219] G. S. Angelsen, Directorate of Fisheries, personal communication.

[220] http://www.fiskeridir.no/fiskeridir/fiske-og-fangst/j-meldinger/gjeldende-j-meldinger/j-57-2007

[221] http://www.lovdata.no/for/sf/nh/th-20000613-0660-003.html

[222] http://www.fiskeridir.no/register/fartoyreg/?m=frtyoppl&s=1

[223] http://www.lovdata.no/for/sf/nh/th-19931222-1242-004.html#11

ANNEX A13

PANAMA

Panama

The Panamanian fishing fleet consists of domestic coastal vessels, mainly targeting shrimp and a fleet of vessels operating internationally often owned by foreign nationals and companies. The shrimp fleet is estimated to consist of approximately 8,700 artisanal vessels and 218 trawlers and forms the main domestic fleet[224].

In 2003, there were 973 fishing vessels in Panama's Merchant Marine Register, 753 of which were domestic and 220 owned by foreigners. 124 vessels were licensed for international fisheries[225]. The 220 foreign-owned vessels had a total tonnage of 117,617 GT, averaging 535 GT. As of 30 November 2009, 307 Panama flagged fishing vessels were listed as active on the LRF SeaWeb database, including 31 fish carriers, 1 factory ship, 5 support vessels, 188 fishing vessels and 82 trawlers[226].

Panama is a member of OSPESCA (Organización del Sector Pesquero y Acuícola del Istmo Centroamericano) and has 730 vessels on the OSPESCA register[227].

Responsible Authorities

The Panamanian Register was established in 1925 and is located in Panama City. The Merchant Marine has privative consuls around the world. They may be delegated to put into effect actions in relation to the vessels' provisional register, according to conditions and limitations fixed in the particular delegation. The Merchant Marine also has Regional Offices with control and maritime security inspection functions, inspections relative to conditions of seamen and a Security Office in New York, which makes plans, organises, manages, co-ordinates and executes functions of the Merchant Marine, the fulfilment of international agreements and the supervision of the security inspections.

Even though the General Division of Marine and Coastal Resources and the General Division of Merchant Marine control the fishing vessels register from within the same institution, there is no apparent policy orientated to achieve synergy to comply with the fishing vessels register regulation. National and international fishing is not as important compared with other activities of the maritime sector, such as the shipping registration and ports. This situation, together with the bureaucracy, has obstructed the establishment of new rules and regulations for fishing and national and international service fishing vessels register[228].

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[224] ARAP (2008) quoted in Araúz, D.: Caracterizacion de la Pesquerías Industrial y Artesanal del Camarón y Langosta en Panamá.

[225] http://www.fao.org/docrep/006/y5244e/y5244e0n.htm#bm23

[226] Driscoll, S. 2010. LRF Fleet Analysis – 30 November 2009. FAO.

[227] http://www.sica.int/WSIRPAC/Paginas/Formularios/Form_IndicadorBarcos.aspx

[228] http://www.fao.org/docrep/006/y5244e/y5244e0n.htm#bm23

Special provisional registration may be granted to international service vessels destined to be broken-up, scheduled for delivery trips or any other kind of temporary navigation (Law 19, 3 August 1992). Such temporary registrations are generally issued for 3-month periods, after which time the registration becomes legally cancelled. Under such registration, the vessel receives a provisional navigation licence and a radio permission for the period of registration. Vessels are not authorised to fish on a Panamanian provisional licence. A provisional licence for fishing vessels must be authorised by the General Division of Marine and Coastal Resources solely for the purpose of transiting from one port to another to be repaired or for sale[229].

Fishing Rights

Panama's register is an open register, i.e. accessible to foreign vessels/companies. However, to operate as a fishing vessel under Panama flag a vessel must also be granted an International fishing licence, issued by the Authoridad de los Recursos Acuaticos de Panama (ARAP)[230]. A fishing licence has a value of US$3,000 for vessels smaller than 2,000 GT and US$50,000 for vessels larger than 2,000 GT[231].

The following documents are required in order to apply for an international fishing licence:

- Power and fishing capacity of the vessel;
- Any document(s) which proves the name of the owner (ARMADOR) of the ship, their nationality and address (domicile);
- Name and address of the legal representatives in Panama (provided by the agent abroad);
- A measure certificate and any other document which may help to show the characteristic and specification of the ship
- A statement describing which fish species will be captured by the vessel, and the coordinates of the area in which the vessel will operate;
- A statement describing the techniques and methods of fishing activities by the ship, when performing its fishing and/or the characteristics of storage and processing;
- A statement to appoint the ports and areas in which the ship plans to perform its deployment/transportation of cargo;
- A validated copy of the vessel's active Vessel Monitoring System (VMS) installation agreement, according to the Authoridad de los Recursos Acuaticos de Panama (ARAP).

ARAP will not issue international fishing licences, if:

[229] http://www.fao.org/docrep/006/y5244e/y5244e0n.htm#bm23

[230] B. Sutadi of PT Elang Mas Sejati (a company providing services in ship management, registrar, crew licenses for Panama), personal communication

[231] http://www.fao.org/docrep/006/y5244e/y5244e0n.htm#bm23

- The area is in the control of a regional/sub-regional fishing organisation, of which Panama is not a member or cooperating non-member[232];
- The proposed activity involves targeting shrimp;
- The proposed activity involves targeting North Atlantic cod;
- The proposed activity involves targeting North Atlantic salmon;
- The proposed activity involves targeting toothfish (*Dissostichus* sp.);
- A vessel proposes to fish for a species in an area in which Panama does not have a fishing quota for that species;
- The fishing capacity may exceed the carrying capacity where a regulation exists;
- The vessel appears on an IUU vessel list (e.g. RFMO blacklists);
- The vessel is a newly built longliner;
- The vessel is designed to fish on the Mediterranean sea;
- The fishing licence was cancelled due to a failure to comply with national or international conservation regulations, unless sufficient evidence may be shown regarding a change of owner of the ship and having complied with the imposed penalties;
- After all the consideration and evaluations, it is determined that the flagging procedure leads to IUU fishing;
- A record of failure of compliance can be shown;
- A vessel comes from a registry of a government whose ships are identified as systematic violators of measures of conservation by the regional or sub-regional organisations involved.

Cancellation

Regulation AR N°1791, 2001, identifies the following reasons to cancel an international fishing licence:

- fishing in prohibited areas or with prohibited gear;
- a vessel's position signal is missing for more than five days on the General Division of Maritime and Coastal Resources monitor;
- no timely reception of fishing information;
- no maintenance of fishing logbook on board;
- no payment of imposed sanctions;
- IUU vessel identification;
- proved violation of regional or sub-regional organisation management and conservation measures;
- failure to fulfil General Division of Merchant Marine rules and regulations;

[232] Panama is a Contracting Party to ICCAT and IATTC.

- when the conditions to obtain an international fishing licence from the Industries and Commerce Ministry come to an end;
- when the international fishing licence has been obtained through fraud or untrue information; and
- failure to fulfil the conditions established in the Executive Decree N°49, 1997.

In combination, the conditions for obtaining an international fishing licence, and the reasons for cancelling it, would limit the Panama-registered fleet's possibility to fish to a few areas.

Information required

The Panama Merchant Marine Register requires all the information required by LRF under the T-RFMO proposal (see section 3.2) except port of registry. This register is not available online.

ANNEX A14

PAPUA NEW GUINEA

Papua New Guinea

As of November 2009, 19 Papua New Guinea flagged vessels were listed as active on the LRF SeaWeb database including, 1 support vessel, 9 fishing vessels and 9 trawlers[233]. The number of licences issued by category in Papua New Guinea is shown in Table A14a below.

Table A14a. Domestic/Locally-based Foreign Fishing Licences[234]

Fishery	Number of Licences
GOP-prawn	15
TSPZ – prawn	7
Orangerie bay - prawn	2
Lobster (TSPZ)	7
Shark L/L	9
Tuna L/L	38 (Domestic) 100 (Locally-based Foreign Fleet)
Tuna P/S	167

Responsible Agency and linkages between vessel registration and fishing rights

Registration of vessels (including fishing vessels) is carried out by the National Maritime Safety Authority[235][236]. Authorisations to fish are the responsibility of the Papua New Guinea National Fisheries Authority (NFA)[237]. Categories for fishing licences are: a) Domestic Fishing vessels; b)

[233] Driscoll, S. 2010. LRF Fleet Analysis – 30 November 2009. FAO

[234] SIDA/SEAFDEC. 2008. Report of the Expert Meeting on Fishing Vessel Registration, Phuket, Thailand, 30 June-2 July 2008. Swedish International Development Cooperation and Development Agency and Southeast Asian Fisheries Development Center. Accessed online at: http://download.seafdec.net/index.php?act=category&id=11&start=2

[235] Michael J. Pidi, Manager – Ship Surveys & Inspections, National Maritime Safety Authority, personal communication

[236] http://www.nmsa.gov.pg/home.html

[237] www.fisheries.gov.pg

Locally-based Foreign Fishing vessels, and; c) Foreign fishing vessels (Bilateral or Multi-lateral Access) [238].

Control and de-flagging

Every owner of a ship or any share therein is required to notify the Registrar of any event requiring closure of the Registry. Reasons for ships becoming deregistered may include:

a. Ship actually or constructively lost;

b. Ship seized, burnt or broken up;

c. Ship ceasing to be a Papua New Guinean ship, by reason of transfer to persons not qualified to be owners of ships registered in Papua New Guinea, and

d. Owner ceasing to qualify to be the owner of a ship registered in Papua New Guinea.

Owners are required to report any event giving rise to closure, stating the exact nature of the event. The Certificate of Registry should accompany the notice or reason given why it cannot be delivered, e.g., lost with the sunken ship, or, to be delivered later. A notice given on behalf of a corporation should be signed by the Authorised Officer. In joint ownership or ownership by a number of individuals, notice from one of the owners is acceptable[239].

Conditions

Vessel owners/companies must meet special eligibility criteria based on the extent of national (PNG) ownership/control when registering their vessel(s) under Papua New Guinea flag. Further to this, registration will not be granted to vessels dually registered in any other country[240].

Linkages to Fishing rights

To obtain a fishing licence in Papua New Guinea, a vessel must first be registered with the National Maritime Safety Authority, be fitted with an approved ALC and Vessel Monitoring System, and clearly display required vessel markings.

Carving and marking

A ship in respect of which an application for registration is made shall not be registered unless the ship has first been marked permanently and conspicuously in the prescribed manner[241]. A Carving and Marking Note is issued after survey to confirm/calculate vessel tonnage and an official number

[238] SEAFDEC: Report on Workshop on Fishing Vessel Record and Inventory, 27-29 July 2009

[239] http://www.nmsa.gov.pg/forms_ships.html

[240] http://www.nmsa.gov.pg/guide_ship_registration.html

[241] ibid

for the vessel has been assigned by the Papua New Guinea Registrar. The vessel tonnage and official number must then be cut into the main beam of the vessel and verified[242].

Information in register

Papua New Guinea requires all information required by LRF under the T-RFMO proposal (see Section 3.2) with the exception of operator and operator address.

Compliance with RFMO Vessel Data Requirements

As a member of the WCPFC, Papua New Guinea is required to provide information on all of its flagged vessels authorised to fish within the WCPFC Convention Area outside of Papua New Guinea's waters of national jurisdiction. Papua New Guinea always supplies the following data for vessels listed on the WCPFC Record of Fishing Vessels: vessel name, registration number, port of registry, IRCS, type of vessel, type of fishing method, length and GRT[243].

Papua New Guinea sometimes (3-21% compliance) supplies information to the WCPFC on: name/address of owner, name/nationality of master, vessel communication types, colour photographs, where/when vessel built, normal crew complement, moulded depth, beam, power of main engines, freezer type, carrying or fish hold capacity, freezer number, form of flag State authorisation, authorisation numbers for its vessels, specific area(s) and species its vessels are authorised to fish for, and valid time periods. Papua New Guinea failed to provide information to WCPFC for any of its 37 vessels (i.e. 0% compliance) on whether each vessel actively fished (days fished) in the previous year[244].

[242] ibid

[243] WCPFC Secretariat (2009) Compliance information requested by TCC5. WCPFC6-2009/IP06 (Rev.1)

[244] ibid

ANNEX A15

RUSSIA

Russia

The Russian fleet consisted of 2,256 nationally licensed fishing vessels in 2005[245] with an average size of 520 GT. The Russian Maritime Register of Shipping contains 2,121 fishing vessels, (1,419 of them are "current", and the rest are registered as "former") and 120 fish processing vessels and fish carriers, 69 of them current. All the vessels in this register are >100 GT and average 1,818 GT[246]. As of November 2009, 1,465 Russian flagged vessels were active on the LFR SeaWeb database, including 125 fish carriers, 20 factory ships, 4 support vessels, 353 fishing vessels and 963 trawlers[247].

Governing Documents and Bodies

The main governing document and legal basis for the Russian fleet is the "Code of Industrial Ship Transport for the Russian Federation"[248] (Kodeks Torgovogo Moreplavaniya Rossiskoi Federatsii) (hereafter referred to as "the Code") passed by the State Duma on 31 March 1999 and approved by the Federation Council on 22 April 1999. The document regulates all issues concerning vessels and registration of such, including fishing vessels. In addition to the Code, there are two more documents that regulate registration of vessels[249]: Regulation No. 87 of 21 July 2006 concerning Confirmation of rules for registration of vessels and their permits at commercial sea ports[250] and Regulation No. 31 of 31 January 2001 concerning Confirmation of rules for registration of fishing vessels and their permits at fishing ports[251] (hereafter referred to as "the Regulation"). Fishing vessels are excluded in the first of these documents, and are thus regulated only by the latter.

The Regulation was presented by the State Committee of Fisheries (Goskomrybolovstvo), the organ with executive power for fisheries. In 2008 the committee was dissolved, and the executive responsibility was transferred to a new organ, the Federal Agency of Fisheries[252], which reports directly to the Russian Government[253].

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[245] FAO: State of the world Fisheries and Aquaculture. 2006. FAO, Rome. http://www.fairtradefish.org/FAO%20state%20of%20fishing%202006%20world.pdf

[246] http://www.rs-head.spb.ru/en/regbook/index.php

[247] Driscoll, S. 2010. LRF Fleet Analysis – 30 November 2009. FAO.

[248] http://www.morkodeks.ru/

[249] http://www.pma.ru/index.php?option=com_content&view=article&id=90&Itemid=36

[250] http://www.pma.ru/images/stories/amp/orfdocs/order_87_21082006.doc

[251] http://www.pma.ru/images/stories/amp/orfdocs/order_30_31012001.doc

[252] http://www.fishcom.ru/

[253] http://www.rbc.ru/rbcfreenews.shtml?/20080603091823.shtml

There is an Expert Council of Port Captains under the Federal Agency of Maritime and River Transport. The council has no decision power, but is designed to provide expertise and give recommendations on issues regarding sea and river transport (e.g. registration and control systems for vessels). [254]

Registration of Vessels

The following presentation of the Russian system for registration of fishing vessels is based on the above mentioned Code and Regulation. Registration of other vessels is not covered in detail.

Types of Registers

A Russian-flagged vessel should be registered in only one of the following registers[255]:

- State Shipping Register (Gosudarstvennii Sudovoi Reestr)
- Ship's Book (Sudovaya Kniga)
- Bareboat Charter Register (Berbout-Charternii Reestr)
- Russian International Ship Register (Rossiiskii Mezhdunarodnii Reestr Sudov)

Vessels should be registered in the different registers as follows[256]:

- State Shipping Register: Fishing vessels with engine power >55kW or tonnage >80GT and passenger ships, cargo-passenger ships, oil barges (Neftenalivnie suda), tugboats and other self-propelling vessels with main engine >55 kW or tonnage >80 GT are included. Leisure and sport boats for non-commercial use are exempted.
- Ship's book: Fishing vessels with engine power <55kW and tonnage <80GT and leisure and sport boats regardless of engine power or tonnage are included. Other vessels are not to be registered in the State Shipping Register.
- Bareboat Charter Register: Vessels registered in a foreign ship register that have been granted a temporary permit to sail under Russian flag are included in this register. Such a permit for fishing vessels is granted by the Federal Agency of Fishery (for other vessels the permitting authority is the Federal Agency of Maritime and River Transport).
- Russian International Ship Register: This register contains vessels used for international transport of cargo and/or passengers. Fishing vessels are not registered here.

The registers are stored both on paper and on magnetic storage devices. In case of a discrepancy between the two, the paper version is considered the official version.

Responsible Authorities

The fishing port captains (kapitan morskogo porta) at maritime administrations are responsible for registration of fishing vessels.[257] Among the responsibilities and competences of a port captain are

[254] http://www.morflot.ru/about/sovkap/index.php

[255] The Code, Article 33, 1

[256] The Code, Article 33, 5-7; 22,2-3 and The Regulation, 17

registration of vessels and their permits and limitations, issuing of documents confirming the registration, and keeping track of ship registers at his/her port.[258]

Registration of fishing vessels can be conducted at only one the following fishing ports: Vladivostok, Magadan, Nakhodka, Nevelsk, Okhotsk, Petropavlovsk-Kamchatskii, Sovetsko-Gavanskii, Khasanskii, Kholmskii, Murmansk, Kaliningrad, Sankt-Petersburg, Novorossiisk, Taganrog, Astrakhan, Makhachkalinsk.[259] Fishing vessels registered at one of these ports enter the respective national vessel register.

Registration Procedure for Fishing Vessels[260]

Registration is conducted according to the following steps (Attachment A15a):

- Reception and registration of necessary documents by the port captain
- Check of application with existing documents to ensure consistency
- If no disagreement in documents or other reasons for rejecting or halting the application are found, the register is updated accordingly.
- Transfer of documents by the port captain to the Federal Agency of Fisheries for state control
- Issuing of ownership certificate
- Information of registered vessels and their permits are presented to the Federal Agency of Fisheries four times a year by the port captain.

A vessel formerly registered under a foreign flag can be registered in the State Shipping Register (or the Ship's Book) conditional on presenting documentation of its removal from the foreign ship register.[261]

Registration Number

(Fishing) vessels are equipped with a several numbers including a national registration number; a Russian Maritime Register of Shipping number (RS number), and an IMO number.

- National Registration Number: All vessels under Russian flag have a national registration number. The number is painted on the hull. Vessels registered in the State Shipping Register are identified by a letter representing the port of registration followed by a four-digit number. Vessels registered in the Ship's book are identified by two letters – the port index followed by the letter "M" – and a four digit-number. The registration number is related to

[257] The Code, Article 35 and The Regulation, 15

[258] The Regulation, 15

[259] The Regulation, Attachment 1

[260] The Regulation, 29

[261] The Code, Article 37

the port of registration. If a vessel changes owner, the registration number is kept only if the port stays the same.

- Russian Maritime Register of Shipping Number: All vessels classified by the Russian Maritime Register of Shipping (RS) get an RS number. The RS number consists of six digits. The RS classifies all vessels in the State Shipping Register, while vessels in the Russian International Ship Register also can be classified by other approved class societies. Vessels in the Ship's book are not subject to compulsory classification. Thus all vessels in the State Shipping Register as well as some of the vessels in the Russian International Ship Register (percentage not known) have an RS number. The RS number is not marked on the vessel, but is a reference number for the class society and ship owner to link the physical ship with the documents and information kept and issued by the class society.[262]

- IMO Number: This number is issued by the International Maritime Organization. The number is assigned to the vessel when built and kept for its lifetime. The number should be marked on the vessel according to IMO regulations: one mark visible on the outside of the vessel, and one mark easily accessible in a rear engine room. This was emphasized by the RS in a circular issued in 2004.[263]

Removal from Register[264]

A vessel is subject to obligatory removal from the register in the case of:

- Loss/disappearance of vessel;
- Irreparable damage;
- Significant change in quality/transformation because of reconstruction, etc;
- Non-compliance with the criteria for sailing under the Russian flag (Article 15, the Code) (these criteria include ownership by a Russian citizen, company or governmental organisation);
- (for vessels in the Bareboat Charter Register only, expiry of the temporary permit to sail under the Russian flag).

A vessel can be removed from a register upon application from the ship-owner. A vessel can only be removed if the vessel is mortgage-free or a written approval from all mortgagees is presented. A precondition for removal is that the vessel poses no threat to the environment or to ship transport. In case of a change of flag, confirmation from the register to which the vessel enters is not required. If the vessel is sold to a foreign citizen or company, both parties must provide an application for removal and present relevant legal documents.

[262] This is assumed based on the absence of marking guidelines/description for the RS number and an impression based on various sources. This is, however, not confirmed.

[263] http://www.dalryba.ru/docs/get.php?id=1266

[264] The Code, Article 47, The Regulation 46

In case of removal, the port captain records the reason for and date of removal in the register and issues a confirmation of removal. The port captain then informs the Federal Agency of Fisheries by sending copies of the necessary documents. The vessel should be removed from the register within 7 days after the application is received.

Technical Control and Class

Technical control and classification of vessels belonging to the State Shipping Register and the Ship's Book is conducted by Russian organisations certified by the Federal Agency of Maritime and River Transport. The officially certified Russian classification organisations are the Russian Maritime Register of Shipping and the Russian River Register. Vessels belonging to the Russian International Ship Register can also be controlled and classified by approved international classification societies.[265]

Russian Maritime Register of Shipping

Russian Maritime Register of Shipping is a classification society and a member of the International Association of Classification Societies (IACS). It classifies the vast majority of fishing vessels under Russian flag. Biennially it publishes a list of sea-going, self-propelled vessels >100 GT that have been classified by the Russian Maritime Register of Shipping. This list is also digitised and searchable online.[266]

Register of Fishing Vessels[267]

This is a description of the planned register of fishing vessels based on the outline to a legal amendment proposed by the Federal Agency of Fisheries[268]. The proposal is still under discussion.

The register of fishing vessels will keep track of vessels under Russian flag used for fishing. A vessel enters the register upon application from the ship-owner. The following documents must be presented:

- Confirmation of permission to sail under Russian flag;
- Confirmation of ownership;
- Ship book (for vessels with engine power <55kW and tonnage <80GT);
- Confirmation of Class;
- Agreement of Fishing Quota;
- Copy of vessel specifications from RS.

A vessel can be removed from the register for the following reasons:

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[265] http://www.law.edu.ru/doc/document.asp?docID=1264492 and the Code, Article 22

[266] http://www.rs-head.spb.ru/en/index.php

[267] http://www.fishcom.ru/files/prkt3.pdf

[268] http://www.fishcom.ru/files/prkt3.pdf

- Application of removal from ship-owner;
- Removal from the State Shipping Register;
- The expiry of any of the documents mentioned above;
- Failure to comply with rules for fishing vessels[269].

The following information about a vessel will be kept in the register

- National registration number and date of registration;
- Name of vessel and name of owner;
- Call sign of vessel;
- Port of registration;
- IMO number;
- Place and year of build;
- Number and date of permission to sail under Russian flag;
- Vessel type;
- Key technical specifications.

[269] http://www.fishpro.org/zakon/61-2009-01-09-22-36-30

Attachment A15a. An example of an application form for vessel registration in Russia.

Данные проверены
Капитан _____ порта _____ (Ф.И.О.)
"__" _____ 20__ г.

Анкета судового реестра

1. Идентификационный номер (ИМО) _____
2. Название судна _____
3. Бортовой номер _____
4. Год постройки _____
5. Страна постройки, город _____
6. Международные позывные судна _____
7. Назначение судна _____
8. Тип судна _____
9. Собственник _____
   его адрес, телефон _____
10. Судовладелец, фрахтователь _____
    его адрес, телефон _____
11. Длина наибольшая, м _____
12. Ширина, м _____
13. Высота борта, м _____
14. Осадка по летнюю гр. марку, м _____
15. Вместимость валовая _____
16. Вместимость чистая _____
17. Водоизмещение в грузу, т _____
18. Дейдвет, т _____
19. Скорость, узл. _____
20. Автономность, сут. _____
21. Количество коечных мест _____
22. Район плавания _____
23. Тип силовой установки, количество ГД _____
24. Мощность ГСУ, кВт _____
25. Год и место постройки ГД _____
26. Количество цилиндров, диаметр, ход поршня _____
27. Количество и тип главных котлов _____
28. Год и место постройки гл. котлов _____
29. Поверхность нагрева, рабочее давление _____
30. Тип холодильной установки _____
31. Род хладагента _____
32. Число компрессоров _____
33. Температура в рефрижераторных трюмах _____
34. Степень автоматизации _____
35. Деление на отсеки _____
36. Ледовый класс _____
37. Трюма: количество _____ кубатура каждого _____
    размер люков _____
38. Реф. трюма: количество _____ кубатура каждого _____
    размер люков _____
39. Сведения об ограничениях / обременениях _____

Дополнительные сведения о судне

Собственник или фрахтователь судна _____

(подпись, печать)

"__" _____ 20__ год

Дата заполнения Анкеты

ANNEX A16

SEYCHELLES

Seychelles

The Seychelles fishery sector has three main components: an artisanal fishery, carried out by local fishers, with small, motorised boats targeting mainly demersal and semi-pelagic species; a semi-industrial fishery, consisting of small (14 to 22m), locally-owned longliners targeting pelagic species (mainly tuna and swordfish); and industrial fisheries, comprising foreign-owned purse seiners and large longliners primarily targeting tuna species (yellowfin and skipjack)[270]. As of November 2009, 28 Seychelles flagged vessels were active on the LRF SeaWeb database, including 1 support vessel, 22 fishing vessels and 5 trawlers[271].

More than 70% landings in the Seychelles derive from the coastal handline fishery which comprises[272]:

- 280 fibreglass vessels of ~5m
- 30 *Lekonomi*-type vessels, which are ~6.5m
- 91 whaler-type vessels, which are traditional clinker-constructed vessels of 9–12m, with inboard engines. These are now mostly partially decked and can accommodate a crew of 6–7 people. Most whalers are now equipped with iceboxes and make trips of 3–6 days.
- 16 schooners, which are wooden-hull, decked vessels, usually between 10 and 13m, and equipped with a three- or four-cylinder diesel inboard engine, with an icebox of 2,500–3,000 kg capacity. Schooner trips average 8 days at sea.

Responsible authority

The responsible authority for vessel registration in the Seychelles is the Port and Marine Services Division (or Seychelles Port Authority) within the Ministry of Transport.

Exemptions

Vessels <10 m in length are exempt from formal registration in the Seychelles[273].

[270] FAO Fisheries and Aquaculture Country Profile - Seychelles

[271] Driscoll, S. 2010. LRF Fleet Analysis – 30 November 2009. FAO.

[272] FAO Country Profile – Seychelles, op cit.

[273] Seychelles Merchant Shipping Act

Numbering and marking

Vessels registering with the Seychelles register are issued with a call sign and an official number, which must be permanently and continuously marked with no alteration to those marks except as allowed by the Merchant Shipping Act[274].

Information requirements

Information required for Seychelles registration includes all information required by LRF under the T-RFMO proposal (see Section 3.2) except operator information and GRT.

Particulars Required for Provisional Registration in the Seychelles include:

- Application for Registration of Ship as Seychelles Ship, official number and call sign;
- A certificate signed by the builder of the ship and containing: i) a description of the ship; ii) the estimated tonnage of the ship; iii) the date and place of construction of the ship; and iv) the name of the person, if any, on whose account the ship was built;
- Where a vessel has been registered under the law of a foreign country, a Certificate of Deletion as evidence that registration in that country has ceased;
- Evidence that the applicant is the owner of the ship, through a Declaration of Ownership;

  Note: To be eligible for registration under the Seychelles flag a vessel must be wholly owned by:
  - Either a Seychelles citizen; or
  - A Seychelles Body Corporate established either as an International Business Company (IBC) with the Seychelles International Business Authority (SIBA) or as a Domestic company with the Registrar of Companies[275].
- A list of not less than three alternative names under which the ship is proposed to be registered, numbered in order of preference;
- A radio licence, which must be approved by the Ministry of Information Technology Communications, and which the Seychelles Licensing Authority licences; and
- A Certificate of Incorporation if a Seychelles Body Corporate owns the vessel[276].

In addition for permanent registration in the Seychelles, applicants must provide a: certificate of class; a cargo ship safety equipment certificate; a cargo ship safety construction certificate; an

[274] Seychelles Merchant Shipping Act

[275] Guidelines to Ship Registration under Seychelles Flag

[276] ibid

international oil pollution certificate; a minimum safe manning certificate; a load line certificate; a GMDSS safety radio certificate; a declaration of transfer; and a bill of sale.

Ships wishing to register under Seychelles flag must not be older than 15 years with an absolute limit of 25 years. Vessels between 15-25 years wishing to register may still do so if acceptable documentation (e.g. builder's certificates) and proof can be provided to demonstrate the vessel has been maintained to a suitable standard[277].

[277] ibid

ANNEX A17

SOUTH AFRICA

South Africa

As of February 2010, 712 fishing vessels were listed on the South African register of fishing vessels including ten sport fishing (recreational) vessels[278]. As of November 2009, 207 active fishing vessels flagged to South Africa were listed in the LRF SeaWeb database, including 8 support vessels, 57 fishing vessels, and 142 trawlers[279].

The South African register only reflects a fraction of the small vessels active in the country whereby, vessels under 25GT are not compelled to be registered[280]. The 94 vessels under 25 GT on this register were therefore disregarded in the following analysis.

Vessels in South Africa are registered with lengths either in feet or meters, making a thorough analysis of length groups difficult. The register contains 142 vessels between 25 and 50 GT, 248 vessels between 50 and 100 GT and 228 vessels over 100 GT. Table A17a provides an outline of the size structure of registered vessels in South Africa.

Table A17a. Fishing vessels in the South African register and in the LRF SeaWeb database.

Vessel Size Class	Total	LRF/SeaWeb
≥100 tonnes	228	99
≥50 tonnes or ≥18 m	248	0
≥10 tonnes or ≥12 m	142	0
<10 tonnes and <12 m	0	0
Total	618	99

Registration and licensing

In general, vessels other than pleasure vessels under 100 GT must either be registered[281] or licensed[282]. However, any South African owned vessel that leaves the South African Exclusive Economic Zone (EEZ) is required to be registered[283].

[278] Copy of vessel register received from E Howard of the Registrar of Ships, SA. 11.02.2010

[279] Driscoll, S. 2010. LRF Fleet Analysis – 30 November 2009. FAO.

[280] E Howard, personal communication

[281] Registration in this sense being formal registration in terms of the Ship Registration Act 58 of 1998 and the regulations made under it.

The South African Ship's Register is administered by the South African Maritime Safety Association (SAMSA)[284] under the Ministry of Transport.

Vessels registered for the first time will be required to undergo a pre-registration survey. This survey is to ensure that the vessel is suitable to be listed on the South African Ship's Register. The survey must be carried out by a SAMSA surveyor[285].

In addition to the pre-registration survey, vessels are required to have either a full tonnage computation or, for existing vessels with previous tonnage computations in accordance the with 1969 Tonnage Convention, figures will simply be verified[286].

Registration requirements are as follows:

- If a new building, notification of intention to build;
- If not a new build, the bill of Sale;
- Pre-registration survey report from the surveyor;
- Application for registration ;
- Tonnage Certificate;
- Deletion Certificate, if the vessel is coming from a foreign register;
- Declaration of ownership and nationality;
- Builder's certificate;
- copy of a South African radio licence;
- copy of the owner's identity document, if the vessel is owned by an individual;
- copy of each member's identity document, if the vessel is owned by a private corporation;

If the vessel is owned by a company:

- Memorandum and articles of association;
- Certificate of incorporation;

---

[282] Licensing of 'commercial' (i.e. non recreational South African) small vessels which are not registered on the South African Register is required under section 68 of the *Merchant Shipping Act, 1951*

[283] http://www.samsa.org.za/siteimgs/2007%20-%20No.13.pdf

[284] http://www.samsa.org.za/

[285] http://www.samsa.org.za/

[286] ibid

- Director's resolution;
- Shareholder's certificates; and
- Proof that the majority shareholders are South African citizens.

If the vessel is owned by a trust:

- The title deed of the trust; and
- Statement of nationality of each beneficiary and description of each person's beneficial interest in the trust.

South African registered fishing vessels can only be owned by South African nationals and cannot be registered under a bareboat charter agreement.

South Africa requires most of the information needed to obtain an IMO/LR number under the T-RFMO proposal (see Section 3.2) with the exception of operator information and previous name and flag. The South African register uses GRT, not GT for tonnage registration.

For efficiency, SAMSA officials now combine a number of the information requirements set out in existing forms into a single 'survey document' during routine surveys to fulfil the information requirements for all of the following[287]:

- application for a licence;
- applications for an approved marking;
- the data collection for the proposed national data base on small vessels;
- the defects sheet; and
- the survey report.

Carving and marking

Section 20 of the *Ship Registration Act 1998*, requires a registered vessel to be 'carved and marked' and Regulation 23 of the Ship Registration Regulations 2002, deals with the manner in which a vessel is to be carved and marked[288]. The register will allocate each ship an official number. Ship's particulars are then required to be etched into their main beam, as evidenced by a Carving & Marking Note[289].

Exemptions are provided by SAMSA for all commercial vessels <25 GT and recreational vessels <100GT, for full compliance with Regulation 23. Such vessels are only required to inscribe the name,

[287] E Howard, personal communication,

[288] *Ship Registration Act 1998*. Available at: http://web.uct.ac.za/depts/shiplaw/shipsreg.htm

[289] http://web.uct.ac.za/depts/shiplaw/fulltext/shipregfaq.pdf

official number and length overall into their main beam for registration purposes[290]. On commercial vessels the official number, length overall and, if known, the gross tonnage, must be inscribed on a plate which is to be placed in a visible position such as the front of the wheelhouse.

Numbering systems

All registered small vessels operating locally must also be issued an "approved marking" which is to be displayed on the exterior of the vessel in the same way as all other vessels. These numbers are those issued by either SAMSA or one of its authorised agencies [291].

Licence vessels are issued an official number. There is no statutory requirement that this be the only number on a commercial vessel; various other authorities may also require their own identifiers for commercial vessels. The only approved numbers which are to be used for SAMSA survey and tracking purposes is the "DT—numbering system (DTC – Cape Town, DTD - Durban, etc) followed by the identifying number and a final letter denoting the category.

- *Category A* — vessels operating any distance from shore;
- *Category B* — vessels operating less than 40 nautical miles from shore;
- *Category C* — vessels operating less than 15 nautical miles from shore;
- *Category D* — vessels operating less than 5 nautical miles from shore;
- *Category E* — vessels operating not more than 1 nautical mile from shore and 15 nautical miles from an approved launch site;
- *Category R* — vessels operating solely on inland waters. (Now defined as all water areas accessible to the public and contained within ports and fishing harbours lagoons, rivers, dams, wetlands and lakes in the Republic)

Inspections and renewal

Since 2001, SAMSA has performed ad hoc inspections of fishing vessels, because *"it is the experience of the Authority that vessels are prepared for survey and what appears on the day of survey is not how the vessel is operated and maintained during the period of validity of a safety certificate."*[292]

Registration is valid for 5 years after which it must be renewed. Registration of a chartered (parallel-in) ship is valid for 5 years or until the end of the charter period (whichever is the earlier). The Registrar must serve a renewal notice on the owner 3 months before the expiry of the registration. Renewal must be applied for during the 3 months before expiry. The application for renewal must be supported with a resubmission of updated declarations of ownership and nationality.

[290] http://www.samsa.org.za/siteimgs/2009%20-%20No%20.13.pdf

[291] ibid

[292] http://www.samsa.org.za/siteimgs/MN%201%20of%202010.pdf

ANNEX A18

SPAIN

Spain

The Spanish fishing fleet consists of 11,143 vessels[293]. It is the third largest in numbers in the European Union after Greece and Italy, and by far the biggest in tonnage. 71% of registered Spanish vessels are under 10 tonnes and <12 m. Table A18a below provides an outline of the size distribution of the Spanish fishing fleet. As of November 2009, 1,280 active Spanish flagged fishing vessels were listed on the LRF SeaWeb database, including 2 fish carriers, 12 support vessels, 432 fishing vessels and 834 trawlers[294].

Table A18a. Spanish vessels in the EU Fleet Register[295]

Vessel Size Class	Number of Vessels
≥100 tonnes	908
≥50 tonnes or ≥18 m length	674
≥10 tonnes or ≥12 m length	1620
<10 tonnes and <12 m length	7941
Total	11143

Registration and licensing

The Registry of Fishing Vessels in Spain sits within the Ministry of Development (Ministerio de Fomento)[296]. Registers of smaller vessels are kept with the Harbour Master of the vessels' home port. The register for larger commercial vessels is kept with Central Maritime Ship Registry (General Instruction on the DGMM of 22.03.95) and the entire fleet is listed in the EU Fleet Register.

The procedures for registration depend on the nature of the ship. To register a vessel under construction, the applicant has to provide an application from the future owner of the vessel as a contractor and the shipyard in question. It should contain information on the owner, and either the social security number, if an individual, or documents of incorporation, if a company. If the engine is not of Spanish origin, the application has to contain a certificate from the importer giving the details of the engine and whether it is imported from another EU country or not.

[293] EU Fleet Register, http://ec.europa.eu/fisheries/fleet/index.cfm.

[294] Driscoll, S. 2010. LRF Fleet Analysis – 30 November 2009. FAO.

[295] EU Fleet Register, op cit.

[296] www.fomento.es

Once registered as a new vessel, copies of the registration papers are handed over to the Special Regime of the Sea (Régimen Especial del Mar) and it is registered in the Commercial Register (Registro Mercantil). If it is a fishing vessel, a copy of the application is also registered in the Census of Fishing Fleet Operations (Censo de la Flota Pesquera Operativa)[297].

For imported vessels, the applicant has to provide a certificate of removal from the register of the flag of origin. In the case of import of a newly constructed ship, the shipyard must produce a certificate which specifies that the vessel has been built for export.

Major changes to the vessel, such as changes of engine, modernisation works, rebuilding, etc. need to be approved by the Harbour Master for vessels under 24 meters and the Central Maritime Ship Registry for larger vessels.

IMO/LR numbers and IRCS

Combining the EU Fleet Register with the LRF SeaWeb database, using call signs to match records, shows that 794 of the vessels in the Spanish register have an IMO/LR number, of which six are 50-100 GT and the remainder are >100GT. 87% of the Spanish vessels >100 GT are registered in SeaWeb. Table A18b below provides further detail on the structure of the Spanish fleet and prevalence of vessels with current IMO/LR numbers and international radio call signs (IRCSs).

Table A18b. Size distribution of Spanish vessels with IMO/LR numbers and IRCSs.

Vessel Size Class	Vessels with IMO/LR #	Vessels with IRCS	Spanish Vessels on the EU Register
≥100 tonnes	788	906	908
≥50 tonnes or ≥18 m length	6	615	674
≥10 tonnes or ≥12 m length	0	681	1,620
<10 tonnes and <12 m length	0	130	7,941
TOTAL	794	2,332	11,143

Nearly all of the vessels >100 GT have International Radio Call Signs (99.8%). Also in the next size group (≥50 tonnes or ≥18m) as many as 91.2% of the vessels have an IRCS. In the third category (vessels ≥10 tonnes or ≥12 m length), 42.0% have an IRCS.

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http://www.fomento.es/MFOM/LANG_CASTELLANO/DIRECCIONES_GENERALES/MARINA_MERCANTE/Subdireccion_Trafico/procedimientos/

There were 474 Spanish fishing vessels in LRF SeaWeb database that are not in the Spanish register of fishing vessels. Five of these are registered with the same IRCS as another vessel that is on the Spanish register (possibly out of service), and five are on order/commissioned and thus not yet in the fishing vessel register. The status of the remaining 464 vessels is unknown.

An additional 120 of the vessels over 100 GT do not have IMO/LR numbers.

Numbering, Carving and marking

Vessels registered in the Spanish register receive a No de Matrícula, registration number, given in sequence of registration. The number is unique to the vessel.

Official numbers allocated to Spanish fishing vessels denote the:

- Vessel category code (3 for fishing vessels)
- Letters designating the Maritime Province
- Number designating the Maritime district
- Serial number and year

External markings consist of one digit two or three letters indicating the home port, and a four digit number sometimes in two pairs with a hyphen between. These numbers are also shown in the data field "external marking" in the EU Fleet Register.

Information required

Spain does not require seven of the 21 fields required by LRF for an IMO/LR number under the T-RFMO proposal (See Section 3.2). LRF-required data fields not currently recorded by Spanish Authorities are: operator name, operator address, previous flag, previous (vessel) name, nationality of ship builder, depth and beam [298].

[298] No application form could be located during this study. This assessment is based on the information requirements at www.fomento.es "Procedures on Registration of Ships and boats: Required Documents"

ANNEX A19

THAILAND

Thailand

12,238 fishing vessels were registered with the Thai Marine Department in 2007, 461 of which were authorised to operate in distant water fisheries outside of Thailand's EEZ[299]. As of 30 November 2009, 97 Thai flagged fishing vessels were listed as active on the LRF SeaWeb database, including 22 fish carriers, 1 factory ship, 7 support vessels, 53 fishing vessels and 14 trawlers[300].

Responsible Authority

Thailand's vessel register is managed by the Ship Registration Division of Thailand's Marine Department (MD) in accordance with the Navigation in Thai Waters Act (Buddhist Era [B.E.] 2456 [1913][301]) and the Thai Vessel Act (B.E. 2481 [1938]). Vessels registered in Thailand must carry a licence to operate and a Thai registration certificate. Licences to operate a vessel in Thai waters are issued annually after a current certificate of survey has been provided for the safety of the ship. This licence contains information on the type of vessel (e.g. deep sea power driven fishing vessel class 1); kind of vessel (e.g. fishing vessel); permitted area (e.g. within 3 nm from coast); and the number of crew[302].

Links between registration and fishing rights

The authorisation and management of fishing gears attached to fishing vessels is the responsibility of the Department of Fisheries (DOF). The DOF requires applicants for fishing licences to first be registered and provide a copy of their registration certificate and a copy of the licence to employ the vessel before issuing an authorisation to fish[303]. Foreign fishing licences are required for vessels wishing to fish outside of Thailand's EEZ.

Registration of small vessels

Problems have been encountered by the DOF in Thailand for vessels <14m length, which to date, could not be registered by the Marine Department. The DOF has dealt with this issue by requiring fishers to register their occupation as fishing operators possessing a fishing vessel <14m in length

[299] Oceanic Développement and Megapesca. 2009. Op cit.

[300] Driscoll, S. 2010. LRF Fleet Analysis – 30 November 2009. FAO.

[301] To convert between Buddhist Era (B.E.) and Christian Era (A.D.) years subtract 543 from the B.E. year. http://en.wikipedia.org/wiki/Thai_solar_calendar)

[302] SIDA/SEAFDEC. (2008). Report of the Expert Meeting on Fishing Vessel Registration, Phuket, Thailand, 30 June-2 July 2008. Swedish International Development Cooperation and Development Agency and Southeast Asian Fisheries Development Center. Accessed online at: http://download.seafdec.net/index.php?act=category&id=11&start=2

[303] ibid

before a licence to fish may be granted. Operators of such vessels could then provide a copy of this certificate to the DOF instead of a vessel registration certificate and copy of licence to employ the vessel. The Marine Department submitted an amendment to the Thai Vessel Act in 2008 requiring the registration of all sizes of vessel in Thailand, except for non-motorised vessels ≤0.5 GRT. It is not known whether or not this amendment has been implemented[304].

General Registration

The ship registration certificate issued under the Thai Vessels Act provides permission to "trade in Thai waters" and is a legal requirement for all motorised fishing vessels of any size, as well as un-motorised fishing vessels above 6 GRT. Vessel registration under Thai law is issued to either:

- an individual (natural person) who must be of Thai Nationality, or to a
- business entity established under Thai legislation, in which case at least 70% of shareholders must be of Thai nationality (for domestic operation) or at least 50% of shareholders must be of Thai nationality (for international operation)

The annual ship operating licence is issued under the Navigation in Thai Waters Act and is a requirement for any vessel used in Thai waters, including fishing vessels. The condition of issue is that the vessel must be in possession of a valid certificate of survey establishing the safety of the vessel construction and equipment. Depending on capacity, the vessel is then authorised for use in specified maritime zones. The period of validity for this operating licence is 12 months. Thus the registration is linked specifically to safety at sea criteria. There are no conditions placed on registration of the fishing vessel which relate to the management of the vessel in terms of its specific fishing activities[305].

Registration Number

Thailand's official ship registration number comprises a 9 digit number (e.g. 5100-82902) representing the following[306]:

- The first two digits are the year of register (B.E.) – 51 means 2551 B.E.
- The next two digits are the port of registration – 00 above refers to Bangkok port.
- The next four digits are the serial number starting from 0001
- The last digit is the official controlling number.

Information required:

Documents required for the registration of vessels (including fishing vessels) in Thailand include[307]:

[304] ibid

[305] Oceanic Développement and Megapesca. 2009. Op cit.

[306] SIDA/SEAFDEC. 2008. Op cit.

[307] ibid

- Owner's personal documents, e.g. Thai identification card;
- Vessel documents, including bill of sale and deletion certificate;
- Photograph of the vessel;
- Name of the vessel; and
- Certificate of survey.

Information contained on Thai registration certificates includes[308]:

- Vessel name
- Official ship registration number
- Vessel Size (GRT)
- Deadweight (DWT)
- Type of vessel
- Kind of vessel (e.g. fishing vessel)
- Permitted to sail
- Name of master and chief engineer
- Number of crew
- Owner's name and address

[308] ibid

ANNEX A20

UNITED KINGDOM

United Kingdom

The United Kingdom (UK) fishing fleet consisted of 6,515 vessels in 2009. Table A20a provides an outline of the size structure of this fleet. As of 30 November 2009, 425 UK flagged fishing vessels were listed as active on the LRF SeaWeb database, including 2 fish carriers, 10 support vessels, 131 fishing vessels and 282 trawlers[309].

Table A20a. Size distribution of the UK fishing fleet listed on the EU Fleet Register (as of 10 January 2010)[310].

Vessel Size Class	UK Vessels on EU Fleet Register	UK Vessels in SeaWeb
≥100 tonnes	467	405
≥50 tonnes or ≥18 m	181	2
≥10 tonnes or ≥12 m	1041	
<10 tonnes and <12 m	4,826	
Total	6,515	407

Of the 467 vessels over 100 GT, 405 have an IMO/LR number and two of the vessels <100 GT also have an IMO/LR number. There are 158 vessels registered as UK fishing vessels in SeaWeb that are not in the UK register.

Responsible authorities

The Merchant Shipping Act 1993 (now Section 8 of the Merchant Shipping Act 1995) established a Register of British ships which is maintained by the Registrar General of Shipping and Seamen[311]. This register is divided into four parts as outlined below:

Part I – for merchant ships and pleasure craft;

Part II – for fishing vessels[312];

[309] Driscoll, S. 2010. LRF Fleet Analysis – 30 November 2009. FAO.

[310] EU Fleet Register (EU 2010a)

[311] http://www.mcga.gov.uk/c4mca/mcga-mnotice.htm?textobjid=DCC8F5745E8DD3B7

[312] http://www.mcga.gov.uk/c4mca/lrgtxt/ukr-home/fishingvessels.htm

Part III – for small ships[313]; and

Part IV – for ships which are bareboat chartered.

The UK Ship Register allows applications from[314]:

- British citizens;
- Citizens of an EU member state exercising their rights under articles 48 or 52 of the EU Treaty in the UK;
- Companies which are incorporated in one of the EEA countries and which have a place of business in the UK; and
- European Economic Interest Groupings. When none of the qualified owners is resident in the UK a representative person must be appointed who may be either:
    - An individual resident in the UK;
    - A Company incorporated in one of the EEA countries with a place of business in the UK; or
    - A local authority in the United Kingdom.

There are two kinds of registration for fishing vessels[315].

Full Registration - where the owner of the vessel has to prove ownership by producing documents of sale covering the previous three years (or in the case of a new vessel, a builders certificate). Any changes of ownership must be carried out on proper Bills of Sale. A vessel with full registration can have mortgages registered against it.

Simple Registration - where formal Bills of Sale are not required but a receipted invoice is acceptable. Mortgages cannot be recorded against a vessel with simple registration.

Link to fishing rights

Before obtaining a fishing vessel licence, a vessel must be registered with the Registry of Shipping and Seamen (RSS) under the Maritime and Coastguard Agency. This applies unless the vessel[316]:

- is a salmon coble;
- has an overall length of 10 metres and under and is not propelled by an engine;
- has an overall length of 10 metres and under and will only be used to fish for common eels.

[313] https://mcanet.mcga.gov.uk/ssr/ssr/

[314] http://www.mcga.gov.uk/c4mca/lrgtxt/ukr-home/fishingvessels.htm

[315] http://www.mcga.gov.uk/c4mca/lrgtxt/ukr-home/fishingvessels.htm

[316] http://www.mfa.gov.uk/management/documents/FVL-Introduction.pdf

Vessel registrations must be renewed every five years. Ongoing registration is also dependent on the vessel continuing to be licensed for fishing. Any fishing vessel that has not held a fishing licence for at least six months may be removed from the register[317].

Fishing licences are issued by the Department of Environment, Food and Rural Affairs through its executive agency, the Marine Fisheries Agency. Licences are linked to the vessel and the vessel name, details and RSS number must be included in the application for an entitlement to obtain a licence and the application to transfer a licence from one vessel to another[318].

Conditions for registering fishing vessels

The MCA provides a matrix assigning points to different types of fishing permit applicants; those types with the fewest number of points are the most likely to be permitted (Attachment A20a). Registration is more likely to be granted to new vessels rather than old, a classed vessel rather than non-classed, a vessel with a flag state history rather than no history, and a longliner rather than a trawler.

Numbering and Carving

Fishing Vessels on Part II of the Register

The official number for a fishing vessel is a six digit alpha-numeric code, for example: A12345 or B23456. As with Part I ships, a previously assigned official number will be re-allocated to a fishing vessel which returns to the Register after having been removed from it for any reason[319].

Once the Registry is satisfied that all of the documents produced are acceptable, it will issue an official number (which has to be carved into the ship), and issue a ship's Carving and Marking (C & M) Note to the owners detailing the markings to be made on the ship. Markings must be inspected by an approved surveyor or the Coastguard and the signed Carving and Marking note returned to the UK Ship Register at RSS in Cardiff[320].

Information Required

The UK register gathers information on 16 of the 21 fields required by LRF under the T-RFMO proposal (see Section 3.2). The LRF-required information not recorded in the UK register is operator information, previous flag, depth and GRT.

[317] http://www.mcga.gov.uk/c4mca/mcga-mnotice.htm?textobjid=DCC8F5745E8DD3B7

[318] http://www.defra.gov.uk/corporate/docs/forms/fish/afl7.pdf

[319] http://www.mcga.gov.uk/c4mca/mcga-mnotice.htm?textobjid=DCC8F5745E8DD3B7

[320] ibid

Attachment A20a. UK points system for decisions on fishing vessel licence applications.

FV FLAG-IN MATRIX

FACTOR	CRITERIA	POINTS	ALLOCATED SCORE
Vessel name			
Pennant Number			
Losing flag **White - Grey – Black; taken from the Paris MOU List**	White Listed Grey Listed Black Listed	0 20 60	
[321]**Class society** **See also Note A:**	(a) UK authorised society (built and maintained to class) (b) other IACS member (c) non IACS member (i.e. NSI Standard) (d) vessel not classed (e) For 15-24m vessels only – Meets Flag in requirements of 15 – 24 metre Code (Equivalent build standard to Seafish)	0 20 30 100 30	
Vessel Type	Long Liner Seiner Pelagic Trawler/Seiner Potter Mussel Dredger Bottom Trawler Scalloper (outriggers only)	0 5 5 5 10 10 15	

[321] References to Class Society refer to the Society BEFORE transfer to the UK Register.

	Beam Trawler/Scalloper	20	
Age	0-15 16-25 Over 25	0 30 60	
Flag State History	Available for previous 24 months No History	0 20	
		TOTAL	
Name of CSM	Check CSM database		

SURVEY THRESHOLDS - FOR USE WITH ABOVE TABLE

Actual Score	Flag in by MCA through survey	Pre Flag in Inspection by MCA prior to flag in survey	Refer to Flag in Panel	Refer to Flag in Panel for confirmation of refusal to register
0 - 50	✓			
51 - 100		✓		
101 - 120			✓	
121 +				✓

Note re: Classification Society - A previously un-classed fishing vessel >24 m or one classed with a non-UK authorised classification society may be accepted subject to a UK authorised classification society classing the vessel prior to joining the UK Register and rigorous survey by the MCA.

ANNEX A21:

UNITED STATES OF AMERICA

United States of America

In 2006 the United States Coast Guard (USCG) reported 21,996 commercial fishing vessels with valid USCG vessel documentation[322] (i.e. vessels >5 GT registered on the national register). In 2005, the total number of vessels > 5 net tons with commercial fishing documents in the United States (US) was approximately 36,150[323]. As of 30 November 2009, 3,372 US-flagged fishing vessels were listed as active on the LRF SeaWeb database, including 8 fish carriers, 23 factory ships, 16 support vessels, 2,681 fishing vessels and 644 trawlers[324].

Responsible authority

The responsible agency for fishing vessel registration in the United States is the USCG – National Vessel Documentation Center[325], within the US Department of Homeland Security. The responsible agency for the issue of fishing licences is the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS)[326].

Documentation of a vessel with the USCG requires that the applicant be a US citizen and that the vessel measure at least five net tonnes. Fishing vessels >100 feet must also have Maritime Administration approval[327].

Renewal

The Certificate of Documentation is valid for one year from the date of issue and must be renewed on an annual basis[328]. Even though it is up to the owner to assure the document does not expire, the Coast Guard will send a Notice of Renewal to the owner approximately 45 days prior to expiration.

[322] USCG. 2006. Commercial fishing vessel count by State/Jurisdiction and Documented. http://homeport.uscg.mil/mycg/portal/ep/contentDetailView.do?BV_&contentType=EDITORIAL&contentId=92220

[323] Personal Communication with D. Sutherland, NMFS. Statistics from US Coast Guard data base. (2005). IN FAO Fishery Country Fishery Profile, USA (2005)

[324] Driscoll, S. 2010. LRF Fleet Analysis – 30 November 2009. FAO.

[325] http://www.uscg.mil/hq/cg5/nvdc/default.asp

[326] http://www.nmfs.noaa.gov/

[327] http://www.marda.dot.gov

[328] http://www.uscg.mil/hq/cg5/nvdc/nvdcfaq.asp#25

There is no procedure for controlling that the information given in the applications for registering or renewing is correct[329].

Fishing rights

Commercial fishing rights in the US are managed by NMFS[330]. Application forms are available online and the following information needs to be submitted when applying for a High Seas Fisheries Permit: USCG Documentation, or State Registration number; vessel name; IRCS; crew size; shaft horsepower; refrigeration type; owners name and taxpayer identification number (or owner's company name, state, and date of formation and address details); and operator's name, taxpayer identification number (or operator company name, state and date of formation and address details). If the vessel has been sailing under another flag within the last three years, additional information is required including the period beginning and end dates (mm-dd-yyyy); the vessel name; flag; IRCS and homeport; the owner's name, date of birth, address, phone, and fax; and the operator's name, date of birth, address, phone, and fax[331].

For a Federal fisheries permit (i.e. in US waters) less information is required. In such cases the applicant should supply: the owner's name; NMFS personal identification number; address and managing company (if any); vessel name; home port; Alaska Department of Fish and Game (ADF&G) processor code; whether vessel is a US vessel; the USCG documentation number; the ADF&G vessel registration number; the vessel length overall (in feet); the vessel's registered length (in feet); GT; net tonnage; shaft horsepower; area of operation; type of vessel; and gear type[332].

Lists of fishing right holders, their vessels and vessel registration numbers are available online for at least some fisheries[333] [334].

Numbering systems

Centrally issued UVIs in the US are 6 or 7 digits. State-issued UVIs are hull identification numbers (HIN) which follow the ISO standard (letters and numbers). Most domestic fisheries regulations require a vessel in the fishery to be marked, usually with its official number (or hull identification number for State-registered vessels). A vessel <five net tons must be identified by a State registration number. All fisheries that require permits require vessel marking[335]. (See Section 2.1.7 of the main report for more information on the US UVI system).

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[329] S. Kraft, Documentation Officer, National Vessel Documentation Center, personal communication

[330] http://www.nmfs.noaa.gov/

[331] http://www.nmfs.noaa.gov/permits.htm

[332] http://alaskafisheries.noaa.gov/ram/FFPAPP.pdf

[333] http://www.nwr.noaa.gov/Groundfish-Halibut/Groundfish-Permits/

[334] https://nwr2.nmfs.noaa.gov/nwp_public_ss/HOME/index_pub_permits_ss.cfm

[335] http://www.fao.org/docrep/005/AC750E/AC750E05.htm

Marking and carving

For commercial vessels, the vessel name must be marked on each bow, and the vessel name and hailing port must also be marked on the stern. The markings may be made by the use of any means and materials that result in durable marking[336].

The official number must be permanently affixed so that alteration, removal or replacement would be obvious and cause some scarring or damage to the surrounding hull area[337]. The Official Number must be marked in block-type Arabic numerals at least 3" high on some clearly visible interior structural part of the hull[338]. The local Officer in Charge of Marine Inspection has the final authority for placement of a vessel's markings[339].

Information required

There are several fields required for a LFR number under the T-RFMO proposal that are not required for all vessels registered to fish in US waters, most notably an IRCS. However, when applying for a fishing permit for the high seas, the IRCS has to be provided as well as other LRF-required fields such as shaft horsepower (power of main engine), operators name and address, and previous flag and owner. Thus, the information recorded when registering vessels in the US appears to be dependent on the type of fishing right(s) held or applied for by the vessel.

Compliance with RFMO Vessel Data Requirements

The US, as a member of the WCPFC, is required to provide information on all US-flagged vessels authorised to fish in the WCPFC Convention Area outside of the US waters of national jurisdiction. The US generally supplies all of the following vessel information to WCPFC for its Record of Fishing Vessels (96-100% compliance): vessel name, registration number, port of registry, name/address of owner, name/nationality of master, IRCS, where and when vessel was built, type of vessel, normal crew complement, type of fishing method(s), length, moulded depth, beam, GRT, form of fishing authorisation, authorisation number, specific areas authorised to fish, species authorised for, valid time periods for authorisation, and the number of days fished by each of its vessels in the previous year (fishing status during previous year).

The following information is sometimes provided by the US to the WCPFC (1-86% compliance): vessel communication types, colour photographs of its vessels, power of main engine(s), carrying and fish hold capacity and freezer type. The US did not provide information on the number of freezers onboard any of its 493 authorised vessels in 2008[340].

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[336] http://www.uscg.mil/hq/cg5/nvdc/nvdcfaq.asp#25

[337] 46 CRF Part 67.121 and 33 CFR Para 181.29

[338] http://www.uscg.mil/hq/cg5/nvdc/nvdcfaq.asp#25

[339] S. Kraft, Documentation Officer, National Vessel Documentation Center, personal communication

[340] WCPFC Secretariat. 2009. Compliance information requested by TCC5. WCPFC6-2009/IP06 (Rev.1)

ANNEX A22

VANUATU

Vanuatu

The vast majority of Vanuatu's international fishing fleet is listed on its International Fishing Vessel Register[341]. As of 2 February 2010, 109 vessels were listed on this International Register including 74 longliners, 2 pole and line vessels, 23 purse seiners, 4 squid jiggers and 4 stern trawl vessels. 24 of the 109 vessels (22%) on Vanuatu's International Register are <100 GT with 23 of those vessels weighing 90-100GT. The remainder of the fleet are >100 GT. As of 30 November 2009, 87 Vanuatu flagged vessels were listed as active on the LRF SeaWeb database, which included 1 support vessel, 78 fishing vessels and 8 trawlers[342].

In addition to the International Register, Vanuatu operates a domestic vessel register which includes a small number of bottom longline commercial vessels and charter fishing vessels. Whilst vessels listed on this register generally operate within Vanuatu's EEZ, they are also known to extend operations outside of Vanuatu waters and into the waters of neighbouring countries[343].

Responsible authority

The Vanuatu Maritime Services Limited (VMSL) is responsible for international vessel registration. VMSL is a privately held Vanuatu company operating under contract to the Vanuatu Government as the Maritime Administrator from New York, USA[344]. VMSL operates the central registry office and handles all details of vessel registration, mortgage recording, crew documentation, and all matters relating to safety, proper vessel inspection and documentation.

Vanuatu's domestic register is currently administered by the licensing section of the Vanuatu Department of Ports and Marine[345].

Links to fishing rights

Fishing vessels wishing to be registered in Vanuatu must first register under the Vanuatu Fishing Management Plan, managed by Tuna Fishing (Vanuatu) Co. Ltd (TFV)[346]. Vessels must report any involvement in any IUU fishing incidents during the previous three years and provide details of any such incidents. A Fishery Certificate of Origin must then be completed for provisional registration to

[341] R. Bohn, President and CEO, VMSL – Port Vila, personal communication

[342] Driscoll, S. 2010. LRF Fleet Analysis – 30 November 2009. FAO.

[343] R. Bohn, President and CEO, VMSL – Port Vila (2010), personal communications. Numbers and sizes of vessels contained on this register could not be sourced during this study.

[344] www.vanuatuships.com

[345] Vanuatu Department of Fisheries, personal communication

[346] D. Rescigno, Vessel Documentation & Customer Relations, VMSL New York, personal communication

be granted (for 1 year)[347]. Upon registration, a vessel may then apply to the Vanuatu Department of Fisheries for a licence/authorisation to fish[348].

Control and renewal

A vessel is provisionally registered in Vanuatu for one year giving the ship owner time to comply with permanent registration requirements. The permanent registry certificate does not expire and the vessel is registered in Vanuatu until it is deleted[349].

All vessels being transferred into Vanuatu must present either: a 'permission for transfer' from the current registry and/or a 'deletion certificate' in addition to evidence that the vessel is free from encumbrances. Whenever a vessel is deleted from the Vanuatu register, for whatever reason, the ship owner must request permission to transfer (delete) the vessel out of Vanuatu and give the reason why[350].

Vessels shall not be older than 20 years from completion of first construction however, this condition may be waived in exceptional cases, upon application, if a vessel meets all other requirements. If a vessel is 20 years or older, a General Condition Survey must be conducted by a qualified independent marine surveyor approved by Vanuatu and the report of such survey must be submitted as proof of vessel's seaworthiness[351].

VMSL may appoint marine inspectors to board and examine or inspect vessels at any time or place deemed to be appropriate and marine inspectors shall render a report with respect to each such boarding to VMSL[352].

Numbering and carving

Vessels registered to Vanuatu are issued an official number and a call sign. Official numbers are issued sequentially and do not encode any specific details about the vessel they are assigned to[353].

The VMSL Commissioner or his duly authorised agent may prescribe a system of numbering documented vessels. The designated number and the net tonnages of each vessel shall be carved deeply or otherwise marked permanently on the vessel's main beam[354].

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[347] ibid

[348] Vanuatu Department of Fisheries, personal communication

[349] D. Rescigno, Vessel Documentation & Customer Relations, VMSL New York, personal communication

[350] ibid

[351] ibid

[352] Vanuatu Maritime Regulations, para 33

[353] [353] D. Rescigno, Vessel Documentation & Customer Relations, VMSL New York, personal communication

[354] Vanuatu Maritime Act para 42

Every documented vessel shall have its name marked upon each bow and upon the stern. The home port of the vessel shall also be marked upon the stern. These names shall be painted or guilded, or consist of cut or carved or cast Roman letters in light colour on a dark background, or in a dark colour on a light background, secured in place and distinctly visible. The smallest letters used shall not be less than 4 inches in size[355].

Each vessel of Vanuatu, in addition to having its name painted on her stern, shall have such name conspicuously placed in distinct plain letters of not less than 6 inches in length, on each side of the pilot house, if any, also on the outer side of each wheelhouse, if any.

Digitisation

VMSL in New York keeps a digital database of Vanuatu's International Register. It is not available online.

Required documentation

The following application forms and documents are required for vessel registration on Vanuatu's International Vessel Register:

1. Form A1 - Application for Official Number, Call Sign, etc.
2. Form A3 - Preliminary Report of Ship's Officers.
3. Form A10 - Application for Ship's Radio Station License.
4. Form A20 - Request for waiver of Vanuatu Age requirement (for vessels 20 yrs or over).
5. Form A21 - Request for waiver of Vanuatu ownership requirement (for Non-Vanuatu Company).
6. Corporate authority, from the registering owner, to register vessel in Vanuatu, in one of following forms: Power of Attorney, Corporate Resolutions, Secretary's Certificate, or Minutes of the Board of Directors.
7. Current registry's consent to transfer to Vanuatu and/or deletion certificate. Owners of an undocumented vessel must submit an affidavit stating the vessel remained undocumented since deletion from its former registry.
8. Proof from current registry that the vessel is free and clear from mortgages, encumbrances, liens, etc.
9. Proof of ownership: Bill of Sale; Transcript of registry; and/or Certificate of Documentation. For new buildings, a Builder's Certificate is acceptable. Owners wishing that the Bill of Sale be recorded must submit one notarised original in English.

[355] D. Rescigno, Vessel Documentation & Customer Relations, VMSL New York, personal communication

10. Proof of Seaworthiness.

11. Confirmation of Class, dated no earlier than 10 days prior to registration.

12. For vessels that are not classed or >20 years old: a General Condition Survey must be conducted by an independent surveyor and the survey report (complete with photos) is to be submitted to VMSL for review prior to registration in Vanuatu.

13. Certificate of Good Standing for a non-Vanuatu company.

14. Copies of current statutory certificates (i.e., ITC69, Load Line, IOPP, Cargo Ship Safety, ISM and ISPS).

15. Confirmation by vessel's Radio Accounting Authority contract stating that the vessel's communications charges are covered under contract.

16. Payment of registration fees in US Dollars.

17. For fishing vessel registration – written permission from Tuna Fishing Vanuatu and Fishery Certificate of Origin.

Content of certificate

Each vessel's Permanent Certificate of Registry shall state the name of the vessel, official number, call sign, service and home port of Port Vila; the name of the person making the required declaration; the names, residences, citizenships, and proportion of the owners of the vessel; the former name or designation of the vessel; the year and place of the build of the vessel, the name of the builder; the number of masts and decks; the material of the hull, the type of her stern and stem; the kind of her propulsion; her length, depth, breadth, and height of the uppermost deck to the hull above the tonnage deck; her gross and net tonnage or tonnages; the name of the person or agent who measured the vessel and the number and date of the Certificate of Measurement issued by such person or agent[356].

Vanuatu compiles and retains all information required under the LRF proposal to the T-RFMOs (see Section 3.2) with the exception of operator and GRT.

Compliance with RFMO Vessel Data Requirements

Vanuatu, as a member of the WCPFC, is required to provide information on all Vanuatu-flagged vessels authorised to fish in the WCPFC Convention Area outside of Vanuatu's waters of national jurisdiction. With the exception of specifying vessel freezer types, Vanuatu met all WCPFC information requirements for its 82 vessels in 2008 providing information on: vessel name, registration number, port of registry, name/address of owner, name/nationality of master, IRCS number, vessel communication types and numbers (Inmarsat A,B, and C and telephone numbers), colour photograph of vessel, where and when vessel was built, type of vessel, normal crew

[356] Vanuatu Maritime Regulations, para 12

complement, type of fishing method(s), length, moulded depth, beam, GRT, power of main engines, carrying capacity, freezer number, fish hold capacity, form of fishing authorisation, authorisation number, specific areas authorised to fish, species authorised for, valid time periods for authorisation, and the number of days fished by each of its vessels in the previous year (fishing status during previous year)[357].

[357] WCPFC Secretariat. 2009. Compliance information requested by TCC5. WCPFC6-2009/IP06 (Rev.1)

ANNEX B1

Existing Standards for Vessel Classification Relevant to Fishing Vessels

IMO-related Standards

Safety of Life at Sea (SOLAS)

The IMO adopted a requirement in 1987 for all ongoing vessels of ≥100GT to have unique and permanent identification numbers. Vessels "solely engaged in fishing activities" were exempted from this requirement. At first the IMO encouraged voluntary implementation of the scheme by its Contracting Parties[358]. However, amendments to the International Convention for the Safety of Life At Sea (SOLAS XI-1/3) adopted in 1994 made the application of the numbering scheme a requirement for all passenger ships ≥100 GT and for all cargo ships ≥300 GT[359]. The requirement was extended to all ships subject to SOLAS in January 1996[360] (i.e. all fishing vessels are still exempted, though fishing vessels ≥100 GT can apply for IMO numbers on a voluntary basis).

SOLAS requirements for the safety of navigation (Chapter V) allow limited exemptions for all fishing vessels, as well as all ships <150 GT and ships <500 GT not engaged on international voyages[361].

Torremolinos Convention and Protocol (Torremolinos)

The Torremolinos Convention containing safety requirements for fishing vessels ≥24 m in length was adopted in 1977, however, due to lack of ratification it never entered into force. As a result in 1993, a revised instrument known as the Torremolinos Protocol was adopted and was subsequently ratified by 15 States with an aggregate fleet of approximately 3,000 vessels of ≥24 m length. The protocol will enter into force when ratified by 15 States with at least an aggregate fleet of 14,000 vessels ≥ 24 m length. The IMO is considering revising the Protocol to apply only to fishing vessels ≥24 m fishing on the high seas or in waters of another State in order to reduce barriers to ratification[362].

While the Protocol generally applies to vessels ≥24 m in length, some of the provisions apply only to vessels ≥45 m even though flag States may decide to apply them to all vessels ≥24 m. In addition, a regional agreement for East and Southeast Asia applies uniform safety guidelines to all vessels ≥24 m and <45 m, and a European regional agreement applies the Protocol standards to all vessels ≥24 m[363].

International Convention on Standards of Training, Certification and Watchkeeping for Fishing Vessel Personnel (STCW-F)

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[358] Resolution A.600(15) Section 1.

[359] http://www.imo.org/Conventions/contents.asp?topic_id=257&doc_id=647#30

[360] http://www.imo.org/Facilitation/mainframe.asp?topic_id=388

[361] http://www.icomia.com/technical-info/docs/SOLASV.pdf

[362] http://www.imo.org/newsroom/mainframe.asp?topic_id=246&doc_id=8877

[363] http://www.imo.org/home.asp?doc_id=675&topic_id=257

This Convention, adopted in 1995, has also not entered into force due to insufficient ratification[364]. Like Torremolinos, it also applies only to fishing vessels ≥24 m in length.

Code of Safety for Fishermen and Fishing Vessels

This voluntary code, adopted in 2005, covers the safety and health of fishermen, and the construction of fishing vessels ≥24 m in length.

Code on Intact Stability for all Types of Ships (ISC)

This voluntary code contains intact stability criteria for certain types of ships ≥ 24 m in length, including fishing vessels.

Voluntary Guidelines for Small Fishing Vessels

The IMO/FAO/ILO's Voluntary Guidelines for the Design, Construction and Equipment of Small Fishing Vessels refers to fishing boats between 12 m and 24 m in length. Other guidelines are under development for decked fishing vessels <12 m in length and undecked vessels of all sizes[365].

Other

The following other instruments are applicable to fishing vessels regardless of size[366]:

- 1972 International Regulations for Preventing Collisions at Sea (COLREG)
- International Convention for the Prevention of Pollution from Ships (MARPOL) 73/78

FAO Standards

International Standard Statistical Classification of Fishery Vessels by GRT Categories (ISSCFV)

This classification system is based on gross register tonnage (GRT) in major (exclusive) categories consisting of <1, <25, <50, <100, <150, <250 and <500 GRT (continues to higher classes)[367]. Note that FAO sources state that GRT:GT relationships are complex but that GT may be as much as four times the corresponding GRT figures[368], therefore it is impractical to relate the two measurements.

[364] http://www.imo.org/Safety/mainframe.asp?topic_id=1022

[365] http://legal.icsf.net/icsflegal/ControllerServlet?handler=theme&code=viewTheme&id=17

[366] SEAFDEC/SIDA. 2008. Report of the Expert Meeting on Fishing Vessel Registration. Phuket, Thailand.

[367] ftp://ftp.fao.org/FI/DOCUMENT/cwp/handbook/annex/annexL1ISSCFVgrt.pdf

[368] http://www.fao.org/fishery/cwp/handbook/L/en

FAO Feasibility Study

The results of an FAO Feasibility Study presented at the FAO Expert Consultation on the Global Record of Fishing Vessels (FAO 2008b) proposed that the GRFV begin with incorporating vessels of ≥100 GT, followed by vessels of ≥55 GT but <100 GT, and then finally by vessels of ≥10 GT but <55 GT[369]. No rationale was given for the 10 GT criterion. The 55 GT criterion was based on discussions at ILO for categorisation of work in the fishing sector on the basis that it equated to a length of 15 m and an LOA of 16.5 m.

[369] ftp://ftp.fao.org/docrep/fao/010/i0149e/i0149e00.pdf

Regional Fisheries Management Organisations (RFMOs)

The following class limits are specified by RFMOs with regard to authorisation to fish within their respective convention areas:

- ICCAT: since 2001 all vessels >24 m must be placed on the ICCAT Record of Fishing Vessels[370]; effective June 2010 this limit will be reduced to ≥20 m[371]. All vessels catching northern bluefin tuna must also be listed since 2008.
- IATTC: since 2003 all longliners >24 m must be placed on the ICCAT Regional Vessel Register[372]
- IOTC: requires all vessels >24 m (length overall), and if not >24 m but operating outside the EEZ of the flag State, to be placed on the IOTC Record[373]
- NAFO maintains a register of fishing vessels >50 GT authorised to fish in the Regulatory Area[374];
- CCSBT, WCPFC[375], CCAMLR, and NEAFC require all vessels regardless of size to be listed with the RFMO if fishing in the Convention Area (or, in the case of CCSBT, for the species of interest).

Japan Vessel Classification System

Japan has long maintained three categories of fishing vessels:

- *Enyo* (遠洋), or distant water, vessels are >120 GRT, have crews of 15-20, are at sea for periods of two to three months, and range throughout the world's oceans.
- *Kinkai* (近海), or offshore, fishing vessels are 10-120 GRT, have crews of less than ten, and are at sea for periods ranging from one week to one month in fishing grounds generally west of 180° longitude.
- *Engan*[376](沿岸), or nearshore, vessels are < 10 GRT, with as few as one fisherman onboard making trips of 1-7 days.

Note that Japan still uses Gross Register Tonnage (GRT) units for these definitions.

United States

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[370] http://www.iccat.int/Documents/Recs/compendiopdf-e/2002-22-e.pdf

[371] http://www.iccat.int/Documents/Recs/compendiopdf-e/2009-08-e.pdf

[372] http://www.iattc.org/PDFFiles2/C-03-07%20Longline%20vessel%20list.pdf

[373] http://www.iotc.org/files/proceedings/misc/ComReportsTexts/resolutions_E.pdf , page 112

[374] From Fitzpatrick, Annex IV document

[375] Only vessels operating outside of national waters

[376] *Engan* vessels may also be referred to as *kogata* (小型), or small-size, vessels. The terms can be used interchangeably.

The United States requires that all vessels ≥5 tonnes, engaging in fishing activities in United States waters, or in coastwise trade, require a certificate of documentation and a unique vessel identifier. The United States uses a unit of net tonnage[377].

(Note: other national vessel category definitions can be found within the 22 individual case studies in Annexes A1-A22).

[377] United States Coast Guard. 2010. National Vessel Documentation Center website. Accessed online at http://www.uscg.mil/hq/cg5/nvdc/nvdcfaq.asp#25

ANNEX B2

Vessel Categories Used in Tuna Regional Fisheries Management Organizations and their Units of Tonnage and Length

Regional Tuna Fisheries Management Organisation:	Key criteria for regional registration:	Tonnage measurement used	Length measurement used	Reference
Commission for the Conservation of Southern Bluefin Tuna (CCSBT)	• Oct 2003 to Oct 2004: all vessels >24 m • Oct 2004 – present: All vessels authorised to fish for Southern Bluefin Tuna (SBT)	Gross Registered Tonnage (GRT)	• Unspecified in resolution • Predominantly recorded as length overall (LOA).	• Resolution adopted at CCSBT11 (Attachment 12)
Inter-American Tropical Tuna Commission (IATTC)	• 2000-present: All vessels authorised to operate in IATTC waters • 2003 to present: All longline fishing vessels >24 m authorised to fish for tuna and tuna-like species	Gross Tonnage (GT)	• Unspecified in some resolutions, LOA in others	• Resolution C-00-06 (general) • Resolution C-03-07 (longline) • Document 75-15
International Commission for the Conservation of Atlantic Tunas (ICCAT)	• 2001 to 2010: all authorised fishing vessels >24 m • From June 2010 all vessels ≥20 m in length and authorised to fish for tuna and tuna-like species in the Convention Area. • 2008 to present: all vessels authorised to catch Northern Bluefin Tuna (No minimum size limit).	GRT and, where possible (as of June 2010) GT	• Unspecified at present, but will be LOA as of June 2010	• Rec 00-17 • Rec 02-22 • Rec 09-08 • Rec 08-05
Indian Ocean Tuna Commission	• All authorised fishing vessels having length overall ≥24 m and fishing vessels having LOA <24m which operate outside the EEZ of their flag country.	2001-2002: GRT or GT (Res 01/02) 2002 – 2007: GRT (Res 02/05 and 05/02) 2005-2007: GRT or GT (Res 05/04) 2007 – Present: GT (Res 07/02 and 07/04)	• 2001-2002: >24 m LOA (or >20 m length between perpendiculars) • 2002 – present: LOA	• Resolution 01/02 • Resolution 02/05 • Resolution 05/02 • Resolution 05/04 • Resolution 07/02 • Resolution 07/04
Western and Central Pacific Fisheries Commission	• 2004-Present: All vessels authorised to operate outside national waters within the Convention Area. (No minimum size limit)	GRT	• Unspecified	• WCPFC CMM2004-01