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BEST PRACTICE STUDY OF CATCH DOCUMENTATION SCHEMES

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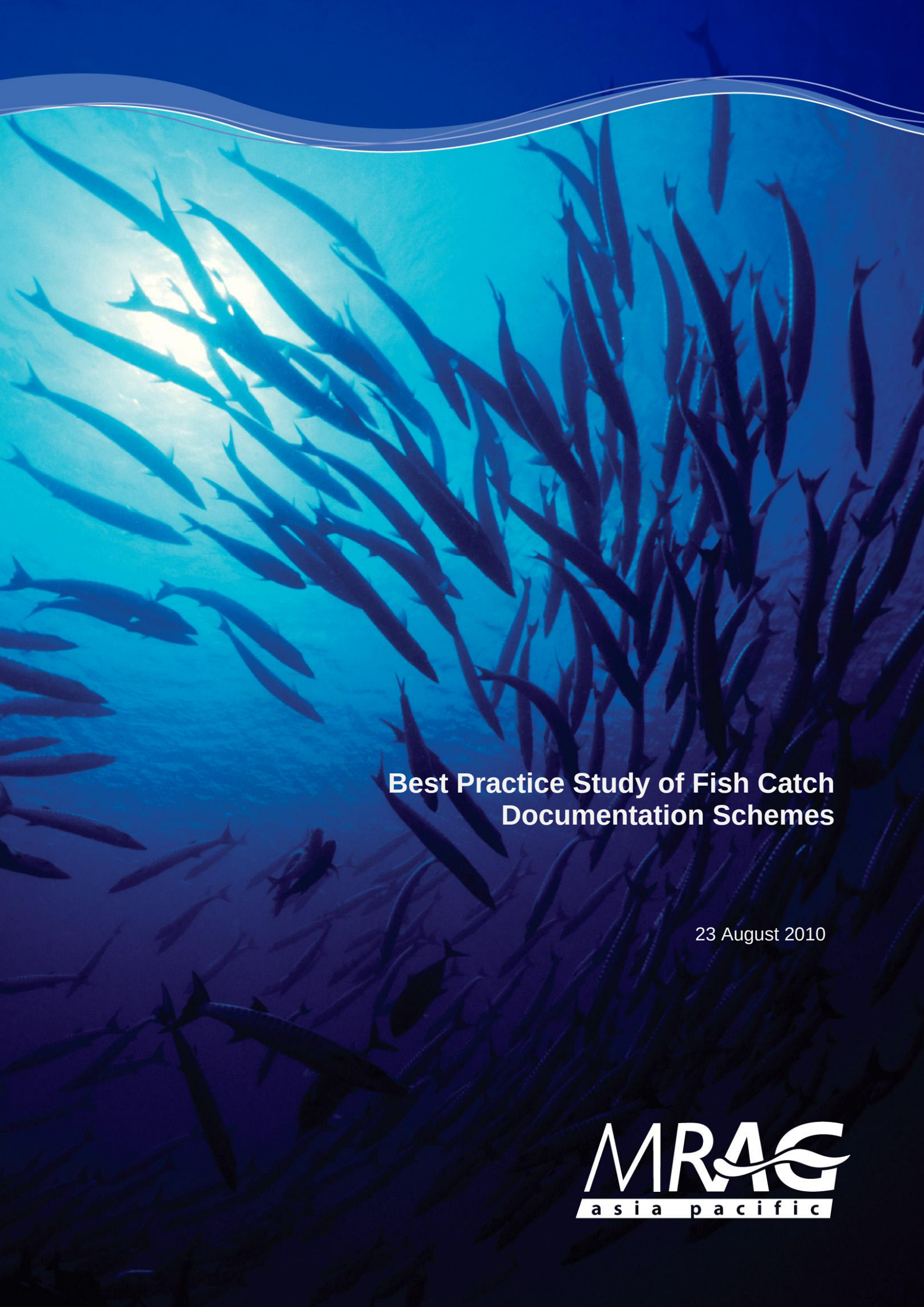

Best Practice Study of Fish Catch Documentation Schemes

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Forward and Acknowledgments

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Executive summary

Trade-based measures are one of a number of monitoring, control and surveillance (MCS) tools, for combating illegal, unreported and unregulated (IUU) fishing activities. One important type of trade-based measure consists of catch and trade documentation schemes developed by Regional Fisheries Management Organizations (RFMOs). As these schemes continue to evolve, they are being supplemented by other nationally- or regionally-based documentation systems such as the European Union (EU) regulation to prevent, deter and eliminate IUU fishing. Implemented in January 2010, the EU IUU regulation recognises certain RFMO schemes as complying with its requirements, however, fish from unrecognised RFMO schemes must provide both RFMO and EU documentation. For this reason, improvements to existing schemes and development of new schemes should take account of and aim to fulfil the requirements of the EU IUU regulation where possible. This report reviews and compares the requirements of all of the RFMO schemes and the EU IUU regulation to identify current best practice as well as gaps inhibiting effective performance. It then assesses the operational performance of three RFMO schemes and makes specific recommendations for the development of a scheme for the Western and Central Pacific Fisheries Commission (WCPFC).

A summary of the development and key characteristics of existing schemes is provided in Section 2. These schemes include those established by the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) for toothfish; the Commission for the Conservation of Southern Bluefin Tuna (CCSBT) for southern bluefin tuna; the Inter-American Tropical Tuna Commission (IATTC) for bigeye tuna; the International Commission for Conservation of Atlantic Tunas (ICCAT) for northern bluefin tuna, bigeye tuna and swordfish; and the Indian Ocean Tuna Commission (IOTC) for bigeye tuna. Linkages between the schemes are traced and the implementation of important innovations is highlighted. A concise introduction to the key features of the EU IUU regulation is also presented.

The history of efforts to harmonise existing RFMO trade and catch documentation schemes is reviewed in Section 3. Although harmonisation efforts began with attempts at standardisation of forms, the need for format standardisation has been eclipsed by the need for consistency and compatibility of information across schemes. In addition, recent developments emphasise that scheme improvement is the primary objective, and that harmonisation should thus be applied to move schemes toward higher rather than lower standards. Despite minor differences in the wording of their objectives, all the existing schemes have an overall consistency of purpose. However, differing perspectives on the role of the schemes in combating all three elements of IUU fishing (i.e. illegal, unreported and unregulated), in particular whether or not they should be used to check the compliance of vessels authorised to fish by RFMO members, is expected to be a continuing topic of debate for some schemes.

A framework to compare the schemes and elucidate current best practices and gaps is described and applied in Section 4. This framework is comprised of three components, each with several criteria, against which each RFMO scheme and the EU IUU regulation are assessed:

- Inclusivity - the extent to which the scheme is designed to provide documentation for all legally-caught fish of the species/fishery in question.
- Impermeability - the extent to which the scheme is designed to exclude illegal fish.
- Verifiability - the extent to which the scheme is audited by those other than the parties directly responsible for filling out and validating the forms.

The assessment results in over 20 specific recommendations to be considered while reforming existing schemes and developing new ones. Several areas are identified for which the standards implicit in the design of the EU IUU regulation appear to be higher than those adhered to in some of the RFMO schemes. Potential discrepancies include exemptions for

tagged fish, specification of the dates of catch and live weight of catch, and control of fish mixing. There are also examples of where the RFMO schemes have set a higher standard than the EU IUU regulation (e.g. unique document numbers, electronic document systems, specification of catch location, and third party audit/oversight). Finally, areas are identified for which both the RFMO schemes and the EU IUU regulation could be better articulated and/or improved. These areas include checks on a vessel's authorisation to fish and registration number; stricter rules for traceability of split catches and shipments; prohibition against re-directed rejected shipments; and periodic, empirically-based programme reviews.

Section 5 of this report provides a review of the operational performance of the CCAMLR toothfish CDS, the ICCAT bluefin tuna CDP and the CCSBT southern bluefin tuna CDS in terms of practicality, effectiveness and transparency. The latter factor was included because transparency, and its corollary accountability, are essential for building trust in RFMO processes among both member and non-member governments and in broader civil society.

The CCSBT southern bluefin CDS was implemented very recently and thus the review was based in part on the performance of the CCSBT TIS. The practicality of the CCSBT TIS was confirmed by the high level of compliance achieved by most members and cooperating non-members and the fact that no major individual member performance issues were highlighted. However, the considerable expansion of the scheme under the newly implemented CDS will test the compliance commitments of members and the resources of the Secretariat to administer the system. The effectiveness of the TIS as a catch monitoring tool was severely compromised by its design as a trade-based, rather than catch-based, scheme. The primary tangible result of the TIS has been to identify several unauthorised fishing vessels, although the Secretariat believes it was also instrumental in improving Member's catch reporting and encouraging new member and cooperating non-member applications. Fortunately, major drawbacks in the effectiveness of the TIS have been addressed with the implementation of the CCSBT CDS which appears to have great potential for monitoring compliance with CMMs including total allowable catch limits. Since the Secretariat is responsible for receiving all data submissions, checking these for completeness and against each other, and reporting the results to all CCSBT Members and the public, the CCSBT schemes were considered to operate with a reasonable and appropriate level of transparency.

The CCAMLR toothfish CDS has proven itself to be practical since its early stages and has recently been successful in converting to a fully electronic format. The effectiveness of the scheme is demonstrated by its high level of compliance among participating States, its contributions to scientific estimates of IUU catches for use in stock assessment, and its record in supporting several major enforcement actions against IUU fishing by CCAMLR member States. Recent data suggest that the quantity of IUU catch leaking from the CDS via trade between two non-participating and/or non-compliant parties is less than 6%. Considerable effort has been, and continues to be, required to secure the participation of flag, port and trade States which were not originally parties to the CDS and this, in combination with a trend toward a growing number of States importing toothfish, presents an ongoing challenge to the scheme. The only apparent weaknesses in the CCAMLR CDS arise from shortfalls in CDS implementation either because flag, port or trade States refuse to participate at all, or fail to implement all components of the scheme in a rigorous manner. While the CCAMLR Secretariat is not mandated to undertake checking and analysis of the CDS data, it nevertheless does perform these functions and thus the scheme does provide for unbiased analysis and transparent reporting across all Parties. CCAMLR's annual publication of summarised versions of all CDS data sets represents the greatest degree of catch and trade data disclosure among the schemes reviewed.

The ICCAT CDP grants the Secretariat no specific mandate for oversight or analysis of the CDP data. Instead, it concentrates enforcement capacity in the CPCs receiving bluefin (i.e. importers) by vesting in them the power to reject or accept shipments based on CDP documentation as well as the authority to bring any non-compliances to the attention of the

Compliance Committee. In this way, the CDP is less of an objective and comprehensive monitoring system, and more of a tool for some CPCs to monitor the catch and trade behaviour of others. Such a structure is not only non-transparent, it is vulnerable to inconsistencies and conflicts of interest. Although ICCAT claims the CDP is comprehensive, an exemption for tagged fish renders up to 17% of the catch potentially invisible to the scheme. This factor in combination with missing, delinquent or erroneous document submissions by CPCs have resulted in coverage of only 50-60%. The ICCAT CDP has been used as the basis for quarantining over 2,300 t of bluefin imports, and for releasing over 800 t of bluefin from farms. While these incidents demonstrate that the CDP is effective in identifying some improperly documented, and possibly IUU, bluefin, its overall effectiveness in deterring IUU activities remains unknown.

The final section (Section 6) outlines a framework for a CDS for the WCPFC. Many details have yet to be specified, and will need to be discussed and agreed among WCPFC members before the full scheme takes shape, nevertheless the scheme as proposed here can be summarised as follows:

- Scheme objectives should include catch monitoring, scientific information and traceability.
- Two documents should be required: a catch document required when fish are transhipped, landed, imported, exported and re-exported; and an export/re-export document required when fish are traded internationally after landing.
- Documents should be required for all catches of bigeye and yellowfin tunas (can be recorded as a mixture, if necessary) with the possible exception of artisanal catches which are not exported (for which annual reporting of exempted quantities should be required).
- Any tagging activities should supplement, rather than replace, the necessary catch and export/re-export documents.
- All CDS documents should be validated by a government authority.
- In order to be compatible with the EU IUU regulation, catch documents should be validated by the flag State; otherwise special arrangements for charter State validation will need be agreed before the WCPFC CDS catch documents will be recognised by the EU.
- All catch and export/re-export documents should be validated and all validated documents issued and received should be copied to the Secretariat.
- The Secretariat should enter all data into a database and prepare six-monthly reports which summarise, reconcile and monitor the data and the scheme.
- Raw data in the database should be confidential to the Secretariat and the member which validated the document, unless permission is granted by that member for the data to be released.
- The Secretariat should prepare and publish public summaries of CDS catch and import/export data by country/entity on an annual basis.
- The need for an electronic system should be agreed and a schedule proposed for its development and implementation.

- The scheme should specify a performance review process and schedule, and a procedure under which the recruitment of new participants to the scheme (e.g. new port or trade States) can be undertaken.

There do not appear to be any issues which will require any delays in implementation of the scheme once agreed. In fact, many of the necessary notification, validation and verification systems should already have been created by flag, port and trade States in response to the recent implementation of the EU IUU regulation. The Commission itself, in the form of the Secretariat, will shoulder much of the cost burden associated with the CDS. However, these costs will be offset by benefits expected to include strengthening of fisheries management, reinforcing external perceptions of the robustness of the MCS systems, and responding to international calls for catch documentation. The major cost is likely to be associated with document handling and data entry by the Secretariat but based on comparison to other CDSs, these costs would be expected to be limited to no more than one technician level position.

List of abbreviations and acronyms

ACP	African, Caribbean and Pacific Group of States
AIDCP	Agreement on the International Dolphin Conservation Programme
ASOC	Antarctic and Southern Ocean Coalition
BCD	Bluefin Catch Document (ICCAT)
BFTRC	Bluefin Tuna Re-export Certificate
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
CCSBT	Commission for the Conservation of Southern Bluefin Tuna
CDP	Catch Documentation Programme (ICCAT)
CDS	Catch Documentation Scheme
CITES	Convention on International Trade in Endangered Species
CMF	Catch Monitoring Form (CCSBT)
CMM	Conservation and Management Measure
COFI	Committee on Fisheries (United Nations)
COFI/FT	Committee on Fisheries/Subcommittee on Fish Trade (United Nations)
CPCs	Contracting Parties, Cooperating non-Contracting Parties, Entities and Fishing Entities (ICCAT)
CR	[European Union] Council Regulation
DCDs	*Dissostichus* Catch Document (CCAMLR)
e-CDS	Electronic Catch Documentation Scheme
EEZ	Exclusive Economic Zone
EPO	Eastern Pacific Ocean
EU	European Union
FAO	Food and Agriculture Organisation of the United Nations
FFA	Forum Fisheries Agency
FTE	Full-Time Employee
IATTC	Inter-American Tropical Tuna Commission
ICCAT	International Commission for the Conservation of Atlantic Tunas
ICES	International Council for the Exploration of the Sea
IMO	International Maritime Organization
IOTC	Indian Ocean Tuna Commission
IPOA	International Plan of Action
IUU	Illegal, Unreported and Unregulated Fishing
MCS	Monitoring, Control and Surveillance
NEAFC	North East Atlantic Fisheries Commission
NGOs	Non-Governmental Organisation
NMFS	National Marine Fisheries Service (United States)
NOAA	National Oceanic and Atmospheric Administration (United States)
PICs	Pacific Island Countries
REEF	Re-export/Export Form (CCSBT)
RFMOs	Regional Fisheries Management Organisations
SBT	Southern Bluefin Tuna
SCIC	Standing Committee on Implementation and Compliance

SCRS	Standing Committee on Research and Statistics
SDP	Statistical Document Programme
SVDCD	Specially-Validated *Dissostichus* Catch Document (CCAMLR)
TDS	Trade Documentation Scheme
TIS	Trade Information Scheme (CCSBT)
US	United States
VMS	Vessel Monitoring System
WCPFC	Western and Central Pacific Fisheries Commission
WTO	World Trade Organization

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1 Introduction

1.1 Trade-based Measures as Tools to Combat IUU Fishing

As the status of fish stocks around the world becomes more and more critical, the range of measures applied to combat threats such as illegal, unreported and unregulated (IUU) fishing has expanded. Monitoring, control and surveillance (MCS) tools such as lists of vessels authorised to fish, high seas boarding and inspection programmes, observer programmes, and vessel monitoring systems have recently been bolstered by the creation of a variety of vessel blacklists by Regional Fisheries Management Organisations (RFMOs) and individual countries (Kirkwood and Agnew 2007). Among other objectives, these tools are designed to prevent IUU fishing before or as it occurs. Downstream measures, designed to penalise the perpetrators and products of IUU fishing activities not thwarted at sea, have also been developed in the form of port State and trade-based measures.

Port State measures consist of actions directed toward vessels in port. These may consist of refusing port access and services to individual vessels believed to have violated regulations (Baird 2005) or requiring prior notice and clearance of all landings from a given fishery as a matter of course (e.g. NEAFC 2009). The text of an international, legally-binding instrument on port State measures was recently agreed by a group of 91 countries and now awaits ratification by 25 States before entering into force (FAO 2009a). This initiative complements other ongoing efforts toward strengthening international standards for flag State responsibility and developing a global record of fishing vessels (FAO 2009b).

Trade-based measures consist of actions directed toward the products of IUU fishing and may include banning products from States found to be undermining fishery management (e.g. resolutions by ICCAT encouraging trade measures by Contracting Parties against certain States (Le Gallic 2008)), or rejecting individual shipments which lack documentation required to establish their legal provenance (e.g. the United States' implementation of the CCAMLR catch documentation scheme for toothfish (NOAA 2003a, CCAMLR 2005)). As these examples indicate, Regional Fisheries Management Organizations (RFMOs) have served as the proving ground for both trade bans and the development of catch and trade documentation schemes for some key species. Another major development in documentation systems occurred with implementation of the European Union's (EU) regulation to prevent, deter and eliminate IUU fishing in January 2010 (European Union 2008, 2009a, 2010). This regulation, which requires documentation for imports of all wild-caught, non-ornamental marine fish, will add a broad spectrum, nationally-based documentation system to the arsenal of internationally-agreed, species-specific RFMO trade-based measures.

1.2 Terminology for Types of Fish Documentation Systems

This study focuses on those trade-based measures which document fisheries products as deriving from authorised fishing activities. The terminology used to describe such measures is often inconsistent and thus can be confusing. Based on a number of definitions including those in COFI (2008) the following classification is proposed for use in this study:

- **Catch documentation schemes** cover all fish from the point of first capture by a flag State through international trade routes (i.e. imports, exports and re-exports) if applicable, and/or farming operations if applicable, to the State of final destination;

- **Trade documentation schemes,** also referred to as **statistical document programs**, are similar in scope to catch documentation schemes but apply only to those fish which enter international trade.

The key difference between the two types of schemes is that under trade documentation schemes, documentation is not required for fish which are landed (without being imported) and consumed in the country of landing. A fundamental criticism of trade documentation schemes is thus that they exclude a large portion of the fish being targeted by the scheme, thereby making it theoretically impossible to match fish quantities documented by trade documentation schemes and actual catch quantities. This has led to a general agreement that current trade documentation schemes have major shortcomings and that movement toward catch documentation schemes is needed (Joint Tuna RFMOs 2007a).

Catch documentation schemes, i.e. trade-based measures, should not be confused with catch certification schemes which are a form of port State measure. For example, under the North East Atlantic Fisheries Commission (NEAFC) regulations, catches must be certified by the flag State as being within quota, properly reported, derived from authorised fishing operations, and originating in an area confirmed through Vessel Monitoring System (VMS) data before they can be landed or transhipped in ports of contracting parties (NEAFC 2009). These procedures involve using documents to prove that landed and transhipped catches meet the requirements at landing (European Commission 2010) and constitute a catch certification scheme, a kind of port State measure. They do not constitute a trade-based catch documentation scheme because the documents do not accompany the fish into onward trade. In contrast, the EU's new IUU regulation requires that a catch certificate be supplied prior to landing in EU ports and that such a certificate accompany landed fish through subsequent trade channels which lead to EU markets. The EU regulation thus combines elements of both port State (catch certification) and trade-based (catch documentation) measures.

It is important to recognise that catch documentation schemes are designed to provide evidence that fish have been caught legally and in compliance with applicable regulations and management measures. However, such documentation is not designed to verify that the fish catch is sustainable, nor that it meets health and sanitary requirements. The former issue requires an eco-labelling approach which may encompass IUU fishing issues but would necessarily include other factors not covered by catch documentation schemes such as evaluations of stock status, ecosystem effects and/or the robustness of management procedures. Health and sanitary issues are covered by existing health and veterinary regulatory systems (see Clarke 2009), and although health and sanitary forms may contain some of the same information, they have no direct connection to catch documentation schemes.

1.3 Purpose and Objectives of this Study

The purpose of this study is to review the current status of RFMO trade and catch documentation schemes in order to assist efforts aimed at improving existing schemes and developing new schemes. This study assumes, as its starting point, that trade or catch documentation schemes are a necessary element in the fight against IUU fishing activities. While a broader review of the efficacy of various types of measures used to combat IUU fishing (e.g. MCS measures versus port State measures versus trade-based measures) may be useful, addressing all of these topics is beyond the scope of this study. Issues of whether trade or catch documentation schemes can or do provide a price premium for their products are also considered to be beyond the scope of this study.

This study has three components as follows:

- The first component provides a comparative, function-based review of the existing RFMO trade and catch documentation schemes and the EU IUU regulation. This type of analysis may be particularly useful for initial discussions regarding the development of new schemes aiming to satisfy both RFMO and EU requirements. This analysis is based solely on publicly available materials and focuses on the schemes' design rather than submitted data.

- The second component examines, to the extent possible, the data submissions and the current and potential use of these data under three schemes: the bluefin tuna Catch Documentation Programme (CDP) under the International Commission for the Conservation of Atlantic Tunas (ICCAT), the southern bluefin tuna Trade Information System (TIS) and Catch Documentation Scheme (CDS) under the Commission for the Conservation of Southern Bluefin Tuna (CCSBT), and the toothfish Catch Documentation Scheme (CDS) under the Commission for the Conservation of Antarctic and Living Marine Resources (CCAMLR). This analysis aims to assess whether the potential functionality identified in the first component is actually being achieved.

- The third component applies the findings of the above analyses to the specific case of scheme development for the Western and Central Pacific Fisheries Commission (WCPFC).

2 A Brief Review of Catch and Trade Documentation Schemes

2.1 Purpose of this Review

As there is already a large volume of literature available on this topic, this review attempts to provide three specific, new contributions:

- A brief, clear, and readable summary of the development and key characteristics of existing schemes;
- An up-to-date description of important developments in trade-based measures through June 2010; and
- A functional review of how current systems can and do perform against reasonable expectations of what a trade-based scheme can deliver.

This review does not analyse the costs and benefits of each scheme, nor does it attempt to examine whether any of the schemes constitute barriers to trade. Given the lack of evidence to the contrary, it is assumed that all currently implemented schemes are cost-effective and not unfairly trade-restrictive.

2.2 Introduction to the Schemes being Reviewed

There are many sources of information about the various trade and catch documentation systems currently in place, i.e. those established by CCAMLR, CCSBT, the Inter-American Tropical Tuna Commission (IATTC), ICCAT, and the Indian Ocean Tuna Commission (IOTC) and the EU regulation to prevent, deter and eliminate IUU fishing. A summary of information sources describing details of the schemes themselves, reviews of individual scheme's performance, and comparative reviews among schemes is given in Table 1. The Western and Central Pacific Fisheries Commission (WCPFC) has yet to develop a trade or catch documentation scheme and is therefore not shown.

A programme designed to certify tuna as dolphin-safe under the Agreement on the International Dolphin Conservation Program (AIDCP) was considered by an FAO-led expert consultation to be "significantly different from programmes adopted by the other RFMOs, in that its primary purpose is unrelated to efforts to combat IUU fishing" (FAO 2002). For this reason, the AIDCP certification is not included in this study.

Given the volume of existing literature, there is clearly no need to re-summarise each individual scheme here. Instead, an overall review tracing the initial establishment of schemes in each of the five RFMOs as well as how new features have been adopted by one scheme and then been assimilated by others is presented (Figure 1)[1]. Since the following discussion describes the major developments and themes, and is not intended to describe every modification to each scheme, please refer to the sources in *Table 1* for more detailed information.

[1] Even though the terminology varies from one RFMO to another, in the following discussion all citations of RFMO conservation and management measures refer to instruments which are binding on all contracting parties.

Table 1. Current status of RFMO Catch and Trade Documentation Systems and the EU Regulation to Prevent, Deter and Eliminate IUU fishing as of June 2010. Schemes which have been superseded, i.e. the ICCAT bluefin tuna SDP and the CCSBT TIS, are not shown. (CDP – Catch Documentation Programme; CDS – Catch Documentation Scheme; SDP – Statistical Document Programme, TIS – Trade Information System)

Scheme Name	*Date of Implementation*	*Date of Last Update*	*Scheme Description*	*Scheme Analysis/Review*
CCAMLR toothfish CDS	May 2000	Nov 2009	CCAMLR (2009a)	Agnew (2000); Lack and Sant (2001); Sabourenkov and Miller (2004); Baird (2005)
CCSBT southern bluefin tuna CDS	Jan 2010	Oct 2009	CCSBT (2009a)	Joint Tuna RFMOs (2009a, 2010)
IATTC bigeye tuna SDP	Mar 2003	Jun 2003	IATTC (2003)	Joint Tuna RFMOs (2007b, 2009a)
ICCAT bluefin tuna CDP	Jun 2008	Nov 2009	ICCAT (2007a, 2008a)	Joint Tuna RFMOs (2007b, 2009a, 2010)
ICCAT bigeye tuna SDP	Sep 2002	Nov 2001	ICCAT (2001a)	Joint Tuna RFMOs (2007b, 2009a)
ICCAT swordfish SDP	Sep 2002	Nov 2001	ICCAT (2001b)	Joint Tuna RFMOs (2007b, 2009a)
IOTC bigeye tuna SDP	July 2002	Dec 2003	IOTC (2001, 2003)	Joint Tuna RFMOs (2007b, 2009a)
EU IUU Regulation	Jan 2010	Jan 2010	European Union (2008, 2009a, 2010)	Baumüller (2010)
(Various)	-	-	-	FAO (2002); COFI (2004, 2006, 2008); Joint Tuna RFMOs (2007b, 2009a); Kirkwood and Agnew (2007); Lack (2007, 2008); Le Gallic (2008); Roheim and Sutinen (2006).

2.3 In the Beginning: the ICCAT bluefin SDP and its offspring

The ICCAT bluefin (*Thunnus thynnus*) SDP was the first of the catch- or trade-based documentation schemes and was implemented in September 1992. This scheme, like all of the SDPs which flowed from it, i.e. the ICCAT swordfish (*Xiphias gladius*) SDP, the ICCAT bigeye tuna (*Thunnus obesus*) SDP, the IOTC bigeye SDP and the IATTC bigeye SDP, only applied to fish which were imported (i.e. domestic landings were excluded) (ICCAT 1992). In addition, imported fish could be exempted from the requirement to show a statistical document when they were tagged by the exporting State, or recorded in an ICCAT-approved logbook or database (ICCAT 1992; Joint Tuna RFMOs 2007a). When the ICCAT bluefin SDP was first established, it only applied to frozen products, but it was extended to fresh products in 1993 (ICCAT 1993a). An amendment agreed in 1994 required Parties to ICCAT to submit statistical documents for imports of bluefin regardless of whether the bluefin was

harvested in the ICCAT Convention Area (ICCAT 1994a, b). Over the years of its operation, other modifications were made to the scheme on a regular basis, but one particularly significant amendment was agreed in 1997 requiring documentation of re-exports in addition to imports, and cross-checking of import and re-export documents and quantities (ICCAT 1997).

When ICCAT established the swordfish and bigeye SDPs in 2001, the requirements for both import and re-export documentation were included in both schemes (ICCAT 2001a, b). However, fresh fish were excluded from the ICCAT bigeye SDP. In order to expand the coverage and effectiveness of the bigeye SDP, ICCAT asked for IATTC and IOTC to consider adopting compatible schemes (IATTC 2002). This was agreed by IOTC in 2001 (IOTC 2001) and by IATTC in 2003 (IATTC 2003). These two additional bigeye SDPs were in effect identical to the ICCAT bigeye SDP, maintaining the requirements for both import and re-export documents and excluding fresh bigeye. The ICCAT SDPs' data requirements were updated in 2003 to include information on catching vessel length and time of harvest (ICCAT 2003). This was reportedly aimed at avoiding forgery or misinformation, and at facilitating better implementation of the scheme. These changes were subsequently reflected in an amendment to the IOTC bigeye SDP (IOTC 2003) but no change was made to the IATTC bigeye SDP.

Another major amendment was made to the ICCAT bluefin SDP in 2006 (ICCAT 2006a). This amendment requires that flag States issue statistical documents only when "the accumulated export amounts are within their quotas or catch limits of each management year, and comply with other relevant provisions of the conservation and management measures". This resolution also required that importers only accept statistical documents which have been issued in compliance with this provision. This measure appears to have been carefully worded to address the need for quota control expressed by some Parties but at the same time overcome objections voiced by other Parties. The objectors insisted that it is the sole responsibility of the flag State to maintain catches within its quota, and that any attempts by other Parties to interfere with or provide oversight to this process could lead to unilateral and discriminatory trade measures. This amendment was not applied to the ICCAT bigeye or swordfish SDP nor was it adopted by IOTC or IATTC.

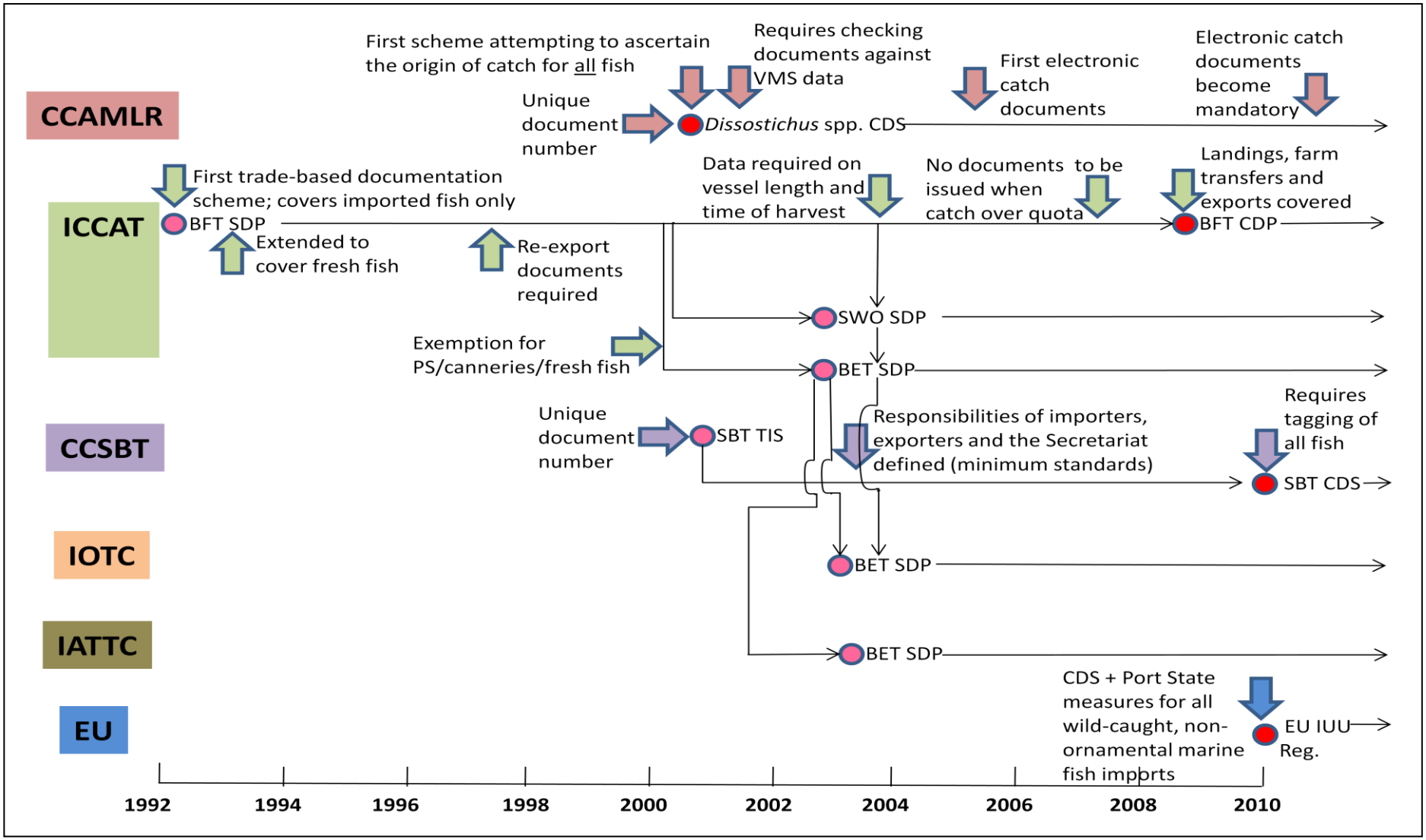

Figure 1 Establishment of trade (pink circles) and catch documentation schemes (red circles), and development of their key features, in five Regional Fisheries Management Organizations (RFMOs) and the European Union's Regulation to Prevent, Deter and Eliminate IUU Fishing.

2.4 Meanwhile in the Southern Ocean: CCSBT and CCAMLR developments

Meanwhile in the southern ocean two other RFMOs were developing trade and catch documentation schemes for different species. CCSBT instituted a Trade Information System (TIS) for southern bluefin tuna (*Thunnus maccoyii*) in June 2000. This system has many elements in common with the ICCAT bluefin SDP including requirements for both import and re-export documentation at a similar level of detail, and coverage of the species regardless of the area of harvest. Despite these general similarities, the CCSBT TIS developed four key features which distinguish it from the ICCAT SDPs. The first of these is the requirement for a unique number on each document as means of preventing fraud. The second feature involves providing specific instructions for handling farmed tuna and requiring that farmed and wild quantities be recorded separately. The third key difference from ICCAT's SDPs is CCSBT's TIS requirement for exporters, as well as importers, to submit data to the Secretariat for comparison and reconciliation. Finally, in an October 2003 amendment to the scheme, CCSBT instituted minimum standards for completion of the documents specifying the responsibilities of the importers, exporters and the Secretariat for ensuring the information on the documents is correct and complete (CCSBT 2006).

In May 2000, just one month prior to implementation of CCSBT's TIS, CCAMLR instituted the world's first catch documentation scheme (CDS) (Agnew 2000, Sabourenkov and Miller 2004, CCAMLR 2009a). Unlike all other schemes up until this point, the CCAMLR CDS for Patagonian toothfish (*Dissostichus eleginoides*) and Antarctic toothfish (*Dissostichus mawsoni*) requires identification and verification of catch information against the vessel's authorisation to fish and, through an amendment in 2001, potentially through its vessel monitoring system (VMS) records (CCAMLR 2001a, Sabourenkov and Miller 2004). The CDS tracks landings and transhipments, and is linked to associated port State measures. It also covers trade by requiring that every import or export/re-export be accompanied by a valid export-validated or re-export validated, uniquely numbered document. After recognising that the scheme was being compromised by the lack of cooperation of some fishing and trading nations (CCAMLR 2000a), CCAMLR expanded the list of parties participating in the CDS to 24 (EU countries as of 2002 counted as 1) by June 2002. At this time, nine other non-participating parties were identified for attention, and by 2004 one of these, Canada, had also implemented the CDS (Sabourenkov and Miller 2004). Efforts to obtain the cooperation of non-participating/non-contracting parties are continuing with the current targeting of an additional 17 States (CCAMLR 2009b). CCAMLR was the first RFMO to establish a fund to channel the proceeds from the sale of seized toothfish into anti-IUU fishing projects (CCAMLR 2000b, CCAMLR 2001b) and to pilot electronic document submission and data management procedures (CCAMLR 2004a) which, as of June 2010, have become mandatory (CCAMLR 2009a).

2.5 Following CCAMLR's Lead: movement toward CDS in two tuna RFMOs

As implementation of the CCAMLR CDS proceeded, two other RFMOs continued to consider the need for full catch documentation systems. CCSBT was the first to decide to implement a catch documentation scheme for tuna in 2006 but the details were not agreed until 2008 and the scheme was not implemented until January 2010 (CCSBT 2009a). ICCAT established its Catch Document Program (CDP) for bluefin tuna in 2007 which became effective in June 2008 making it the first functioning catch documentation scheme for a tuna species (ICCAT 2007a). Both systems are broadly consistent with the CCAMLR CDS but include additional provisions for tracking activities related to fish farming.

The ICCAT bluefin CDP differs from the former ICCAT bluefin SDP in several ways (ICCAT 2007a). Unique document numbers are now required and Contracting Parties must now report total quantities landed, transferred to/from farms, imported, exported and re-exported, rather than only imports and re-exports, to ICCAT. Similar to the former ICCAT bluefin SDP, electronic document submission is encouraged but not required (ICCAT 2006b), and documents are not required for fish which are tagged (ICCAT 1992, ICCAT 2007a). The CDP, like the SDP, remains based on two forms: the Catch Document and the Re-Export Certificate. Minor amendments to these forms, and changes to procedures for caging of fish for farming and carry-over of farmed fish from one year to the next, have been agreed since the ICCAT bluefin CDP was implemented in June 2008 (ICCAT 2008a, 2009a).

In contrast, the CCSBT Catch Documentation Scheme (CDS), while covering a similar range of points along the supply chain as the ICCAT bluefin CDP, comprises five forms: a Farm Stocking Form; a Farm Transfer Form; a Catch Monitoring Form (for catch, [domestic] landings, transhipment, exports and imports of both wild and farmed SBT); a Re-export or Export after Landing of Domestic Product Form; and a Catch Tagging Form. The latter must be submitted in electronic format but the other forms may be either paper or electronic submissions. Under the new CCSBT CDS all southern bluefin must be tagged at the time of kill unless exceptional circumstances apply (CCSBT 2009a).

2.6 A Far Greater Impact on the Fish Trade: the EU's IUU regulation

Beginning in late 2007, the EU began consultation on a suite of measures designed to prevent, deter and eliminate IUU fishing. These efforts culminated in Council Regulation (EU) 1005/2008 enacted in September 2008 (European Union 2008). The regulation features elements of port State measures such as prior notification of landing, catch certification and vessel blacklists like the NEAFC Port State Control scheme, but also incorporates elements of catch documentation schemes like CCAMLR's and ICCAT's by requiring documents proving the legality of the catch before authorising its import to the EU. Although its elements are therefore not new, CR 1005/2008 is likely to have a far greater impact on the fish trade than any of the catch or trade documentation schemes currently in place. This is because the EU IUU regulation applies to all wild-caught marine fish, other than ornamental species, imported to the EU— a trade estimated to comprise over 7 million t of fish in 2007 (FISHSTAT 2010)[2]. Some sources have estimated imports of IUU fish into the EU each year at 500,000 t, worth as much as much as 1 billion Euros (European Commission 2007).

Despite the far-reaching scope of the EU's IUU regulation it does not necessarily apply to landings of fish by EU vessels, although catch certificates may be requested by non-EU members under a reciprocity clause contained in Article 15 of the regulation (European Union 2008). Otherwise, the regulation only applies to the trade of fish caught by EU-flagged vessels if those fish are first landed in a third country and then imported to the EU (for example, Spanish-caught Indian Ocean tuna landed in Mauritius for processing and exported to the EU). Fishing and fish trade activities within the EU (including national waters), and related activities of EU-flagged vessels operating outside of the EU, are regulated under a separate Control Regulation applicable as of 1 January 2010 (European Union 2009b). The extent to which implementation of these two separate regulations amount to different sets of rules for EU and foreign operators may lead to questions about compatibility with World Trade Organization (WTO) rules (Baumüller 2010). The potential for the EU's IUU regulation to create discriminatory trade barriers, as well as the cost and

[2] Some of this quantity may be intra-EU trade reported as imports by individual EU members (imports by Italy from Spain) and tallied in the database to present an EU import total.

capacity burden associated with compliance, are major concerns among developing countries (ACP 2009).

With regard to its proposed fish documentation systems, the EU regulation provides for catch documents issued under certain RFMO catch documentation schemes to be accepted in lieu of the catch certificates required by the regulation (CR 1005/2008, Article 13). Despite concerns raised by a recent report commissioned by the EU regarding transparency, variable standards of implementation and lack of a standardised means of independent audit in most existing RFMO schemes (Megapesca and Oceanic Développement 2009), the CCAMLR CDS and the ICCAT CDP have been recognised as being in compliance with the requirements of the EU IUU regulation[3]. CCSBT CDS documents will be also be accepted as equivalent to a catch certificate under the EU scheme if they are accompanied by an additional form on transport details (European Union 2009a)[4]. While this equivalency is useful for those involved in the catch and trade of toothfish and bluefin tuna, the overall impact is very small: if all fish from these fisheries are imported by the EU, they would represent approximately 73,000 t per annum[5], approximately 1% of total EU imports.

[3] Correspondence with the EU on behalf of this study failed to shed any light on why these and only these schemes were deemed fully compliant.

[4] It is noted that the EU's decision was based on the CCSBT CDS as defined in CCSBT (2008). An amendment to the CCSBT CDS in October 2009 (CCSBT 2009a) allows for validation by "a competent authority or institution of the chartering Member or Cooperating Non-Member" when the fishing vessel is operating under a charter arrangement. Since the EU has stated its firm position that validation can only be performed by the flag State (see http://ec.europa.eu/fisheries/cfp/external_relations/illegal_fishing/pdf/report_pacific_en.pdf, p.2. item 1 and http://ec.europa.eu/fisheries/cfp/external_relations/illegal_fishing/pdf/report_121109_en.pdf, p4. Item 2.6), it remains to be seen whether this amendment will create difficulties for acceptance of the CCSBT CDS documents by EU authorities.

[5] Based on average annual reported catches of Atlantic bluefin tuna, southern bluefin tuna, Patagonian toothfish and Antarctic toothfish for 2004-2008 in FISHSTAT (2010).

3 Harmonisation – History and Outlook

The preceding section has demonstrated that while various RFMOs have developed trade and catch documentation systems separately, many of them contain common features. This section describes past and present attempts at harmonising the schemes. Many of the harmonisation efforts described below were initiated without first defining their purpose or scope. As result, different views on the intent of harmonisation hindered progress. One view held that harmonisation should be primarily focused on standardisation of the document formats. These harmonisation efforts were motivated by a desire to reduce the paperwork burden on fishermen, traders, processors and government officials, as well as promote compliant submissions. As described below, many of the early attempts at harmonisation appeared to aim at this goal. According to another viewpoint, however, harmonisation was less about form and more about content. In this way of thinking, schemes should be compatible in the range of activities they cover and the verification functions they serve. This approach involves much more than a comparison of formats; it is premised on being able to define a set of common objectives for all schemes.

As the following chronology and outlook sections highlight, the second view appears to have emerged only after several years of discussion and still seems fraught with complications. However, as will be argued later in this report, major improvements in catch documentation will not be achieved unless there is a shift away from scheme-by-scheme format reviews and towards identifying the high-level objectives that all schemes seek to achieve. Other potential problems relating to species identification; effective scheme coverage; and flag, port and trade State responsibilities will also need to be addressed.

3.1 A Brief History of Harmonisation Efforts

The International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (IPOA-IUU) adopted by FAO's Committee on Fisheries in March 2001 contained two clauses relating to RFMO documentation schemes (**emphasis added**):

> *Clause 69.* *Trade-related measures to reduce or eliminate trade in fish and fish products derived from IUU fishing could include the adoption of multilateral catch documentation and certification requirements, as well as other appropriate multilaterally-agreed measures such as import and export controls or prohibitions. Such measures should be adopted in a fair, transparent and non-discriminatory manner.* ***When such measures are adopted, States should support their consistent and effective implementation****.*
>
> *and*
>
> *Clause 76.* ***Certification and documentation requirements should be standardized to the extent feasible****, and electronic schemes developed where possible, to ensure their effectiveness, reduce opportunities for fraud, and avoid unnecessary burdens on trade* (FAO 2001).

These calls for consistency and standardisation resulted in an FAO-led expert consultation in March 2002 on RFMO catch certification harmonisation. This consultation produced two lists of items (data) to be included in trade and catch documentation forms, respectively, and a recommended standard format, but did not document the rationale for including certain data items on the list (FAO 2002). The results of the expert consultation were discussed at

COFI and at COFI's Subcommittee on Fish Trade (COFI/FT) meetings in subsequent years but little progress was reported (COFI 2004, COFI 2006). The COFI/FT meeting in 2006 noted that a meeting of Regional Fisheries Bodies held in 2005 "acknowledged that catch documentation harmonization is a complex and highly technical issue and it is also necessary to ensure that schemes are kept simple, achievable and, as far as possible standardized." COFI/FT itself produced a table comparing the data requirements of the six SDP/CDS schemes against the FAO Expert Consultation recommendations and concluded that while the schemes were "broadly similar […] they cannot, however, be regarded as 'harmonized'" (COFI 2006).

By 2008 COFI/FT had concluded:

> *"there was little enthusiasm by RFMOs to modify the formats of the trade documents that are currently operational. […] Rather than attempt to harmonize the documents themselves, it may be possible to harmonize the information collected in the documentation scheme so that data from all TDS and CDS schemes are compatible. […] This would enable RFMOs to have consistent data, which could be used for cross-checking.*" (COFI 2008)

In its most recent recommendations on this topic (COFI 2009), FAO appeared to be stepping back from the issue and suggesting that its role in the harmonisation of catch documentation schemes should be limited to perhaps developing best practice and integrated traceability guidelines.

As the FAO has relinquished its lead on this issue, it has been taken up by the Joint Tuna RFMOs forum which held its first meeting in Kobe, Japan in January 2007. One of four priority actions agreed at this meeting was "harmonization and improvement of the trade tracking programs and, as appropriate, development of catch documentation including tagging systems as required" (Joint Tuna RFMOs 2007b).

The Kobe agreement led to a Joint Tuna RFMO Working Group on Trade and Catch Documentation Schemes (Joint Tuna RFMOs 2007a) in Raleigh, United States in July of the same year. In contrast to previous forums which had focused on comparing the existing SDPs, discussion centred on gaps in coverage of SDPs and the slow rate of progress in improving the SDPs. As a result, there was general agreement that "SDPs had major shortcomings and that movement to catch documentation schemes […] was needed". However, varying opinions were expressed regarding whether all RFMO-managed species should be covered by CDSs and regarding the pace of migration from SDPs to CDSs. A proposal was submitted to this meeting by Canada, the EU and US identifying eight elements of best practice in trade tracking programmes, presumably referring to the trade-based elements of both trade and catch documentation schemes. Japan submitted a proposal for a harmonised SDP for bigeye tuna applicable to all oceans (Joint Tuna RFMOs 2007a).

Since the 2007 Raleigh meeting, ICCAT discontinued its Atlantic bluefin SDP, replacing it with a CDP (ICCAT 2007a, 2008a) and CCSBT agreed to implement a CDS to replace its TIS for southern bluefin tuna (CCSBT 2008). Despite these two major but separate improvements in individual schemes, there was no progress on harmonisation to report at the Second Joint Meeting of Tuna RFMOs in San Sebastian in June 2009. Each RFMO presented a summary of the current state of play of its trade or catch documentation scheme (Joint Tuna RFMOs 2009a) and it was agreed to convene another working group on improvement and harmonisation of monitoring, control and surveillance measures to address, *inter alia*, extension of bigeye SDPs to cover fresh products and canneries, and minimum standards or best practices for CDSs (Joint Tuna RFMOs 2009b).

A workshop on improvement, harmonisation and compatibility of monitoring, control and surveillance measures, including monitoring catches from catching vessels to markets was

held in June 2010 and included presentations by the CCSBT and ICCAT Secretariats on their respective CDSs. Three issues were highlighted as special considerations in the expansion of CDSs to other species and other RFMOs. These included treatment of multi-species catches from purse seine fisheries, handling of fresh and chilled products, and potential exemptions for artisanal fisheries. It was recommended that CDSs be expanded to tuna species and sharks covered by RFMO CMMs, that tagging be considered for fresh and chilled products, and that simplified schemes be developed for artisanal fisheries. It was also recommended to develop a common/harmonised form for use across RFMOs. The importance of technical assistance and capacity building for developing countries for the implementation of CDSs was highlighted (Joint Tuna RFMOs 2010).

3.2 Outlook for Improvement and Harmonisation

During the process of developing RFMO trade and catch documentation schemes since 1992, and as a result of calls for harmonisation since 2001, three major shifts in thinking have emerged. These are:

- Harmonisation need not be focused on standardisation of forms and must be pursued in parallel with scheme improvements;
- The objectives of the various SDPs and CDSs are sufficiently similar that there already exists a compatibility of purpose between schemes; and
- The ability of a given scheme to provide meaningful data may be determined by whether the species of interest can be easily distinguished; whether the key States involved in the fishery or trade participate in the scheme; and whether the flag, port and trade States effectively implement the scheme.

Each of these is discussed separately below.

3.2.1 Harmonisation, not Standardisation per se, and Improvement

Although harmonisation efforts began with attempts at standardisation of forms, it is now acknowledged that this was not the best approach (COFI 2008). Early attempts were characterised by either producing a standardised format that lacked justification (e.g. FAO 2002) or failing to proceed beyond comparison of data fields across schemes (COFI 2006). These efforts were not particularly welcomed by RFMOs (COFI 2006, COFI 2008), and have become increasingly anachronistic with the introduction of electronic document systems in many aspects of international trade including some of the RFMO schemes themselves. One of the benefits of electronic document schemes is that if common information standards can be agreed amongst RFMOs, data from a variety of paper formats can be held in a single database format common to all RFMOs (COFI 2008). As a result, the need for format standardisation has been eclipsed by the need for consistency and compatibility of information across schemes.

Another concern inherent in harmonisation (and standardisation) is that it will lead to a lowest common denominator scheme. This danger was recognised by the 2007 Raleigh workshop and reflected in language calling for both harmonisation and improvement. The workshop also achieved consensus on the need to convert SDPs to CDSs, thereby shifting the focus of RFMO coordination in this area to upgrading the existing, problematic SDPs (Joint Tuna RFMOs 2007a). The agreements reached in Raleigh were further reinforced by work priorities agreed at the Second Joint Meeting of Tuna RFMOs in 2009, i.e. extension of SDPs and developing best practice standards for CDSs (Joint Tuna RFMOs 2009b). These latest developments emphasise that scheme improvement is the primary objective, and that harmonisation should thus be applied to move schemes toward higher rather than lower standards.

3.2.2 Fundamental Similarities in RFMO Trade and Catch Documentation Schemes

In parallel with the evolution of the concept of harmonisation, there is a growing recognition that the objectives of the various RFMO trade and catch documentation schemes are more similar than they are different. Early coordination efforts seemed to have been stymied by "[difficulties in developing] a harmonised document from the plethora of documentation schemes that exist, especially if the objectives, scope and history of those schemes are different" (COFI/FT 2002 cited in COFI 2008). However, by 2008, the same FAO body had concluded that "Despite some differences in wording, the main objectives of all RFMO TDS and CDS schemes are 1) to improve catch statistics for stock assessment purposes; and 2) to assist RFMOs in combating Illegal, Unreported and Unregulated (IUU) fishing" (COFI 2008).

Table 2 lists the objectives of the latest versions of each RFMO's scheme(s) and classifies each objective against the two consolidated objectives given in COFI (2008). Those objectives which relate to obtaining better estimates of catches or which otherwise link to scientific information, are classified under COFI (2008) Objective 1. Those objectives which specifically mention compliance or IUU, or relate to product traceability or trade are classified under COFI (2008) Objective 2. With the exception of one of the objectives of the ICCAT CDP (ICCAT 2007a which combines catch data and compliance (i.e. "to control catches to ensure compliance with conservation and management measures"), the two COFI (2008) consolidated objectives provide a framework which illustrates the strong similarities in the objectives of the various schemes. This analysis thus confirms the conclusion of COFI (2008) that all the existing schemes have an overall consistency of purpose despite minor differences in the wording of their objectives.

Two key points concerning the analysis in *Table 2* require further comment. The first relates to the expansion of COFI (2008) Objective 2 ("assist RFMOs in combating IUU fishing") to include compliance with RFMO conservation and management measures (CMMs) in general. In fact, contravention of RFMO CMMs by vessels flagged to States bound to comply with those CMMs through their membership in the RFMO is a form of "illegal" fishing, and thus a form of IUU fishing (FAO 2001). Furthermore, misreporting (under-reporting) of vessels which are authorised by RFMO-member States to fish in the RFMO's convention area is a form of "unreported" fishing and thus also a form of IUU fishing (FAO 2001). Therefore, it is clear that combating IUU fishing and maintaining compliance with CMMs are integrally related.

Table 2. Objectives of the latest RFMO trade and catch documentation schemes compared against the COFI (2008) objectives of improving catch statistics for stock assessment purposes (COFI (2008) Objective 1) and assisting in combating IUU fishing (COFI (2008) Objective 2).

Scheme (Date of Implementation)	Objectives	COFI (2008) Objective 1	COFI (2008) Objective 2	Reference
CCAMLR *Dissostichus spp*. CDS (May 2000)	• To track landings of, and the world trade in, toothfish caught both inside and outside the Convention Area. • To restrict access to international markets of toothfish taken by IUU fishing in the Convention Area. • To facilitate the determination of whether toothfish taken in the Convention Area were caught in a manner consistent with CCAMLR conservation measures.	✓	✓ ✓	Sabourenkov and Miller (2004)
IOTC bigeye tuna SDP (July 2002)	• To reduce uncertainty in total catch figures of bigeye tuna in the IOTC Convention Area, particularly with regard to "flag of convenience" vessels. • To assist the Commission's efforts to eliminate IUU fishing.	✓	✓	IOTC (2001)
ICCAT bigeye tuna SDP (Sept 2002)	• To reduce uncertainty in total catch figures of Atlantic bigeye tuna. • To assist the Commission's efforts to eliminate IUU fishing.	✓	✓	ICCAT (2001a)
ICCAT swordfish SDP (Sept 2002)	• To improve the reliability of statistical information on Atlantic swordfish, particularly with regard to non-Contracting Parties. • To assist the Commission's efforts to eliminate IUU fishing.	✓	✓	ICCAT (2001b)
IATTC bigeye tuna SDP (March 2003)	• To reduce uncertainty in total catch figures of bigeye tuna in the EPO, particularly with regard to "flag of convenience" vessels. • To assist the Commission's efforts to eliminate IUU fishing.	✓	✓	IATTC (2003)
ICCAT Bluefin Tuna CDP (June 2008)	• To control catches to ensure compliance with conservation and management measures. • To provide strict tracking from the point of capture to the final market. • To help support scientific research	✓ ✓	✓ ✓	ICCAT (2007a)[6]
CCSBT Southern Bluefin Tuna CDS (Jan 2010)	• To identify, quantity and/or validate the catch of Members, Cooperating Non-members and Non-Cooperating States. • To ensure traceability of legitimate product flow to the point of first sale. • To provide tools to restrict the trade of non-cooperating non-members.	✓	✓ ✓	CCSBT (2005)

[6] It is noted that subsequent ICCAT recommendations on the bluefin tuna CDS have deleted all references to the overall objectives of the scheme from the chapeau (ICCAT 2008, 2009a).

Despite this, many of the schemes seem primarily interested in curtailing fishing activities by vessels flagged to non-members (potentially "unregulated" fishing (depending on a number of other circumstances)), rather than using the scheme to check the compliance of vessels authorised by RFMO members to fish. For example, it was not until agreement of an amendment of the ICCAT bluefin SDP in 2006, thirteen years after implementation of the scheme, that validation of statistical documents for which the cumulative amount of catch exceeded the flag State's catch quota (a form of non-compliance with a CMM and thus a form of "illegal" fishing) was expressly prohibited. In fact most, if not all, of the trade documentation schemes (SDPs and the TIS) are targeted at verifying only the catch of non-members on the assumption that members accurately report their own catches[7]. While some RFMO members have begun to question this, other members have insisted that this limited scope is appropriate.

This difference of opinion appears to have been overcome when agreeing the ICCAT bluefin CDP and the CCSBT southern bluefin CDS: these schemes aim to cover all catches, not just those of non-members or those which enter international trade[8]. However, as will be discussed in Sections 4 and 5, implementation of these schemes does not always result in documentation of all catches. Furthermore, differing perspectives on the role of trade and catch documentation schemes in combating all three elements of IUU fishing (i.e. illegal, unreported and unregulated) continue to be an issue in the ongoing debate regarding conversion of the remaining SDPs to CDSs, and in the formulation of new schemes.

The second point of clarification regarding *Table 2* pertains to the degree of overlap between the objectives of improving catch statistics and combating IUU fishing. If, as discussed above, the term IUU fishing is used to refer to catches by non-members then it is sufficient to simply determine the identity (flag) of the fishing vessel and whether it was fishing inside the RFMO's convention area. If the objective of combating IUU fishing is more expansive and includes non-compliance with CMMs, potentially by vessels authorised to fish by RFMO members, then the data required to assess compliance may go beyond simple catch statistics to encompass issues such as whether an observer was present, whether transhipment occurred, and/or whether VMS requirements were met. In addition, objectives relating to obtaining better scientific information for stock assessment could be served by a narrower range of data requirements than full compliance monitoring (*Figure 2*). When designing trade and catch documentation programmes the complementarity of scientific and compliance objectives in trade and catch documentation programmes should be explicitly addressed, drawing suggestions for improvement from existing experience with linking catch and trade data (e.g. Restrepo 2004).

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[7] Two examples:
1) At CCSBT9 in October 2002 "Australia and New Zealand expressed concerns with the major weakness of the TIS scheme that was mentioned in the review, which is that it is a trade only scheme and does not record catches that are not exported to a CCSBT member, including Japan's entire catch. […] Japan pointed out that the original purpose of the TIS was to better account for the catch from non-members and that catch by the Members was already being reported" (CCSBT 2002).
2) At the 2nd Meeting of the ICCAT Working Group to Review Statistical Monitoring Programmes in April 2006 "Several suggestions [for improving the SDPs] were put forward including: using a secure internet site for rapid exchange of information between importing and exporting States; increasing the frequency of reporting to ICCAT; an electronic system to improve access to data; *providing cumulative catch information by flag States and chartering States on the ICCAT website; and monitoring of trade data by the importer or the Secretariat who would notify a flag State when it was approaching its quota limit (emphasis added)*. Many Parties had concerns with these suggestions, particularly the last two items, because they felt it was the sole responsibility of the flag State to maintain catches within its quota and any alleged failure to do so should be brought to the attention of the Commission via the Compliance Committee. There was also concern by some that the issue of catch data reporting was beyond the scope of the working group terms of reference" (ICCAT 2007b).

[8] The original ICCAT bluefin CDP chapeau notes "the need for improved and strict control on all the components involved in the bluefin tuna fisheries" (ICCAT 2007a). The CCSBT agreed "a performance measure that the CDS must be capable of accounting for at least 95% of all sources of fishing mortality of southern bluefin tuna" (CCSBT 2005).

It should be noted that the forthcoming EU IUU regulation is purely concerned with combating IUU fishing and does not aspire to improve catch statistics. There are currently no mechanisms proposed by which the large amount of data collected under the EU scheme will be used to improve, or otherwise cross-check, catch statistics and thereby improve the scientific basis for management.

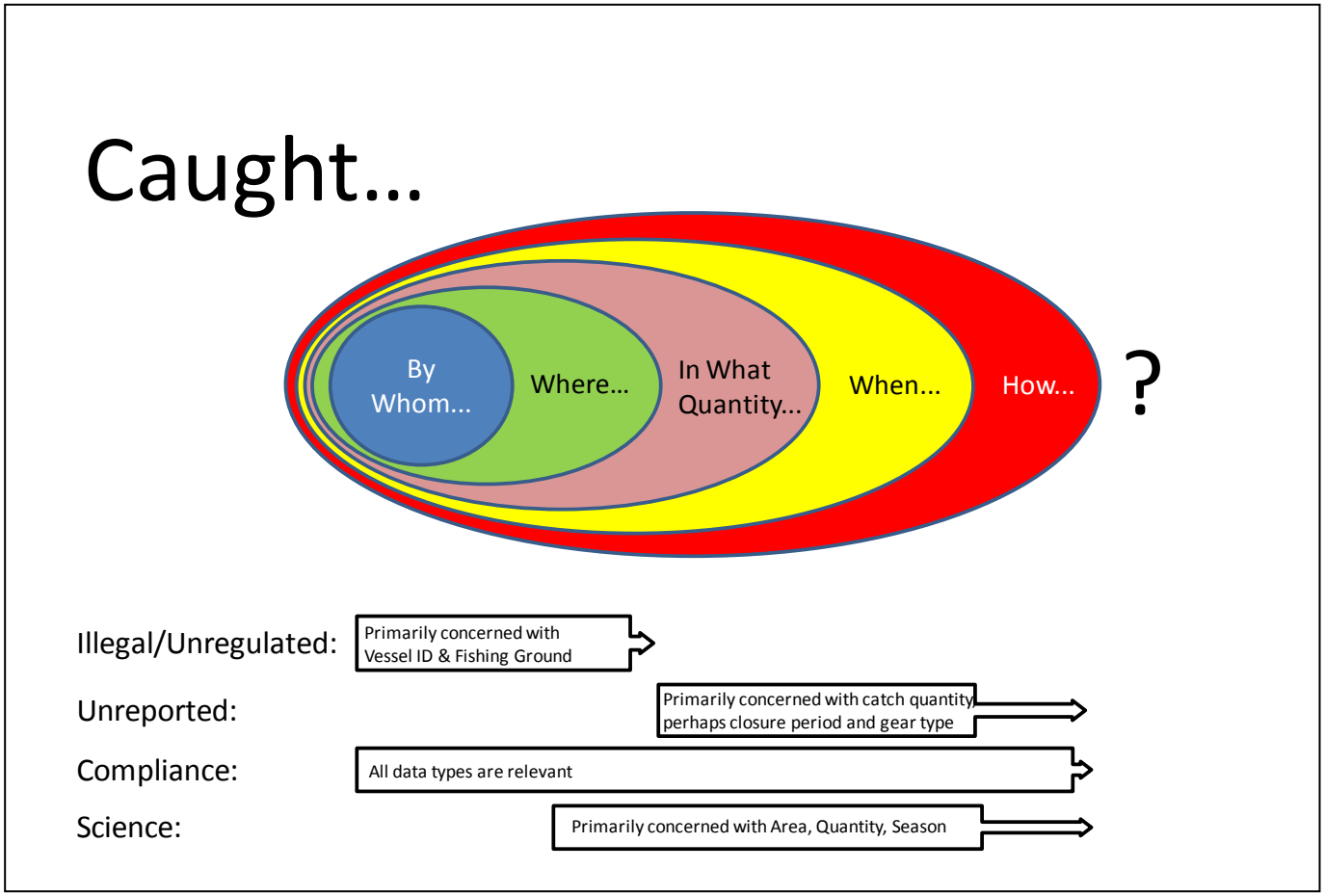

Figure 2. Schematic diagram of data types needed for compliance (illegal/unregulated vs unreported) and scientific purposes.

3.2.3 Differences in Species Identification, Effective Coverage of the Scheme and Flag/Port/Trade State Responsibilities

The preceding sections have described two emerging trends in thinking about trade and catch documentation schemes: that compatibility of objectives is more important than standardisation of forms; and that all of the existing RFMO schemes' objectives are already more similar than they are different. In combination, these factors suggest that harmonisation efforts should focus on achieving similar levels of functional performance among schemes, perhaps through identifying and applying current best practice, rather than modifying formats or objectives *per se*. Before pursuing this theme further in Sections 4-6, it is necessary to first acknowledge that accumulated experience with the existing schemes has highlighted weaknesses which are, at times, highly specific to the RFMO and fishery being covered. This section explores the prospects of overcoming RFMO-specific differences in the pursuit of effective and consistent scheme performance.

Species Identification

One of the major obstacles to improvement of the existing SDPs for bigeye, and to the expansion of trade and catch documentation systems to other species, is the ability to separate and identify the species of interest from mixed catches. This is likely to be a particularly problematic issue when large quantities of the species in question are taken in purse seine fisheries[9]. This is both because purse seine fleets are often servicing canning operations which do not require that catches be precisely sorted to species before processing, and because identification of juvenile tuna, which are often caught by purse seines, by fishing crew and observers may be problematic. These difficulties were side-stepped by the bigeye SDPs implemented by ICCAT, IOTC and IATTC by exempting all purse seine and pole and line-caught bigeye destined for canneries from the schemes (ICCAT 2001a, IOTC 2001, IATTC 2003). Unfortunately, experience with other species such as toothfish, Atlantic bluefin tuna and southern bluefin tuna, all of which are covered by CDSs, will not assist in solving this problem, as these species are caught in smaller quantities and/or can be reliably identified at the time of capture.

One possible solution lies with ongoing efforts to improve purse seine catch species composition data for scientific purposes. Some studies are underway to develop improved sampling and estimation techniques, but until these methods are confirmed to be both reliable and practical, and until they are widely adopted, it is expected that lack of accurate species-specific catch data will continue to hinder the further development of trade and catch documentation schemes for species caught by purse seine. Another option could be to explore documentation schemes based on gear types rather than species (e.g. a documentation scheme for quantities of mixed tuna (e.g. yellowfin and bigeye) caught by purse seiners or pole and line for canneries). This option would sacrifice some of the potential scientific objectives of a documentation scheme but would still fulfil compliance objectives.

Effective Coverage of the Scheme

Another substantive issue to be faced when improving existing or formulating new schemes is the effective coverage of the scheme. CMMs, including trade-based CMMs, agreed by an RFMO are binding upon its members and cooperating non-members, and may be voluntarily adopted by non-members. Problems may arise when key players in the fishery or trade are not required to comply, and do not opt to voluntarily comply, with these CMMs. It could be argued that such problems are more likely when RFMOs adopt trade-based measures: most key players in the fishery itself would be expected to already be members of the RFMO, but this is not necessarily the case for key players in the trade[10]. While this certainly is an issue for trade-based CMMs, it is actually also an issue for fishery-based CMMs, particularly with the continuing re-flagging of fishing vessels from member States to non-member States without a history of fishing in the area. In the case of both fisheries and trade, increasing the number of member or cooperating non-member States bound by the CMMs will increase the coverage and should increase the effectiveness of the scheme (see below).

Both CCAMLR and CCSBT have had some success in dealing with these issues. CCAMLR actively persuaded several non-members to either join CCAMLR or to adopt the CDS because of their role in the toothfish trade. For example, as a result of these and other factors, Namibia and China joined CCAMLR, and Canada, the Seychelles and Singapore agreed to implement the CDS (Sabourenkov and Miller 2004; CCAMLR Secretariat,

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[9] Worldwide approximately 70% of the tuna catch is taken by purse seiners including 45% of the Atlantic catch, 39% of the Indian Ocean catch and 72% of the Pacific catch. Reported species composition of purse seine catches indicates that about 75% of the catch is skipjack tuna (*Katsuwonus pelamis*) with yellowfin tuna (*Thunnus albacares*) and bigeye comprising the remainder (Miyake *et al*. in prep).

[10] For example, there may be countries with major canneries supplied by the RFMO Convention Area but limited or no fishing operations under their flag in the Convention Area.

personal communication). After recognising that the diversity of the market for southern bluefin was expanding beyond its list of six members and three cooperating non-members, CCSBT sought to expand the number of parties participating in the TIS. Implementation of regulations in the United States for trade tracking of southern bluefin tuna as of 1 July 2005 (NOAA 2004a) brought another important market for this species under the TIS.

These examples demonstrate that it has been possible to extend coverage of some schemes through RFMO membership expansion and/or through voluntary agreements which are scheme-specific and do not relate to membership. Therefore current member and cooperating non-member States do not necessarily need to include all of the States critical to effective implementation of trade-based measures at the time of establishment.

Flag, Port and Trade State Responsibilities

The final issue pertains to the responsibilities of the flag, port and trade States to effectively implement the documentation schemes. Although the RFMO is responsible for designing the scheme, the quality of information provided in the submissions largely depends on the rigour with which the flag, port or trade State implements the scheme. Obviously flag, port and trade State capacity varies and each RFMO arguably has members which provide highly reliable information and those which do not. It is thus useful to examine what steps have been taken by different RFMOs to ensure that data provided by members are of consistently acceptable quality.

One of the most basic features of all the schemes is that they require States to designate specific authorities as responsible for validating documents and to provide the RFMO with their credentials. This does not however necessarily ensure the quality of the submitted information. As a further step, the CCSBT TIS, in recognition of ongoing problems with missing, illegible and incorrect information, adopted minimum standards for document acceptance in 2003 (CCSBT 2003). These standards placed explicit responsibilities on importers, exporters and the Secretariat to verify the accuracy and completeness of certain portions of the documents.

Also unique to the CCSBT TIS was designation of the CCSBT Executive Director as responsible for cross-checking submitted catch and trade documentation (CCSBT 2006)[11]. Further responsibilities for analysis and reporting have been assigned to the CCSBT Executive Director under the newly implemented southern bluefin tuna CDS including estimation of the quota year catch of each Member/Cooperating Member from the catch monitoring forms; and discrepancy reports on catch monitoring forms which have been "over-utilised" in subsequent exports/re-exports, differ from transhipment declarations or observer reports, and/or do not agree with quantities recorded on farm stock and transfer forms (CCSBT 2009a). These critical features of the scheme ensure that data will be routinely and consistently analysed, and issues brought to the attention of the Commission, by a neutral party rather than leaving this responsibility with the parties involved in the trade.

[11] As described in CCAMLR (2009a) the latest version of the toothfish CDS provides for catch documents to be promptly submitted to the Secretariat who makes them available within one working day to all Contracting Parties (Articles A9 and A12; note that with implementation of the electronic CDS on 1 June 2010 this process has become automatic). Under the CCAMLR CDS, the Secretariat has no specific mandate to check the documents for discrepancies but in practice they do perform this function (CCAMLR Secretariat, personal communication) Under the ICCAT bluefin tuna CDP (ICCAT 2009a), catch documents or re-export certificates are provided by the flag/export State to the landing/farm/import State and to the Secretariat within five working days (Article 18). The Secretariat extracts some information from the catch document or re-export certificate to a database (Article 19), but is given no responsibility to check or otherwise analyse these data. Questions regarding catch documents or re-export certificates are to be resolved between the State receiving the fish and the flag/export State (Article 22). These issues are only reported to the Secretariat and to other Contracting Parties in the Contracting Parties' annual reports which provide the number of verifications requested and conducted, and the number of, and reasons for, consignment prohibitions (Annex 6).

The most rigorous verification requirement to date has been instituted by CCAMLR in relation to the catch location. The use of satellite-based VMS on all toothfish vessels licensed by CCAMLR members to fish in the Convention Area has been compulsory since 1998 (Sabourenkov and Miller 2004) and, since 2004 has included centralised VMS reporting of vessel positions to the CCAMLR Secretariat. States receiving toothfish via landings, transhipments or imports are able to seek VMS-based verification from the Secretariat that the catch location shown on the toothfish catch document is accurate (CCAMLR 2004b, Clause 22)[12]. This feature of the CCAMLR CDS represents the potentially most intrusive step taken toward independent verification of information contained in a catch document. The CCSBT TIS and the CCAMLR CDS thus provide examples of both the need to, and the feasibility of, prescribing verification standards that flag, port and trade States are responsible for meeting. These examples suggest that improvements in trade-based documentation systems may require that more and higher standards be imposed on participating States[13].

Handling of these three issues under the EU IUU Regulation

These three issues, i.e. species identification, effective coverage of the scheme, and flag, port and trade State responsibilities, have been handled under the EU IUU regulation in ways which are not particularly helpful when considering RFMO trade-based schemes. Most importantly, by requiring catch certificates for all fish species imported to the EU from any country, the EU IUU regulation largely avoids problems associated with schemes of limited scope (i.e. both species and member States). The approach of the EU IUU regulation with regard to flag, port and trade State responsibilities is to require notification that the flag State "has in place national arrangements [for controlling] fishing vessels" and that its nominated "authorities are empowered to attest the veracity of the information contained in catch certificates" (European Union 2008 (Article 20)). No specific guidance is provided for evaluating the completeness or quality of information on the certificates, and verification standards are likely to vary between EU member States. The regulation is designed to handle verification problems through an alert system for suspected non-compliant fishery vessels and products, an EU IUU vessel list, and a list of Non-cooperating Third Countries (European Union 2008 (Articles IV-VI)). Assuming sufficient transparency in the application of these tools, it may be possible to infer catch certificate data standards as EU member states accumulate practical experience with the new system.

[12] As of September 2007, the United States requires use of the CCAMLR VMS as a condition for the import of toothfish into US markets (NOAA 2007).
[13] Internal auditing of documents submitted under each scheme is the subject of more detailed analysis in Sections 4.4 and 5.

4 Functional Review of RFMO Catch and Trade Schemes and the EU IUU Regulation

As argued above and acknowledged by ongoing efforts, the existing trade and catch documentation schemes have slightly different formats and objectives but are fundamentally similar and compatible. Nevertheless their requirements and procedures vary and this can lead to variations in the effectiveness of their performance. This section presents a framework for comparing the requirements and procedures of the RFMO schemes and the EU IUU regulation. This comparison is used to identify current best practice as well as gaps, both of which will be useful in discussions of improvements to existing schemes and development of new schemes. Evaluation of the actual performance of each scheme, based on submitted data and operational history, is presented in the following section.

The comparison below is limited to the existing RFMO schemes (the four SDPs (three for bigeye and one for swordfish), the ICCAT bluefin CDP, the CCSBT CDS and the CCAMLR CDS) and does not cover superseded schemes such as the CCSBT TIS. The EU regulation is included, even though it is not a trade or catch documentation scheme *per se*, because it serves many of the functions of a CDS. Another important reason for including the EU regulation in the review is that there is a high potential for overlap between it and the RFMO schemes. As described in *Section 2.4*, fish from those RFMO schemes which are not recognised by the EU will have to provide both RFMO and EU documentation. In order to avoid this kind of redundancy and inefficiency, improvements to existing schemes and development of new schemes should take account of and aim to fulfil the requirements of the EU regulation where possible. This analysis provides a starting point for these considerations.

4.1 Description of the Review Framework

The framework used to compare the schemes and elucidate current best practices and gaps has three main components:

- Inclusivity – This measures the extent to which the scheme is designed to provide documentation for all legally-caught fish of the species/fishery in question. If the sole objective of the scheme is to prevent the products of IUU fishing from reaching the market, inclusivity is not particularly important as long as all fish which do enter the market are properly documented. However, if there are legally caught fish which do not receive documentation, this greatly compromises the usefulness of the scheme for monitoring compliance, including catch reporting. In particular, under such circumstances, it would not be expected that the number of fish documented would match the number of fish caught. In addition, the potentially wrongful exclusion of otherwise legal fish on the grounds that they lack documentation could be a problem for fair trade. Inclusivity should therefore be as high as possible for maximum effectiveness and defensibility. Current best practice is thus considered to be found in the most inclusive of the schemes.

- Impermeability – This measures the extent to which the scheme is designed to exclude illegal fish. The scheme's impermeability directly determines its effectiveness for both combating IUU fishing and for monitoring compliance. It should be noted that a scheme may be highly impermeable but not very inclusive. While high impermeability is desirable, marginal improvements in schemes which are already highly impermeable may incur high costs and diminishing returns. Current best practice is defined as those measures which are likely to be most effective in promoting impermeability under each of seven criteria outlined below.

- Verifiability – This measures the extent to which the scheme is audited by those other than the parties directly responsible for filling out and validating the forms. The existence of penalties or sanctions for improper documentation is also taken into account. A third issue is the extent to which any audit results are used not only to accept or reject individual shipments, but also to identify patterns in IUU fish trade and/or systemic weaknesses in the scheme. This analysis considers verifiability based on the theoretical requirements and procedures of the schemes; verifiability will be assessed again in the following section using actual RFMO data and operational experience. Those schemes which currently have the most robust checks and balances are considered to represent best practice.

The results of the comparisons between the RFMO schemes and the EU regulation for each of the three components are provided below.

4.2 Inclusivity: Including all legal fish

As described above, issues of inclusivity mainly relate to the types and quantities of fish exempted from the schemes. These exemptions may be based on product form (e.g. fresh versus frozen), type of gear used to catch the fish (e.g. purse seines), the use or destination of the fish (e.g. canneries), and/or whether alternative procedures apply which would result in different documentation being produced (e.g. tagging) (*Table 3*).

4.2.1 Exceptions by Product Form, Gear Type and Disposition

All of the tuna and swordfish schemes exclude by-products such as heads, eyes, roe, guts and tails. The extent of trade in these by-products is unknown but is likely to be negligible. Therefore the exclusion of these by-products probably does not have a large effect on the overall inclusivity of these schemes. It is noted, however, that the CCAMLR toothfish CDS and the EU IUU regulation do not exempt by-products of fish species otherwise covered by the schemes.

The bigeye SDPs implemented by ICCAT, IOTC and IATTC exclude all fresh fish and all catches by purse seine or pole and line (bait) vessels destined principally for canneries in the Convention Area. The resolutions establishing these programmes refer to practical problems, including “guidelines to ensure procedures to handle fresh products at customs”, as the reason for the fresh fish exclusion. No rationale for the purse seine, pole and line and cannery-destined exemptions is given in the resolutions. Fresh products, and products caught by certain gear types or for certain types of processing operations, are not exempted under any of the other schemes. CCAMLR’s CDS exempts toothfish taken as bycatch (i.e. ≤5% of the total catch and ≤ 50 t) by trawlers on the high seas outside the Convention Area as these vessels were recognised as forming a fishery targeting another species (kingclip) and only rarely taking toothfish (CCAMLR Secretariat, personal communication).

Table 3 Comparison of RFMO schemes and the EU IUU regulation in terms of inclusivity. Current best practice is identified by thick-bordered boxes.

INCLUSIVITY						
Scheme	**Swordfish SDP (ICCAT)**	**Bigeye SDP (ICCAT, IATTC, IOTC)**	**Bluefin CDP (ICCAT)**	**Southern Bluefin Tuna CDS (CCSBT)**	**Toothfish CDS (CCAMLR)**	**EU IUU Regulation**
Exceptions by product form?	By-products excluded.	By-products excluded. Fresh fish excluded.	By-products excluded.	By-products excluded.	No.	No.
Exceptions by gear type?	No.	Purse seine and pole & line (bait) vessel catches destined principally for canneries in the Convention Area exempted.	No.	No.	Toothfish taken as bycatch (≤5% of total catch and ≤50 t) by trawlers on the high seas outside the Convention Area require catch documents but are exempted from VMS verification.	No.
Exceptions by disposition?	Landings are excluded. (Only fish which are imported or re-exported require documents).	Landings are excluded. (Only fish which are imported or re-exported require documents).	No.	No.	No.	Landings by EU vessels into the EU are excluded (but are covered under a separate Control Scheme).
Exceptions for tagged fish?	No.	No.	Yes (see text).	No.	No.	No.

In addition to the exclusions in the bigeye SDPs, another large exclusion is inherent in all of the SDPs. By exempting all domestic landings the SDP documents, by definition, apply to only a fraction of the total catches. For example, using FAO statistics for 2007[14], the total reported catch of bigeye was 443,000 t but only 129,000 t of bigeye was recorded as imports (FISHSTAT 2010). These figures suggest that perhaps only 30% of bigeye catches would be recorded under the SDP. This percentage would be even lower if a substantial portion of the recorded imports qualify for one of the other SDP exemptions (fresh or purse seine/pole and line caught and destined for canneries). A presentation given by Japan at the Second Joint Meeting of Tuna RFMOs (Ota 2009) stated that of the 68,096 t of bigeye reported to ICCAT in 2007, only 29% was covered by the SDP. In contrast, the FAO figures for swordfish (reported catch of 109,000 t and total imports of 88,000 t) suggest that over 80% of the catches would be covered by the SDP documentation (FISHSTAT 2010). It should be noted that the fresh, gear and cannery exemptions do not apply to swordfish.

Aside from the SDPs, the other RFMO schemes are catch documentation schemes and aim to cover all catches regardless of whether the products enter international trade. The EU IUU regulation is directed at wild-caught, non-ornamental marine fish entering the EU market

[14] As re-imports are not tallied separately, import statistics may represent double-counted fish.

via foreign-flagged vessels or imports, and does not aspire to be inclusive for a particular fishery or fisheries. Nevertheless, through the combination of this regulation and the companion regulation for EU Member State fisheries (European Union 2009b) full coverage of some fisheries may be achieved (i.e. assuming all products of those fisheries are destined for EU markets). Under this scenario, both regulations would work under separate schemes to exclude IUU fish from different sources, and together they would provide a comprehensive system. However, the use of data collected under the EU IUU regulation is not envisaged to be used for scientific purposes (e.g. alternative estimates of catch) and thus there is no contribution to this benefit of inclusivity from the EU IUU regulation.

4.2.2 Exceptions for Tagged Fish

The final possible exemption relating to inclusivity involves tagging. Two of the schemes, the CCSBT southern bluefin CDS and the ICCAT bluefin CDP, include special provisions for tagged fish. In the CCSBT CDS tags are mandatory and additional documentation is required for the tagging data, i.e. over and above that required on the mandatory catch document. In the ICCAT CDP tagging is optional, but if fish are tagged by the flag State catching the fish they do not require a validated Bluefin Catch Document (BCD) (ICCAT 2009a, Clause 12(c)). Nevertheless, there is a requirement to link tag numbers to the BCD (ICCAT 2009a, Clause 20) which suggests that a BCD must be filled out but not necessarily validated. Under these circumstances, the reporting arrangements for tagged fish are considerably less detailed and transparent than for untagged fish recorded on validated BCDs. Specifically, only validated BCDs must be submitted to trading partners and to the ICCAT Secretariat (ICCAT 2009a, Clause 18); annual reports by members are required to contain information on validated BCDs only (ICCAT 2009a, Annex 6); and only a one-time summary of the implementation of the tagging programme is submitted to ICCAT (ICCAT 2009a, Clause 20). For these reasons, the documentation exemption for tagged fish acts to reduce the inclusivity of the ICCAT bluefin CDP. In particular, the lack of validated BCDs for tagged fish which are actually caught in compliance with ICCAT regulations could conceivably create problems for compliance monitoring in trade, including import to the EU given that some form of validated catch document, i.e. either a catch certificate or a BCD is required.

4.3 Impermeability: Keeping all illegal fish out

Impermeability refers to the ability of the design of the scheme to prevent IUU fish from entering markets. There are many design features which could be implemented to achieve this objective but this assessment is based on seven criteria intended to cover an indicative range of such features (*Table 4*).

4.3.1 Document Security

One of the most basic document security features used to prevent fraud is a unique number. This feature facilitates identification of forgeries which use duplicated, cancelled or out-of-sequence numbering. Unique numbering was recommended as a basic item to be included in all catch certificate or trade document forms by FAO (2002). While all the schemes require document numbers, the SDPs appear to have less rigorous standards by requiring only that a country coded document number be assigned. In contrast, the ICCAT bluefin CDP, the CCSBT CDS and the CCAMLR CDS specify that this country coded document number must be unique. The CCAMLR CDS requires a two-character country code, a two-digit year code and a four-digit, unique sequence number (CCAMLR 2009a) whereas the ICCAT bluefin CDP requires a two-character country code followed by an eight-digit number with at least two of these digits indicating the year (ICCAT 2009a). The CCSBT CDS requires only that a unique document number be assigned by the validating authority; the Secretariat uses this number and the country code to create a unique field in the database

(CCSBT Secretariat, personal communication). The EU IUU regulation is silent on this point: although a document number is required no guidance is provided.

4.3.2 Electronic Document Systems

The usefulness of electronic document systems for increased management efficiency, information sharing and fraud prevention was recognised by FAO (2002) and the Joint Tuna RFMOs (2007b) but at present all but one of the schemes is primarily paper-based. The CCAMLR toothfish CDS initiated a pilot electronic CDS in 2004, by January 2008 all members were using the electronic format, and in June 2010 the use of the e-CDS became mandatory (CCAMLR 2008, 2009a). CCSBT will require that one of its five new documentation forms (the Catch Tagging Form) be submitted electronically on a quarterly basis. The other RFMO schemes have not yet agreed electronic protocols but an ICCAT resolution in 2006 encouraged the development of pilot projects to assess the feasibility of electronic systems (ICCAT 2006b). There are no requirements for electronic systems under the EU IUU regulation although electronic submission is allowed assuming administrative protocols can be agreed (European Union 2008, Articles 14(3) and 20(4)).

4.3.3 Credentials of Validation Authorities

The schemes differ in the range of officials which can validate forms and the requirements for information about these officials. For example, under the ICCAT SDP schemes, government authorities or national Chambers of Commerce may validate documents (ICCAT 1993b). The ICCAT CDP requires validation by a government authority for re-export certificates, and validation by a government authority or other authorised individual or institution of the flag State for catch documents (ICCAT 2009a). The CCSBT CDS similarly allows validation authority to be delegated to non-government bodies (CCSBT 2009a). In contrast, under the CCAMLR toothfish CDS and the EU IUU regulation only government authorities may validate catch certificates. Unless there is a compelling rationale for delegation, restricting validation activities to government authorities would appear to be a better means of assuring impermeability.

Most of the schemes require similar information about the validating authorities to be submitted for the purposes of auditing the validation process. This information generally includes the name and address of the institution, the name and title of the authorised individual, contact details, and the signature or seal sample, although the CCAMLR scheme does not require the latter. The ICCAT bluefin CDP states specifically that it makes the credential information available on a secure website and encourages Contracting Parties to access this information to help verify the validation of import and re-export documents. It is assumed this practice is also followed in the other schemes and if not, it should be encouraged.

4.3.4 Check of Catch Conditions

One of the most important functions of the schemes is to certify that the catches were made in compliance with all applicable laws and regulations. Key elements in determining this are the location, gear type and dates of the catch which are considered here, and the vessel authorisations which are considered in the following section.

None of the schemes require precise information about the location of the catch to be presented on the document. At one end of the spectrum, the bigeye SDPs require catch location only to be specified in terms of Atlantic, Pacific or Indian Ocean. Similarly, the ICCAT bluefin CDP requires that catch area be specified only in terms of "Mediterranean, western Atlantic, eastern Atlantic or Pacific" (ICCAT 2009a). At the other end of the spectrum, the CCAMLR toothfish CDS requires catch location to be reported by CCAMLR statistical subarea or division (or FAO Statistical Area/Subarea/Division if outside the convention area)[15], and whether or not inside an Exclusive Economic Zone (EEZ). In addition, any party to the toothfish CDS can request that the flag State issuing the catch documents provide additional verification of catch location using VMS records (see Section 5.2). CCSBT also requests catch location data be provided according to its own management areas but lacks the VMS mechanism of CCAMLR. The EU IUU regulation (European Union 2008) does not provide specific guidance with respect to the level of detail required for catch location information on the catch certificate but does request FAO area, division and subdivision and ICES statistical rectangle data on some other forms required under the regulation (European Union 2009a).

The SDPs and the CCSBT southern bluefin scheme require only the month and year of catch to be specified. All of the other schemes (the ICCAT bluefin CDP, the CCAMLR toothfish CDS, and the EU IUU regulation) require the dates of catch. CCSBT explained that dates were not deemed practical because of the number of lines which would need to be added to the forms to allow for separate reporting of catch by date (CCSBT Secretariat, personal communication). It is noted that if the catch or trade documentation scheme is to be used in conjunction with VMS data, as is the case in CCAMLR, then more specific time reporting, such as date, is useful.

All of the tuna schemes require that gear type be recorded. The CCAMLR toothfish CDS and the EU IUU regulation do not require this information.

4.3.5 Check of Catch Amount and Species

Another critical aspect of documenting legal catches involves providing accurate estimates of fish weights. If the purpose of the scheme is to document quantities primarily for trade, as in the SDPs, it is not surprising that the net weight only is recorded. However, if the purpose of the scheme is also to cross-check catch data, then estimates of whole weight or conversion factors from various primary processed forms to whole weight are necessary. It may also be necessary to allow for differences between estimated weights prior to landing and verified weights after landing. As shown in *Table 4*, three of the schemes explicitly acknowledge conversions to whole/live weight. The CCSBT southern bluefin scheme requires conversion factors for "other" forms to be recorded but applies unpublished conversion factors for the standard product forms listed on the document (CCSBT Secretariat, personal communication). The toothfish CDS requires that the product form and landed weight be specified; the Secretariat uses conversion factors agreed by the Commission to cross-check submitted data for discrepancies (CCAMLR Secretariat,

[15] CCAMLR statistical subareas are shown at http://www.ccamlr.org/Pu/e/conv/maplge.htm and FAO statistical areas/subareas/divisions are shown at http://www.fao.org/fishery/area/search/en

personal communication). The EU IUU regulation requires an estimate of the live weight to be written on the form.

Another interesting feature of the schemes is the degree to which validation of the catch amount on the forms is tied to the flag State's catch quota. Obviously, this is only relevant for those fisheries which operate under quota systems. In agreeing a resolution in 1996, ICCAT implemented a specific requirement that the accumulated amounts of catches documented on validated BCDs be within the quota or catch limit of the validating flag State for each management year (ICCAT 2006a). This resolution does not apply to the ICCAT swordfish and bigeye SDPs even though these species are also under quota. CCSBT operates under a catch allocation system and through a combination of resolutions, it does require that validation only be performed for authorised vessels and that all vessels on the authorised vessel list abide by the CCSBT CMMs including the allocations. The EU IUU regulation, which applies across a wide range of quota- and non-quota managed species requires only that the validating authority attest that the catch is in accordance with all applicable laws, regulations, and international CMMs. The only scheme in which special procedures for over catch are described is the toothfish CDS. This scheme provides for a "Specially Validated *Dissostichus* Catch Document" which allows otherwise unauthorised (e.g. confiscated or in exceedance of catch limit) fish to be recorded for statistical and management purposes, thus assisting in documenting the cumulative catch. While there should be no doubt that documents for unauthorised catches should not be validated in the same manner as authorised catches, it would be advisable for all of the schemes to make this requirement explicit and to implement special procedures, like CCAMLR's, for recording quantities of unauthorised catch found within the system.

4.3.6 Check of Vessel Authorisation

In theory, none of the schemes permit validation of documents for catches caught by vessels which are not authorised to fish. However, not all of the schemes appear to be designed to compile data that would facilitate monitoring of this important point. All of the schemes require the catching vessel's "registration number" to be recorded. However, it is sometimes not clear whether it is the flag State registration number or the RFMO registration number that is requested[16]. Only two of the schemes (CCAMLR and the EU IUU regulation) specifically request the vessel's IMO/Lloyd's number, the only unique number that is attached to the vessel permanently. Also, only these two schemes specifically request information on the vessel's fishing permit/license.

Each of the three catch documentation schemes requires that documentation/forms be given only to those vessels authorised to fish. Although this is perfectly logical, it is not an explicit requirement of the SDPs. Under the EU IUU regulation, catch certificates should only be granted when fishing operations were conducted in accordance with all applicable laws, regulations, and international CMMs and there is a box on the form where applicable CMMs should be referenced. As experience with this scheme accumulates, it will be interesting to review what information is noted in this box and what standards are applied to determine sufficiency.

[16] The ICCAT bigeye and swordfish SDPs and the IOTC bigeye SDP require both the catching vessel's "registration number" and the RFMO Record (vessel) number. The ICCAT bluefin CDP specifies that the ICCAT Record (vessel) number is required. The other schemes (i.e. IATTC and CCSBT) do not specify which vessel registration number is required.

Table 4 Comparison of RFMO schemes and the EU IUU regulation in terms of impermeability. Current best practice is identified by thick-bordered boxes.

IMPERMEABILITY						
Scheme	**Swordfish SDP (ICCAT)**	**Bigeye SDP (ICCAT, IATTC, IOTC)**	**Bluefin CDP (ICCAT)**	**Southern Bluefin Tuna CDS (CCSBT)**	**Toothfish CDS (CCAMLR)**	**EU IUU Regulation**
Document security (unique numbering)?	No.	No.	Yes.	Yes.	Yes.	No.
Electronic systems used?	SDP currently paper-based.	SDP currently paper-based.	CDP currently paper-based.	One form (Catch Tagging Form) must be submitted electronically on a quarterly basis.	Yes. The e-CDS became mandatory on 1 June 2010.	Allowed if protocols agreed.
Credentials of Validation Authorities?	Competent government authority or designate. Credentials: Organization name, address, sample seal and individual name, title and address.	Competent government authority or designate. Credentials: Organization name, address, sample seal and individual name, title and address.	Government authorities only for re-export certificates; delegation possible for catch certificate. Credentials: name, title, address; sample form, stamp, and date of effect.	Competent government authority or designate (e.g. validation of transhipment by observer). Credentials: name, title, organization, signature and seal.	Government authorities only. Credentials: names, addresses, phone and fax numbers and email addresses.	Public authorities only. Credentials: names, addresses and official seal prints.
Check of Catch Conditions?	Area of ocean described as N. Atlantic, S. Atlantic, Med, Indian or Pacific. Month and year of catch recorded. Gear type recorded.	Area of ocean described as Atlantic, Indian or Pacific. Month and year of catch recorded. Gear type recorded.	Area of catch must be recorded as Mediterranean, western Atlantic, eastern Atlantic or Pacific. Dates of catch recorded. Gear type recorded.	Area of catch recorded by CCSBT statistical area. Month and year of catch recorded. Gear type recorded.	Area of catch should be specified by FAO Statistical Area/ Subarea/Division if outside the Convention Area or by CCAMLR statistical subarea or division if caught in the Convention Area and indicate whether taken on the high seas or within an EEZ. Additional verification using VMS data can be requested. Dates of catch recorded. Gear type not recorded.	Area of catch required but no guidance is given (FAO areas used on other forms however). Dates of catch recorded. Gear type not recorded.

IMPERMEABILITY						
Scheme	**Swordfish SDP (ICCAT)**	**Bigeye SDP (ICCAT, IATTC, IOTC)**	**Bluefin CDP (ICCAT)**	**Southern Bluefin Tuna CDS (CCSBT)**	**Toothfish CDS (CCAMLR)**	**EU IUU Regulation**
Check of Catch Amount?	Product form and net weight.	Product form and net weight.	Number of fish, total (round) weight, average weight. Requires that the accumulated validated amounts are within quota or catch limit of each management year.	Product form, net weight and number of fish. Unpublished conversion factors are applied for standard product forms. Conversion factors for "other" forms must be specified.	Product form, estimated landed weight, verified landed weight, net weight sold. Secretariat uses Commission-agreed conversion factors to check for discrepancies.	Species and product code, estimated live weight, estimated landed weight and verified landed weight required. Catch required to be in accordance with applicable laws, regulations, & international CMMs.
Check of Vessel Authorisation?	Vessel name, registration number, vessel length and ICCAT record (vessel) number (if applicable).	Vessel name, registration number, vessel length (ICCAT and IOTC only) and RFMO record (vessel) number (ICCAT and IOTC only).	Vessel name, flag state and ICCAT record number. Documentation should only be issued to vessels and traps authorized to fish for bluefin tuna in the Convention area.	Vessel name, registration number and flag state. Fish caught by unauthorised vessels cannot be landed, transhipped or traded. Unauthorised farms cannot receive or harvest SBT.	Vessel name, home port, national registry number, call sign, IMO/Lloyd's registration number, reference number of the licence or permit. Forms provided only to vessels authorised to harvest toothfish.	Vessel name, flag state, home port and vessel registration number, call sign, fishing license number and validity, IMO number (if available) and Inmarsat number (if available). Required to be in accordance with applicable laws, regulations, & international CMMs.
Control of Fish Mixing?	Upon re-export, relevant import documentation must be attached. Exporters must verify (but not attach) documents showing traceability between imported and re-exported fish. (Traceability up to the point of import not accounted for).	Upon re-export, relevant import documentation must be attached. Exporters must verify (but not attach) documents showing traceability between imported and re-exported fish. (Traceability up to the point of import not accounted for).	Unique number of BCD should be used to link split shipments. Re-export certificates may be validated if "the products to be re-exported are wholly or partly the same products" on the validated import form.	All fish shown on the catch document must be sent to single, final destination (split shipments prohibited). A verified copy of the original catch document should be attached to the re-export document for whole or partial shipments.	Transhipments are accounted for. Total landed catch weight is reported on the catch document and if split, individual export and re-export documents record the total catch weight landed and partial weight of the split. The electronic CDS format does not allow weights in excess of the total catch weight to be exported/re-exported.	Re-exports must be accompanied by the catch certificate (can be a copy) and a statement from the processing plant and endorsed by local authorities attesting traceability.

4.3.7 Control of Fish Mixing

If they are to function effectively, trade and catch documentation schemes must provide traceability from catch to market. This traceability, in combination with certification, ensures that fish which are certified as legally caught are kept segregated from other fish. The various schemes have substantially different requirements with respect to this issue.

The SDPs are only concerned with fish that enter international trade, but even so do not document transhipment operations and thus do not assure traceability from catch to the point of import. The SDPs' traceability standard from import to the point of re-export is also weak. The SDPs require that the import documents be attached to the re-export documents when the fish are re-exported. The officials validating these re-export documents are responsible for verifying that the re-exporting dealer can establish traceability between the imported and re-exported fish. However, this traceability is not formally documented unless the flag State or importing State requests it.

When it established the bluefin CDP, ICCAT tightened the traceability requirements beyond those required in the SDPs. First, transhipment and farming activities are now explicitly accounted for in a special section of the form. Once imported, the ICCAT CDP requires that if shipments of bluefin are split they should remain linked to the BCD through the BCD's unique document number. The responsible authority may validate the re-export certificate if "the products to be re-exported are wholly or partly the same products" on the validated import form. The inclusion of the phrase "partly the same products" appears to allow for mixing and thus may frustrate future attempts to match trade and catch data. Phrasing such as "…wholly the original product, or an unadulterated portion of the original product…" would better ensure traceability.

The CCSBT southern bluefin CDS also explicitly accounts for transhipment but requires separate catch documents if catches are split prior to landing. Re-export/export forms must indicate a single, original catch document (i.e. no mixed re-exports/exports permitted) and indicate whether the full or partial quantity from the catch document is being re-exported/exported[17]. This procedure would seem to prevent any single re-export/export from exceeding the original catch document quantity. Examination of all re-export/export forms against their corresponding catch documents and identification of whether any catch documents have been over-utilised will be undertaken by the Secretariat on a six-monthly basis and be reported to the designated authority of each member (CCSBT 2009a).

Like the other CDSs, the CCAMLR CDS accounts for transhipment. Unlike the other CDSs, it also incorporates a useful procedure for tracking split catches at landing: if split, a copy of the catch document is signed over to each consignee showing the original catch amount and the amount of the split portion. In this way each consignee's copy of the catch certificate shows exactly how much certified fish material was transferred. This prevents consignees from adding other material to make up the difference between the amount they received and the full amount shown on the catch certificate. The same procedure is required when material is passed on as exports or re-exports. The electronic format of the CCAMLR CDS maintains a tally of the quantities of subsidiary material from each catch document and does not accept quantities in excess of the amount shown on the catch document. Despite this robust feature, the CCAMLR CDS does not have sufficiently reliable conversion factors for processed forms of toothfish to accurately monitor the expected loss of material during secondary processing (e.g. reducing "allowable" re-exports based on filleting yields (CCAMLR Secretariat, personal communication)).

[17] Note that this one-for-one requirement is new to the CCSBT CDS. Under the CCSBT TIS one re-export/export form could be referenced to multiple catch forms.

The EU IUU regulation, while placing considerable restrictions on transhipment[18], also accounts for legal transhipment activities on its catch certificate. The EU IUU regulation's re-export requirements appear to be a stricter version of the ICCAT CDP's requirements. Upon re-export, fish must be accompanied by the original import (catch) certificate and a statement from the processing plant endorsed by local authorities "giving an exact description of the unprocessed and processed products and their respective quantities indicating that the processed products have been *processed in that third country from catches accompanied by catch certificate(s)* validated by the flag State" (emphasis added). While these requirements provide some measure of traceability, they do not exclude the possibility of mixing. A higher standard would be established by modifying the requirement to read "…*processed in that third country exclusively from catches accompanied by catch certificate(s)*…" (emphasis added).

4.4 Verifiability: Built-in Checks and Balances

Verifiability refers to elements of the scheme which provide a series of checks and balances on the information received from the parties involved in the catching and trading of the species of interest. While the actual performance of the scheme is best assessed through an audit of the submitted data (see Section 5), this section examines three design factors in theory: responsibility for oversight, penalties for improper documentation, and system learning and improvement (*Table 5*).

4.4.1 Responsibility for Oversight

As discussed above, each RFMO arguably has members which provide highly reliable information and those which do not. Therefore, in order to assure data quality, each scheme should incorporate procedures for cross-checking and/or auditing of trade and catch documents.

In all of the schemes the primary responsibility for checking the veracity of the documents lies with the government authorities (or designate) of the flag State and the trading partner. All of the schemes contain procedures for verifications, i.e. requests from one member or party to another to check the information on the forms. The CDSs, but not the SDPs, require that copies of validated forms be sent to the RFMO Secretariat, although submission timeframes and subsequent use of the information varies. Under the EU IUU regulation, there is no provision for a common repository of documents. However, the regulation does establish an IUU Fishing Information System which appears intended to serve as an intelligence network focusing on incidents of non-compliance (European Union 2008, 2009a). Under this system EU member States shall report certain types of information[19] to the European Commission, thereby allowing for some level of oversight by a party, or parties (if the information is distributed through the network), not directly involved in the trade.

[18] Transhipment at sea in EU waters between two non-EU fishing vessels, and between a non-EU fishing vessel and an EU fishing vessel, is prohibited. Outside of EU waters, non-EU fishing vessels may only tranship to an EU fishing vessel if the receiving vessel is registered as a carrier vessel by an RFMO (European Union 2008, Article 4). Landing or transhipment in port may only take place in ports designated and listed by EU Member States (European Union 2008, Article 5).

[19] EU Member States are required to report to the European Commission on, *inter alia*, quantities landed or transhipped by third country vessel in their ports; any landing, transhipment or importation subject to the IUU regulation which is refused; the results of any verification actions; owners and operators being investigated in connection with presumed IUU fishing; any reflagging of its fishing vessels to a third country; and information pertaining to sighting reports of any fishing vessel flying its flag (United Kingdom Government, personal communication).

Table 5. Comparison of RFMO schemes and the EU IUU regulation in terms of verifiability. Current best practice is identified by thick-bordered boxes.

VERIFIABILITY						
Scheme	**Swordfish SDP (ICCAT)**	**Bigeye SDP (ICCAT, IATTC, IOTC)**	**Bluefin CDP (ICCAT)**	**Southern Bluefin Tuna CDS (CCSBT)**	**Toothfish CDS (CCAMLR)**	**EU IUU Regulation**
Responsibility for Oversight?	Importers report to RFMO every 6 months and data are circulated by the RFMO to exporters. Exporters examine circulated data and respond in annual reports. No formal RFMO oversight.	Importers report to RFMO every 6 months and data are circulated by the RFMO to exporters. Exporters examine circulated data and respond in annual reports. No formal RFMO oversight.	All parties must report annually on: number of BCDs validated; number of validated BCDs received; number of verifications requested; number of verification requests received; and number of verifications conducted. No formal RFMO oversight.	All parties provide copies of documents to the Executive Secretary who analyses and notifies parties of discrepancies in accordance with a detailed reporting format. Parties are required to follow up on discrepancies.	All parties must promptly submit copies of all catch documents issued and copies of all export/re-export documents issued or received to the Secretariat which makes them available to all Contracting Parties (as of June 2010 this is an electronic process). No formal Secretariat oversight, though this occurs in practice.	The European Commission does not maintain oversight over all documents and day-to-day operations, but Member States must report to the Commission on a variety of issues which relate to compliance, e.g. refusal of importation, and this information may be shared through an intelligence network.
Penalties for improper documentation?	Improperly documented shipments will be denied entry into the territory of a Contracting Party or subject to "administrative or other sanction".	Improperly documented shipments will be denied entry into the territory of a Contracting Party or subject to "administrative or other sanction".	If the documents are invalid, domestic trade, import, export or re-export "shall be prohibited".	Parties to the scheme may not accept southern bluefin for landing or trade without proper documentation. Verification issues may be brought to the attention of the Compliance Committee.	If the catch document is invalid, the import, export or re-export is prohibited. Some port States may seize or confiscate such shipments. Proceeds from seized fish can be deposited to an anti-IUU fishing fund.	If documentation is improper or the results of verification do not resolve concerns, importation can be refused and products may be confiscated and destroyed, disposed of or sold in accordance with national law. Examples of enforcement measures and sanctions are given.
System learning and improvement?	No standing commitment to programme review specified, however, the ICCAT SCRS may request the Secretariat to undertake basic analyses.	No standing commitment to programme review specified , however, the Commission may request the Secretariat to undertake basic analyses.	No standing commitment to programme review specified, however, the ICCAT SCRS may request the Secretariat to undertake basic comparative analyses.	Implementation issues, strengths, and weaknesses, and options to improve the scheme and its supporting procedures to be reviewed by the Compliance Committee.	No standing commitment to programme review specified, although some analyses appear to be done by the Secretariat.	Based on member state reports, alerts may be issued by the EU, vessels may be placed on the EU IUU vessel list, and countries may be placed on a list of non-cooperating third countries. Systems for intelligence sharing are being established.

Even though all of the RFMO catch documentation schemes require copies of all documents to be submitted to the RFMO Secretariat[20], only the CCSBT southern bluefin CDS provides for an independent audit of the documents. Under the CCSBT CDS, documents are provided on a quarterly basis, and the Executive Secretary analyses the documents and reports on any identified discrepancies (CCSBT 2009a (Annex 3)). Members then cross-check discrepancies raised by the Executive Secretary and "investigate and resolve any irregularities identified in relation to their information in the CDS reports" (CCSBT 2009a). The CCAMLR Secretariat publishes annual CDS data summaries in its *Statistical Bulletin*, but it does not have a similar mandated audit mechanism. ICCAT has no such mechanisms under any of its SDP or CDS schemes, although the Secretariat is sometimes asked by the ICCAT Standing Committee on Research and Statistics (SCRS) to undertake comparative reviews of trade/catch documents (submitted every six months) against member's annual reports of catch data (Joint Tuna RFMOs 2007a).

4.4.2 Penalties for Improper Documentation

All of the schemes specify that shipments lacking proper documentation shall not be landed or traded. However, the schemes are less specific regarding the potential for penalties or sanctions when shipments are improperly documented. Only the SDPs refer to "administrative or other sanction" in addition to rejecting importation. The CCSBT CDS mentions provisions for the Compliance Committee to consider any identified irregularities and anomalies. This may also be the case for other RFMOs even though it is not made explicit in the specification of their trade or catch documentation schemes. The CCAMLR CDS does not mention any penalties or sanctions imposed by the Commission itself but it notes that members may seize or confiscate improperly documented catches or shipments. The Commission has established provisions for transferring all or part of the proceeds from the sale of seized or confiscated toothfish into a fund for activities which will enhance the capacity of the Commission to combat IUU fishing activities (CCAMLR 2009a). The EU IUU regulation states that member States may confiscate and destroy, dispose of or sell fishery products which do not meet documentation requirements.

Based on this review it appears that penalties or sanctions are generally considered the responsibility of the port State rather than the RFMO/EU. Nevertheless, it is useful if the schemes refer to potential actions to be taken by port States at their discretion, and in accordance with national laws, as guidance. For example, the EU IUU regulation gives examples of seven immediate enforcement measures (for example, immediate cessation of fishing activities) and eight sanctions (for example, sequestration of the fishing vessel) which can be considered by member States in the case of serious infringements (European Union 2008). It is also useful for the schemes to explicitly discourage a situation in which refused shipments are bounced to other port States which may have less stringent import requirements. Finally, incidents of improper documentation, rejection and/or confiscation should be reported to RFMOs so that these issues can be highlighted to other members and/or referred to the RFMO's Compliance Committee.

4.4.3 System Learning and Improvement

Most of the schemes do not provide for periodic review of performance. The exception is the CCSBT CDS which sets a specific date and terms of reference for review of the new scheme. Under the ICCAT bluefin CDP only the Secretariat has access to all of the validated documents, but it is given no responsibility for data analysis or programme review.

[20] Under the SDPs, the Secretariats receive only data summaries from members; they do not receive the statistical documents themselves.

However, such activities could be, and sometimes are, authorised by the ICCAT SCRS (see Section 4.4.1).

One major strength of the EU IUU regulation is its linkage between import documentation and other tools for combating IUU fishing. The EU IUU regulation establishes a number of systems including an Alert System for warning of compliance problems with vessels or fishery products from third countries; an IUU vessel list; a list of non-cooperating third countries which fail to discharge their duties to combat IUU fishing; and an IUU Fishing Information System to network the relevant competent authorities in each Member State. All of these systems will be informed by Member States' reporting against the requirements of the new regulation (see Section 4.4.1). Since application of the procedures across Member States, and their reporting to the EU, may be uneven, the EU-wide system is likely to function differently from an empirical systems compiling and analysing data held in a central database.

4.5 Summary of the Functional Review

The preceding analysis has identified a set of criteria for evaluating trade and catch documentation schemes, and through comparison of existing schemes has identified various elements of current best practice. The following summary is based on Section 4 and Tables 3-5 and represents both elements of current best practice and recommendations for filling gaps in functional performance. These elements and the associated recommendations should be considered both when improving existing schemes and developing new schemes.

Inclusivity: Including all legal fish (Section 4.2, Table 3)

- Inclusivity should be as high as possible for maximum effectiveness and defensibility.
- Several schemes successfully cover by-products and fresh products, so exemptions based on these issues appear unwarranted.
- Exemptions for purse seine/pole and line/cannery operations may be avoided through improved catch sampling protocols or by defining schemes by fishery rather than by species.
- Trade documentation schemes appear increasingly anachronistic as they cover only a fraction of the fishery (only those fish which enter international trade), cannot fulfil many scientific or compliance/anti-IUU objectives, and are increasingly being replaced with catch documentation schemes.
- Tagged fish should not be exempted from standard documentation as this creates confusion for compliance monitoring and joint recognition of schemes.

Impermeability: Keeping all illegal fish out (Section 4.3, Table 4)

- While high impermeability is desirable, there may be diminishing returns when attempting to attain incrementally higher levels.
- For document security and fraud prevention, a unique document number (e.g. country code, year code and unique sequence number) should be required.
- As one of the CDSs is already using a fully electronic document system, and since electronic systems promote document security and information sharing, other systems should accelerate progress toward and aim to implement electronic protocols as soon as possible.

- Unless there is a compelling rationale for delegation, validation activities should be restricted to government authorities.
- A seal sample should be provided as part of the validation credentials and should be made available to all parties that may need to check validated documents through a secure website.
- The use of VMS data to verify the catch location annotated on catch documentation forms is currently encouraged under some schemes. If VMS data are not available, e.g. through the RFMO Secretariat on a confidential basis, the scheme should require catch location to be reported by the smallest available FAO Statistical Area, Subarea or Division.
- Dates of catch and gear type used should be recorded on the catch documents.
- When recording fish weights, the net weight as well as the live weight, or an appropriate conversion factor for net weight:live weight should be required.
- Schemes should confirm an explicit requirement that standard catch documents shall not be issued for catches which exceed authorised catch limits, and should implement special procedures through which unauthorised catches can be tallied for statistical and management purposes.
- Schemes should include an explicit requirement that no catch documents shall be issued for catches from vessels which are not authorised to fish.
- Vessel registration numbers should be specified as national registry, RFMO registry, and/or IMO/Lloyd's number. The latter should be encouraged as it is the only numbering system which is permanent.
- Traceability components of the schemes should account for transhipment prior to landing, splitting of catch upon landing, and further splitting of split catches during processing operations.
- Whenever catch or consignment splits occur, measures should be in place to ensure that mixing (e.g. of legal and illegal fish) does not occur and that splits are tallied against, and do not exceed, the original catch document.

Verifiability: Built-in Checks and Balances (Section 4.4, Table 5)

- Schemes should vest responsibility for auditing documents in a neutral third party, such as the RFMO Secretariat, rather than relying on members involved in the trade to report irregularities and discrepancies.
- All documentation should be copied on a quarterly basis, or more frequently, to this neutral third party.
- Although penalties or sanctions for improperly documented landings or shipments are generally considered the responsibility of the port or trade State, schemes should provide guidance for potential actions which could be taken, in accordance with national laws.
- Schemes should explicitly discourage bouncing of rejected shipments to other port States with less stringent import controls.

- Schemes should explicitly require that incidents of improper documentation, rejection or confiscation are reported to all members and/or referred to the appropriate compliance monitoring body.

- Schemes should specify timetables for programme review and should commission relevant analyses to inform these reviews.

With regard to comparability between the RFMO schemes and the EU IUU regulation, the preceding analysis has identified several areas for which the standards implicit in the design of the EU IUU regulation appear to be higher than those adhered to in some of the RFMO CDSs. Potential discrepancies include exemptions for tagged fish (*Section 4.2*); and dates of catch, live weight of catch, and control of fish mixing (*Section 4.3*). There are also examples of where some of the RFMO CDSs have set a higher standard than the EU IUU regulation (e.g. unique document numbers, electronic document systems, and specification of catch location (*Section 4.3*); and third party audit/oversight (*Section 4.4*)). Finally, areas have been identified for which both RFMO schemes and the EU IUU regulation could be better articulated and/or improved (e.g. checks on a vessel's authorisation to fish and registration number, and stricter rules for traceability of split catches and shipments (*Section 4.3*); and prohibition against re-directed rejected shipments, and periodic, empirically-based programme reviews (*Section 4.4*).

5 Operational Review of RFMO Catch and Trade Schemes

Following on from the structural review of RFMO and EU catch and trade documentation schemes above, this section provides a review of three of the schemes in practice. The three schemes selected for this review are the three schemes recognised in the EU's IUU regulation's detailed rules for implementation (European Union 2009a) as complying with the requirements of the regulation: the CCAMLR toothfish CDS, the ICCAT bluefin tuna CDP and the CCSBT southern bluefin CDS. Since the CCSBT CDS was implemented earlier this year and has not yet produced its first reports, the following discussion also includes a review of some aspects of the performance of the CCSBT TIS which served as the basis for development of the new CDS.

Each scheme is described in terms of its history of operation, data access and resourcing; its membership and compliance record; the extent to which is internally and externally (i.e. with other catch and trade data) consistent; compliance actions that have been taken on the basis of the scheme; and use of the scheme information for scientific purposes[21]. Performance is then summarised in terms of transparency, practicality and effectiveness.

The latter two themes would be expected to be included in any operational review. An assessment of transparency was also unavoidable as the degree of transparency of each scheme dictated the amount of information available for the review. This situation begs the question of whether less transparent schemes may be judged more harshly in an operational review such as this one, simply due to a lack of evidence, but yet in reality perform well. While this may be true, it is also true that transparency, and its corollary accountability, are essential for building trust in RFMO processes among both member and non-member governments and in broader civil society. Building trust does not necessarily require that the schemes be transparent to this study, however, if not, at a minimum transparency to a neutral third party should be built into each scheme. In other words, the schemes reviewed here were given credit for their transparency to neutral third parties, even if that transparency did not extend to this study.

At present there no normative standards for what constitutes transparency in RFMOs, and only a fleeting reference to the concept, which is usually interpreted in terms of rules for observers at meetings, in the United Nations Fish Stocks Agreement (Swan 2004). At the same time, a growing chorus of academics and non-governmental organisations (NGOs) lament RFMO "failure" (e.g. Cullis-Suzuki and Pauly 2010). This has led most recently to a proposal to list Atlantic bluefin tuna on Appendix 1 of the Convention on International Trade in Endangered Species (CITES). Such a listing would have banned international trade and, given that the market is currently almost entirely export-orientated, either reduced and/or radically altered the fishery. While ICCAT would have retained management authority for the species under such a revised fishery, its sphere of influence would have been significantly reduced by the overarching authority of CITES. Although the bluefin Appendix 1 proposal failed, it is clear that at least some of the public's trust in RFMOs has eroded. As a result RFMOs will not only have to continue to defend their management procedures for key species, they will also need to demonstrate the effectiveness of these procedures with evidence rather than empty assertions, to avoid further diminution of their authority. For

[21] This operational review does not consider farm monitoring programmes, such as those under ICCAT and CCSBT, for two reasons. First, monitoring protocols are still under development in both RFMOs and there is very little information in the public domain about the structure of the programmes, and no information on their performance. Second, farm monitoring programmes are not directly relevant to the development of a CDS for the WCPFC as there is currently no substantive tuna farming activity in this region.

these reasons, this analysis explores each of the scheme's approaches to transparency as well as their practicality and effectiveness.

5.1 CCSBT Southern Bluefin TIS and CDS

5.1.1 Operational History, Data Access and Resourcing

The CCSBT southern bluefin tuna TIS was implemented in June 2000 and was one of the earliest trade documentation systems. Although it was superceded by the CCSBT CDS as of January 2010, the TIS has one of the longest available time series of data, some of which are summarised and published online. Published data consist of summarised six-monthly import data by importer and flag State/source country from statistical documents and, where import data are missing, summarised export data from statistical documents (CCSBT 2009b). Re-export records were also required under the TIS but are not published. The first data under the CDS are currently being compiled and will be reported beginning in December 2010.

As noted above, the TIS was primarily based on importers' submissions of statistical documents (Table 6), and it required importers to take responsibility for the import section of those documents and to report any missing, illegible or incorrect export data contained in them. It also required that exporters take responsibility for the export section of the documents and maintain, and submit to the Secretariat, a subset of the information contained on the same statistical documents submitted to the Secretariat in full by the importers (CCSBT 2006, Articles 5.7-5.10). The exporters' data subsets were used to supplement the database compiled from the importer-submitted statistical documents whenever data gaps in the importers' submissions were apparent and could not be remedied (e.g. when no corresponding statistical document was received from the importer). In these two ways, the TIS incorporated an internal checks and balances system (Figure 3a).

Copies of all documents under the TIS were submitted to the Secretariat which was responsible for identifying missing and discrepant documents, and for reporting on these issues to the Commission. The Secretariat role under the CDS continues in a similar vein but involves even greater responsibilities for compliance monitoring and data analysis. There is no Compliance Officer within the CCSBT Secretariat and, with the exception of casual data entry, existing staff have undertaken the TIS-related work in addition to their other duties. The Secretariat intends to manage the CDS mainly from within existing resources although resource constraints may preclude any investigative functions (CCSBT Secretariat, personal communication).

5.1.2 Membership, Cooperation and Compliance

Prior to the implementation of the CCSBT record of authorised vessels in July 2004, a number of non-member States participated in the TIS. Afterward, since only Members and Cooperating Non-Members could authorise vessels, the TIS became limited to these parties. Nevertheless, the TIS was able to track trade beyond the current nine Members and Cooperating Non-Members though the dual importers' and exporters' submissions: as long as either the importer or exporter was a Member or Cooperating Non-member the trade would be recorded. In addition, the United States, which is not a CCSBT Member or Cooperating Non-member, agreed to cooperate with the TIS as of July 2005.

In total during the operation of the TIS (2003-data available through 2008), 19 countries or fishing entities were documented as importing southern bluefin tuna (CCSBT Secretariat, personal communication). Since >99% of the known catch, and >99% of the known trade, is reported by States which are participating in the TIS (CCSBT 2010), issues arising from the lack of participation by key States appear to be minor. As trade tracking continues under the CDS, cooperation will again be sought from the United States as well as from China (CCSBT Secretariat, personal communication).

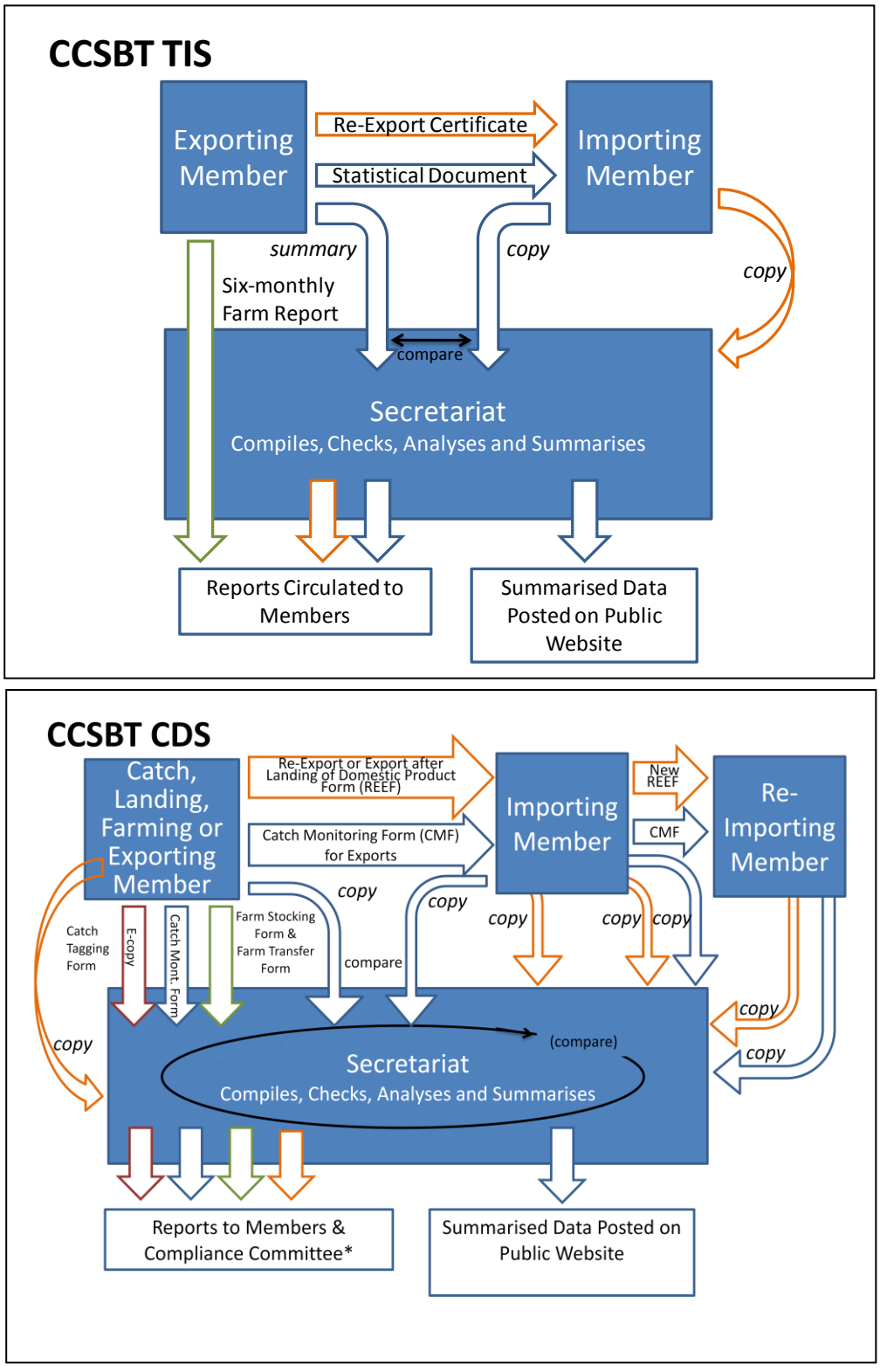


Figure 3. Flow of CCSBT TIS and CDS data between scheme participants, the Secretariat and the public.
*: Reports to be produced by the Secretariat for the Members and the Compliance Committee under the CDS include Production Reports (production summary and reported catch comparison report and detailed production summary report), Re-export and Export Form (REEF) Reports (detailed REEF summary report and reef discrepancy report), a Tagging Summary Report, Transhipment Reports (transhipment summary report and transhipment discrepancy report), Farm Reports (farm summary report and farm discrepancy report) and Reconciliation Reports (discrepancies in forms from different sources).

TIS performance data for the period April 2007 to March 2008 indicated that the scheme was operating smoothly with very few compliance issues arising. Of the 1,059 TIS documents received, only 21 had problems remaining with the export data, and only 1 of the documents had problems remaining with the import data, after correspondence with the relevant countries/fishing entities. Most of the remaining problems (13 of 22) were associated with a lack of specificity in the month of harvest (i.e. a range of months rather than a single month provided) which could not be corrected retrospectively (CCSBT Secretariat, personal communication).

The CCSBT Compliance Committee has been briefed on participants' individual compliance with TIS requirements since its first meeting in 2006. In 2009, after the second meeting of the Joint Tuna RFMOs called for development of compliance review mechanisms (Joint Tuna RFMOs 2009b), a "compliance report card" format covering several CMMs was produced (CCSBT 2009c). The report card contained six data fields pertaining to catch and trade documentation which are either percentages or categorical scores, i.e. compliance within the required timeframe (√), compliance outside the required timeframe (F), partial compliance (P) and non-compliance (X). These fields evaluate: receipt of electronic export data and percent complete; receipt of import documents and percent complete; receipt of updated validation details; and receipt of 6-month farm reports. The report card for July 2008-June 2009 showed full compliance (√ or F) for 6 of 9 members for export data; for 5 of 9 members for import data; 6 of 9 members for validation details; and all relevant farm monitoring reports submitted. In general, submitted data were largely complete. It should be noted that this performance review of individual Members and Cooperating Non-members does not necessarily reflect the overall effectiveness of the scheme since the scheme itself will perform well if the participants with the greatest trade volume perform well, even if the others do not (as is illustrated by the preceding paragraph).

5.1.3 Internal Consistency: Cross-checking CDS Data

Of the total reported trade quantity (i.e. imports supplemented by export data as necessary (see Section 5.1.1)), 99% was destined for Japan (Table 6).

Table 6. Traded quantities reported under the TIS by importing country (CCSBT 2009b, subset of Annex 2a report).

Year	2003	2004	2005	2006	2007	2008	TOTAL
Japan	10,669	10,156	10,320	9,704	10,743	9,560	69,132
United States*	42	73	81	74	26	38	344
Korea, Republic of	8	1	73	68	34	100	284
Indonesia	0	0	0	0	1	23	24
Belgium	0	4	11	0	0	0	15
France	0	0	0	0	0	11	11
United Kingdom	0	0	0	0	0	7	7
Netherlands	0	0	0	0	0	5	5
Other	1	1	5	5	0	8	22
TOTAL	10,721	10,235	10,490	9,851	10,804	9,753	69,844

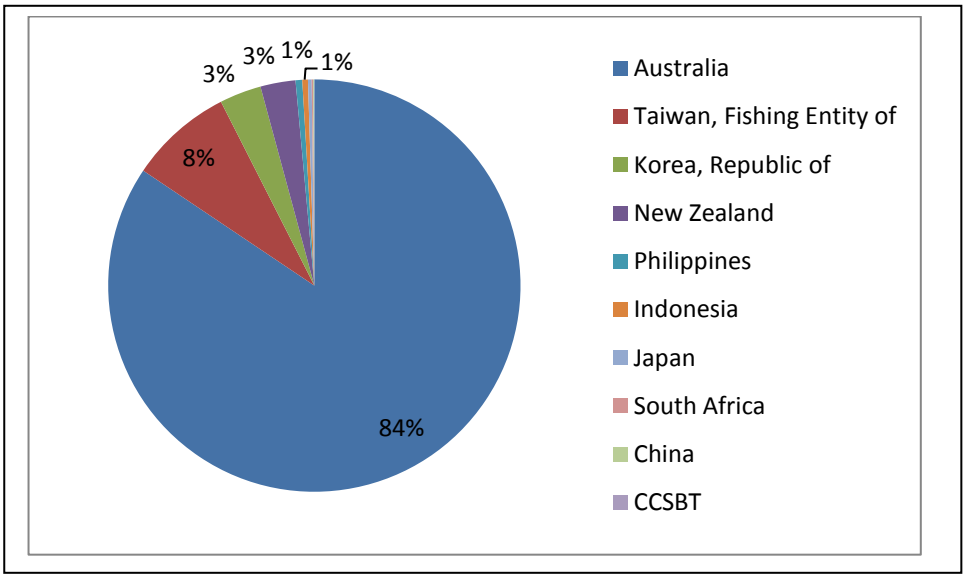
* Although the United States implemented the TIS in July 2005, it has never reported any imports to CCSBT. The quantities shown as imports by the United States in this table are derived from export records.

The origin of the imports reported under the TIS for 2003-2008 are shown in Figure 4. Since nearly all of the trade is imported by Japan, the total figures closely match the Japan import figures. The vast majority of the trade to Japan consisted of shipments from Australia (84% overall, 99% of which were farmed).[22] The remainder of the Japanese imports were largely

[22] Designation as "farmed" is only available for imports, therefore those records known only through export data are not included in this calculation of "farmed" quantities.

composed of shipments from Taiwan (8%), Korea (3%) and New Zealand (3%). Japan reported receiving southern bluefin tuna from China through 2004 but exempted these from the TIS for various reasons which are not elaborated upon in CCSBT meeting reports (e.g. the fish were dispatched by Japanese vessels to free-trade zones and were not actually imported to China (CCSBT 2003, 2004); the fish were mis-identified northern bluefin tuna (CCSBT 2005)).

Figure 4. Origin of the imports reported to CCSBT under the TIS (2003-2008) (CCSBT 2009b).



The percentages of the total reported trade known only through export records were calculated for each year from data published by CCSBT and show that the quantity is small (2-8% per year[23]) with no clear trend over time (Table 7, third and fifth columns). This indicates that the system operated with a reasonable level of internal consistency, i.e. import data matched export data more than 92% of the time.

Table 7. Trade Information System (TIS) data and catch data (in t) reported by CCSBT, 2002-2008 (CCSBT 2009b).

Year	Reported as Imports	Reported as Exports (only)	Total Reported under TIS	Percentage of Total Reported as Exports (only)
2003	10,113	608	10,721	0.06
2004	9,465	770	10,235	0.08
2005	10,061	428	10,490	0.04
2006	9,515	335	9,851	0.03
2007	10,602	203	10,804	0.02
2008	8,683	1,069	9,753	0.11

In addition to internal consistency between import and export data, the TIS was designed to guarantee internal consistency between import and re-exported quantities of southern bluefin. It addressed this by requiring that a copy of the original, validated statistical document be attached to each re-export certificate (CCSBT 2006, Article 6.1). The TIS re-export data are not published and were generally not used for compliance or scientific purposes. However, the Secretariat reports that it routinely checked these data to ensure

[23] Excluding 2008 for which import records may not have been submitted or processed at the time these data were published.

there was no “over-utilisation” of statistical documents by re-export certificates (CCSBT Secretariat, personal communication).

The re-export certificates differed from the statistical documents in that their validation depended on being able to establish traceability of the fish to a validated statistical document. (Under Article 6.3 of the TIS (CCSBT 2006) re-exporting Members and Cooperating Non-members shall request necessary traceability documentation from traders before validating the re-export certificates, and shall provide this documentation to flag country/fishing entities and importing countries upon their request). As there are no reporting requirements for these traceability procedures, compliance cannot be evaluated. Despite the lack of oversight and monitoring with regard to re-export procedures, the CCSBT Secretariat considers that the risk to the TIS was small because re-exports occurred infrequently and involved only small quantities (CCSBT Secretariat, personal communication).

Six-monthly farm reports were also required under the TIS (CCSBT 2006, Article 2.2(e)). These documents were not subject to analysis or checking by the Secretariat, except to the extent that some of the data contained in these reports are also reported on the statistical documents as imports and exports. Although they were not formally analysed, the six-monthly farm reports were circulated to all Members for comment (CCSBT Secretariat, personal communication).

Checks on internal consistency under the CCSBT CDS will be considerably strengthened. The reconciliation of import and export data will continue as formal Reconciliation Reports identifying the number and types of documents that are expected but have not yet been received by the Secretariat, and any discrepancies between these forms. Re-export discrepancy reports will also be produced to highlight any statistical documents (now known as Catch Monitoring Forms) that have been over-utilised in subsequent exports and re-exports. In addition, the CDS requires new documents (Farm Stocking Form, Farm Transfer Form, Catch Tagging Form) and new information for its Catch Monitoring Form (formerly the TIS statistical document) and Re-Export Form, and these data also will be cross-checked in Production Summary Reports, Tagging Reports, Transhipment Reports and Farm Reports. All of these reports will be prepared by the Secretariat every six months and distributed to each CCSBT Member (Figure 3b).

5.1.4 External Consistency: Cross-checking CDS Data with Other Catch and Trade Data

External consistency of the TIS can be evaluated by comparisons to logbook-based catch data or catch estimates from other sources. It is theoretically possible to construct a comparison of the total quantity of southern bluefin reported under the TIS and the total reported catch for each year but this comparison is complicated by the following factors:

- The catch data are reported in whole weights whereas the TIS data published by the CCSBT are in processed (net) weights;
- The TIS data reflect the increase in weight of farmed fish since the time of catch;
- The TIS data exclude domestically-landed fish (i.e. almost all of the Japanese catch (26-49% of the total reported catch in 2002-2008 (CCSBT 2009b)), as well as potentially small quantities landed and consumed domestically in other countries); and
- There may be lags in the data resulting from fish being reported as catch in one year and as trade in a subsequent year, especially for farmed fish.

CCSBT has dealt with some of these issues under the TIS and continues its attempts to resolve them under the CDS. The CCSBT Secretariat routinely applies ad hoc conversion factors to processed weights received on TIS documents to produce figures for comparison to reported catch figures (CCSBT 2009d). These adjustments account for the first factor listed above. As shown in Table 8, the TIS-based estimates are generally 15-30% lower than the reported catch, however, in 2007, the TIS-based estimate exceeded the reported catches by nearly 20%.

Table 8. Reported catches of southern bluefin tuna (CCSBT 2009b) and Secretariat's estimate of catch in whole weight (t) based on TIS data (CCSBT 2009d). The Secretariat notes that TIS data for 2007 and 2008 may have been incomplete at the time the estimates were prepared (CCSBT 2009d).

Year	Reported Catch	TIS-based Catch Estimate	Percent Difference
2001	16,031	12,232	0.24
2002	15,258	12,269	0.20
2003	14,077	11,539	0.18
2004	13,505	11,312	0.16
2005	16,151	11,764	0.27
2006	11,741	11,089	0.06
2007	10,583	12,626	-0.19
2008	11,376	8,598	0.24

The Secretariat provides the conversion factors used to make the adjustments from processed to whole weight (CCSBT 2009d), but uncertainties in these conversion factors are compounded by the fact that the shipments known through the export records only do not provide any information on the product form. This will be remedied under the CDS as all import and export data must be coded by product form.

As evident from the substantially lower TIS-based catch estimates in Table 8 for most years, these TIS-based catch estimates do not account for domestic landings or the growth of fish in farms. This will also be remedied under the CDS because it includes domestic landings in the system and will provide more detailed information on farm inputs and outputs.

The discrepancies in the TIS associated with time lags between quantities recorded as catch and quantities recorded as trade are expected to continue under the CDS as there remains the potential for fish to be held in a frozen state for several months. However, the CDS requires both importers and exporters to submit the same form (the Catch Monitoring Form) on a quarterly basis (CCSBT 2009a, Article 6.1) thus making both submissions identical in information content and reducing the time lag for export reports from six months to three months (CCSBT 2006, Article 5.8). This new feature is expected to reduce the influence of time lags on the trade dataset and allow for more timely comparisons with logbook-based catch data.

Another potential application of TIS or CDS-based catch estimates is comparison to ad hoc market-based estimates of catches such as those produced by the Independent Panel for the Japanese Market Southern Bluefin Tuna Review in 2006. CCSBT was unable to reach a consensus view on the amount of over-catch present in the Japanese market, but Japan admitted an over- catch of 1,800 tonnes in 2005 and had its future catch allocations reduced by half for five years as a penalty (New Scientist 2006). At the time, the TIS data were not useful in evaluating the results of this review, nor in informing the differing views of CCSBT members. This is because the TIS was incapable of producing a reliable estimate of all catches, in particular the Japanese catches which were at the centre of the dispute, because it excluded such data from the scheme. This situation galvanised support for reforming the TIS to a CDS in order to provide an ongoing, formal and comprehensive system for cross-checking logbook-based catch data.

Under the CDS, CCSBT has a set a performance target of accounting for at least 95% of all sources of fishing mortality of southern bluefin tuna. A methodology for evaluating the CDS data against this target has not yet been developed as it is believed to be best to begin receiving the new types of data under the CDS and to conduct some trial calculations before agreeing on methods (CCSBT Secretariat, personal communication).

5.1.5 Compliance Actions Taken

Originally, the TIS functioned to reduce IUU fishing activities and to collect catch information from non-members. Once the CCSBT record of authorised vessels was introduced, this record in combination with the TIS, limited market access, which encouraged participation in the CCSBT by new members and cooperating non-members. The primary compliance function of the TIS since then has been to provide a means of cross-checking some catch data, to identify markets, and to verify that vessels catching southern bluefin tuna for international trade are listed on the CCSBT authorised vessel list. In the history of the scheme, there have been about a dozen instances in which unauthorised vessels have been identified. Most of these have been quickly resolved because they arose from a CCSBT member or cooperating non-member not having kept its authorised vessel list up to date. In some cases, however, Port States initiated compliance actions against vessels that were not on the CCSBT authorised vessel list (CCSBT Secretariat, personal communication).

In addition to checking the authorisation status of fishing vessels, calculations performed by the Secretariat comparing TIS estimates to catch estimates have shown that some Members' catch as calculated from the TIS data has occasionally been greater than their nationally reported catch. The CCSBT Compliance Committee has not taken any action on the basis of these findings, nevertheless, the Secretariat attributes improvements in the catch reporting of existing members to the implementation of the TIS (CCSBT Secretariat, personal communication).

5.1.6 Use of Information for Scientific Purposes

TIS data have been made available to the Scientific Committee but have not to date been used for scientific purposes (CCSBT Secretariat, personal communication). One of the reasons for this appears to be associated with time lags associated with provision and receipt of data.

5.1.7 Summary and Discussion

This section summarises and discusses the CCSBT schemes in terms of its transparency, practicality of operation, and overall effectiveness for compliance and scientific purposes.

Transparency

Under the CCSBT TIS, the Secretariat is responsible for receiving all data submissions, for checking these for completeness and against each other, and for reporting the results to all CCSBT Members. This feature provides for unbiased analysis and transparent reporting across all Members. The requirements under the newly implemented CDS extend the remit of the CCSBT Secretariat for data analysis and reporting and are thus expected to improve upon the standard set by the TIS.

With regard to publicly available information, summarised TIS data have been provided on the CCSBT website on a regular basis. Analysis of published information, supplemented by analyses undertaken by the CCSBT Secretariat and made available to the public in accordance with published data confidentiality procedures, was able to confirm and evaluate the performance of most system components. It is therefore considered that the CCSBT TIS operated with a reasonable and appropriate level of transparency. Reporting to members

and to the public has not yet occurred under the CCSBT CDS. Ideally, it should provide at least the same, if not greater, level of transparency to generate confidence in its effectiveness.

Practicality of Operation

The practicality of the CCSBT TIS was confirmed by the high level of compliance achieved by most Members and Cooperating Non-members and the fact that no major individual member performance issues were highlighted. The internal checks and balances provided by requiring both importers and exporters to submit the same data, has proved useful in accounting for otherwise missing records. Re-export data appears to have been under-utilised but it could be argued that more might have been done with the re-export data if it had been a more significant component of the trade.

The operation of the TIS involved 19 trade States with approximately 1,000 documents handled each year. The CCSBT Secretariat was able to support this level of effort without additional resources, and despite the greater functionality of the CDS, the Secretariat will attempt to maintain the scheme under existing staffing levels. Furthermore, CCSBT sought, and continues to seek, to expand participation in the TIS/CDS as the market for southern bluefin tuna diversifies. While the operation of the TIS has proven to be practical, the considerable expansion of the scheme under the newly implemented CDS will test the compliance commitments of members and the resources of the Secretariat to administer the system.

Overall Effectiveness

Despite its focus on a relatively small fishery (currently ~10,000 tonnes with ~1,700 authorised vessels from ten flags[24] (CCSBT 2010)), and despite the fact that States participating in the TIS account for practically all of the known catch and trade, the effectiveness of the TIS as a catch monitoring tool was severely compromised by its design as a trade-based, rather than catch-based scheme. This is most clearly illustrated by its failure to identify, or to shed any light upon, the issue of over-catch by Japanese vessels for the domestic market. The vast majority of records submitted under the TIS (84%) tracked the trade flow of southern bluefin tuna from Australia to Japan, but it was difficult to conclusively relate even these quantities to catch data because of uncertainties regarding the appropriate adjustments to account for growth of farmed fish. Furthermore, despite the fact that some discrepancies between catch quantities calculated from the TIS and nationally-reported catches have been identified by the Secretariat, this has not yet been seen by the Compliance Committee as a sufficient basis for action. The primary tangible result of the TIS has been to identify several fishing vessels as not being authorised to catch southern bluefin tuna, although the Secretariat believes the TIS was also instrumental in improving Member's catch reporting and encouraging new member and cooperating non-member applications (CCSBT Secretariat, personal communication). Fortunately, major drawbacks in the effectiveness of the TIS have been addressed with the implementation of the CCSBT CDS in January 2010.

One of the major strengths of the CCSBT schemes (TIS and now CDS) is that compliance among existing participants should be sufficient to achieve a high level of effectiveness, thus while efforts to expand the scheme to other participants, e.g. China, are worthwhile they do not appear to be critical. Another major strength is the authority vested in the Secretariat to compile and analyse all submitted data. The quality of the data available for analysis will be integrally linked to the compliance of individual Members with the requirements under the

[24] Includes vessels flagged to Spain and Portugal under the European Union's CCSBT cooperating non-member status.

new CDS. Although these requirements are rigorous, CCSBT should consider the following points as potential future enhancements to further improve effectiveness:

- Adopting formal standards of evidence and procedures for exempting traded quantities from the CDS on the basis of purported species mis-identification, or other reasons;
- Establishing a formal process for agreeing, and approving deviations from application of agreed conversion factors;
- Developing procedures for documenting over-catch within the CDS in parallel with ongoing discussion of procedures for handling over- and under-quota annual catches;
- Reviving and updating the very useful minimum standards for completion of TIS documents, which were not carried forward into the CDS (i.e. detailing the responsibilities of importers, exporters and the Executive Secretary for ensuring the correctness and completeness of data on the forms).

In its current form, and ideally with these enhancements, the CCSBT CDS appears to have great potential as a tool for monitoring compliance with CMMs including total allowable catch limits.

5.2 CCAMLR Toothfish Catch Documentation Scheme

5.2.1 Operational History, Data Access and Resourcing

The CCAMLR toothfish CDS was implemented in May 2000 and its fundamental data submission requirements have remained largely unchanged since then. The CCAMLR CDS datasets derive from the reporting requirements for CDS parties to the Secretariat which include a) providing copies of all validated *Dissostichus* catch documents (DCDs) issued to their vessels catching toothfish; and b) providing copies of all export or re-export[25] documents issued or received. Despite the requirement for the Secretariat to compile these documents, there is no explicit requirement for it to check or analyse them.

The scheme was primarily motivated by a need to distinguish between legal and IUU fishing operations, but also aimed at preventing IUU fish from entering markets (Sabourenkov and Miller 2004). For these reasons, the CDS is designed to track toothfish at each step from the point of landing for as long as they are moving in trade. The maximum number of movements recorded under the scheme thus far is eight (CCAMLR Secretariat, personal communication). Originally, the CCAMLR CDS was designed to provide only one-sided reporting of landings (i.e. by the flag State) but allowed for cross-checking of exports and re-exports (i.e. if both the sending and receiving party submitted the forms as required) (Figure 5). With the formal implementation of the electronic CDS (e-CDS) in June 2010, all issued DCDs, and as well as all export and re-export forms, are automatically included in the database and thus made available to all CCAMLR members participating in the scheme for verification and information[26].

[25] Under the CCAMLR CDS an export is considered to be the first international movement of toothfish after landing. Any subsequent exports are considered to be re-exports.
[26] Non-Contracting Parties participating in the scheme are only given access to documents for which they are reported as the port or import State.

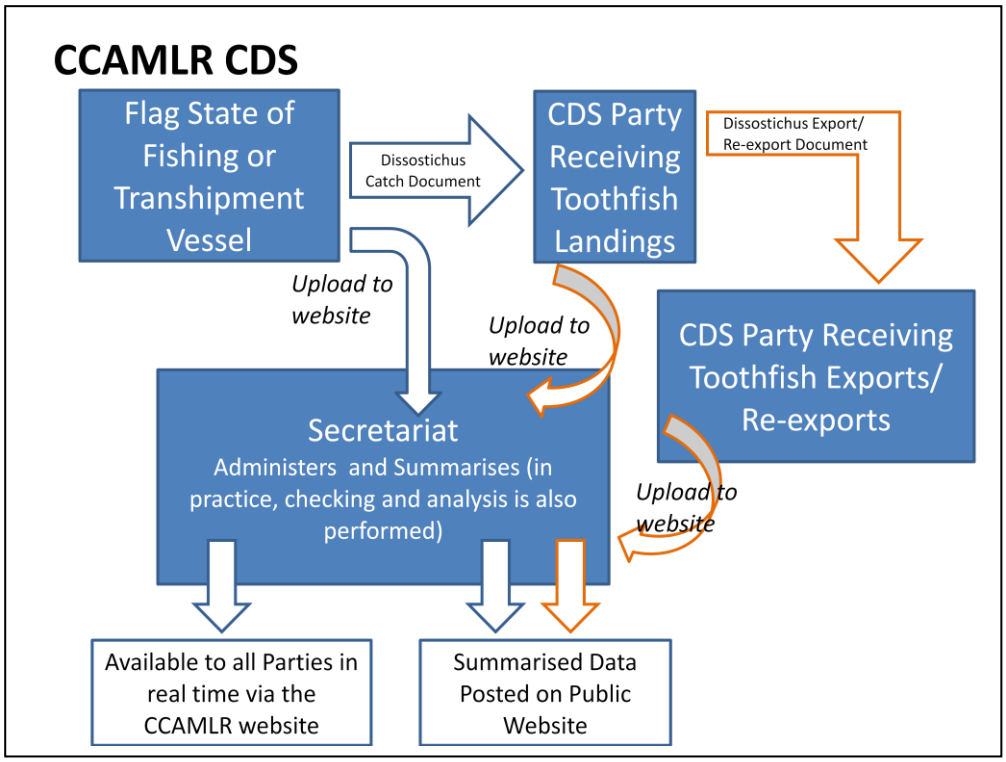


Figure 5. Flow of CCAMLR CDS data between scheme participants, the Secretariat and the public.

One of the most significant and unique features of the CCAMLR CDS is that it seeks to encompass all toothfish caught and traded, regardless of whether these fish are taken from the Convention Area. It achieves this by requiring all CDS Parties to certify, in the form of a DCD, that toothfish taken by vessels flying their flag were caught either outside the Convention Area, or within the Convention Area in compliance with all applicable CMMs. Furthermore, it requires that all CDS Parties refuse landings or imports of toothfish without a DCD. Validation of a DCD by the flag State requires VMS confirmation of the vessel's position (i.e. inside or outside the Convention Area) and under the CDS, Port and Import Parties may also request additional verification of DCDs via VMS (CCAMLR 2009a, Clauses A5 and 17). In this way, the CCAMLR CDS is able to monitor, for compliance purposes, whether catches within the Convention Area are within agreed limits. Also, although CCAMLR does not control catches of toothfish outside of the Convention Area, the CDS provides a means of recording the level of such catches. It should be noted that the CDS is not intended to provide real-time monitoring of catches against catch limits, as there are other mechanisms to achieve this, for example, catch and effort reporting at daily or five-day intervals.

CCAMLR is unique among RFMO schemes in providing a means for IUU catch (or over-catch) to be documented within the CDS. Procedures for the Specially-Validated *Dissostichus* Catch Document (SVDCD) allow for seized or other unsanctioned catch to be acknowledged and yet still enter the markets provided that the catch is recorded and appropriate actions are taken in response to the conditions of its catch.

Summaries of CDS data for all years have been published in the CCAMLR Statistical Bulletin through 2009. These data include annual total landings by area caught, in processed and estimated live weight; annual landings in processed weight by area caught and by flag State; and annual total quantities traded between each source and receiving

country for exports and re-exports. Data represent the combined total of both Patagonian toothfish (*Dissostichus eleginoides*) and Antarctic toothfish (*D. mawsoni*; CCAMLR 2010).

The CCAMLR CDS initially invested several months of staff time in developing the CDS, and an additional 84,000 Australian dollars in developing the web-based, e-CDS format. At present, the Secretariat receives 5,000 – 10,000 CDS-related documents per year and claims it can handle a considerably higher volume (i.e. up to double) with the current resources devoted to CDS issues (one full-time employee (FTE) recently reduced to 0.75 FTE). Some Parties with high CDS-related workloads have dedicated staff resources to implementing the CDS but this is not believed to exceed 1 FTE (CCAMLR Secretariat, personal communication). Secretariat staff have noted that the CDS's benefits offset its costs by offering improved, long-term protection of toothfish stocks as well as market premiums of up to 100% for certified-legal toothfish (Agnew 2000, Sabourenkov and Miller 2004).

5.2.2 Membership, Cooperation and Compliance

As of 2010, the number of Contracting and Non-Contracting Parties participating in the CCAMLR CDS stood at 36 (counting all EU Member States and overseas territories of CCAMLR Members as one; CCAMLR Secretariat, personal communication). However, the range of implementation among these participants varies considerably. For example, the United States strictly implements the CDS through a pre-approval process which requires that all imports derive from vessels which have been confirmed by the CCAMLR Secretariat to have reported the catch location via VMS (NOAA 2003a, 2007). In contrast, Singapore, a Non-Contracting Party voluntarily participating in the CDS, is implementing the scheme for re-exports but not for landings, and the Hong Kong Special Administrative Region of China does not implement the scheme even though China is a member of CCAMLR. Furthermore, China's opposition to direct engagement of Taiwan in CCAMLR prevents addressing issues associated with Taiwanese imports of toothfish caught by both licensed and IUU vessels.

In addition to varying levels of implementation between participants, the number of countries thought to be involved in the trade of toothfish continues to expand requiring CDS participation to also expand in order to maintain its effectiveness. CCAMLR is currently targeting 17 countries under its policy to enhance cooperation with Non-Contracting Parties (CCAMLR 2009b)[27]. According to CDS data from 2000-2009, 22 countries exported toothfish and 42 countries imported it, with a total of 46 countries involved in the trade (CCAMLR 2010). Some of these countries have submitted CDS documents and taken steps to control landings of toothfish in their ports but are not formally participating in the scheme. Sabourenkov and Miller (2004) note that the market premiums for certified-legal toothfish should serve to encourage Parties to participate in the CDS.

The CCAMLR Secretariat reports that day-to-day operation of the scheme has proceeded smoothly from the beginning (CCAMLR Secretariat, personal communication). In the first two years of CDS operation (mid-2000 to mid-2002), 4,222 DCDs were issued of which 18 (<0.5%) were found to be fraudulent or otherwise unauthorised (Sabourenkov and Miller 2004). Since that time the number of fraudulent documents has virtually fallen to zero (CCAMLR Secretariat, personal communication). When documents are received by the Secretariat they are checked for discrepancies and they may then be referred to the CDS Party which issued the document for clarification. This process is facilitated by the required appointment under the CDS of a national CDS contact officer by each participating State. Discrepancies that are not resolved in this manner may be referred to other involved parties

[27] The 17 countries are Cambodia, Equatorial Guinea, Nigeria, Democratic People's Republic of Korea, Panama, Sierra Leone, Togo, Kenya, Mozambique, Malaysia, Columbia, Mexico, Morocco, Philippines, Thailand, United Arab Emirates and Vietnam.

or to the CCAMLR Standing Committee on Implementation and Compliance (SCIC) (CCAMLR Secretariat, personal communication). Although non-governmental organizations have accused some flag and port States of failing to implement proper document validation and verification procedures (e.g. ASOC 2004), and there have been indications that some Parties are not submitting documents as required (CCAMLR Secretariat, personal communication), the SCIC has not recommended action against any Party for non-compliance.

Most of the remaining problems associated with the submission of documents have been resolved under the e-CDS. Although the system was formally implemented in June 2010, some Parties have been using the e-CDS for several years and all Parties have exclusively used the e-CDS format since January 2009. After completion of the CCAMLR e-CDS trial in 2004, the United States' toothfish import pre-approval system required the e-CDS format (NOAA 2003a, 2007) and since the major market for toothfish was the United States this greatly incentivised uptake of the system. In addition to the data management and access benefits mentioned above, the electronic format allows for data entry controls (e.g. each user is authorised to enter data for certain vessels and ports only) as well as electronic credentialing of submitters, routine error-checking, and automated comparisons between trade and catch quantities (CCAMLR Secretariat, personal communication).

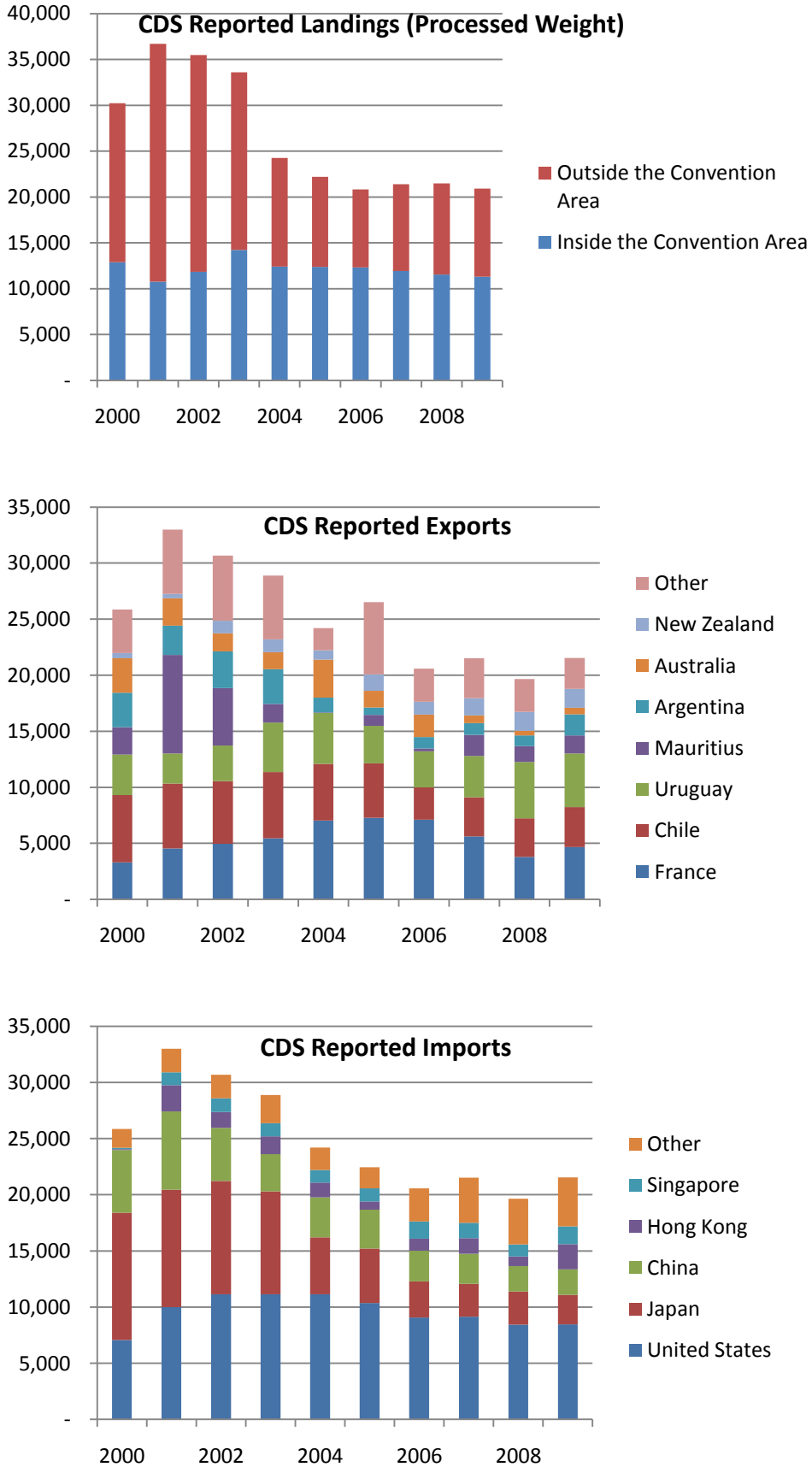
5.2.3 Internal Consistency: Cross-checking CDS Data

Parties to the CDS are required to submit copies of all export or re-export documents issued or received to the CCAMLR Secretariat but as only a single annual figure representing the trade between two Parties is published, it is not possible to assess from publicly available data how many shipments are reported by both parties and the degree of consistency between those reports. Nevertheless, discussions at the SCIC indicate that this parallel reporting requirement has usefully served to identify parties which are not participating in the scheme including, for example, Hong Kong (CCAMLR 2009b).

Published landings and export data are presented in Figure 6 and show a decrease in catch and trade from a peak in 2001 of approximately 37,000 t to relatively stable level in 2006-2009 of around 20,000 t. This decrease stems mainly from a reduction of over 50% in the amount of catch reported from outside the Convention Area. Despite this decline, patterns in the proportion of the trade handled by major exporting and importing countries have remained relatively constant (Figure 5, panels b and c). Some exceptions include a decline in the share of exports originating from Mauritius, Argentina and Australia, and a decrease in the proportion of imports by Japan and China. In the case of exports, the major trading entities are all parties to the CDS and the proportion of exports from "other" countries (some of which are also CDS Parties) is declining with time. In contrast, for imports, two of the major trading entities, Hong Kong and Singapore are not fully implementing the CDS, and the number of countries reporting toothfish imports under the CDS has increased from 20 in 2000 to 31 in 2009. It is noted that this increase in importing countries may reflect either a diversification of the trade and/or more comprehensive implementation of the CDS (i.e. more Parties submitting documents).

There have been some efforts to compare CDS-documented traded quantities with national customs statistics in order to gauge the coverage of the CDS as compared to the total trade. These types of comparisons are not always straightforward as there is potential double-counting of toothfish crossing more than one customs boundary, and the use of erroneous or non-specific customs codes may either inflate or deflate the estimate. As a point of reference Miller and Sabourenkov (2004), citing Lack and Sant (2001), state that 90% of global imports and exports are handled by CDS Parties.

Figure 6. Landings data in processed weight (in t), and reported trade data from export documents showing exporting and importing countries and quantities (in t), 2000-2009 (CCAMLR 2010). For exports and imports, only those trading entities with a total of >10,000 t over the ten-year period are shown.



A simple comparison between the quantity of toothfish reported as landings under the CDS, and the quantity of toothfish reported as exports is likely to suffer from the same confounding factors as the "global" trade estimate. Nevertheless, this comparison shows the quantity of exports recorded under the CDS hovered near 90% of the quantity of landings recorded under the CDS for 2000-2003 and in 2008. In other years, such as 2005, the quantity of exports exceeded the quantity of landings by 20%. In 2004, 2006 and 2007 there was less than 3% difference between exports and landings figures (CCAMLR 2010)[28]. These data show a reasonable degree of consistency between CDS landings and export figures given that stockpiling due to market conditions and price fluctuations, domestic consumption or other factors could lead to discrepancies between annual landings and trade figures. This comparison does not, however, provide any insight into the quantities of toothfish which may escape both landings and trade documentation under the CDS.

5.2.4 External Consistency: Cross-checking CDS Data with Other Catch and Trade Data

In order to address the issue of IUU fishing for toothfish, several non-traditional methods of estimating total catch have been developed, some of which involve trade data. CCAMLR's Scientific Committee produces an annual estimate of IUU toothfish catch from the Convention Area by extrapolating catch rates from legal fisheries to the probable number of IUU vessel trips by area and season (Sabourenkov and Miller 2004). CDS-reported landings assist in these calculations, but are just one of several information sources used (e.g. sightings of IUU vessels, any available information regarding catch rates of IUU vessels, reports of undocumented landings and trade, seizures and gear recoveries).

Taking a different approach, Lack and Sant (2001) compiled a "global" trade estimate (based on summing several major trading entities' customs statistics), converted it using standard CCAMLR conversion factors to whole weight, and subtracted reported legal catches to obtain an estimate of IUU catches. This analysis did not utilise CDS data as the CDS had been in operation for less than one year at the time of the study. For the three years examined (1997/98 through 1999/00), the IUU catch represented 54%, 27% and 57%, respectively, of the calculated "global" trade-based catch figures. For comparison, CCAMLR's Scientific Committee estimated the percentage of the total catch that was IUU catch for the same three years as 66%, 21% and 32%, respectively (Sabourenkov and Miller 2004). Differences between the two sets of figures would be expected due to differences in the methodologies. Also, if there is a non-negligible level of domestic consumption (i.e. quantities reported as catch but not as trade), the resulting IUU catch percent would be erroneously inflated.

The Secretariat calculates landings figures in whole weight by applying factors agreed by the CCAMLR Scientific Committee to the CDS-reported landings data (in processed weight). A comparison of these CDS-derived whole weights for toothfish reported to be caught in the Convention Area with catches reported from the Convention Area show a very close correspondence (Table 8, first three columns). These figures suggest that the CDS performs very well (≤6% difference in each year) in terms of identifying those catches which were taken legally and reported properly from within the Convention Area.

[28] Landings data for 2009 have been recently updated but were not compared with trade data for 2009 as a lag is expected and cannot be fully accounted for given the trade data available at this time.

Table 9. Comparison of CDS data with catch data for both species of toothfish (*D. eleginoides* and *D. mawsoni*) 2000-2009 in t, whole weight (CCAMLR 2010).

	Catch Reported from Inside the Convention Area	CDS Landings from Inside the Convention Area (estimated whole weight)	Percent Difference (Catch vs CDS Landings Inside the Convention Area)	CDS Landings from Outside the Convention Area	Percent Taken Outside the Convention Area
2000	17,664	17,765	1%	23,669	57%
2001	13,804	14,514	5%	36,053	71%
2002	15,341	16,319	6%	32,545	67%
2003	18,508	19,772	6%	24,959	56%
2004	15,876	16,923	6%	14,652	46%
2005	16,235	17,336	6%	11,992	41%
2006	16,843	17,534	4%	10,599	38%
2007	16,328	16,737	2%	12,228	42%
2008	15,592	16,405	5%	12,925	44%
2009	15,783	16,140	2%	12,590	44%

There certainly has been some additional catch taken within the Convention Area which has not been reported as catch or under the CDS at all, or if reported, has been fraudulently recorded as taken from outside the Convention Area. This could occur, for example, if the flag State did not confirm the vessel's position as being outside the Convention Area before validating the DCD, or the port State did not request verification of the DCD via VMS data. It was suspected that in the early days of the CDS, reporting IUU catches taken inside the Convention Area as being from outside the Convention Area was a common way of subverting the system. In fact, estimates of IUU catch in the Convention Area made by the Scientific Committee for this period (2002-2004) matched CDS-derived landings data for three areas outside the Convention Area which were suspected to have low catch rates but which were reporting high catches (Figure 7). The lower catches for 2004 and 2005 estimated under both methodologies are reportedly due to prohibition by the United States of imports from two of these areas (high seas areas 51 and 57; CCAMLR 2006). Thereafter, requirements for VMS verification of catch location curtailed this type of subterfuge and estimates of IUU catch have remained below 4,000 t since 2005, dropping below 1,000 t in the 2008/2009 season (CCAMLR, various years).

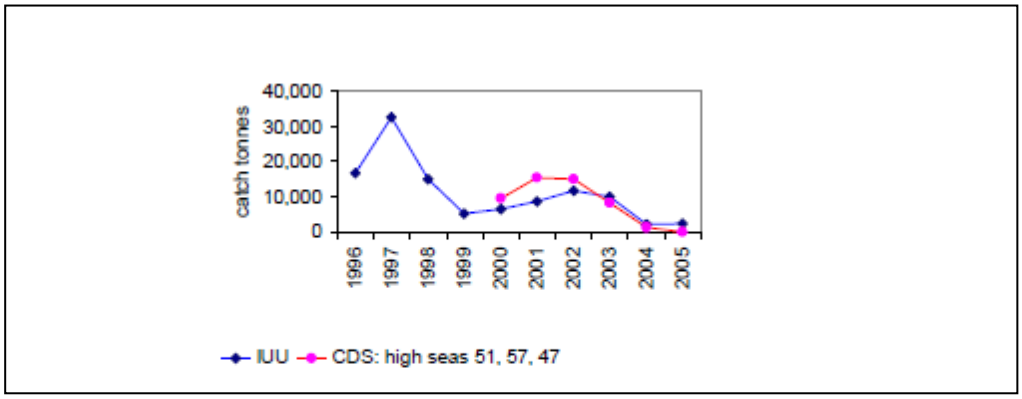


Figure 7. Comparison by the CCAMLR Joint Assessment Group (CCAMLR 2006) of the Scientific Committee's estimates of IUU catch and the CDS-derived landings data for three areas outside the Convention Area. The close correspondence between the figures in some years (2002-2004) suggests that IUU catch from the Convention Area was being camouflaged by reporting it as being from these three areas outside the Convention Area.

As shown in Table 9, the proportion of catch reportedly taken outside the Convention Area reached a high of over 70% of the total in 2001, but as CDS, VMS requirements and inspection

procedures have tightened, the percentage has declined and recently stabilised at about 40% (Table 9, right column). In the years prior to the CDS (1983-1999), Agnew (2000) reports that the percentage of catch taken outside the Convention Area ranged from 27-91% with an annual average of 62%.

5.2.5 Compliance Actions Taken

As discussed above, the CCAMLR Standing Committee on Inspection and Compliance (SCIC) has not recommended or taken any action on the basis of non-compliance with the CDS. However, several enforcement cases directed at IUU fishing for toothfish have cited the lack of required CDS documentation as part of their grounds for action.

In the first major case against toothfish smugglers (United States v. Arnold Maurice Bengis, Jeffrey Noll, Grant Berman and David Bengis), one of the original charges brought against the defendants alleged submitting a false DCD to United States authorities (NOAA 2003b, NOAA 2004b, Knecht 2006). In this case both South Africa and the United States pursued legal action on the basis of CDS violations. Although up to 18 containers with up to 240 t of illegal toothfish may have been imported, ultimately, the defendants pled guilty to associated charges involving rock lobster, and the case was decided on the basis of that plea (Knecht 2006, Michigan State University 2010). The three perpetrators were sentenced to a total of 88 months in federal prison and a total fine of $7.4 million (NOAA 2004b).

In the case of Antonio Vidal Pego and Fadilur, S.A., the defendants pled guilty to an indictment brought by United States' authorities charging that they had attempted to import and sell 25 t of illegally acquired toothfish in violation of the conservation and management measures of CCAMLR, including improper CDS documents, as well as other import violations. Sentencing involved fines of $400,000 and $100,000, respectively, and four years' probation for both parties (NOAA 2006).

Action has also been taken by Korea against a shipment of toothfish suspected to have derived from IUU fishing. The CCAMLR Secretariat had notified Parties that toothfish transferred to a Panamanian-flagged reefer "Seed Leaf" were not in compliance with CCAMLR conservation and management measures because they had been caught by the Togo-flagged "Hammer", one of the vessels included on CCAMLR's IUU vessel list and therefore ineligible to be issued with a DCD. Korea detained the vessel and prevented the landing of 255 t of toothfish on the grounds that it is bound by its responsibilities as a CCAMLR member to uphold the conservation and management measures and that these responsibilities included imposing a ban on unauthorised landings by its own vessels as well as by foreign-flagged vessels entering its ports (Park 2006, ASOC 2006).

In these cases, all involving CDS parties, the existence of the CDS created a rebuttable presumption that any toothfish not accompanied by proper CDS documents should be considered to be IUU catch. This creates a clear basis for enforcement actions on the part of authorities who may not otherwise have the resources or ability to investigate the provenance of the toothfish on their own.

5.2.6 Use of Information for Scientific Purposes

For scientific purposes it is important to add any known or suspected IUU catches to the amount of reported total removals from the stock when estimating future yield scenarios. As discussed above, CCAMLR's Scientific Committee and Joint Assessment Group have found CDS data to be useful particularly for understanding what portion of the catch may be legitimately derived from outside the Convention Area. This information can then be compared to expected yields from those areas and, if excessive, may be attributed to IUU catches within the Convention Area.

Despite the demonstrated scientific utility of CDS data, it remains difficult for scientists to assess the extent to which the recently observed declining trend in IUU fishing (Figure 7) is due to the CDS itself. In one sense, increasingly tighter implementation of the CDS by Parties should lead to gradually fewer and fewer IUU incidents by those Parties. However, IUU catch by vessels flagged to or trading with States which are not party to the CDS may continue to escape detection, particularly outside the Convention Area. Such activities may or may not be picked up by the CDS and by the methodology used by the Scientific Committee to estimate IUU. The Scientific Committee has furthermore noted that a trend of apparent decrease in the amount of IUU fishing may also arise from overall depletion of toothfish stocks (CCAMLR 2004c).

5.2.7 Summary and Discussion

This section summarises and discusses the CCAMLR CDS in terms of its transparency, practicality of operation, and overall effectiveness for compliance and scientific purposes.

Transparency

The CCAMLR CDS in its original paper format, and now in its electronic format, requires landings and trade documents to be submitted to the Secretariat and made available to all Parties for verification and information. While the CCAMLR Secretariat is not mandated to undertake checking and analysis of the CDS data, it nevertheless does perform these functions and brings any issues to the attention of relevant Parties for resolution, or to the SCIC for discussion. These features provide for unbiased analysis and transparent reporting across all Parties.

The annual web-based posting of summarised versions of all CCAMLR CDS data sets represents the greatest degree of catch and trade data disclosure among the schemes reviewed. As the CCAMLR CDS data are provided by area and in both processed and estimated whole weight, and are designed to encompass all catches, comparison with catch or global trade data is possible for both CDS Parties and concerned non-Parties such as non-governmental organizations (NGOs). Indeed, the longstanding and active participation of NGO advocates in CCAMLR's management processes has undoubtedly contributed to the high level of transparency with which the CCAMLR CDS operates.

Practicality of Operation

The demonstrated high level of compliance at which the CCAMLR CDS has operated since its early stages confirms that its requirements are reasonable and practical (as well as effective--see below). The mandatory e-CDS, formally implemented as of June 2010, is the first of its kind among the RFMOs. It was initially resisted by several Parties but gradually won acceptance through a trial phase of implementation and the unilateral action of one major trade State which refused to accept imports which did not use the electronic format. While the requirements of the CCAMLR CDS thus appear to be practically achievable, it must be acknowledged that considerable effort has been, and continues to be, required to secure the participation of flag, port and trade States which were not originally parties to the CDS. This, in combination with a trend toward a growing number of States importing toothfish, presents an ongoing challenge to the scheme.

The resources required to operate the scheme appear to be manageable both on the part of the Secretariat and the participating States, i.e. no more than one full-time employee each. The CCAMLR CDS involves a considerable number of flag, port and trade States (46 since 2000) and volume of documents (5,000 to 10,000 per year), but the scale of the CCAMLR CDS is still relatively limited compared to most of the larger tuna fisheries subject to RFMO catch or trade documentation schemes. It is noted that initial investment in an electronic format does not only mitigate to some extent the greater administrative burden arising from a high volume of

documents, but also conveys other benefits in terms of data quality, and ease of data management and dissemination.

Overall Effectiveness

The CCAMLR CDS was developed with the dual aims of distinguishing between legal and IUU products and preventing these products from entering the market. In combination with several compatible and complementary conservation and management measures (involving e.g. inspections, transhipment and VMS), it has been largely successful on both counts. In the early years of the scheme, it is likely that IUU catch taken within the Convention Area was misreported as being taken outside the Convention Area and thereby camouflaged. The CDS was considerably empowered thereafter by requirements for VMS verification of catch location, and was further strengthened by the mandatory electronic format in June 2010, both of which are unique to the CCAMLR CDS at this point in time. Another unique feature, undoubtedly reflecting CCAMLR's focus on achieving complete catch coverage, is the "specially validated DCD" procedures for accounting for toothfish which have been acquired through IUU fishing or over-catch. Overall, the CCAMLR CDS has achieved a high level of compliance among participating States, has contributed to scientific estimates of IUU catches for use in stock assessment, and has supported several major enforcement actions against IUU fishing by CCAMLR member States.

The only apparent weaknesses in the CCAMLR CDS arise from shortfalls in CDS implementation either because flag, port or trade States refuse to participate at all, or fail to implement all components of the scheme in a rigorous manner. The major concerns in this regard are continuing implementation shortfalls by Hong Kong and Singapore, both of which consistently appear as major receivers of toothfish based on CDS export documents. In addition, CCAMLR has identified a further list of 17 countries for which CDS participation is desirable given the ongoing diversification of the trade to new importing States. Political considerations notwithstanding, inclusion of Taiwan in the scheme is also important from the standpoint of effectiveness. The quantity of IUU catch leaking from the CDS via trade between two non-participating and/or non-compliant parties appears be impossible to estimate precisely. Nevertheless, if CDS leakage is commensurate with estimates of IUU fishing, recent data suggest levels are less than 6%[29].

5.3 ICCAT Bluefin Tuna Catch Documentation Programme

5.3.1 Operational History, Data Access and Resourcing

The ICCAT CDP was first implemented in June 2008, amended twice in November 2008 and November 2009, and implemented in its current form in June 2010. The objectives cited in the original version of the ICCAT CDP (ICCAT 2007a) suggested that the purpose of the scheme was to improve control of catches and compliance with CMMs, to provide traceability from capture to market, and to support scientific research (see Table 2). The most recent version of the CDP, however, does not re-state these, or any other, objectives of the scheme (ICCAT 2009a). A press release issued by ICCAT in conjunction with its most recent Commission meeting (November 2009) described the CDP as "a comprehensive catch documentation system that will track bluefin tuna products from the point of catch to the first point of sale, whether nationally or internationally" (ICCAT 2009b).

The data generated under the ICCAT CDP derives primarily from two types of documents (Figure 8). Bluefin Catch Documents (BCDs) are required when bluefin tuna are landed in ports, delivered to farms or harvested from farms. These documents must be validated by flag

[29] The estimate of IUU catch by the Scientific Committee for the 2008/2009 season was 938 t. The reported catch inside the Convention Area for the same season in estimated live weight was 16,140 t.

States of fishing vessels catching bluefin tuna or by farm States harvesting bluefin tuna and must be provided to the competent authorities receiving the fish and to the Secretariat within five working days of validation. The second type of document required under the ICCAT CDP is the Bluefin Tuna Re-export Certificate (BFTRC) which is issued by any State re-exporting bluefin tuna (i.e. any subsequent movement of tuna after import from a fishing vessel or farm). The responsibility for providing copies of BFTRC to the Secretariat lies with the State receiving the fish, i.e. the importer. All BFTRCs must have a copy of the corresponding BCD attached. The Secretariat has noted that some BCDs are known only because they are submitted as attachments to BFTRCs (ICCAT 2009c).

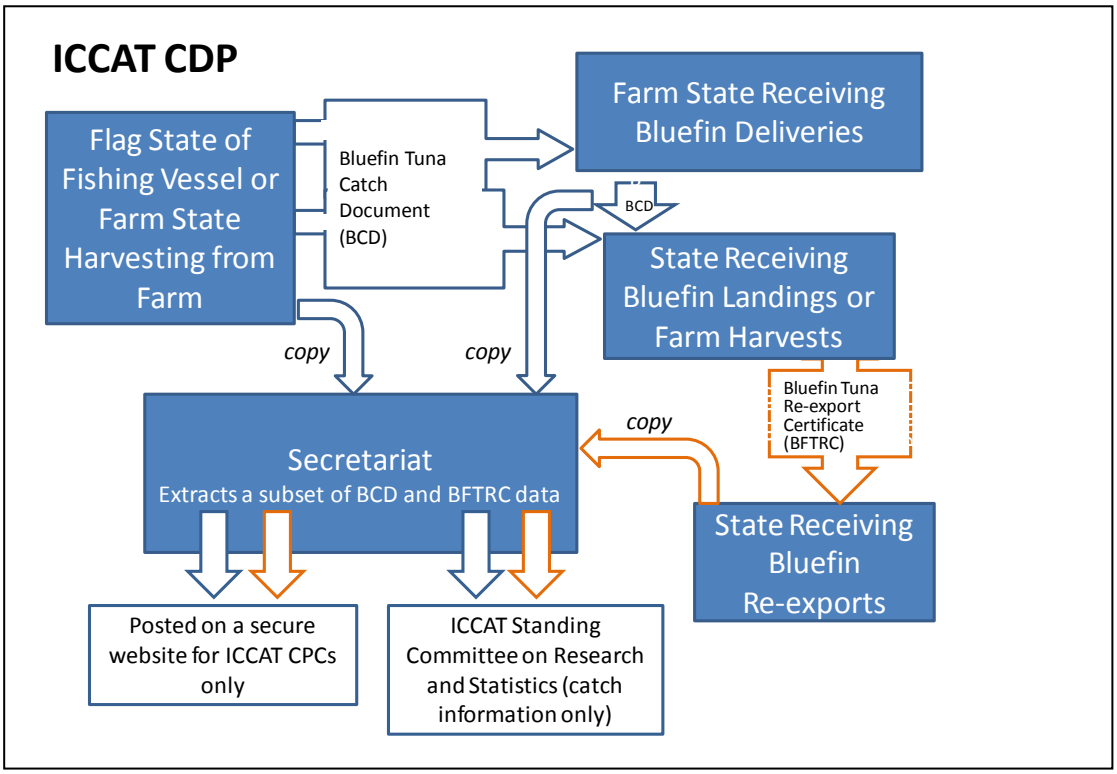


Figure 8. Flow of ICCAT CDP data between ICCAT CPCs, the Secretariat and the SCRS.

The Secretariat is required under the CDP to compile a database from the submitted BCDs and BFTRCs, but this database contains only a subset of the information contained on the documents. Specifically, only 15 of 50 data fields from the BCD and 7 of 24 data fields from the BFTRC, in both cases about 30%, are compiled for the database. While these fields appear to contain most of the key information from the documents, they omit information on product form for landings or traded products, thereby complicating the application of conversion factors to compare catch and trade figures. It is only this subset of data that is posted by the Secretariat to a secure website accessible by ICCAT Contracting Parties, Cooperating non-Contracting Parties, Entities and Fishing Entities (CPCs). A portion of this subset can be made available to the Standing Committee on Research and Statistics (SCRS) upon request.

In addition to submitting copies of BCDs and BFTRCs to the Secretariat, as required, CPCs are required to submit annual reports on the implementation of the CDP (ICCAT 2009a, Article 34) and, if they tag fish and thus exempt those fish from the requirement for validated BCDs, a one-time report on the implementation of the tagging program (ICCAT 2009a, Article 20). These reports are posted on the password-protected ICCAT website accessible by CPCs. The annual reports follow a format set by ICCAT that includes information extracted from the BCDs, and can be made available to the SCRS upon its request (ICCAT 2009a, Article 34). The tagging reports do not follow a set format but usually contain information on the regulatory framework for the tagging programme and the design and attachment of the tags. This tagging reports are

only submitted once and do not provide annual summaries of numbers or weights of tagged fish.

According to the draft ICCAT Suggested Rules and Procedures for the Protection, Access to and Dissemination of Data Compiled by ICCAT (ICCAT 2009d), CDP data is classified as medium risk. The risk classification is based on *inter alia* "the damage that would be done to the operations or creditability of the Commission as a consequence of the unauthorised disclosure or modification of such information". The only information about the CDP maintained by ICCAT on its public website is the date of the last update of each CPCs' validation authority details. A limited amount of CDP data is summarised in reports that are available online (e.g. ICCAT 2010a) but most summaries are contained in limited-distribution reports or on password-protected websites accessible only to ICCAT CPCs.

As ICCAT declined to participate in interviews requested under this study, there is no information available on the amount of resources ICCAT devotes to maintaining the CDP per se. The Secretariat's Compliance Department employs a compliance officer, a technical officer and a data entry technician but their responsibilities span a very broad range of tasks across all of ICCAT's CMMs and programmes. According to the structure of the CDP, most of the effort associated with the CDP should be performed by the CPCs, especially those which engage in the largest volume of catches, farming and trade. The first full-year reporting by the Secretariat on the CDP (November 2008 – October 2009) indicated receipt of 1,974 BCD versions representing 1,630 BCD events, and 464 BFTRCs (ICCAT 2009b).

5.3.2 Membership, Cooperation and Compliance

ICCAT currently has 48 CPCs (EU Member States counted as one), all of which are required to comply with the requirements of the CDP if they participate in bluefin fisheries. Of those that do participate in such fisheries (i.e. Mediterranean countries plus Canada, China, Iceland, Japan, Korea, Mexico, Norway, and the United States), 18 have submitted at least one of the five types of information required under the scheme to be submitted to the Secretariat (EU Member States counted as one; ICCAT 2009c). The number of CPCs submitting BCDs is however much lower as this number is comprised only of those CPCs receiving bluefin landings, receiving live bluefin for farms or harvesting bluefin from farms, excluding those CPCs which tag fish. In the one-year reporting period from November 2008-October 2009, only twelve CPCs submitted BCDs (EU Member States counted as one). Statistics presented at the ICCAT Compliance Committee Inter-sessional in February 2010 indicate that the number of CPCs submitting BCDs for the 2009 fishing season had decreased to eight, i.e. Albania, Croatia, the EU, Korea, Libya, Morocco, Tunisia and Turkey (ICCAT 2010a). Only one CPC (Japan) submitted BFTRCs to the Secretariat for the November 2008-October 2009 period (ICCAT 2009b) suggesting that Japan is currently the only market for re-exported bluefin.

ICCAT acknowledged a low rate of BCD submissions for the 2009 fishing season but pointed to time lags in document submission and data entry, and the CDP provision which exempts those CPCs tagging captured bluefin tuna from submitting BCDs to the Secretariat as reasons (ICCAT 2010b). There is contradictory information available regarding how many CPCs invoke the tagging programme exemption: some sources report that three CPCs currently pursue such programmes (ICCAT 2010b), whereas other sources indicate that five CPCs (Canada, China, Japan, Spain and the United States) have submitted a one-time summary of the implementation of the tagging programme as required (ICCAT 2009c).

According to the requirements of the CDP (ICCAT 2009a), all CPCs shall provide an annual report on implementation of the CDP to the Secretariat. However, as of the end of February 2010 only ten reports had been submitted for the 2009 fishing season (ICCAT 2009c). Each annual report follows a template that requires each CPC to report on the number of BCDs validated and number of validated BCDs received, and the number of verifications requested

and number of verification requests received. The latter statistics provide some insight into the level at which CPCs are examining and confirming the accuracy of received documents. As shown in Table 10, the EU reported validating the highest number of BCDs but was requested to verify <0.2% of them (3 / 1,678). In contrast, the number of verifications requested by the EU relative to the number of BCDs received amounted to 55% of the total (159 / 291). Japan reported receiving over 5,000 BCDs but reported requesting verification for only two. The United States received over 1,000 BCDs but reported no requests for verification; however, it did report investigating five cases of potential bluefin tuna import violations (United Kingdom Government, personal communication). These statistics suggest that the overall level of scrutiny applied to BCDs is low (2%), although it is possible that there may be other confirmation processes operating which are not reported by the CPCs in their annual reports.

Table 10. Statistics compiled from BCD Annual Reports submitted to ICCAT by three CPCs for the period 1 July 2008 to 30 June 2009 (United Kingdom Government, personal communication)

	EU	**Japan**	**United States**	**Total (EU, Japan and United States)**
Number of BCDs Validated	1,678*	1,002** (660 BFTRCs)	181*** (181 BFTRCs)	2,861
Number of BCDs Received	291	5,032*	1,231 (185 BFTRCs)	6,554
Number of Verifications Requested	159	2	0	161
Number of Requests for Verification Received	3	na (presumably nil)	0	3

Notes: *It is noted that this figure exceeds the number of BCDs reported to have been received by the Secretariat from 1 November 2008 – 16 October 2009 (n=1,630; ICCAT 2009c).
**This figure is comprised of the 660 BFTRCs as well as 40 "domestic trade" BCDs and 302 "export" BCDs. As Japan has not submitted any BCDs for its own catches to the Secretariat for either 2008 or 2009 (ICCAT 2009d, 2010a), it appears that fish covered by these 342 BCDs are excluded from reporting requirements under the tagging exemption.
***Since the United States reported catches of BFT in 2008 (ICCAT 2009d) but according to these statistics no BCDs were issued, it appears that United States catches are excluded from reporting requirements under the tagging exemption.

Although the Secretariat has not been granted any specific responsibilities for checking or analysing the CDP data, it noted it was "having a great deal of problems" with regard to CPC's compliance with scheme requirements (ICCAT 2010c). The most important of these is that many CPCs are not respecting the "five working days after validation" deadline for provision of completed BCDs to the importing authorities and the Secretariat. In fact, Japan, which reports receiving most of the imports under the CDP (see Section 5.3.3), reported that only Croatia was compliant with this requirement. It was noted that this situation "undermines the process of verification" and thus weakens the effectiveness of the scheme (ICCAT 2010a). Issues associated with the timing of the validation itself have also been extensively discussed (ICCAT 2010a). Another issue has been raised with regard to the numbering of documents: some documents are numbered differently but appear to contain the same information, and split catches are sometimes given different BCDs rather than using version numbers as required (ICCAT 2009c). This issue is potentially critical to the scheme because it complicates traceability and could lead to double-counting or other tallying problems. Other issues noted by the Secretariat include illegible entries on forms; and missing information on points of export and import, fishing gear and geographic location [of catch] (ICCAT 2009c). The outcome of the most recent discussions of these issues was to encourage CPCs to comply with the scheme requirements as written (ICCAT 2010a).

5.3.3 Internal Consistency: Cross-checking CDP Data

There is little opportunity for cross-checking of CDP data for several reasons including the reporting requirements of the scheme, the lack of a clearly assigned responsibility for oversight, and the incomplete nature of the datasets. First, under the ICCAT CDP there is no requirement

for both the issuing and receiving CPCs to submit copies of the documents to the Secretariat. This unilateral reporting does not allow missing or discrepant documents to be identified through comparison of submissions of both parties to the trade. The structure of the CDP also requires that landing of dead catches, live deliveries to farms and dead harvests from farms all be recorded on the same form. At best this system facilitates traceability by integrally linking several consecutive steps in production, however, it is has led to confusion regarding BCD versions versus duplicates. For example, for the year ending October 2009, the Secretariat reported receiving 1,974 versions of BCDs but believed that these represented only 1,630 BCD validation "events". Related problems with unique document numbering have been identified and remain to be fully resolved (ICCAT 2009c).

Second, as described under Section 4.4, the ICCAT CDP has no formal provision for data analysis by the Secretariat although the Secretariat may be requested by the SCRS to compare CDP data with catch data. There are no publicly available CDP data and CPCs themselves can only access approximately 30% of the data required under the scheme. As a result, most of the responsibility for document verification remains with parties involved in the trade, with very limited opportunities for independent, third party oversight. In particular, importers of bluefin tuna are required to verify the BCDs associated with each BFTRC received. In the year ending in October 2009, BCDs covering 18,145 t of bluefin were reported to the Secretariat, and Japan reported importing 17,374 t of bluefin under 464 BFTRCs. Assuming that the influence of time lags between BCD and BFTRC issuance is minimal, it is estimated that Japan receives approximately 96% of the bluefin covered under the CDP. As it is the only ICCAT member which has full access to and responsibility for verifying the BCDs associated with this 96%[30], this places it in a position of disproportionate authority in terms of identifying CDP compliance issues. In fact, the February 2010 ICCAT Compliance Committee Inter-sessional report states that "Japan will undertake a review of all recent trade data and present information to the Committee if other CPCs had potential overcatch which had not been reported."

Finally, data deficiencies also limit the ability to conduct internal verification and checking of the scheme. The Compliance Committee has highlighted problems with late submission of documents to authorities receiving bluefin and to the Secretariat (ICCAT 2010a). Part of these delays arise from farm harvesting schedules (ICCAT 2010b) which may again suggest that documentation procedures for dead landings, live transfers of fish for farms, and dead fish from farms need to be revisited and perhaps separated onto different forms. Other delays arise purely from a lack of compliance by CPCs with scheme requirements. Gaps in data also arise from the tagging exemption. BCDs for tagged fish do not require validation and are not required to be submitted to the Secretariat, although they may eventually reach the Secretariat as attachments to BFTRCs (i.e. if re-exported). As there is also no requirement to report the number or weight of fish tagged each year, tagged fish are potentially invisible to the CDP and introduce a discrepancy which cannot be quantitatively accounted for when comparing CDP and catch data (see below).

5.3.4 External Consistency: Cross-checking CDP Data with Other Catch and Trade Data

As discussed in Section 3.2.2, discussions held at ICCAT prior to the implementation of the CDP revealed deep divisions in the opinions of CPCs regarding the appropriateness of using catch/trade documentation for catch monitoring purposes. As the preceding description of the CDP's structure, oversight and data submissions has highlighted, and the following analysis will show, it is currently impossible to meaningfully compare CDP and catch data.

Compilation of documents by the Secretariat for the ICCAT Compliance Committee Inter-sessional in late February 2010 indicated that BCDs submitted as of that time accounted for

[30] It is noted that the Secretariat should eventually receive copies of these BCDs from Japan but the Secretariat has no responsibility for verifying these documents.

only 54% of the reported catches for the 2009 fishing season (ICCAT 2010b). As introduced above the shortfall was attributed to late reporting of farm harvests and delays in data entry, as well as to the tagging exemption (ICCAT 2010b). Another factor which was not mentioned is that the catches against which received BCDs were compared (Table 11) appear to be based on weekly catch reports to ICCAT which are only required for the eastern Atlantic and Mediterranean stocks (ICCAT 2008b, Article 69) whereas the CDP applies to all Atlantic bluefin[31]. In 2008, the bluefin catch from the eastern Atlantic and Mediterranean represented about 92% of the total catch. Therefore, if the best estimate of catches based on weekly reports for the 2009 fishing season is raised by 8% (i.e. to (21,400 t) to account for western Atlantic catches which are not reported weekly, the amount reported under the CDP as of February 2010 is reduced to 50% of the expected amount.

Table 11. Comparison of ICCAT Bluefin tuna catches reported for the 2009 fishing season with data submitted under the CDP as of 26 February 2010 (ICCAT 2009c). Note that figures shown are those given in the original data source; differences between totals shown and actually sums are likely due to rounding.

	Reported Catch for 2009	Number of BCDs Submitted	Weight of Bluefin covered by the Submitted BCDs
Albania	0	2	50
Algeria	222.82	0	0
China	9.19	0	0
Croatia	617.73	23	4
European Union	11,056.90	796	5,043
Japan	1,844.81	0	0
Korea	102.35	5	102
Libya	1,081.64	163	964
Morocco	2,276.15	198	2,274
Tunisia	1,931.72	86	1,546
Turkey	665.47	128	661
TOTAL	19,808.79	1,401	10,646

ICCAT considers that some of this shortfall will be corrected once CDP documents become available and are entered into the database. However, it is interesting to consider how much of the shortfall is due to the tagging exemption, as documents for these fish will not be validated and submitted (unless they are re-exported and attached to BFTRCs). For the purposes of this analysis, and in the absence of information to the contrary, it will be assumed that those CPCs who have submitted a report on the implementation of the tagging program, i.e. Canada, China, EU-Spain, Japan and the United States (ICCAT 2009c), are tagging all fish which are not transferred to farms. It is expected that all of Canada's, China's, Japan's and the United States' catch is thus tagged and this is supported by the absence of any BCD submissions from these countries in Table 10. Since it is expected that most of Spain's catch (approximately 3,000 t per year (ICCAT 2009d)) is transferred live to farms, the number of Spanish-caught bluefin which are tagged is likely to be negligible. The 2009 catches of the tagging CPCs other than Spain amounted to 3,611 t or 17% of the total catch (3,611 t / 21,400 t; Table 12). While this percentage is relatively small, it is large enough to seriously compromise any attempts to match CDP data with catch data. Furthermore, while some of the fish comprising this 17% may eventually be included in document submissions to the Secretariat (i.e. those which are re-exported with unvalidated BCDs attached to BFTRCs), 60% of these or 10% of the total catch, is caught by Japan and is thus unlikely to be re-exported.

[31] The source of the catch data in Table 9 is inferred to be the ICCAT weekly reports based on references in the report text of the Compliance Committee Inter-sessional (ICCAT 2010a) and the fact that catches by the United States and Canada are not shown.

Table 12. Reported catches of those CPCs thought to be exempt from BCD validation and submission requirements under the tagging exemption. Figures shown for Canada and the United States are based on their quota allocation for the western Atlantic (ICCAT 2008c). Figures shown for China are those in Table 10. Figures shown for Japan are the sum of those shown in Table 10 (eastern Atlantic and Mediterranean) and their quota allocation for the western Atlantic (329.79 t; ICCAT 2008c).

	2009 Fishing Season Catch/Quota	Number of BCDs Submitted as of 26 February 2010
Canada	417.29	0
China	9.19	0
Japan	2,174.60	0
United States	1,009.92	0
TOTAL	**3,611.00**	**0**

ICCAT expects that the percentage of 2009 bluefin catches covered under the CDP will increase as the documents are gradually received and the backlog is cleared (ICCAT 2010b). However, comparison of the 2008 bluefin catches against the amount of bluefin covered under the CDP for 2008 provides only limited support for this expectation. According to data compiled as of October 2009, catches in 2008 amounted to nearly 26,000 t whereas the amount of bluefin reported under the CDP for 2008 totalled only 15,364 t (59%, ICCAT 2009d). While some of this discrepancy may be explained by the fact that the bluefin season begins in mid-April and the CDP was not implemented until the beginning of June 2008, it is unlikely that this factor alone would account for the entire shortfall, particularly as BCDs are required upon harvesting from farms which would occur later in the year.

5.3.5 Compliance Actions Taken

ICCAT was the first RFMO to implement a trade monitoring scheme (see Section 2.1), and was probably the first RFMO to use trade measures as a tool against IUU fishing (Le Gallic 2008). Beginning in 1995 ICCAT encouraged its CPCs to take non-discriminatory trade restrictive measures to prohibit imports of bluefin tuna, swordfish and/or bigeye tuna from countries including Belize, Cambodia, Equatorial Guinea, Honduras, Panama, and Saint Vincent and the Grenadines. These recommendations were based, in part, on trade statistics compiled under the ICCAT SDPs. CPCs such as the EU and Japan, took domestic actions in response to the ICCAT recommendations, and these actions succeeded in encouraging closer cooperation between ICCAT and the countries in question (Le Gallic 2008).

Under the CDP for bluefin, two incidents of improper documentation have resulted in the release of fish from farms since November 2009. In both cases the bluefin were caught by vessels flagged to Algeria and improprieties were brought to light during the 2009 regular meeting of the Compliance Committee. As a result, 560 t of bluefin were released from farming operations in Tunisia and 262 t were released from farming operations in Malta (ICCAT 2010a). With regard to fish that had already been harvested from farms, Japan reported in 2009 that it had identified improprieties in BCDs involving farms operating in Turkey, Tunisia and the EU and was holding over 2,300 t of bluefin in customs quarantine pending resolution of the issues. Despite bilateral discussions between Japan and Turkey and Japan and Tunisia, as well as extensive discussions among all parties at the February 2010 Compliance Committee Inter-sessional, Japan maintains that the shipments cannot be accepted because the BCDs were not validated before the fish were placed into farming facilities and thus the documentation is not compliant with the CDP requirements (ICCAT 2010a, 2010b).

5.3.6 Use of Information for Scientific Purposes

Compliance data, including data from the ICCAT bluefin CDP, are currently provided to the SCRS in summarised form for potential application in cross-checking fishery statistics (ICCAT

2009d). To date, however, this usually takes the form of a table with no associated analysis or discussion and CDP data have not been used for any scientific purposes. Part of the reason for this is undoubtedly due to the data deficiencies described above. For example, the 2008 data are incomplete as the CDP was not implemented at the start of the 2008 fishing season. CDP documents for the 2009 season as of February 2010 season covered approximately 50% of known catches. Although this percentage is expected to increase prior to the SCRS meeting in October 2010, as described above, as much as 17% of the catch is potentially unaccounted for due to the tagging exemption. These data shortfalls are similar to, though less severe than, the shortfalls arising from the ICCAT bigeye and swordfish SDPs with their exclusion of domestic landings. Given these data limitations it is not surprising that the SCRS has thus far declined to use either SDP or CDP data for scientific purposes.

5.3.7 Summary and Discussion

This section summarises and discusses the ICCAT CDP in terms of its transparency, practicality of operation, and overall effectiveness for compliance and scientific purposes.

Transparency

Several features of the ICCAT CDP impair its transparency, both from the standpoint of publicly available information as well as full disclosure among the ICCAT CPCs. BCDs and BFTRCs are generally submitted by only one trading partner and therefore the opportunity for cross-checking parallel documents from both senders and receivers is lost. Furthermore, since only a subset of CDP data (~30%), are loaded onto the ICCAT website for CPC viewing, the only parties with full access to the data are the trading parties themselves and the Secretariat. Public access to all data compiled under the CDP is tightly controlled, therefore independent assessment of the scheme is effectively precluded. Concerns regarding the transparency of decision-making processes to fellow CPCs, as well as to NGOs, were raised by an independent review panel commissioned by ICCAT itself (Hurry et al. 2008), but do not appear to have been taken into consideration in the design of the CDP.

The scheme grants the Secretariat no specific mandate for oversight or analysis of the CDP data. Instead, it concentrates enforcement capacity in the CPCs receiving bluefin (i.e. importers) by vesting in them the power to reject or accept shipments based on CDP documentation as well as the authority to bring any non-compliances to the attention of the Compliance Committee. In this way, the CDP is less of an objective and comprehensive monitoring system, and more of a tool for some CPCs to monitor the catch and trade behaviour of others. Since one CPC imports 96% of the bluefin covered by the CDP, this CPC, rather than the Secretariat or another independent third party (e.g. the Compliance Committee), has a disproportionate amount of power in monitoring and enforcing the scheme. The methods and standards it uses to evaluate CDP documentation are not revealed, nor are the details of its bilateral discussions with CPCs it has identified as non-compliant. Furthermore, given the potential for such dependent importing States to be heavily invested in major production operations, the possibilities for conflict of interest are high.

At the same time, several CPCs are exempt from the requirement to validate and submit BCDs for their own bluefin catches through an exception for tagged fish. Although only a few CPCs have taken up the tagging exemption, it is available to all CPCs and may become more widely used over time. While tagging can be useful in establishing clear traceability for particular fish, there appears to be no justification for exempting tagged fish from the standard CDP documentation, especially as there is no requirement to provide any information to ICCAT concerning the numbers or weights of bluefin tagged each year. There are also no explicit requirements for how far through the market chain the tag must remain attached to the fish. The current tagging exemption not only introduces a discrepancy of up to 17% between CDP data and catch data, it represents a double standard of transparency and disclosure for those CPCs who tag versus those who do not.

With respect to transparency, the ICCAT CDP thus suffers from several serious design flaws. Two immediate steps which could be taken as remedies would be to: 1) establish a neutral oversight mechanism, e.g. by formalising Secretariat responsibilities for document verification and data analysis; and 2) require tagged bluefin to meet the same validated BCD submission requirements as untagged bluefin.

Practicality of Operation

The de-centralisation of management responsibilities within the ICCAT CDP serves to lessen the burden on the Secretariat by distributing the workload to those parties most heavily involved in the trade. While this approach is practical, it is not necessarily efficient, as the scheme is thus dependent on prompt and diligent processing of documents by CPCs. Given that the scheme is thus far entirely paper-based, and that delays in document submission and illegible data have been cited as problems, greater focus should be given to developing and implementing an electronic format. Further consideration by ICCAT of an electronic CDS is awaiting the results of trials by CPCs under a recommendation agreed in 2006 (ICCAT 2009a). System development should be facilitated by the fact that the number of active participants in the CDP is relatively limited (eight CPCs submitting BCDs and one CPC submitting BFTRCs). Development of an electronic system would also be expected to significantly ease the data entry burden on the Secretariat and could also increase transparency by making data more accessible.

As the ICCAT CDP has evolved from the earlier SDPs, forms and procedures have been adapted and expanded to cover both domestic landings and farming operations. While the re-export forms have not required substantial modification, the bluefin tuna catch document now covers landings, transfers to cages, harvesting from farms, transhipment, domestic trade and export. The need for validation of this single form at a number of stages has led to confusion about version numberings and cases of erroneous, duplicative documents. Splitting the BCD into separate forms covering a smaller range of activities (e.g. separate forms for landings versus farm transfers/harvests as CCSBT's CDS does) should be considered as a means of enhancing the practicality of the scheme.

Overall Effectiveness

ICCAT's claim that the scheme is "comprehensive" is not supported by this analysis. The most important source of data gaps, and perhaps the most easily corrected, is the tagging exemption which renders a non-negligible portion of the catch (up to 17%) potentially invisible to the scheme. Beyond this issue with the design of the scheme, missing, delinquent or erroneous document submissions by CPCs hamper the effectiveness of the scheme and are potentially more difficult to address. Therefore, while the theoretical "comprehensiveness" of the scheme is already notably less than 100%, it is reduced even further by substantial compliance shortfalls. Although there are valid reasons why neither data from 2008 nor 2009 CDP datasets should be fully complete, the latest available information indicates a coverage of only 50-60%.

The ICCAT CDP has been used as the basis for quarantining over 2,300 t of bluefin imports, and for releasing over 800 t of bluefin from farms. While these incidents demonstrate that the CDP is effective in identifying some improperly documented, and possibly IUU, bluefin, statistics on the number of verifications conducted suggest that the overall level of scrutiny is low (2%), or at best under-reported. Furthermore, despite being in operation for two years, there remain critical differences of interpretation among the CPCs about the scheme requirements. Actions taken thus far on the basis of what appear to be procedural issues, such as validation dates being out of sequence, have sparked considerable debate. It remains to be seen whether the CDP is capable of protecting against more subtle forms of fraud, for example, identifying when traded weights exceed within-quota catch quantities. Proving such cases will likely require a substantial amount of coordinated methodological development (e.g. formulae, conversion factors) but the current decentralised analysis (by individual CPCs) does not facilitate this process. Until these issues are resolved, and until the scheme achieves a higher and more

standardised coverage of the fishery, its overall effectiveness in deterring IUU activities will remain unknown.

5.4 Summary of the Operational Review

The preceding discussion has identified key features of three RFMO catch documentation schemes based on their operational performance. Table 13 summarises this discussion by comparing the three schemes in terms of current practice, achievements and challenges.

Of the three schemes, the CCAMLR toothfish CDS is currently by far the largest, both in terms of the number of participating parties and the number of documents handled. Despite this, the CCAMLR Secretariat reports that it has been able to manage the workload associated with the CDS within its existing resources and with only a minor, dedicated expenditure for building the e-CDS. The experience of CCAMLR with the e-CDS clearly demonstrates its value in improving the quality and timeliness of the data, increasing accessibility, and easing the burden of document management. CCAMLR also leads the field in transparency, both in terms of providing all data to all parties in real time via the e-CDS, as well as its disclosure of information to the public through annual published data summaries. It is also the only one of the three schemes that is currently characterised by its Secretariat as operating smoothly and efficiently. While it could be argued that CCAMLR maintains these advantages because it is the longest running of the three CDS, the CCSBT TIS began operating at nearly the same time and the ICCAT SDP for bluefin was implemented in 1992. It is thus more likely that CCAMLR's original focus on designing a CDS aimed at overall IUU estimation and deterrence, rather than one-off actions against individual non-compliant parties, has resulted in a better-integrated and more comprehensive monitoring tool.

Compliance and scientific achievements are linked to each schemes' ability to attain sufficiently reliable and comprehensive coverage of catch and trade. Precise estimation of coverage is elusive as there is always a risk that some IUU fishing may avoid detection. However, based on the best available data it appears that the CCSBT and CCAMLR CDS schemes' cover (or is expected to cover, in the case of the CCSBT CDS) at least 90% of their fisheries' catch and trade. The ICCAT CDP has only been able to demonstrate a coverage of 50-60% thus far, and appears intrinsically limited in achieving full coverage due to the tagging exemption. While CCSBT's TIS and ICCAT's CDP have identified and remedied some compliance issues, CCAMLR's CDS has proven itself to be an adequate legal basis for international litigation and penalties. Similarly, only the CCAMLR CDS has achieved sufficient rigour to allow its data to used for scientific purposes. The CCSBT CDS, implemented earlier this year, represents a significant improvement over the CCSBT TIS and has the potential to achieve some of the same benefits as the CCAMLR scheme. Both the CCAMLR CDS and the CCSBT CDS have several positive, unique features that should be considered by other schemes (Table 13). In contrast, there appear to be several serious design flaws associated with the ICCAT CDP (see Section 5.3).

One of the most important challenges facing the three schemes is to increase participation either by parties that are not currently involved, or those that are not fully implementing all scheme requirements. While level of coverage for each scheme seems acceptable for the time being, addressing this challenge is likely to require an ongoing effort. As the CCSBT and ICCAT schemes are relatively new, both will need to clarify and refine procedures as experience is gained. However, the apparent issues for CCSBT are minor when compared to the confusion about scheme requirements, unwieldly document formats and data submission shortfalls currently being experienced under the ICCAT CDP. It is suggested that at least two substantial revisions to the ICCAT CDP would be required to allow the scheme to function properly and achieve its stated aims (Table 13).

Table 13. Summary of descriptive features, achievements and challenges for the CCSBT CDS, CCAMLR Toothfish CDS and the ICCAT Bluefin CDP.

	CCSBT CDS	CCAMLR Toothfish CDS	ICCAT Bluefin CDP
Current Practice			
Number of Participating Parties †	9	36	18
Number of Documents Handled per Year (as reported by Secretariat)	1,059*	5,000 to 10,000	~2,500
Resources Required	Secretariat intends to manage the CDS mainly from within existing resources although resource constraints may preclude any investigative functions	Managed thus far under existing Secretariat resources plus some funding for e-CDS development	na
Transparency	Documents managed and analysed by Secretariat, summaries to members, public summaries on web	All documents loaded in real time on e-CDS accessible to all CDS parties; annual summary data released to public	Scheme data are only fully available to the trading parties and the Secretariat (but the latter has no authority for data analysis)
Secretariat's View of Scheme Operation	Too early to judge	Smooth and efficient	"Having a great deal of problems" (ICCAT 2010c), but "proven effective" in some cases (ICCAT 2010b)
Achievements			
Coverage of Trade and/or Catch	>99% of the known catch and trade is thought to be handled by scheme participants*	~90% of global trade handled by CDS parties; ~90% of CDS-reported landings are tracked as exports under the CDS; IUU levels are estimated at <6%	Currently at least 50-60%, but up to 17% of catch can be excluded under an exemption for tagged fish
Compliance Benefits	Limited thus far primarily to identification of unauthorised vessels*, but should be able to monitor against total allowable catch limits.	IUU fishing appears to have diminished considerably‡; several successful enforcement actions taken based on CDS violations	Over 2,300 t of imports have been quarantined by Japan, and over 800 t of caged fish have been released due to improper documentation
Scientific Benefit	None thus far.	Assists in the estimation of IUU fishing levels and may deter IUU fishing.	None thus far.
Positive, Unique Features	• Secretariat has full authority for data analysis/reporting • Separate forms for farm input/output, catch and tagging • Has developed a compliance "report card" • Requires both tagging and CDS documentation for all fish	• Procedure for documenting IUU (or over-) catch • e-CDS provides numerous benefits • Integration with VMS, transhipment and port State measures increases effectiveness	• None identified
Challenges			
Key Issues being Addressed	• Market diversification requires broadening of participation • Resourcing may need to increase to support investigative functions	• Market diversification requires broadening of participation (including Taiwan) • Hong Kong and Singapore are not fully implementing the CDP	• Development of an electronic system will be considered • Ongoing confusion among CPCs as to CDP requirements leading to compliance shortfalls
Key Issues not yet being Addressed	• Need for special procedures to deal with over-catch under CDS • Process for agreeing exemptions from scheme	• None identified	• Need for an neutral oversight function • Tagging exemption critically weakens scheme effectiveness

Notes: *based on TIS data
† counting all EU Member States (and any of their overseas territories) as one
‡ may be only partially attributable to the CDS

6 Guidance for Development of a Scheme for the WCPFC

In parallel with the ongoing development of catch documentation schemes in CCSBT, CCAMLR and ICCAT (Section 5), and discussion of catch documentation topics in the Joint Tuna RFMOs forum (Section 3.1), deliberations on the development of a catch or trade documentation scheme for the WCPFC have been underway for several years. The issue was most recently raised at the December 2009 Commission meeting where the need for a CDS was agreed in principle. At that time, an offer by the Forum Fisheries Agency (FFA) to bring forward a proposal for discussion at the WCPFC Technical and Compliance Committee meeting in October 2010 was accepted.

This section of the report is designed to assist in the formulation of that proposal and/or in evaluating it against alternative components and formats used by other RFMOs. It begins with a discussion of whether there any unique characteristics of WCPFC fisheries which create difficulties for adoption of components used in existing schemes for other fisheries. A framework for a WCPFC CDS is then proposed and issues to be considered for each section are identified and cross-referenced to this report's findings on best practice and operational performance of existing schemes (Sections 4 and 5, respectively). Cross-references to specific language in existing schemes which could be adopted for the WCPFC CDS are also provided. Finally, overarching concerns relating to costs, implementation and expected long-term benefits, are highlighted in a summary section.

6.1 Recommendations to Address Special Considerations in WCPFC Fisheries

Previous deliberations regarding development of a catch or trade documentation scheme for the WCPFC have identified several problematic issues. These include high proportions of mixed species catches, landings of fish outside the Convention Area in non-member States, a relatively high number of charter vessels controlled by the coastal State rather than the flag State, and a limited ability of Pacific Island Countries (PICs) to implement a CDS with existing capacity. Other considerations, not specific to the WCPFC, but under discussion in the context of expanding CDSs to other RFMO fisheries include potential exemptions for fresh/chilled fish and artisanal fisheries (Joint Tuna RFMOs 2010). As will be argued below, none of these issues pose unique problems for the WCPFC and thus they should not prevent drawing lessons from existing CDSs to apply to the WCPFC.

6.1.1 High Proportion of Mixed Species Catches

The species to be covered by a CDS implemented for the WCPFC have not yet been decided, however, previous discussions have focused on bigeye tuna (WCPFC 2009a)[32]. This species is caught primarily by longliners (56% of the 2008 WCPFC bigeye catch) which target it. This species is also caught by purse seiners (30% of the 2008 WCPFC bigeye catch) which target primarily skipjack but also catch juvenile bigeye and yellowfin tuna and often do not sort their catches before delivering them to canneries (WCPFC 2009b, Williams and Terawasi 2009). While uncertainty in species composition is arguably most problematic in the Pacific where the proportion of purse seine catches is highest (see footnote 9), catch or trade schemes for bigeye in other oceans face similar issues. This was addressed in the

[32] As of the time of writing, WCPFC has not yet considered the recommendation of the Joint Tuna RFMOs (Joint Tuna RFMOs 2010) to include" tuna species and sharks covered by conservation and management measures" in the CDS.

bigeye statistical document programmes in place at ICCAT, IATTC and IOTC by exempting purse seine catches, however, this severely compromises the inclusivity of the schemes and renders them incapable of serving catch monitoring and scientific functions (see Section 4).

Based on the argument articulated in Section 3.2.3, it is recommended that the WCPFC initially consider a CDS for both bigeye and yellowfin tuna combined. Those fisheries which are able to note the quantities separately may do so, whereas purse seine catches can be recorded as a mixture. When scientific sampling techniques for estimating purse seine species composition are developed to the point at which they able to produce species-specific estimates, the scheme can then require separation of the species (these estimates may also be applied to CDS data retrospectively). As noted, the value of the initial, mixed species data for scientific purposes may be limited, but less so than if purse seine catches are exempted altogether. Since the WCPFC does not manage these fisheries via quotas, the initial lack of species-specific data should not have a major effect on the compliance functions of the scheme, e.g. vessel identity, area and season will still be documented[33].

6.1.2 Landings of Fish in States which are not Party to the CDS

Another issue which has been raised in deliberations regarding a CDS for the WCPFC is occurrence of landings in non-member States (WCPFC 2008a). As markets, like fisheries, are dynamic, continuous expansion of participation in the CDS is likely to be an ongoing effort for all RFMOs (see Section 5). Although there have been concerns that an increasing number of States with WCPFC cooperating non-member status will lead to greater demands for fishing rights in the Convention Area, these issues are being addressed through the cooperating non-member application process (WCPFC 2010). Furthermore, as demonstrated by CCSBT (Section 5.1) and CCAMLR (Section 5.2), processes can be developed to allow cooperation with the CDS per se without implications for overall membership status under the Convention.

Foremost among key non-member port States in the WCPFC context is Thailand. Of 56 tuna processors in the WCPFC area, 15 are located in Thailand and these together comprise 48% of the region's processing capacity[34]. The prospects for further cooperation with Thailand appear high given that Thailand has attended WCPFC Commission meetings as an observer, is participating in a cannery sampling programme led by Japan, and has distributed the WCPFC IUU Vessel List to traders with a request to avoid purchases from these vessels (WCPFC 2010). The remaining canneries in the WCPFC area are all located in States which are already WCPFC members or cooperating non-members. Therefore, scheme participation issues appear to pose no greater problem for the WCPFC than for other RFMOs.

6.1.3 Control of Charter Vessels by Coastal States

In order to avoid duplication of effort, it will be useful to maximise the potential for the WCPFC CDS to be recognised by the EU as complying with the EU IUU regulation requirements, thereby allowing the WCPFC documentation to substitute for the catch certificates mandated by the EU for all imports. One of the issues consistently raised in discussions between the EU and PICs pertains to document validation requirements for chartered fishing vessels. The EU has stated a firm position that this validation must be undertaken by the vessel's flag State, whereas PICs, which often manage foreign-flagged

[33] Although not actively under consideration for the WCPFC, the Joint Tuna RFMO's 2010 recommendation to apply CDSs to shark species could be initially implemented in a similar manner (i.e. initially a mixture of species can be recorded in cases where individual species cannot be readily identified).
[34] Data from a presentation by M. McGowan, Bumble Bee Foods, at the Fifth Regular Session of the WCPFC held at Busan, Korea, 8-12 December 2008.

vessels operating in their coastal waters under charter, are calling for coastal State validation to be accepted (European Commission 2009a, 2009b; Joint Tuna RFMOs 2010).

While the WCPFC CDS could easily allow for either the flag State or the chartering coastal State to validate documents, this may jeopardise EU recognition of WCPFC CDS documents as equivalent to the EU catch certificates[35]. One potential solution to this issue of compatibility lies in the special arrangement negotiated between New Zealand and the EU whereby the EU accepts the New Zealand catch certificate in lieu of the EU catch certificate (European Union 2010). It has not proved possible during the course of this study to understand precisely which standards the New Zealand catch certificate was required to meet, or indeed whether the New Zealand catch certificate will be accepted when issued for vessels chartered, but not flagged, to New Zealand[36]. Nevertheless, this arrangement warrants further investigation as it appears to offer the promise of validation procedures acceptable to both sides while avoiding duplication of certification processes.

6.1.4 Capacity for Implementation by Pacific Island Countries

Previous deliberation on a WCPFC CDS has also raised issues of implementation by PICs, both in terms of technical capacity and administrative burden (WCPFC 2008b). As the EU is a major market for PIC's fisheries products, these issues are already being faced under the EU IUU regulation. Although organizations such as the FFA may be able to assist PICs in complying with the EU IUU regulation requirements, the EU has noted that some procedures require direct communication with the national competent authorities, and thus it will not consult or involve other parties on these issues (European Commission 2009b). A study of eight developing countries' ability to implement the EU IUU regulation (MegaPesca and Oceanic Développement 2009) did not include any PICs, but highlighted a daunting number of issues requiring attention including revision of legal frameworks, strengthening of MCS, and upgrading of traceability systems.

Within the WCPFC, the FFA provides an important coordination function for PICs on many issues and could be enlisted to provide substantial support to development of a WCPFC CDS through programmes such as DevFish 2 (PRIP 2010). As in other RFMOs, the WCPFC Secretariat is also expected to play a critical role in supporting the operation of the CDS. In these ways, the implementation of a WCPFC CDS should be easier than the implementation of the EU catch certification scheme. Administrative and technical capacity burdens associated with the WCPFC CDS can be substantially reduced by maximising compatibility between the two schemes, both in terms of EU recognition of the equivalency

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[35] The EU has recognised the ICCAT bluefin CDS, the CCAMLR toothfish CDS and the CCSBT southern bluefin CDS (with supplemental information on transport details) as complying with the requirements of the EU IUU regulation (European Union 2009a). The ICCAT bluefin CDP and the CCAMLR toothfish CDS both require validation of catch documents by the flag State. CCSBT amended its CDS provisions three days before the EU published its implementing regulations on 22 October 2009, to allow for catch document validation by the charter State for vessels operating under charter. As the EU maintains its position that only flag State-validated documents will be accepted, and has not yet issued any further guidance with regard to the CCSBT CDS, at this time it is not clear whether CCSBT documents validated by charter States will be accepted.

[36] The EU Implementing Regulations (European Union 2010) state that "…*the catch certificate […] shall be replaced – for fisheries products obtained from catches made by fishing vessels flying the flag of New Zealand – by the New Zealand catch certificate*", but also states "…*the New Zealand catch certificate, which shall replace the European Community Catch Certificate and Re-export Certificate for catches by fishing vessels registered in New Zealand and which are landed in New Zealand*…". The EU's DG MARE has confirmed that "*the catch certificate agreed for New Zealand may be validated only in respect of catches by vessels flagged to this country*" (J.P. Vergine, personal communication, 7 May 2010). In contrast, a guide to the EU IUU regulation published by New Zealand's Seafood Industry Council states that "*for fish caught by a NZ flag vessel or vessel registered in New Zealand (such as the charter vessels registered with MFish), the Ministry of Fisheries is required to provide a Catch Certificate. While there is a model certificate contained in the* [EU] *regulation, New Zealand has sought and gained approval* [from the EU] *for an alternative Catch Certificate for New Zealand caught and processed product*." (New Zealand Seafood Standards Council, 2010).

of the WCPFC CDS documents, and by designing WCPFC CDS procedures to build on systems being developed in response to the EU IUU regulation implemented earlier this year.

6.1.5 Handling of Fresh and Chilled Products

Special handling of fresh and chilled products has been frequently raised as an issue for a bigeye CDS, most recently in the Joint Tuna RFMOs MCS workshop (Joint Tuna RFMOs 2010). Proponents appear to be concerned that paperwork delays associated with catch documentation may result in spoilage and a loss of product value, and note that fresh products have been exempted from the existing statistical document programmes implemented by IATTC, ICCAT and IOTC (see Section 4.2.1). However, Atlantic and southern bluefin tuna, some of which are undoubtedly shipped in fresh or chilled form, are not excluded from documentation under the ICCAT CDP or the CCSBT CDS on this basis, although the ICCAT CDP tagging exemption may cover some fresh or chilled fish (see Sections 5.1 and 5.3). Furthermore, the EU IUU regulation covers an extremely broad range of seafood products and does not make exemptions for fresh or chilled products.

Based on discussions at the Joint Tuna RFMOs MCS workshop, it is expected that tagging may be proposed as an alternative means of documenting fresh and chilled bigeye under a proposed CDS for the WCPFC (Joint Tuna RFMOs 2010). When considering such a proposal, the first step should be to carefully scrutinise the justification for special handling of fresh and chilled products given that this appears to be unnecessary under the CCSBT CDS, the ICCAT CDP and the EU IUU regulation. If special handling is required, it should then be considered whether tagging is the appropriate method, and in particular whether tagging should supplement standard documentation, as in CCSBT, or replace it, as in ICCAT (see Section 5 for further discussion of this issue).

6.1.6 Potential Exemptions for Artisanal Catch

Another issue raised at the most recent discussion of RFMO CDSs involved a potential exemption for artisanal catches. The resulting recommendation was to develop a simplified catch document, possibly using the EU IUU regulation's simplified catch certificate as a model, for application to artisanal catches that are exported (Joint Tuna RFMOs 2010). Although it was not discussed, it will also need to be decided whether to adopt the EU's definition of small-scale fisheries to which the simplified catch certificate may be applied[37], or to develop an alternative definition.

Before deciding whether to exempt domestically consumed catches from the proposed WCPFC CDS, further investigations should be conducted to determine whether this exemption is truly necessary, the amount of the total catch which would fall under this exemption, and whether it would adversely affect the inclusivity of the scheme. It is noted that the ICCAT bluefin CDP does not make any special provisions for artisanal catch and the CCSBT CDS exempts recreational catches which are prohibited from sale (ICCAT 2009a, CCSBT 2009a). The CCAMLR CDS includes artisanal catches, but the United States exempts "small artisanal boats fishing in the exclusive economic zones of Peru or Chile" from the requirement to verify their location of catch using the CCAMLR VMS (see Section 5.2) when importing such catches to the United States (NOAA 2007).

[37] The EU allows a simplified catch certificate for fishing vessels with an overall length of less than 12 m without towed gear; with an overall length of less than 8 m with towed gear; without a superstructure; or of less than measured 20 GT (European Union 2009a).

6.2 Framework and Specific Considerations for a WCPFC CDS

This section provides detailed recommendations for development of a WCPFC CDS by presenting a framework for the scheme based on an amalgamation of the contents of three existing CDSs: the CCSBT bluefin CDS (CCSBT 2009a), the CCAMLR toothfish CDS (CCAMLR 2009a) and the ICCAT bluefin CDP (ICCAT 2009a). Except for the objectives and chapeaux section each heading below contains a table (Tables 14-21) showing key issues and elements of best practice to be considered, references to related discussions earlier in this report, and pointers to where draft language may be found in existing schemes. It should be noted that in many cases the draft language referred to in other schemes will need to be slightly modified to suit the proposed WCPFC CDS.

6.2.1 Objectives and Chapeaux

The definition of the objectives of the proposed WCPFC CDS is a fundamental consideration which should be addressed before specifying any details of the scheme. As discussed in Section 3.2.2, CDSs may aim to provide a form of catch monitoring, supplement scientific data and/or establish traceability of the origin of landed and traded fish. Agreement on whether all or a subset of these objectives are desirable will then determine the priority given to the functioning of the CDS in terms of inclusivity (provision of documentation for all legally-caught fish), impermeability (exclusion of illegal fish), and verifiability (third party oversight). For example, if the main focus of the scheme is traceability then it will need high impermeability, but it may place a low priority on inclusivity (i.e. not all catches would need to be documented). In contrast, if catch monitoring and scientific purposes for the data collected under the scheme are important then a premium would need to be placed on inclusivity (i.e. if not all catches are documented, tallies from the scheme cannot validly be compared to catches). Verifiability functions will allow the scheme to conform to best practice standards for third party oversight and transparency in certification such as those called for in the FAO Eco-labelling Guidelines (FAO 2008). This will be particularly useful if a high level of external scrutiny, e.g. by NGOs or other intergovernmental organizations such as CITES, is anticipated. Since articulating and achieving consensus on the objectives and necessary functions of the scheme is important not only for designing an appropriate scheme, but also for providing a basis for future evaluation of programme effectiveness, it should therefore be the first priority.

Based on the analysis presented in this report, there is no incompatibility or detriment to adopting all three types of objectives, i.e. catch monitoring, scientific information and traceability, for the WCPFC scheme. The CCAMLR CDS provides an example of a highly successful scheme which has achieved all three objectives. The CCSBT CDS also aims at both catch monitoring and traceability, i.e. by including all catches, and may also be able to provide data for scientific purposes. Both of these schemes also prioritise verifiability functions by allowing the Secretariat to perform an auditing function. In these respects the ICCAT CDP appears deficient in that it only focuses on traceability of a portion of the catch, i.e. it is not useful for catch monitoring or scientific purposes because of its incomplete coverage, and its verifiability is low (see Section 5.3). For these reasons, only the objectives of the CCAMLR and CCSBT CDSs are recommended as models for the WCPFC CDS.

Drawing upon the lessons learned from the existing schemes as summarized above, specific objectives recommended for consideration for the WCPFC CDS include:

- To identify, quantify and/or validate the catch of WCPFC CCMs (members and cooperating non-members) thereby confirming compliance with CMMs and facilitating market access through traceability for these catches;

- To provide a mechanism to identify and account for fish caught in the Convention Area through IUU fishing activities and to provide a means of preventing the products of such activities from entering markets; and

- To supplement and reinforce catch reporting thereby strengthening scientific stock assessment activities.

It should be noted that the first objective arises from the need to respond to national catch certification schemes, such as the EU IUU regulation, whereas the latter two objectives follow the COFI (2008) standardised objectives for all CDSs, i.e. combating IUU fishing and improving catch statistics (see Section 3.2.2).

Although it is not an objective, transparency is a key cross-cutting issue which may determine the ultimate success or failure of the scheme. Therefore, it will be important to consider, and perhaps even specify, the degree of transparency under which the WCPFC CDS will operate. As discussed in Section 3.2.2, there has usually been consensus that catch and trade documentation schemes should be applied to control the catch and trade of non-members, but there have been divergent views about the application of the schemes to the activities of members. As shown in Section 5, some schemes currently offer substantial exemptions to the activities of some members and do not in general provide for a clear, third party audit process. This lack of transparency not only has the potential to erode confidence in the scheme within the RFMO membership, it also does not serve the RFMO well in the face of increasing external challenges to its ability to manage the fish stocks for which it is responsible. As these challenges are as likely as not to be motivated by concerns about the catches of members (as opposed to non-members), some minimum standard of transparency should be applied to all parties under the schemes. Although specific suggestions for audit and disclosure are provided in the following sections, a statement on transparency such as the following should also be considered for inclusion in the chapeaux to the scheme:

> *"RECOGNISING* that a balanced, fair and sufficiently transparent catch documentation scheme provides for an equal level of accountability among all CCMs and an audit function performed by an impartial third body such as the Secretariat*;*

It is recommended that other chapeaux, at minimum, articulate the objectives of the CDS (catch monitoring, scientific data, and/or traceability) and its desired functionality (inclusivity, impermeability and verifiability (see preceding text and Section 4)). For reasons articulated above, examples of concepts and wording for the WCPFC CDS may be found in the CCAMLR and CCSBT CDSs. The ICCAT CDP does not provide a useful model in this regard because unlike the other two schemes, its chapeaux do not articulate its objectives.

6.2.2 Definitions

For clarity, it is important to provide an agreed list of definitions to be used in the scheme. Terms to be considered include: "port State", "flag State", "landing", "export", "import", "re-export" and "transhipment". Initial ideas for WCPFC CDS definitions may be found in the CCAMLR CDS and ICCAT CDP (Table 14). (The CCSBT CDS does not provide explicit definitions).

One important difference between the CCAMLR and ICCAT definitions is the treatment of landings and exports. The CCAMLR scheme uses straightforward terminology: the first landing of fish is referred to as "landing" regardless of whether it is in a port of the flag State of the fishing vessel or a foreign port State; an "export" is the first movement of the fish after landing. The ICCAT CDP definition is less intuitive as it refers to landing in a foreign port as

"export", and landing in a domestic port as "domestic trade", and then needs different terms to describe the next movement in trade.

Whichever definitions are used, it is important to align them with the required documents and their uses. Since the documents are likely to include a catch form and an export form (see following section), the CCAMLR terminology appears simpler: all landings require catch forms and all onward trade after landing requires export/re-export forms. (Following the CCAMLR scheme, an export is the first international movement after landing; any subsequent movements are referred to as re-exports.) The remainder of this discussion uses these terms.

Table 14. Content summary for the proposed WCPFC CDS Definitions section

Key Issues	Best Practice Recommendation	Relevant Sections of this Report	Potential Draft Language
Define terms such as "port State", "flag State", "landing", "export", "import", "re-export" and "transhipment".	Ensure definitions are clearly aligned with the forms to be implemented CCAMLR terminology is recommended	N/A	CCAMLR CDS, Item 1 ICCAT CDP, Part 1, Item 2

6.2.3 Required Documents

The three existing CDSs rely primarily on two basic forms: a form which documents the catching of the fish (usually referred to as the catch document), and a form which documents the onward trade of the fish (usually referred to as the export/re-export document). These two basic forms are recommended for the WCPFC CDS (Table 15). The three additional forms used by the CCSBT CDS pertain to farm stocking, farm transfer and tagging. The first two are not relevant to the WCPFC CDS at this time; tagging of fish is discussed in the following section (Section 6.2.4).

The CCSBT "Catch Monitoring Form" and the "Re-export/Export after Landing of Domestic Product Form" are recommended as templates for the initial development of the WCPFC CDS catch document and export/re-export forms. The reason for selecting these formats is that they compare favourably with the other CDSs' forms in terms of being applicable to tunas, up-to-date, comprehensive, well-designed, and easy to understand. In addition, unlike the ICCAT CDP forms, the CCSBT forms have separated farming activities onto separate documents, thereby rendering the CCSBT catch form more simply adapted for tunas from the WCPFC. (The three boxes relating to farming on the CCSBT "Catch Monitoring Form" and the single box relating to tagging on both this form and the "Re-export/Export after Landing of Domestic Product Form" can be easily removed). Another advantage of the CCSBT forms is that they contain instructions which are integrated onto the forms themselves. One useful feature that is recommended for the WCPFC scheme but not incorporated by any of the existing schemes is to include a flowchart showing document movements and the responsibilities of each party at each step.

The catch document should accompany all transhipments, landings (in both domestic and foreign ports[38]), imports, exports (first international movement after landing) and re-exports. It is a one-page form with three main sections: Catch/Harvest; Intermediate Product Destination; and Final Product Destination. The Catch/Harvest and Final Product Destination sections must always be completed; the Intermediate Product Destination section only needs to be completed if the product transits an intermediate destination on its

[38] Note that CCSBT CDS references to landing in a foreign port as "export" will need to be modified.

way to being landed (the "Final Product Destination"). In the case of WCPFC the intermediate product destination will almost always be a transhipment vessel (carrier or bunker)[39]. All fish listed on a single catch document must be landed together (i.e. in other words, have a single "final product destination"). Therefore if a catch is to be split before landing, separate catch documents are required.

In order to be appropriately specific regarding the location of catch on the catch form, a map with coded areas should be attached to the form, and the code for the location of the catch recorded on the form. Depending on the specificity of the map, an additional tick box (and blank) could be provided for noting whether the catch was taken in an EEZ (and which one) or on the high seas. The date(s) of catch and the gear type should also be recorded (Section 4.3.4). Weight should be recorded to the nearest kg and the product form specified by means of a code. If the weight recorded is a processed weight, live weight should also be recorded, or an appropriate conversion factor should be annotated (Section 4.3.5, also discussed below).

The identity of the fishing vessel should be recorded using its flag State registration number and its RMFO registration number. An option should also be provided to record the vessel's IMO number, if available (Section 4.3.6).

The export/re-export document must accompany fish which have already been landed and then enter onward trade either as an export (first international movement after landing) or a re-export[40]. This form must be accompanied by a copy of a single associated catch form (no mixed exports or re-exports allowed) and any previously issued export/re-export forms for fish being re-exported. The number of the preceding document (catch form or export/re-export form) should be annotated on the form. Export/re-export forms may cover either the entire quantity shown on the catch document, or a portion. To fully account for the latter case, the CCSBT export/re-export form should be modified to require entry of a conversion factor that can be used to relate the product form and weight on the export/re-export form to the product form and weight shown on the catch form, thereby allowing all partial re-export forms to be tallied against their original catch document (see Section 4.3.5). (Note that if processing takes place on board the fishing vessel before the catch is landed, a conversion factor should be annotated on the catch form; if subsequent processing takes place after landing, the export/re-export form should also annotate a conversion factor).

The CCSBT CDS was recognised as complying with the requirements of the EU IUU regulation only if additional information on transport details is provided. To avoid similar issues arising with the WCPFC CDS, the following information should be included on the WCPFC CDS export/re-export forms: sea or air shipments should specify container number or vessel name or flight number; bill of lading number or airway bill number; and date and place of issue. Ground shipments should specify truck registration number and nationality, or railway transport number; and date and place of issue.

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[39] The CCSBT CDS has special provisions for an intermediate product destination to be a port and calls such movements "exports". It then exempts tuna landed solely for the purpose of re-export (referred to as "first exports") from using a Re-export/Export after Landing of Domestic Product Form. This seems overly complicated as in practice it may be difficult to distinguish between a port used as an intermediate destination from one which is the "final destination" from which it is processed and re-exported to its "ultimate" destination. (For example, tunas in cold stores may be sold in the country of the cold store or sent to other country, and this may not be known at the time of import). It is thus recommended that the first port of entry be considered the landing (rather than using the term "final destination") and the first export after landing be considered an "export" (thereby removing the possibility of "export" before landing). This proposed terminology is drawn from the CCAMLR CDS (CCAMLR 2009a).

[4040] The CCSBT CDS term "export after landing of domestic product" can be replaced simply by "export" (see previous footnote).

It is recommended that catch and export/re-export documents be required for all bigeye and yellowfin tuna catches in the WCPFC, separately by species if possible, or if necessary as a mixture, using tick boxes to indicate relevant quantities (see Section 6.1.1). Based on current best practice, there should be no exemptions for by-products; all gear types and product forms (e.g. fresh and chilled) should be included; all landings (including domestic), transhipments, imports, exports and re-exports should be included, and any tagging activities should supplement rather than replace required documentation (see Sections 4.2, 6.1.1 and 6.1.5). An exemption for artisanal catches which are not exported may be considered (see Section 6.1.6), but in order to protect the inclusivity of the scheme, flag States should be required to report the quantity of fish thus exempted in their annual reports.

Each document should be completed in English and have a unique document number of a specified format, e.g. country code plus unique series number including the year of issuance (Section 4.3.1).

Table 15. Content summary for the proposed WCPFC CDS Required Documents section

Key Issues	Best Practice Recommendation	Relevant Sections of this Report	Potential Draft Language in Existing CDSs
Define number and types of forms	Construct a catch form and an export/re-export form based on CCSBT forms	N/A	CCSBT CDS, Appendix 1
Define document flows	Include a flowchart showing document movements and responsibilities	(examples provided in Sections 5.1-5.3)	N/A
Landing of split catches	Require separate catch documents	Section 4.3.7	CCSBT Catch Monitoring Form Instructions ("Description of Fish")
Mixed exports/re-exports	Do not allow	Section 4.3.7	N/A (implied, not stated)
Check of catch conditions	Define codes for areas (EEZs and high seas). Catch date and gear type code to be recorded.	Section 4.3.4	(include on form)
Identification of fishing vessel	Flag state registration number, RFMO registration number and IMO number (if available)	Section 4.3.6	(include on form)
Product form	Require weight in metric units and product form (code) to be recorded.	Section 4.3.5	(include on form)
Reconciling traded quantities with catch quantities	Require conversion factors for processed products (to whole weight) to be recorded	Sections 4.3.5 and 6.2.3	(include on form)
Species identification	Allow for bigeye and yellowfin to be recorded separately or as a mixture, if necessary	Section 6.1.1	(include on form)
Artisanal catches	Develop a simplified form for those that are exported; an exemption for those which are not exported may be considered.	Section 6.1.6	N/A
Transport details	Include transport details required by the EU for CCSBT CDS recognition	Section 2.6	CCAMLR, Item A13 (v)
Language	English should be used for all forms.	N/A	N/A
Document numbering	Unique and standardised document numbers with country code and year	Section 4.3.1	CCAMLR CDS, Item A1

6.2.4 Supplementary Processes

Some of the existing schemes require or allow tagging of fish as a means of ensuring traceability of the product through the supply chain. The benefits of a tagging scheme for WCPFC tuna are not clear and such a scheme is very likely to be impractical for purse seine catches. As discussed in Sections 5.3-5.4 and 6.1.5, there appears to be no justification for exempting tagged fish from any of the requirements of the CDS. If fish are to be tagged as an additional measure under the WCPFC CDS, all information necessary to support a tag registry should be identified, standardised and developed into forms which cross-reference the catch forms, completed by parties tagging fish, and submitted to a centralised database maintained by the Secretariat (Table 16).

Although it need not be a priority for the initial development of the WCPFC CDS, consideration should be given to formulating a special type of document akin to CCAMLR's specially-validated *Dissostichus* catch document. This type of document has proved useful in CCAMLR for recording, but not sanctioning, unauthorised catches which are subsequently allowed to move in trade. In the WCPFC context this could be useful for seized fish, as well as, for example, catches from trips which exceed Vessel Day Scheme allowances.

Table 16. Content summary for the proposed WCPFC CDS Supplementary Processes section

Key Issues	Best Practice Recommendation	Relevant Sections of this Report	Potential Draft Language
Tagging	If deemed necessary, it should supplement, not replace, required CDS documentation	Section 5.3, 5.4 and 6.1.5	N/A (none of the existing schemes provide for optional tagging which supplements documentation)
Documentation of unauthorised catches	Consider developing a process similar to CCAMLR's specially-validated catch document	Section 5.2	CCAMLR CDS, Item 19

6.2.5 Validation

Validation is the requirement for an authorised body to certify the veracity of the completed documents by signature or seal. The ICCAT CDP and the CCAMLR CDS both require validation by government authorities for at least one of the two main documents[41], while the CCSBT CDS allows for validation authority to be delegated to a duly authorised person (CCSBT 2009a, Item 5.2). As best practice would involve government validation (Section 4.3.3), and as the EU IUU regulation also requires validation by public authorities, it is recommended that the WCPFC CDS require validation by government officials (Table 17).

The ICCAT CDP gives the most thorough example of the notification process, i.e. the process by which the government validation authorities are designated under the scheme, and provides for the name, title, address, sample form, stamp, and date of effect to be communicated to the Secretariat. A copy of the provisions adopted under national law for implementing the CDS should also be provided at the time of initial notification (ICCAT 2009a). Each member should nominate and provide contact details for a single point of contact to act as a clearinghouse for all queries regarding that member's participation in the

[41] It appears that the ICCAT CDP catch document can be validated by non-governmental authorities (ICCAT CDP, Items 12 and 27) whereas the re-export document must be validated by an "authorised government official or authority" (ICCAT CDP, Item 15).

CDS. All of this information should be made available on a secure portion of the WCPFC website to aid parties in verification (see following section).

Given that the EU's firm position is that flag State validation is required, if compatibility with the EU IUU regulations is prioritised, the WCPFC should require flag State validation. If this is unacceptable, attempts to negotiate a compromise such as that between the EU and New Zealand should be undertaken by PICs with charter fisheries (see Section 6.1.3). When considering validation authorities for the WCPFC CDS it should be borne in mind that PICs with charter fisheries must currently provide flag State validated catch certificates for any fish products they export to the EU.

Validation forms shall only be granted to those vessels which appear on the WCPFC Record of Fishing Vessels or WCPFC Interim Register of Non-Member Fish Carrier and Bunker Vessels. Checking of the catch documents against the WCPFC vessel authorisation lists should be a component of document verification (Section 4.3.6).

Based on the catch document proposed in Section 6.2.3, the flag State of the fishing vessel (or alternative, as described above) must validate the document (by signature and seal), and the master of the vessel receiving transhipped fish, as well as the observer, and the party receiving fish at landing (i.e. either the importer or the party receiving domestic landings) must certify (by signature) the document. The export/re-export form must be validated by the exporter's government authority, and certified by the exporter and the importer. Fish unaccompanied by validated documents shall not be accepted for landing, transhipment or trade (import, export, or re-export). The persons certifying and validating the documents should not be the same. For clarity it is recommended that all validation steps and responsibilities be shown on the flowchart to be included in the CDS documentation.

Documents which are incomplete, contain obviously incorrect information or have not been validated as required in previous stages of the document flow should not be validated. Minimum standards for completion of documents, similar to those contained in the CCSBT TIS and under development for the CCSBT CDS (Sections 2.2 and 5.1), should be considered.

Validation authorities should conduct an appropriate level of audit to support their validation activities and should report on these audits to the Secretariat. Port States should be encouraged to take actions in accordance with their own domestic legislation to prevent the onward trade of landings or shipments without proper documentation. Provisions for administrative or other sanctions to be taken by the WCPFC in the event of CDS violations should also be considered, and if appropriate, specified (Section 4.4.2).

Table 17. Content summary for the proposed WCPFC CDS Validation section

Key Issues	Best Practice Recommendation	Relevant Sections of this Report	Potential Draft Language
Competency of Validator	Validation should be by government authorities only	Section 4.3.3	ICCAT CDP, Item 15
Notification of Validation Authorities	Name, title, address, sample form, stamp, and date of effect to be posted on secure website	Section 4.3.3	ICCAT CDP, Items 27-28
Designated Point of Contact	Each member should nominate a point of contact to act as a clearinghouse for queries	N/A	ICCAT CDP, Item 29
National identity of Validator	To ensure compatibility with EU IUU regulation, flag State validation appears necessary	Section 6.1.3	ICCAT CDP, Item 12 (but note inconsistency with Item 15)
Validation steps and stages	Follow CCSBT forms and include on a flowchart	(this section)	(see CCSBT forms)
Authorisation of fishing vessel	Validated forms can only be provided to those vessels on the official WCPFC vessel lists	Section 4.3.6	ICCAT CDP, Item 8 CCSBT CDS, Item 2.3
Validation requirements	Fish which are not accompanied by completed and validated documents should be rejected	N/A	CCSBT CDS, Item 5.6
Minimum standards for completion of documents	Include in CDS	Section 2.2	CCSBT CDS, Item 5.5 (see also, CCSBT TIS (CCSBT 2006), Annex 5)
Validation audits	Should be conducted by all members and reported to the Secretariat	N/A	CCSBT CDS, Item 5.8
Consequences of rejected fish	Provide a mechanism for Port States to take appropriate action; provide for action by WCPFC as well	Section 4.4.2	ICCAT Bigeye SDP (ICCAT 2001a), Annex 1, Item 4; CCAMLR CDS, Items 19 & 20

6.2.6 Verification

Verification is the process through which the receiver of a validated document can verify the contents of the document and the provenance of the fish to which it is attached. The CCSBT CDS provides a robust example of verification best practice involving inspection of documents and consignment contents; cross-checking against other scheme data; and identifying and communicating irregularities to the relevant authorities, the Secretariat and the Compliance Committee. The CCSBT's verification process is recommended for the WCPFC mainly on the basis that it is more transparent than the verification procedures under the ICCAT CDP which are limited to the trading parties and involve the Secretariat in only a peripheral way (Table 18).

The CCAMLR CDS provides for a verification procedure under which the State receiving a validated catch document can request VMS-based verification of the catch location via the Secretariat. While it is acknowledged the catch location is a much more important issue in the CCAMLR CDS (see Section 5.2) than it is likely to be in the WCPFC, inclusion of such a provision in the WCPFC CDS, to be triggered only on rare occasions, could incentivise better catch location reporting.

Table 18. Content summary for the proposed WCPFC CDS Verification section

Key Issues	Best Practice Recommendation	Relevant Sections of this Report	Potential Draft Language
Responsibilities of receivers of validated documents	CCSBT verification procedures are recommended as being both explicit and transparent	N/A	CCSBT, Items 7.1-7.7
Use of VMS to cross-check catch location	This option could incentivise more accurate catch location reporting	Section 4.3.4	CCAMLR CDS, Items 17 and A5

6.2.7 Reporting Requirements

As discussed in Section 5.3, there appears to be little reason to fill out documents, but not validate them or submit them to the Secretariat. Therefore, it is recommended for the WCPFC CDS that all catch and export/re-export documents be validated (see Section 6.2.5) and copies of all documents validated and received be submitted to the Secretariat. The existing CDSs vary in their requirements for the timing of document submission from immediately (CCAMLR) to five working days (ICCAT) to quarterly (CCSBT). In the absence of an electronic CDS, the five working day standard appears reasonable, although it is noted that ICCAT has experienced compliance issues with this particular provision. In addition to submitting copies to the Secretariat, members should retain the originals of all CDS documents received and copies of all CDS documents validated for a minimum of two years (Table 19).

The experience of CCAMLR has highlighted the multiple benefits arising from an electronic CDS (Section 5.2) and such a system is encouraged to be implemented for the WCPFC as soon as possible. However, it is likely to be more efficient to begin with a paper-based system and adjust the forms as necessary as the scheme begins to operate, and once the system has passed through several rounds of improvements, to then devise and implement an electronic format. The WCPFC CDS should thus agree the eventual need for an electronic CDS and propose a timeline for its development.

Centralised compilation of documents, either in paper or electronic format, allows for third-party auditing and oversight of the system. This feature provides for consistent functioning and transparency of the CCSBT and CCAMLR CDSs, and allows for analysis and reporting by the Secretariat. The content and timing of such analyses are, however, only explicitly provided for under the CCSBT CDS. For this reason, the reporting responsibilities assigned to the CCSBT Secretariat are proposed as a model for the WCPFC CDS.

Reports should be prepared by the Secretariat every six months and should follow prescribed formats which are attached as an annex to the scheme. Since the WCPFC CDS is proposed to be based on two forms, rather than the five used by CCSBT, the reporting formats prescribed for CCSBT can be simplified by ignoring the farm reports. The CCSBT production reports (2), the export/re-export detailed summary and discrepancy reports, the transhipment summary and discrepancy reports, and the reconciliation reports can be used as a starting point for WCPFC

reporting formats. These can likely be simplified further to remove farming elements and other unnecessary detail as experience is gained with both the forms and the reports.

It is noted that this centralised analysis and reporting system reduces the annual reporting burden on WCPFC members. Under this scenario members would only need to report annually on validation and verification processes, possibly using a format adapted and simplified from the ICCAT CDP.

Table 19. Content summary for the proposed WCPFC CDS Reporting Requirements section

Key Issues	Best Practice Recommendation	Relevant Sections of this Report	Potential Draft Language
Submission of documents to the Secretariat	Submit copies of all validated documents issued and received to the Secretariat within five working days of validation/receipt	N/A	CCSBT CDS, Item 6.1 (but note recommended change in submission timeframe)
Retention of documents	Parties should retain copies of all documents validated and originals of all documents received.	N/A	CCSBT CDS, Item 6.1
Electronic CDS	As immediate implementation is likely to be inefficient, recommend to initially agree the need for an e-CDS and propose a timeline	Section 5.2	ICCAT CDP, Item 31
Centralised analysis and reporting by Secretariat	Adapt CCSBT production, export/re-export , transhipment and reconciliation report formats	Section 5.1	CCSBT CDS, Section 6.3 and Appendix 3
Members reporting	Can be limited to annual reporting on validation and verification processes	Section 5.3	ICCAT CDP, Annex 6

6.2.8 Access to and Security of Information

In the absence of an electronic CDS (see previous section), a means of storing CDS data electronically will be needed to facilitate reference and analysis. It is proposed that initially, the Secretariat should undertake to enter data submitted by members on paper documents into a database. The CCSBT's CDS has such provisions and requires that all data be entered, whereas the ICCAT CDP requires that only a subset of data be entered. In order to provide a complete reference database, it is preferable to enter all of the data on the forms (Table 20). It should be noted the amount of data on the WCPFC catch forms should be less than that on either the CCSBT or ICCAT forms because the proposed WCPFC scheme does not cover farming and tagging.

Raw data in the database should be held in a secure format accessible only by the Secretariat and the member which validated the document: the flag State of the fishing vessel (or alternative, see Sections 6.1.3 and 6.2.5) for the catch form, and the exporting State for the export/re-export form. Raw data from documents validated by one member shall not be released to another member without the first member's permission. However, the Secretariat should be given the authority to facilitate queries by members participating in the CDS

regarding documents they did not validate, e.g. to assist in verification, by referring to but not releasing data of other members in the database. Also, the Secretariat shall make CDS data available on a confidential basis to the WCPFC Scientific Committee or Technical and Compliance Committee upon receipt of a formal request from either of those bodies.

Following the procedures in the CCSBT CDS, the reports to be prepared by the Secretariat (see preceding section) should be distributed to members participating in the CDS at six-monthly intervals. These reports may also be accessed through a password-protected website.

In addition to the detailed reports prepared by the Secretariat for the members, summary data for the CDS should be published annually on the public access portion of the website. This is important to allow non-members to have confidence in the scheme by providing for an appropriate degree of transparency in its operation. CCAMLR annual Statistical Bulletin currently embodies the best practice for published CDS summaries. It contains annual tables of landings by catch area and flag State, and cross tables of imports by exports and imports by re-exports, by country/entity (CCAMLR 2010).

Table 20. Content summary for the proposed WCPFC CDS Access to and Security of Information section

Key Issues	Best Practice Recommendation	Relevant Sections of this Report	Potential Draft Language
Database construction	In the absence of an electronic system, all data on forms should be entered by the Secretariat	N/A	CCSBT CDS, Item 6.2
Database confidentiality	Data should only be accessible to the Secretariat and the member validating the document, unless permission is given for release; or to the Scientific or Technical and Compliance Committees upon their formal request	N/A	CCSBT CDS, Item 6.2 ICCAT CDP, Item 19
Release of Secretariat reports	Detailed reports prepared by the Secretariat should be released to members through a password-protected website	N/A	CCSBT CDS, Item 6.3
Public summary reports	Publish annual summaries of landings by catch area and flag State, and imports by export/re-export, by country/entity	Section 5 (discussions of transparency)	CCAMLR (2010)

6.2.9 Implementation and Review

A date for the implementation of the scheme and a schedule for a regular review of its performance should be specified within the WCPFC CDS (Table 21). The only CDS that contains such provisions is the CCSBT CDS. This scheme calls for a performance review no later than 22 months after the scheme was implemented, i.e. the second meeting of the CCSBT Compliance Committee after implementation.

Formal procedures under which the Secretariat is tasked with identifying, contacting and seeking the cooperation of non-members which are active participants in the trade should also be specified. CCAMLR's procedures for recruiting new cooperating parties to the scheme require the Executive Director to liaise with potential co-operators directly; another option could involve specifying the requirement for the Commission to review CDS data, to identify parties to be recruited and to direct the Executive Director to contact these parties.

Table 21. Content summary for the proposed WCPFC CDS Implementation and Review section

Key Issues	Best Practice Recommendation	Relevant Sections of this Report	Potential Draft Language
Implementation date	Specify implementation date and any necessary phasing in	N/A	CCSBT CDS, Item 9.1
Performance review schedule	Specify date of first and/or recurring performance reviews	N/A	CCSBT CDS, Item 9.2
Recruiting new parties to cooperate with the scheme	Specify the procedures under which new participants are identified and invited to participate	N/A	CCAMLR CDS, Annex C

6.2.10 Annexes

Annexes to the WCPFC CDS should include examples of the catch and export/re-export documents including instructions and a flowchart (Section 6.2.3), any specifications for tags to be used under the scheme (Section 6.2.4), and formats for required reports (Section 6.2.7).

6.3 Summary of the Proposed Scheme and its Implementation and Cost Implications

The preceding sections have outlined the framework for a CDS for the WCPFC. Many details have yet to be specified, and will need to be discussed and agreed among WCPFC members before the full scheme takes shape, nevertheless the scheme as proposed here can be summarised as follows:

- Scheme objectives should include catch monitoring, scientific information and traceability.
- Two documents should be required: a catch document required when fish are transhipped, landed, imported, exported and re-exported; and an export/re-export document required when fish are traded internationally after landing.
- Documents should be required for all catches of bigeye and yellowfin tunas (can be recorded as a mixture, if necessary) with the possible exception of artisanal catches which are not exported (for which annual reporting of exempted quantities should be required).
- Any tagging activities should supplement, rather than replace, the necessary catch and export/re-export documents.
- All CDS documents should be validated by a government authority.

- In order to be compatible with the EU IUU regulation, catch documents should be validated by the flag State; otherwise special arrangements for charter State validation will need be agreed before the WCPFC CDS catch documents will be recognised by the EU.
- All catch and export/re-export documents should be validated and all validated documents issued and received should be copied to the Secretariat.
- The Secretariat should enter all data into a database and prepare six-monthly reports which summarise, reconcile and monitor the data and the scheme.
- Raw data in the database should be confidential to the Secretariat and the member which validated the document, unless permission is granted by that member for the data to be released.
- The Secretariat should prepare and publish public summaries of CDS catch and import/export data by country/entity on an annual basis.
- The need for an electronic system should be agreed and a schedule proposed for its development and implementation.
- The scheme should specify a performance review process and schedule, and a procedure under which the recruitment of new participants to the scheme (e.g. new port or trade States) can be undertaken.

Although the WCPFC has already agreed in principle to develop a CDS, issues of cost and timing are yet to be discussed. In terms of timing, there are several details of the scheme proposed above which will need to be agreed before it is ready for implementation. However, beyond this scheme development process there do not appear to be any issues which will require any delays in implementation of the scheme once agreed. In fact, many of the necessary notification, validation and verification systems should already have been created by flag, port and trade States in response to the recent implementation of the EU IUU regulation. The proposed use of elements of existing CDSs, in which many WCFPC member States already participate, should also facilitate the development and implementation of a WCPFC CDS.

Cost implications are more difficult to assess given that it is not clear whether the WCPFC CDS will be recognised as complying with the requirements of EU IUU regulation. If so, it is likely that those States which export substantial quantities to the EU will benefit more than those which do not (i.e. the incremental documentation burden of the former will be less). The CDS may also increase the value of the certified catches as has occurred under the CCAMLR CDS (see Section 5.2), although these benefits may not be shared equally among scheme participants due to differences in markets.

The Commission itself, in the form of the Secretariat, will shoulder much of the cost burden associated with the CDS. These costs will be offset by benefits expected to include strengthening of fisheries management, reinforcing external perceptions of the robustness of the MCS systems, and responding to international calls for catch documentation (e.g. Joint Tuna RFMOs 2007a, 2009b, 2010). The cost to the Secretariat will depend most directly on the number of CDS documents that it needs to process. While the scale of the WCPFC fishery relative to the CCSBT southern bluefin, CCAMLR toothfish and ICCAT bluefin fisheries might be expected to result in a larger amount of documents, this is not necessarily the case if the WCPFC catches and trade deliveries are also larger, e.g. large purse seine catches delivered to a single cannery. In such cases the total number of documents produced by the fishery may be relatively small, perhaps near the level currently produced in other fisheries. The CCAMLR CDS has handled up to 10,000 documents per year using only the existing staff resources of

the Secretariat plus a small consultancy to implement the electronic CDS. The major cost under the WCPFC CDS is expected to arise from the need for document handling and data entry by the Secretariat. Based on comparison to other CDSs (see Section 5.4), the cost for such services, however, would be expected to be limited to no more than one technician level position. Six-monthly reports could be prepared by this technician under the supervision of the WCPFC's Compliance Manager. Whether these capacity commitments can be accommodated within the Secretariat's existing resources would need to be determined by the Secretariat itself. The eventual development of an electronic CDS would be expected to substantially reduce recurring data management costs.

In summary, there appear to be no major obstacles in terms of cost, timing or capacity to implementing a CDS for the WCPFC. Key principles for the scheme, recommended here on the basis of analysis of existing schemes' best practice, can form the starting point for more detailed discussions among scheme participants. Once the CDS has been fully specified, the exact cost, timing and capacity implications can then be assessed and provided for.

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