REVIEW OF TUNA REGIONAL FISHERIES MANAGEMENT ORGANISATIONS LONGLINE SCIENTIFIC OBSERVER PROGRAMMES

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SUMMARY

All five tuna Regional Fisheries Management Organisations (tRFMOs) have recently adopted some form of longline scientific Regional Observer Programme (ROP). These ROPs are particularly important for the collection and dissemination of reliable bycatch data on sensitive marine taxa (e.g. seabirds, turtles and marine mammals). The Kobe process aims to harmonise a wide suite of methodologies and data standards across tRFMOs, including those applicable to ROPs. This paper aims to review the extent to which existing schemes are currently harmonised. The five main tRFMOs are at different stages of execution, as all initiated ROPs in different years and agreed different timescales for implementation. Accounting for such discrepancies, there remain further significant differences in how they have approached the establishment of ROPs. All follow a model of implementing ROPs through coordinated National Observer Programmes (NOPs). But variation occurs in the extent to which they have set prescriptive regulations on how CPCs are to collect and report observer data back to the Secretariat. They also differ in the degree to which they provide guidance to CPCs on observer training standards and protocols. While some have gained agreement from CPCs to submit raw data, others are hindered by indistinct data confidentiality issues. None have yet achieved the minimum level of observer coverage thought to reliably estimate bycatch (c. 20%), with all currently requiring 5-10%. This paper sets out potential next steps to achieve best practice implementation and greater harmonisation of tRFMO ROPs.

RÉSUMÉ

Les cinq Organisations régionales de gestion des pêcheries thonières (ORGP thonières) ont toutes récemment adopté un type de programme régional d'observateurs scientifiques sur des palangriers (ROP). Ces ROP sont tout particulièrement importants pour la collecte et la diffusion de données de prises accessoires fiables sur les taxons marins sensibles (p.ex. oiseaux de mer, tortues et mammifères marins). Le processus de Kobe vise à harmoniser une vaste gamme de méthodologies et de normes pour les données entre toutes les ORGP thonières, y compris celles qui sont applicables au ROP. Le présent document a pour but d'examiner dans quelle mesure les schémas existants sont actuellement harmonisés. Les cinq principales ORGP thonières se trouvent à des stades d'exécution différents, étant donné qu'elles ont toutes lancé leurs ROP à différentes années et qu'elles ont convenu de calendriers de mise en œuvre différents. Compte tenu de ces divergences, il demeure encore d'importantes différences dans la façon dont elles ont abordé l'établissement des ROP. Toutes suivent un modèle de mise en œuvre des ROP par le biais de programmes nationaux d'observateurs coordonnés (NOP). Mais des variations voient le jour dans la mesure dans laquelle elles ont établi des règlements normatifs sur la façon dont les CPC doivent recueillir et déclarer les données d'observateurs au Secrétariat. Elles diffèrent également dans le degré auquel elles fournissent des orientations aux CPC sur les normes et les protocoles de formation des observateurs. Tandis que certaines ont reçu l'aval des CPC pour transmettre des données brutes, d'autres sont freinées par des questions indistinctes de confidentialité des données. Aucune n'a encore atteint le niveau minimum de couverture par observateurs censé estimer de façon fiable les prises accessoires (environ 20%), toutes exigeant actuellement un niveau de 5-10%. Le présent document expose les prochaines étapes potentielles visant à atteindre la meilleure mise en œuvre pratique et une plus grande harmonisation des ROP des ORGP thonières.

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RESUMEN

Las cinco Organizaciones regionales de ordenación pesquera de túnidos (OROP-t) han adoptado recientemente alguna forma de Programa regional de observadores científicos de palangre (ROP). Estos programas son especialmente importantes para la recopilación y difusión de datos fiables de captura fortuita de taxones marinos sensibles (por ejemplo, aves marinas, tortugas y mamíferos marinos). El proceso de Kobe tiene como objetivo armonizar una amplia gama de metodologías y estándares de datos entre las OROP de túnidos, lo que incluye aquellos aplicables a los ROP. Este documento tiene como fin examinar el alcance de la armonización actual de los programas existentes. Las cinco OROP de túnidos se encuentran en diferentes etapas de ejecución, ya que todas iniciaron los ROP en diferentes años y acordaron diferentes plazos para su implementación. Teniendo en cuenta dichas discrepancias, siguen existiendo importantes diferencias en la forma en que han enfocado el establecimiento de los ROP. Todas siguen el modelo de implementar los ROP a través de Programas nacionales de observadores (NOP) coordinados. Pero existen variaciones en las reglamentaciones prescriptivas que han establecido sobre cómo las CPC deben recopilar y comunicar los datos de los observadores a la Secretaría. Asimismo, difieren en el grado en el que facilitan alguna orientación a las CPC sobre los protocolos y estándares de formación de los observadores. Aunque algunas han obtenido el acuerdo de las CPC de enviar los datos en bruto, otras se han encontrado con dificultades debido a cuestiones poco definidas relacionadas con la confidencialidad de los datos. Ninguna ha logrado aún el nivel mínimo de cobertura de observadores que se considera estima de manera fiable la captura fortuita (aproximadamente 20%), y todas requieren actualmente entre el 5 y el 10%. Este documento establece posibles pasos futuros para lograr la implementación de las mejores prácticas y una mayor armonización entre los ROP de las OROP de túnidos.

KEYWORDS

RFMOs, fisheries management

1. Introduction

All five[2] of the tuna Regional Fisheries Management Organisations (tRFMOs) now have Regional Observer Programmes. The joint tRFMO process, also known as the Kobe process[3], seeks to harmonise activities between the organisations and move towards a more consistent, sustainable and science-based management approach. This paper reviews the extent to which the five tRFMOs have harmonized their activities in establishing scientific longline Regional Observer Programmes (ROPs), particularly in relation to recording bycatch data.

In order for bycatch information to be useful and help us understand the relative impacts of wide-ranging fisheries on taxa like seabirds, turtles and marine mammals, it must be collected using standardised protocols, reported to Member States and Cooperating Non-Contracting Parties (CPCs) and tRFMOs in a consistent and transparent manner, and provide some level of open-access to external interested parties. Without standardised protocols, it is impossible to assess the relative impacts of different fleets/regions/tRFMOs on various bycatch taxa. Often, there is a disconnection between data that are collected by CPCs and the level of information passed on to tRFMO Secretariats for collation and wider dissemination. Frequently, CPC annual reports to tRFMO Secretariats on data collected by observers do not go into sufficient level of detail on bycatch rates, observer effort, etc. Equally, if ROP data are not reported in a harmonized manner between tRFMOs, it becomes impossible to quantify the cumulative impacts of the various tRFMOs on wide-ranging, mobile bycatch taxa.

Regional Observer Programmes (ROPs) can be set up in two ways: (i) through the establishment of a centralised programme, coordinated by the tRFMO Secretariat, with a mandate to deploy observers, as well as receive, curate and disseminate bycatch information (e.g. the IATTC Agreement on the International Dolphin Conservation Programme (AIDCP)); or (ii) through the coordination of national programmes, implemented in-

[2] The International Commission for the Conservation of Atlantic Tunas (ICCAT), The Inter-American Tropical Tuna Commission (IATTC), The Indian Ocean Tuna Commission (IOTC), The Western and Central Pacific Fisheries Commission (WCPFC), The Commission for the Conservation of Southern Blue-fin Tuna (CCSBT).
[3] http://www.tuna-org.org

country, with a requirement to report data back to the tRFMO Secretariat or relevant Working Groups at regular intervals.

A centralised programme has the benefit of facilitating uniform standards of data collection and reporting, observer training and observer coverage (Wolfaardt 2011). In practice, all tRFMOs have implemented longline scientific ROPs through the second mechanism, albeit differing in the extent to which each Secretariat has been given a coordinating role. The use of national observer programmes requires clear communication of data collection and reporting protocols to all CPCs and effective coordination of the ROP by the tRFMO.

This review aims to compare how longline ROPs are being set up and the structure and processes each tRFMO has put in place to ensure data collected are relevant, comparable, and open to external scrutiny. In order to do this, we have used a criteria-based assessment.

2. Methods

The review uses nine criteria to assess tRFMO activities in relation to establishing longline ROPs. The criteria were informed by previous tRFMO performance reviews on bycatch governance (Small 2005, Gilman and Passfield 2012). The focus was to compare the structures and processes being put in place by each tRFMO to build a framework for an effective ROP, rather than assessing the extent to which CPCs have adhered to such schemes or the extent of data already collected, as most schemes only commenced in the past two or three years.

In selecting the criteria, focus was placed on processes set up to ensure adequate levels of observer coverage, data collection and reporting. Criteria were also included to establish whether a centralised database on target and non-target catch had been created and whether guidance on observer training had been provided to all CPCs. Transparency and consistency with other tRFMOs were also deemed important.

In detail, the criteria are as follows:

1. Has the tRFMO required all CPCs to establish longline scientific observer programmes and adhere to adequate (see below for definition) minimum levels of observer coverage?
2. Has the tRFMO required all CPCs to collect spatio-temporally representative bycatch data?
3. Has the tRFMO required all CPCs to collect data using standardised protocols and established a data collection template?
4. Has the tRFMO required all CPCs to report data to the Secretariat within a stipulated time?
5. Has the tRFMO required all CPCs to report data to an adequate minimum standard and provided data reporting templates? (Adequate minimum standards would include raw observer data sheets or spatio-temporally aggregated data records, i.e. 5x5 degree grid squares by month/quarter).
6. Has the tRFMO required all CPCs to implement observer training and provided guidance on minimum training standards? (Minimum training standards would include knowledge of target and non-target species, gear configurations, appropriate ID guides, etc.).
7. Has the tRFMO created a centralised database and gained commitment from all CPCs to input data?
8. Has the tRFMO stipulated adequate levels of access for external audiences to collated observer information held at the Secretariat?
9. Has the tRFMO made efforts to ensure consistency in data collection and reporting with other tRFMOs?

Information from publically available sources from RFMO Secretariats was examined to assess each tRFMO against the criteria. This involved a review of all relevant Resolutions and Recommendations agreed at tRFMO Commission meetings, meeting reports where ROPs were listed as an agenda item or the specific topic of a Working Group, and correspondence with regional expects (including Secretariat staff from each of the 5 tRFMOs included in the study). In order to facilitate comparison, a qualitative score was given for each tRFMO against each criteria (0=absent, 1=poor, 2=medium and 3=good).Commitments made within the text of relevant Resolutions and Recommendations were given particular emphasis: if agreement was only reached within a Working Group, but not later supported in statements by the Commission, this was deemed weaker than if formally recognised and agreed at Commission level.

In relation to Criterion 1, most tRFMOs require 5% coverage and some note a wish to extend this as the programme progresses. However, studies have demonstrated a minimum level of observer coverage (20%) below which there is an exponential increase in the coefficients of variation associated with estimating bycatch, i.e. before significant error is introduced to estimates of incidental mortality associated with a particular fishery (e.g. Lawson 2006). For this reason, any tRFMO that currently requires less than 20% observer coverage scores as 'Poor' against this criterion.

3. Results

Table 1 below outlines the main sources of information used to qualitatively rank tRFMOs on ROP activity.

4. Discussion

Delivery of an effective tRFMO regional observer program requires a range of elements to be in place, including harmonization of data standards, and adequate coverage, reporting, capacity building and funding. In this comparison we have focused on nine elements that we consider essential to the effectiveness of longline observer programs in relation to bycatch data in particular. In the last 5 years, significant progress has been made in establishing tRFMO longline observer program requirements. However, there are key differences between the setting up of the tRFMO longline observer programs.

4.1 WCPFC

WCPFC performed highest against the criteria compared with other tRFMOs. A distinguishing feature is that it has made mandatory that all CPCs submit raw observer data forms to the Secretariat. Currently no other tRFMO requires this level of data submission. WCPFC also performs well in that it gives clear guidance on what is expected of NOP training (WCPFC 2011b). There is also clear and comprehensive guidance on minimum data collection fields for inclusion in NOP templates (WCPFC 2008a). The WCPFC observer program measure (CMM 07-01) also includes a detailed role for the Secretariat, including a NOP accreditation process, and the allocation of significant funds to support the programme. The drafting of a strategic implementation plan at the start of the ROP process (WCPFC 2007a,b), is likely to have aided the well-structured execution of the ROP.

While it is not clear at what stage the WCPFC centralised ROP database is currently, it is set to include data provided through raw observer data forms and consequently is likely to be of a higher standard of data resolution than most other tRFMOs.

The main weaknesses of the WCPFC ROP in relation to our criteria were the low (5%) coverage requirement, and lack of external availability of data, or commitments to harmonizing data collection outside WCPFC/IATTC.

4.2 IOTC

IOTC ranked second, based on its activities towards establishing a ROP. Following adoption of Res. 09-04 in 2009, IOTC established annual Technical Meetings on the IOTC Regional Observer Scheme, to progress the implementation of the ROP. IOTC made significant progress in specifying, to a high level of detail, the information that CPCs should collect from their NOPs (IOTC 2010a).

Unlike WCPFC, CPCs have the option of submitting observer trip reports to the IOTC Secretariat, which have aggregated, rather than raw, data (IOTC 2010a, Res 11-04), and while the ROP Technical Working Group recommended a centralised database be set up in the Secretariat (IOTC 2010a), the Working Party on Ecosystems and Bycatch (WPEB) acknowledged that this could only happen once data submissions increased and encouraged CPCs to maintain their own databases to a high standard in the interim (IOTC 2011b). In addition, compared to WCPFC the IOTC Secretariat doesn't have a centralised role of observer program accreditation and training. However, more optimistic progress comes from a new Resolution 12-02 on data confidentiality, which stipulates that standard stratification of catch-effort and observer data (i.e. aggregated 5x5° grid/month) must be observed by all CPCs submitting data to the Secretariat and would thereafter be considered to be in the public domain (IOTC 2012a).

4.3 ICCAT

ICCAT has only recently established a regional longline observer program (Rec. 10-10), and has not yet created firm guidelines on observer training manuals, or data collection and reporting requirements. However, Rec 10-10 includes some detail on what is required of CPCs, in terms of ROP data collection and reporting standards.

Rec. 10-10 however, does not explicitly require CPCs to submit raw observer data forms to the Secretariat or give the Secretariat a centralised role in implementing the programme, unlike WCPFC. Furthermore, while a bycatch database has been established, few raw data have been submitted as CPCs are only encouraged, not required, to submit this level of data.

In 2010, the Working Group on Integrated Monitoring Measures noted that minimum standards for NOPs were required, but did not go so far as to establish them (ICCAT 2010a). This illustrates the fundamental issues around the implementation of the ICCAT ROP, in that principles of strong data collection and reporting are enshrined within the Res. 10-10 (ICCAT 2010a) and Res. 11-10 (ICCAT 2011a), but further detail is required to expand on what exactly CPCs must do to achieve good reporting status. Minimum data collection and reporting requirements must be agreed, if a data reporting template for all CPC NOPs is not deemed appropriate. Also, further work to produce a ROP Manual for use in all CPC NOPs must be done, building on the work of the bycatch contractor (Cotter 2010, ICCAT 2011c).

4.4 IATTC

IATTC only adopted Resolution C-11-08 on a ROP in 2011 (IATTC 2011a) and so this late start must be borne in mind when assessing the relative merits of the programme to-date. Nevertheless, some gaps were apparent from the outset, namely in relation to small vessels (<20m), although this type of exemption is not limited to IATTC. It identified the Secretariat as responsible for drawing up data collection templates for NOPs and that CPCs were to submit data in a format to be established by the Scientific Committee by the 31 March each year (IATTC 2011a). However, no details on minimum standards for data collection or reporting were included in the resolution. In 2011, a meeting was recommended between NOPs and existing IATTC ROPs to discuss data collection and reporting procedures (IATTC 2011b) and the Commission also approved a Memorandum of Cooperation between IATTC and WCPFC on approved observers (IATCC 2011c), thus demonstrating efforts to ensure data harmonisation between tRFMOs.

There is no mention in the relevant literature to-date of the creation of a centralised database for longline ROP data. However, in 2010 Secretariat staff re-organised the Tuna and Observer database groups into a single Data Collection and Database group (IATTC 2010a). It is possible that this group might provide a suitable forum to coordinate the founding of such a database, or the incorporation of longline NOP data into existing databases. Nevertheless, the omission of a requirement on CPCs to submit data of a certain resolution (as opposed to a activity report), the failure to stipulate a discrete role for the Secretariat or the housing of a centralised database within the Secretariat, are potentially significant omissions from C-11-08.

4.5 CCSBT

CCSBT, while initially a fore-runner in establishing a ROP, has now fallen behind that of other tRFMOs. Of all the tRFMOs, CCSBT appears the least centralised in terms of the structure and organisation of its ROP, with all NOP operating independently and no requirement to submit data to the Secretariat.

CCSBT has provided guidance on minimum data standards (2001b), but CPCs use their own NOP data collection templates. There is some degree of collaboration among CPCs with regards to analysis of data across multiple NOPs, and the sharing of specific information in a bilateral approach on a case by case basis (R. Kennedy, in lit.), however this remains limited. The requiring of CPCs to submit raw observer data to the Secretariat has been discussed for a number of years, but agreement has been hindered by confidentiality issues (R. Kennedy, in lit.). CPCs are required to annually report on the operation of their NOPs (CCSBT 2001b, Attachment 2), which includes details on coverage, training, and broad statistics on data collected. However, current annual reports are highly variable in relation to bycatch data reporting, and the 2012 meeting of the CCSBT Ecologically Related Species Working Group recognised the need to improve the national reporting template in order to make interpretation of bycatch rates possible.

4.6 Cross-cutting issues among tRFMO ROPs

Across the tRFMOs, there are several common issues faced in relation to implementation of longline observer programs.

If tRFMOs are to fulfil their aspirations to monitor and reduce their impact on non-target species, there needs to be stronger recognition, at the Commission level, of the importance of collating bycatch data across a region (i.e. across fleets of an RFMO), and also across tRFMOs, in order to properly assess and monitor the impacts of tRFMO fisheries on non-target bycatch taxa. If only annual reports are submitted, with data summaries, data are not sufficient to estimate the likely combined impacts of multiple fleets on major bycatch taxa, which are often wide-ranging and can cross multiple tRFMO Convention Areas. Such data collation depends on harmonizing minimum data standards, but also crucially on strong data reporting requirements.

In relation to this, data confidentiality is an issue that currently hinders the establishment and comprehensive reporting of bycatch data from CPCs to the relevant Secretariat, even at 5x5 degree resolution. Efforts need to be made to explore and elucidate the potential commercial and national interests that may be put at risk by providing raw observer data. It is possible that the recent IOTC Resolution 12-02 on data confidentiality might pave the way for other tRFMOs to follow suit and agree that observer data at 5x5 level should be in the public domain. .

A second issue is that only WCPFC has established a clear role for the Secretariat in accrediting NOPs and in monitoring the implementation of the ROP. WCPFC is also the tRFMO in which significant funding has been made available for implementation.

An additional problem for several tRFMOs is the issue of placing observers on small, artisanal vessels. This has led to exemptions in IOTC, IATTC and ICCAT for smaller-sized vessels being required to have observers onboard. Given that this is an issue for several tRFMOs, it would seem beneficial to establish a joint technical working group to investigate potential solutions to the problem of acquiring observer-level data from boats too small to permit observer-access. One option may be the use of video-monitoring technology.

All five tRFMOs have so far failed to require CPCs to achieve a statistically reliable level of observer coverage (e.g. 20%) in the collection of bycatch data. CCSBT is the highest, recommending 10% observer coverage, but as this remains a target level of coverage rather than a requirement, it may in practice be weaker than the universal 5% applied by all other tRFMOs. If tRFMOs are to deliver their aspirations of effective monitoring and reduction of bycatch, greater efforts must be taken by all tRFMOs to increase the requirement of CPCs in relation to observer coverage. While recognising the resource implications of raising coverage above 5%, examples of much higher coverage exist elsewhere, including the 100% coverage of CCAMLR vessels, and large purse seines in WCPFC and IATTC. These programs also use independent observers and centralised databases, which is also an ideal to aim for, with respect to the longline tRFMO observer programs covered in this study.

5. Conclusions

A milestone was reached in 2011, with all of the tRFMOs now having established requirements for observer coverage in their longline fleets. The Kobe process has also emphasised the importance of harmonising data collection across the tRFMOs. However, while significant progress has been made in recent years, our review highlights key differences between the setting up of the tRFMO longline observer programs. Rectifying some of these differences could add enormous value to these observer programs in relation to bycatch data, particularly if this facilitates the vital collation and comparison of bycatch data between fleets within each RFMO, and between RFMOs.

The following points identify critical aspects that are likely to result in a highly effective ROP:

- Clarification of data confidentiality concerns about 5x5 or 1x1 degree bycatch data
- Submission of raw observer data (or aggregated to 1x1° or 5x5° grid resolution) to tRFMO Secretariats.
- Harmonization of minimum data standards and minimum reporting requirements across tRFMO longline observer programs

- Agreement on rules of access to bycatch data to allow analyses of combined data sets, preferably harmonized across tRFMOs. Ideally this will include some level of external access to observer program bycatch data.
- Reporting on how CPCs have assessed spatio-temporal representativeness in their observer programme coverage (e.g. provide aggregated data to 1x1 grid resolution on the distribution of effort in NOP reports).
- Establishment of a joint technical working group to investigate potential solutions to the problem of acquiring observer-level data from boats too small to permit observer-access.
- Increasing the minimum level of observer coverage to levels that will allow tRFMOs to fulfil their commitments to monitor catch of target and non-target species.
- Establishing an observer program accreditation role and observer training role for tRFMO Secretariats, following the example of WCPFC

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Table 1. The five main tRFMOs assessed on the nine ROP performance criteria listed in Section 3. Scores are allocated qualitatively, based on how each tRFMO has performed against a criteria. Greater weighting was given to elements that were mandated under tRFMO resolutions (0=Absent, 1=Poor, 2=Medium, 3=Good).

		ICCAT		*IATTC*		*IOTC*		*WCPFC*		*CCSBT*	
	Criteria		*Summary*		*Summary*		*Summary*		*Summary*		*Summary*
1.	Has the tRFMO required all CPCs to establish longline scientific observer programmes and adhere to adequate minimum levels of observer coverage?	**1**	- Min. 5% observer coverage required (excl. vessels <15m, which must use alternative methods, subject to SCRS approval **(Rec. 10-10, 11-10)**	**1**	- Min. 5% observer coverage required (excl. vessels <20m) from Jan 2013. Coverage to be reviewed in 2014 and possibly extended. Does not indicate if/how data collected from vessels <20m **(Res. C-11-08)**	**1**	- Min. 5% coverage (by no. of operations/sets) for vessels ≥24m and <24m that fish outside their EEZs (but latter can be achieve progressively until Jan 2013) **(Res. 09-04)** - Artisanal vessels to be monitored by field samplers in port. Coverage increasing to 5% (of total no. of vessel trips or total no. of vessels active) **(Res. 10-04)** - Coverage subject to review/ revision in 2012 and subsequent years **(Res. 11-04)**	**1**	- Min. 5% coverage (excl. small vessels, troll, pole and line for skipjack/albacore) **(CMM 07-01)** - Exclusions to be reviewed in subsequent years by IWG-ROP **(CMM 07-01)** - Existing NOPs subject to audit on approved standards. **(WCPFC8-2011/24)** - Initial data to be used to assess necessary coverage for more sporadic bycatch incidents (e.g. seabirds) **(WCPFC 2007a)**	**1**	- No specific resolution requiring CPCs to have an observer programme, but recommends a min of 10% coverage **(CCSBT 2001b)** - Adopted resolution on action plans for compliance with CMMs, incl. improvement in verification of catch data through NOPs with 10% coverage **(CCSBT 2009)**
2.	Has the tRFMO required all CPCs to collect spatio-temporally representative bycatch data?	**1**	- Requires representative spatio-temporal coverage, but not how to achieve it **(Rec. 10-10)**	**1**	- Recommend 5% coverage be defined by no. of days fishing (excl. transit), as no. of hooks deemed impossible **(SAC 2012)** -Requires representative spatio-temporal coverage, but not how to achieve it **(Res. C-11-08)**	**1**	- Mentions representative sampling of gear types, but not spatio-temporal representativeness explicitly **(Res. 09-04, 10-04, 11-04)** - **S**tratified observer data (i.e. aggregated 5x5° grid/month) should be submitted to the Secretariat but no clear requirement to be representative **(IOTC 2012a).**	**1**	- Recommended observer effort be representative of species of interest, fishing areas, types and seasons **(WCPFC 2007a)**	**2**	- Stipulates representative sampling strategy for allocating observers to vessels. Recommends CPCs report on mechanism for observer assignment **(CCSBT 2001b)**
3.	Has the tRFMO required all CPCs to collect data using standardised protocols and established a data collection template?	**2**	- Requires collection of bycatch data, with list of min. data standards, but no template **(Rec. 10-10)** - Established min. data standards (but limited to species, number caught, fate, effort and gear used). Forms to alter by fishery, but no standard forms agreed **(SC-ECO 2010)**	**1**	- Bycatch taxa listed under recording tasks for observers, but no detail provided. Director, with SAC, nominated to draw up standard data collection forms for NOPs **(Res. C-11-08)**	**3**	- Must collect data to a minimum standard (estimate catch incl. bycatch, record gear type, enable cross-checking of logbooks, other scientific work), but no min. data fields listed **(Res. 09-04, 10-04, 11-04)** - Established comprehensive min. data standards and data collection templates (on gear and mitigation set-up, and catch/bycatch data). **(ROP**	**3**	- Can use existing NOP data formats, but must ensure ROP standard fields are included **(WCPFC8-2011/24)** - FFA/SPC formats (used by most NOPs) altered in 2009 to include all WCPFC approved data fields **(WCPFC8-2011/24)** - SPC to assess quality of data collected for ROP Secretariat to audit and monitor **(WCPFC7-2010/26)**	**1**	- The Scientific Observer Standards Report goes into quite a lot of detail regarding data collection requirements, but no min. standards as such. Refers frequently to catch of SBT, but no specific mention of bycatch data collection **(CCSBT 2001b)**

		ICCAT		IATTC		IOTC		WCPFC		CCSBT	
	Criteria		*Summary*		*Summary*		*Summary*		*Summary*		*Summary*
							Tech. WG 2010)		- Full suite of ROP required data fields **(WCPFC 2008a)**		
4.	Has the tRFMO required all CPCs to report data to the Secretariat within a stipulated time period?	**2**	- Requires annual report to SCRS. Lists catch rates, coverage and how calculated. Every 3 yrs report on coverage, summary of data, review min. standards and give recommendations **(Rec. 10-10)**	**2**	- Requires submission of NOP information to SAC by 31 March each year **(Res. C-11-08)** Recommended meeting of NOP and IATTC ROPs to discuss data exchange and deadlines **(IMM Committee 2011)**	**3**	- Observers to submit trip report to CPC within 30 days of trip. CPCs required to report in 90 days (later extended to 150 days) **(Res. 09-04, 11-04)** - Commission pressed CPCs for timely reporting of observer trip reports **(Commission 2012)**	**2**	- No detail on submission deadline after initial date of 31 Dec 2008 **(CMM 07-01)** - All observers to forward data to Secretariat /CPC as soon as possible after each trip **(WCPFC 2007a)**	**0**	- There is no stipulated time period for reporting **(CCSBT 2001b)**
5.	Has the tRFMO required all CPCs to report data to an adequate minimum standard and provided a data reporting template? [Adequate minimum standards would include raw observer data sheets or spatio-temporally aggregated data records (i.e 5x5 degree grid squares by month/quarter)]	**1**	- Requires annual report to SCRS (only catch rates, coverage and how calculated) consistent with domestic confidentiality requirements. Does not require raw or spatio-temporally aggregated data **(Rec.10-10)** - Requires reporting of bycatch data in format specified by SCRS (detail not addressed) **(Rec. 11-10)** - CPCs noted confusion on how to report data, hence lack of reporting compliance. Secretariat to produce questionnaire to standardise CPC reporting against Rec. 10-10 requirements **(SCRS 2011)** - SC-ECO recommended bycatch data reporting under Task II rules (distinguishing between logbook and observer data). Data to be spatio-temporally aggregated to allow for data confidentiality issues. - Asked Secretariat to develop electronic forms **(SC-ECO 2010)**	**1**	- Requires CPCs to report to SAC in format to be established by SAC. No detail on format or minimum standards listed **(Res. C-11-08)**	**3**	- Trip report template for observers to give to CPCs includes data stratified at 5x5 ° resolution. Within 150 days, CPCs must submit this to Secretariat. **(Res. 11-04)** - In addition, recommended to submit data) to Secretariat at 1x1° resolution. -	**3**	- Requires CPCs to submit data (as collected) to Commission and thereafter considered Commission data **(CMM 07-01)** - Secretariat to receive data from Commission data provider (SPC). NOPs need to authorise release of ROP data from SPC **(WCPFC7-2010/26)** - Supports training of qualified de-briefers for full report after each trip **(WCPFC7-2010/26)** - Data collected on ROP data forms and reports collected under ROP will be verified for accuracy and provided to the Commission on a timely basis **(WCPFC 2007a)**	**1**	- Report details quite extensive protocols for data reporting, but always in relation to SBT and target catch. The omission of reference to bycatch allows significant room for interpretation by CPCs on what species to actually report data on to the Secretariat **(CCSBT 2001b)**

		ICCAT		IATTC		IOTC		WCPFC		CCSBT	
	Criteria		*Summary*		*Summary*		*Summary*		*Summary*		*Summary*
6.	Has the tRFMO required all CPCs to implement observer training and provided guidance on minimum training standards? [Minimum training standards would include knowledge of target and non-target species, gear configurations, appropriate ID guides, etc.]	**1**	- Requires observers to have sufficient knowledge of species, gear, ICCAT CMMs, ability to observe and record data, be independent. Does not give guidance on training **(Rec. 10-10)** - Secretariat to collate observer manuals/protocols from NOPs and develop guidelines on bycatch data analysis for ICCAT Manual.SC-ECO to work with WGSAM to incorporate data into risk management advice framework **(SCRS 2011)**	**0**	- No mention of observer training in CPC requirements **(Res. C-11-08)** - Memorandum of cooperation on approved observers between IATTC and WCPFC (approved in WCPFC Dec 2010) means some training must be required, but no detail provided **(Commission 2011)**	**2**	- Scientific Committee tasked with elaborating an observer working manual and training programme . No explicit requirement for CPCs to undertake observer training, just implied. However, states funds to be made available to developing states for training **(Res. 09-04, 10-04)** - Produced observer training manual (incl. data collection forms), essential qualifications and knowledge, guidance on sampling protocols, etc. Recommended CPCs send list of accredited observers to IOTC **(ROP Tech. WG 2010)**	**3**	- Secretariat to maintain ROP Manual (incl. min. requirements for training and trainer authorisation) and observer workbook and CPCs to maintain standards adopted by the ROP **(CMM 07-01)** - Supports the use of FFA/SPC Pacific Island Regional Fisheries Observer (PIRFO) criteria for training observers **(WCPFC7-2010/26)** - Highlights need for comprehensive debriefing of observers, but capacity an issue (no other tRFMO addresses debriefing protocols specifically) **(WCPFC8-2011/24)**	**1**	- Report details minimum standards for observer training, recommends CPC-led training programme, with observer manual to come from CPC rather than Secretariat. No requirement for CPCs to implement training as no resolution **(CCSBT 2001b)**
7.	Has the tRFMO created a centralised database and gained commitment from all CPCs to input data?	**1**	- Approved bycatch coordinator appointment to manage database and monitor CPC reporting **(Commission 2011)** - Agreed on need to complete and maintain databases created by bycatch contractor **(SCRS 2010)** - Secretariat commissioned bycatch database in 2010, with provision for logbook and observer data. To-date mostly extracts from reports not raw data, so will not allow analysis of spatio-temporally explicit aggregated data across multiple CPCs. Noted simplest method of reporting bycatch data was under Task II (catch and effort) rules **(SC-ECO 2010)**	**0**	- No mention of centralised database or commitments from CPCs to allow input of data within resolution **(Res. C-11-08)** - Secretariat reorganised Tuna and Observer Database groups into single Data Collection and Database Group. Future plans to create separate databases orientated to individual subjects **(SAC 2010)**	**1**	- Recommended observer data be sent to centralised database, housed at Secretariat. **(ROP Tech. WG 2010)** - WPEB encouraged CPCs to maintain their own databases to high standard, rather than recommending a centralised database, although acknowledged this was planned for the future **(WPEB 2011)**	**3**	- ROP Data Quality Officer to develop and maintain databases (i.e. on coverage, catch retention, etc.) **(WCPFC8-2011/24)** - Early 2010, Secretariat to have established data infra-structure. Mid-2010, training and data gathering. July 2010 - full data entry **(WCPFC 2009a)** - Database to take into account needs of Commission and be as compatible as possible with NOP databases. Needs to accept ROP min. standards data in different formats (i.e. those of existing NOPs) **(WCPFC 2007b)**	**0**	- No mention of centralised database or commitments from CPCs to allow input of data **(CCSBT 2001b)**
8.	Has the tRFMO stipulated adequate levels of access for external audiences to collated observer information held at the	**0**	- Presumption in favour of domestic confidentiality requirements. No indication of public access or provision for data requests **(Rec. 10-10)**	**0**	- None mentioned	**2**	- Agreed best quality observer data to be collected and maintained by CPCs and be available on request for joint analysis **(WPEB 2011)**	**0**	- CPCs have requested copies of data collected by observers. Need clarification on what data should be released by Commission data provider	**0**	- None mentioned

		ICCAT		IATTC		IOTC		WCPFC		CCSBT	
	Criteria		*Summary*		*Summary*		*Summary*		*Summary*		*Summary*
	Secretariat?		- In 2008, Secretariat provided Data Confidentiality Agreement to Commission, in turn passed to FWG. No evidence of formal approval as yet. Report states catch and effort data aggregated to 5x5° grid (for LL fisheries) suitable for public domain. Remains unclear if bycatch is covered under Task II 'Catch' data. Wording indicates it is, but not commonly reported under Task II **(Commission 2010)** - Suggested spatio-temporally aggregated bycatch and effort data should overcome domestic data confidentiality issues **(SC-ECO 2010)**				- Resolution 12-02 agrees that 5x5 aggregated data (incl observer data) will be in the public domain. Data requests to be made by relevant working parties **(IOTC 2012a).**		(SPC) **(WCPFC7-2010/26)** - The website is intended to present summaries of ROP data that are in the public domain, but no list of what level of public access to ROP data will be made available **(WCPFC 2007b)**		
9.	Has the tRFMO made efforts to ensure consistency in data collection and reporting with other tRFMOs?	**0**	- Does not stipulate how minimum standards should dovetail with other tRFMOs (**Rec. 1010)** - Commitment by the Secretariat to support work plan of tRFMO Joint Bycatch Tech. WG **(Rec. 11-10)** - Recommended work on harmonizing bycatch related activities with other tRFMOs **(SCRS 2010)**	**1**	- Does not stipulate how minimum standards should dovetail with other tRFMOs **(Res. C-11-08)** - Memorandum of cooperation on approved observers between IATTC and WCPFC (approved in WCPFC Dec 2010) **(Commission 2011)**	**0**	- Does not stipulate how minimum standards should dovetail with other tRFMOs **(Res. 11-04)**	**1**	- Cross-endorsement of observers between IATTC and WCPFC (CMM-2008-01, Para 29) directs the Secretariat to work with IATTC to develop procedures to allow observers from each RFMO to work in one another's Convention Area **(WCPFC7-2010/26)**	**1**	- The 6th SC agreed that Australia would develop programme standards and data forms, taking particular note of characteristics of other tRFMO ROPs. Good commitment but problematic as most other tRFMOs developed their ROPs later **(CCSBT 2001b)**
	Total (out of 27)	**9**		**7**		**16**		**17**		**7**	