# UPDATE ON THE IMPLEMENTATION OF THE IOTC REGIONAL OBSERVER SCHEME

**PREPARED BY: IOTC SECRETARIAT[1], 21 AUGUST 2015**

## PURPOSE

To inform the Working Party on Ecosystems and Bycatch (WPEB) of the status of implementation and reporting to the IOTC Secretariat of the Regional Observer Scheme (ROS) set out by Resolution 11/04 *on a Regional Observer Scheme* at the 15th Session of IOTC (S15) in 2011.

## BACKGROUND

At the 13th Session of the Commission (S13), the Commission adopted Resolution 09/04 *on a Regional Observer Scheme*, which was superseded in 2010 by Resolution 10/04, and again in 2011 by Resolution 11/04. In 2010, the Commission addressed concerns raised by some CPCs with artisanal fleets, on which it is difficult to deploy on-board observers due to the small-size of the artisanal vessels and/or to their large numbers which would require high deployment levels and in 2011, the Commission extended the period for submitting the Observer Trip Report from 90 days to 150 days.

Resolution 11/04 *on a Regional Observer Scheme* makes provision for the development and implementation of national observer programmes among the IOTC CPCs starting in July 2010 and covering "*at least 5 % of the number of operations/sets for each gear type by the fleet of each CPC while fishing in the IOTC Area of competence of 24 meters overall length and over, and under 24 meters if they fish outside their EEZs shall be covered by this observer scheme. For vessels under 24 meters if they fish outside their EEZ, the above mentioned coverage should be achieved progressively by January 2013".*

Moreover, the Resolution states that "*the number of the artisanal fishing vessels landings shall also be monitored at the landing place by field samplers"* and that *"the indicative level of the coverage of the artisanal fishing vessels should progressively increase towards 5% of the total levels of vessel activity (i.e. total number of vessel trips or total number of vessels active)".*

The Resolution goes on to state *"CPCs shall provide to the Executive Secretary and the Scientific Committee annually a report of the number of vessels monitored and the coverage achieved by gear type in accordance with the provisions of this Resolution".*

At is 13th Session the IOTC Scientific Committee (SC13) reviewed the report of the technical workshop organised in May 2010, and endorsed the documents produced by the Secretariat; an Observer Manual[2] and an Observer Trip Report template[3] containing the minimum reporting requirements. These were formally adopted at the 15th session of the Commission where it was noted[4] "*Minimum data requirements were adopted as well as an observer report template that will be reviewed and revised as necessary."*

## DISCUSSION

### *Implementation of the observer scheme*

As of 14th August 2015, fourteen CPCs (Australia, China (including Taiwan,China), Comoros, EU (France[5] and Portugal), Indonesia, Japan, Kenya, Rep. of Korea, Madagascar, Maldives, Mauritius, Mozambique, Seychelles and South Africa) have submitted a list of observers and have been allocated an IOTC observer registration number. This makes a total of 259 IOTC registered observers.

[1] Sarah Martin (sm@iotc.org) and Lucia Pierre (lp@iotc.org); IOTC Secretariat (secretariat@iotc.org)

[2] IOTC-2010-SC-11

[3] IOTC-2010-SC-12

[4] IOTC-2011-S15-R[E]

[5] Including Mayotte due to its status as a French outermost region since January 2014

As of 14th August 2015, one hundred and eighty five (185) observer trip reports have been submitted to the IOTC Secretariat by Australia, China, EU(France and Portugal), Japan, Rep. of Korea, Madagascar, Mozambique and South Africa and two pilot trip reports have been submitted by Sri Lanka.

Appendix A provides a summary of the status of implementation of the ROS by all IOTC CPCs. Appendix B and Appendix C provide an estimation of the level of effort covered by observers in 2010, 2011, 2012, 2013 and 2014 for industrial longline and purse seine vessels (data as of 14th August 2015). Reported coverage for the artisanal fleets is currently zero, but in future a summary will also be provided to give an overview of the level of coverage achieved by these fleets. While CPCs are required to report on the level of coverage by gear type, the methods used to estimate the level of coverage achieved are often not provided. Given there are some discrepancies between coverage rates estimated by the IOTC Secretariat and the coverage rates reported by CPCs, clarity on the methods used are needed.

***Interim reporting templates***

**Reporting templates**

At its 13th Session in 2010, the IOTC Scientific Committee reviewed the report of the technical workshop organised in May 2010, and endorsed the documents produced by the Secretariat; an Observer Manual[6] and an Observer Trip Report template[7] containing the minimum reporting requirements. These were subsequently formally adopted at the 15th session of the Commission in 2011 where it was noted[8] "*Minimum data requirements were adopted as well as an observer report template that will be reviewed and revised as necessary".* Resolution 11/04 was also adopted which states *"the IOTC Scientific Committee will elaborate an observer working manual, a template to be used for reporting (including minimum data fields) and a training program".*

During the 10th WPEB a number of issues with the quality of data reported and the current format in which the data are submitted were discussed. Bearing in mind the comments at the 15th Session of the Commission where it was noted that the observer report template '*will be reviewed and revised as necessary",* a number of potential areas for revision were identified as outlined in paper IOTC–2014–WPEB10–08 Rev_1.

During the WPEB10 a number of fishery-specific breakout working groups were held in order to review the current format of the observer reporting templates. A key issue raised was the need for data submission in electronic format, noting that to date only one CPC has provided all data electronically and that this would improve the efficiency of data collation and management for analysis. The WPEB agreed to prioritise the data collection requirements based on the objectives of the Scientific Committee, ensuring that all necessary data are collected in the required format while ensuring that there is a clear purpose for every data field to prevent the collection of redundant information. Based on this, a number of suggestions for improvements to the data collection process were raised by these groups. This led to the request by the Working Party, as noted in paragraph 55 of the report[9]:

*"The WPEB **REQUESTED** that the IOTC Secretariat finalise the revision of the observer reporting templates inter-sessionally based on the gear-specific recommendations made by the breakout group meetings held during the current working party meeting, and for these revisions to be provided to the WPDCS for its consideration and then the Scientific Committee for adoption".*

The revised templates were presented to the Working Party on Data Collection and Statistics (IOTC–2014–WPDCS10) where they were reviewed and put forward for consideration and adoption by the Scientific Committee. The main adjustments to the reporting requirements included the resolution of information provided (catch information not linked to effort information), redundancy of certain data fields, lack of clarity resulting in different types of information provided for one data field, lack of information on sampling strategies, lack of standardisation in data submitted in terms of codes or different types of information provided for a single data field, inappropriate level of detail required (not detailed enough to be able to address some requests of the Commission, e.g. effectiveness of mitigation measures, and information that was considered to be too detailed by some observer programme managers, such as the make and model of all electronic equipment.

At the 17th session of the Scientific Committee, *"the SC **NOTED** the revisions to the observer reporting templates proposed by the WPEB10 and the WPDCS10 to improve the quality of the data submissions for scientific purposes such as stock assessments and other such scientific work as requested by the IOTC Scientific Committee".* Further

[6] IOTC-2010-SC-11

[7] IOTC-2010-SC-12

[8] IOTC-2011-S15-R[E]

[9] IOTC-2014-WPEB10-R[E]

"***NOTING*** *that improving the quality of data submissions is a process that evolves and develops over time, the SC* ***ADOPTED*** *the revised observer templates as interim reporting templates for immediate use by CPCs where ready and for preliminary use by CPCs where further time is required for review. The SC* ***AGREED*** *that the IOTC Secretariat will make these templates available in 2015 and update the guidance in the manual accordingly. Following implementation in interim format, the SC* ***AGREED*** *that these will be reviewed and modified further as appropriate in 2015.*

The interim reporting templates, updated version of the manual and data collection forms will be made available on the IOTC website: www.iotc.org/science/regional-observer-scheme-science

All CPCs are reminded that the data can be submitted in any electronic format as long as the data required for reporting are present.

**Electronic reporting**

The majority of observer data are currently submitted as word, pdf or scanned documents to the IOTC Secretariat. This is a highly inefficient arrangement, requiring a substantial amount time to be dedicated to data entry, cleaning and processing and is not conducive to data management or analysis. To improve the situation, a project has been developed which will allow the electronic reporting of observer data to improve the consistency, efficiency, quality, timeliness and accuracy of data reporting and management for analysis. This project is targeted particularly at developing country CPCs which have not yet developed observer data collection and management processes and will be an important capacity building tool for these countries, providing a template database structure for data storage as well as exporting functions for regional data reporting. The interface will be designed to be highly user-friendly and will be trialed in two CPCs and reviewed by experts at NOAA, IATTC, WCPFC, ICCAT, OSPESCA and SPC so that existing processes and proven successes can be built into the system. The data management system will be integrated into the new IOTC database structure currently under development to streamline data management processes and facilitate the provision of data by the IOTC Secretariat. This project will be jointly funded by the European Union (EU) and the National Oceanic and Atmospheric Administration (NOAA) and is due to commence at the end of 2015, running until the end of 2016.

**Electronic monitoring**

At the 17th Session of the Scientific Committee in 2014, a recommendation was made for the development of electronic monitoring to support the implementation of the ROS, noting that electronic monitoring systems are meant to complement rather than replace the work conducted by onboard scientific observers:

Para. 166. *"****NOTING*** *that electronic monitoring (including video) has been trialled and successfully implemented in many fisheries worldwide (e.g. Australia, European Union, USA, New Zealand), with the aim of supplementing scientific observers on board vessels; and given the current difficulties cited as reasons for not deploying scientific observers under the IOTC Regional Observer Scheme (ROS) on board large-scale gillnet vessels operating in the Indian Ocean; the SC* ***RECOMMENDED*** *that the Commission considers assigning the IOTC Secretariat, in consultation with interested IOTC scientists, to develop a project on electronic monitoring in the IOTC area of competence. This would allow an evalution of the efficacy of electronic monitoring in the collection of information on catch, discards and fishing effort as a means to supplement scientific observer coverage for large-scale gillnet vessels. The trial will include an evaluation of the main challenges of using electronic monitoring data such as the accurate identification of IOTC and bycatch species, weight and size of catches and the time taken to process the footage and extract the required data. The concept note/proposal shall also include a clear indication that the IOTC data confidentiality policy (Resolution 12/02) will need to be modified to ensure any data/information collected is for the sole purpose of scientific analysis and not for compliance purposes. The concept note should include a detailed budget and be communicated to a range of potential funding organisations".*

A draft proposal for the development and trial of an e-monitoring system for Indian Ocean gillnet fisheries is currently being worked up by the IOTC Secretariat. This is being worked on in collaboration with WWF-Pakistan as part of their ABNJ project, and technical review and guidance is being sought from a variety of sources, including NOAA and the Australian Fisheries Management Authority (AFMA) and from Digital Observer Services. Once finalised, this will be sent to a range of potential funding organisations.

***Capacity building***

**Support to the implementation of the IOTC Regional Observer Scheme in Sri Lanka**

Sri Lanka has important gillnet-longline fisheries for tropical tunas, ranking third in terms of total fleet catches from 2010–12, and has also reported important amounts of shark catches. However, Sri Lanka has not reported catch and effort data consistent with IOTC standards, including separate catch and effort data for gillnet and longline gears and for vessels operating outside the EEZ. In 2014, the Sri Lankan Department of Fisheries and Aquatic Resources made a formal request to the IOTC Secretariat for assistance to support the implementation of a national regional observer scheme.

An evaluation, training and planning workshop was held in February 2015 to review the experience and data collected by observers in 2014 and to use the findings to identify key data gaps and quality issues in order to improve the process and develop a working protocol, specific to the Sri Lankan fisheries. There were 17 participants at the workshop, comprising the observer scheme manager, future and current observers as well as the trainers. Training was provided in species identification for all species groups, sampling approaches and observer debriefing processes. Results from pilot observer trips were reviewed and discussed in detail and set of recommendations were laid out for next steps in implementation of the scheme in Sri Lanka.

**Support to the implementation of the IOTC Regional Observer Scheme in Oman, I.R. Iran and Pakistan**

I.R. Iran and Pakistan have important gillnet fisheries for neritic tuna fisheries (I.R. Iran reported 20% of total neritic tuna catches from 2010–12) and has a substantial offshore fleet. However, neither have reported catch-and-effort data in recent years or length-frequency data according to IOTC standards and although important amounts of sharks are harvested, these are rarely identified to species level. A regional training workshop is due to be held in Oman from 18–22 October 2015 for observer programme managers, trainers and observers from I.R. Iran, Pakistan and Oman. The IOTC Secretariat is organising this workshop in collaboration with IOSEA, CMS and WWF-Pakistan as part of the ABNJ initiative. Experts from NOAA, the Five Oceans Environmental Services, WWF-Pakistan, the Oman Marine Science and Fisheries Centre, the Gulf Elasmo Project and the IUCN Cetacean Specialist Group have been invited to assist facilitate the training sessions.

**Support to the implementation of the IOTC Regional Observer Scheme through the introduction of an e-reporting system**

As part of the e-reporting project, funding has been obtained for the trial and roll out of the e-reporting system. The tool will be trialled in two developing country CPCs as part of the review stage of the project. A number of roll-out capacity building workshops will then be undertaken in 2016 to implement the system in CPCs requiring assistance with their data collection, management and reporting processes.

***IOTC Species ID guides***

**Table 1.** Summary of priority languages and species groups for translation and printing as identified by the SC16 and SC17.

| | 1. Tuna & like | 2. Billfish | 3. Turtles | 4. Sharks and rays | 5. Seabirds |
|---|---|---|---|---|---|
| **Farsi** | 2 | 1 | 1 | 1 | 1 |
| **Arabic** | 2 | 2 | 2 | 2 | 2 |
| **Urdu** | 4 | | | | |
| **Bahasa Indonesian** | 1 | 3 | 5 | 5 | 5 |
| **Swahili** | | 4 | | | |
| **Spanish** | | 5 | 3 | 3 | 3 |
| **Portuguese** | | 6 | 4 | 4 | 4 |
| **Thai** | | 7 | | | |
| **Sinhala** | 3 | 8 | | | |
| **Tamil** | | 8 | | | |
| **Bahasa Malaysia** | 1 | | | | |
| **Hindi** | 3 | | | | |

Progress to date:

- Translation and printing of all IOTC species ID guides into Farsi is underway (WWF-Pakistan)
- Translation and printing of all IOTC species ID guides into Arabic is underway (IOTC and WWF-Pakistan)
- Translation and printing of tuna, billfish, turtles and shark ID guides into Urdu is complete (WWF-Pakistan)
- Translation and printing of tuna and billfish ID guides into Bahasa Indonesian is complete (OFCF)
- Translation of turtle ID guides into Bahasa Indonesian and Spanish completed (IOSEA)
- Translation of tuna and tuna-like species ID guides into Hindi completed and printing due to take place (IOTC)
- Translation and printing of all IOTC species ID guides into Portuguese is underway (WWF-Mozambique, OFCF)

## RECOMMENDATIONS

That the WPEB **RECOMMEND** that:

1) all observer data are submitted to the IOTC Secretariat in electronic format.

2) capacity building activities continue to be supported via the Commission's annual budget, to improve the lack of compliance with the implementation of observer programmes by CPCs for their fleets and lack of reporting to the IOTC Secretariat as per the provisions contained within Resolution 11/04 *on a Regional Observer Scheme*.

3) the implementation of the Regional Observer Scheme be supported through a variety of methods, including the development and implementation of electronic reporting and monitoring systems.

4) the establishment of a set of regional training hubs be established for IOTC observers to be trained according to IOTC ROS standards, specialised by gear types, through a request for offers from CPCs to host these centres.

## APPENDICES

**Appendix A:** Update on the implementation of the IOTC regional observer scheme

**Appendix B:** Estimated observer coverage for longline vessels

**Appendix C:** Estimated observer coverage for Purse seine vessels

# APPENDIX A
# UPDATE ON THE IMPLEMENTATION OF THE IOTC REGIONAL OBSERVER SCHEME

| CPCs | Active Vessels LOA≥24m or High Seas vessels[10] | | | | Progress | List of accredited observers submitted | Number of observer reports provided[11] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LL | PS | GN | BB | | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
| **MEMBERS** | | | | | | | | | | | | |
| Australia | 3 | 5 | | | Australia has implemented an observer programme for the longline fleet | **YES: 21** | **2(O)** | **1(O)** | **3(O)** | **No** | **2(O)** | **No** |
| Belize | 4 | | | | No information received by the Secretariat. | **No** | **No** | **No** | **No** | **No** | **No** | **No** |
| China<br>–Taiwan,China | 47<br>241 | | | | China has implemented an observer programme | **YES: 3**<br>**YES: 54** | **1(O)**<br>**No** | **No**<br>**No** | **1(O)**<br>**No** | **1(O)**<br>**No** | **No**<br>**No** | **No**<br>**No** |
| Comoros | | | | | Comoros does not have vessels ≥ 24m. Two observers were trained under the IOC Regional Monitoring Project, and 5 by SWIOFP. | **YES: 7** | N/A | N/A | N/A | N/A | N/A | N/A |
| Eritrea | No information received | | | | No information received by the Secretariat. | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| European Union | 15<br>6<br>22<br>2 | 13<br>0<br>15<br>0 | | | EU has an observer programme on-board its purse seine and longline fleets. To date, no information has been received from EU,Spain and EU,UK. | Partial:<br>**EU,France: 52**<br>**EU,Portugal: 4**<br>**EU,Spain : No**<br>**EU,UK : No** | **No** | EU, France: 13+9**(O)**<br>EU, Portugal: 1**(O)** | EU, France: 13+7**(O)**<br>EU, Portugal: 1**(O)** | EU, France: 15+7**(O)**<br>EU, Portugal: 1**(O)** | EU, France: 18(O)<br>EU, Portugal: 1**(O)** | **No** |
| Guinea | | | | | Guinea has had no vessels operating in the Indian Ocean since 2006 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| India | | | | | India has not yet developed an observer programme. | **No** | **No** | **No** | **No** | **No** | **No** | **No** |
| Indonesia | 458 | | | | Indonesia has 13 registered IOTC observers and a number of initiatives, however, no data have been submitted to the IOTC Secretariat | **YES:13** | **No** | **No** | **No** | **No** | **No** | **No** |
| Iran, Isl. Rep. of | | 5 | 1223 | | 30 observers have been selected and are due to be deployed in 2016. IOTC observer training will be taking place in 2015. | **No** | **No** | **No** | **No** | **No** | **No** | **No** |
| Japan | 53 | | | | Japan started its observer programme on the 1st of July 2010, and currently deploys 19 observers in the Indian Ocean. | **YES: 19** | **6(E)** | **8(E)** | **7(E)** | **No** | **No** | **No** |
| Kenya | | | | | Kenya is developing an observer programme and 5 observers have been trained by SWIOFP. Kenya has had no vessels listed in the active vessel registry since 2010. | **YES: 5** | **No** | N/A | N/A | N/A | N/A | N/A |
| Korea, Rep. of | 10 | 4 | | | Korea has had an observer programme since 2002 and has 28 observers registered in the Indian Ocean. | **YES: 28** | **2(O)** | **No** | **2(O)** | **3(O)** | **3(O)** | **No** |

[10] The number of active vessels is given for 2014
[11] Year in which the observed trip has started (E: Electronic; O: Other)

| CPCs | Active Vessels LOA≥24m or High Seas vessels[10] | | | | Progress | List of accredited observers submitted | Number of observer reports provided[11] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LL | PS | GN | BB | | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
| Madagascar | 7 | | | | Madagascar is developing an observer programme. Five and three observers have been trained through SWIOFP and IOC respectively. | YES: 7 | No | No | 5(O) [12] | 8(O) | 7(O) | No |
| Malaysia | 11 | | | | Malaysia is developing plans for the implementation of an observer programme. | No | No | No | No | No | No | No |
| Maldives | 27 | | | 317 | Maldivian vessel landings are monitored by field samplers at landing sites. Maldives is currently developing an at-sea observer programme. | YES: 4 | No | No | No | No | No | No |
| Mauritius | | 7 | | | Mauritius is developing an observer programme. Five observers have been trained through SWIOFP and three through the IOC. | YES: 8 | No | No | No | No | No | No |
| Mozambique | | | | | Mozambique has an observer programme and has submitted one trip report, but did not have any active vessels ≥24m in 2013. | YES: 11 | No | No | 1(O) | N/A | No | No |
| Oman | 3 | | | | No onboard observers have yet been deployed, however ITOC training will take place in 2015. | No | No | No | No | No | No | No |
| Pakistan | | | | | Onboard observers have been deployed through WWF-Pakistan, however no data has been submitted to the IOTC Secretariat. Training will be taking place in 2015. | No | No | No | No | No | No | No |
| Philippines | 4 | | | | No information received by the Secretariat. | No | No | No | No | No | No | No |
| Seychelles | 31 | 8 | | | Seychelles is developing an observer programme. Four observers have been trained through SWIOFP and three through the IOC. | YES: 7 | No | No | No | No | No | No |
| Sierra Leone | No information received | | | | No information received by the Secretariat. | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Somalia | No information received | | | | No information received by the Secretariat. | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Sri Lanka | 13 | 7 | 1589 | | Sri Lanka has begun a pilot observer initiative and submitted observer data from pilot trips in 2015 for review. | No | No | No | No | No | No | No |
| Sudan | No information received | | | | No information received by the Secretariat. | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Tanzania, United Rep.of | 3 | | | | Tanzania does not currently have an observer programme in place. | No | No | No | No | No | No | No |
| Thailand | 6 | | | | No information received by the Secretariat. | No | No | No | No | No | No | No |
| United Kingdom (OT) | | | | | The UK(OT) does not have any active vessels in the Indian Ocean. | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Vanuatu | | | | | Vanuatu does not currently have an observer programme in place. | No | No | N/A | No | No | No | No |
| Yemen | No information received | | | | No information received by the Secretariat. | No | No | No | No | No | No | No |
| **COOPERATING NON-CONTRACTING PARTIES** | | | | | | | | | | | | |

[12] Reports from Madagascar include observers onboard foreign vessels

| CPCs | Active Vessels LOA≥24m or High Seas vessels[10] | | | | Progress | List of accredited observers submitted | Number of observer reports provided[11] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LL | PS | GN | BB | | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
| Bangladesh | | | | | No information received by the Secretariat. | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Djibouti | | | | | No information received by the Secretariat. | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Liberia | | | | | No information received by the Secretariat. | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Senegal | | | | | Senegal has not had any active vessels in the Indian Ocean since 2007. | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| South Africa | 6 | | | | South Africa currently only operates an observer programme for foreign vessels operating within the EEZ. | **YES: 16** | **No** | **13(O)[13]** | **10(O)** | **13(O)** | **No** | **No** |

[13] Reports from South African observers onboard foreign vessels operating in the EEZ of South Africa.

# APPENDIX B
## ESTIMATED OBSERVER COVERAGE FOR LONGLINE VESSELS

| | Total effort (no.hooks) | | | | | Observed effort (no. hooks) | | | | | Coverage | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **MEMBERS** | **2010** | **2011** | **2012** | **2013** | **2014** | **2010** | **2011** | **2012** | **2013** | **2014** | **2010** | **2011** | **2012** | **2013** | **2014** |
| Australia | 622,461 | 359,832 | 672,398 | 609,995 | 449,387 | 15330 | 6232 | 89490 | | 20040 | 2.46% | 1.73% | 13.31% | 0.00% | 4.46% |
| Belize | 653,332 | 693,449 | 1,626,217 | 315,470 | 1,639,340 | | | | | | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| China | 16,993,970 | 4,136,710 | 11,295,050 | 23,439,470 | 19,212,540 | 95205 | | 185742 | 216640 | | 0.56% | 0.00% | 1.64% | 0.92% | 0.00% |
| –Taiwan,China | 219,630,038 | 182,770,834 | 170,510,584 | 199,408,593 | 204,860,159 | | | | | | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| Comoros | | | | | | | | | | | | | | | |
| Eritrea | | | | | | | | | | | | | | | |
| EU - France | 3,855,936 | 3,862,073 | 3,486,795 | 4,160,931 | 3,692,302 | | 113269 | 74502 | 96379 | 67831 | 0.00% | 2.93% | 2.14% | 2.32% | 1.84% |
| EU - Portugal | 949,134 | 903,600 | 685,206 | 1,558,000 | 1,460,464 | | 140317 | 73685 | 127580 | 90894 | 0.00% | 15.53% | 10.75% | 8.19% | 6.22% |
| EU - Spain | 3,174,705 | 3,758,516 | 4,673,785 | 6,262,822 | 6,262,823 | | | | | | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| EU - UK | 61,400 | 92,300 | 71,400 | 55,000 | 84,700 | | | | | | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| Guinea | 575,706 | | | | | | | | | | 0.00% | | | | |
| India | 67,647,814 | 86,414,352 | 65,307,478 | 68,888,882 | 68,568,466 | | | | | | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| Indonesia | 124,235,772 | 147,671,304 | 212,043,061 | 201,002,634 | 200,923,010 | | | | | | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| Iran, Isl. Rep. of | | | | | | | | | | | | | | | |
| Japan | 37,032,932 | 28,854,054 | 31,460,928 | 29,125,098 | 31,851,882 | 1150505 | 603157 | 953098 | | | 3.11% | 2.09% | 3.03% | 0.00% | 0.00% |
| Kenya | 188,663 | | | | | | | | | | 0.00% | | | | |
| Korea, Rep. of | 6,013,391 | 5,862,681 | 4,350,708 | 5,337,464 | 6,740,247 | 389042 | | 282656 | 546927 | 213225 | 6.47% | 0.00% | 6.50% | 10.25% | 3.16% |
| Madagascar | 461,202 | 378,092 | 352,179 | 329,795 | 329,795 | | | 6140 | 16578 | 17192 | 0.00% | 0.00% | 1.74% | 5.03% | 5.21% |
| Malaysia | 17,662,451 | 13,573,214 | 4,152,912 | 5,670,899 | 5,016,015 | | | | | | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| Maldives | | | | 3,054,590 | 3,040,716 | | | | | | | | | 0.00% | 0.00% |
| Mauritius | 267,063 | 252,480 | 182,300 | 150,560 | | | | | | | 0.00% | 0.00% | 0.00% | 0.00% | |
| Mozambique | 387,200 | 387,200 | 387,200 | | 7,249 | | | 1100 | | | 0.00% | 0.00% | 0.28% | | 0.00% |
| Oman, Sultanate of | 17,564,313 | 16,337,868 | 6,379,166 | 2,620,599 | 1,465,331 | | | | | | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| Pakistan | | | | | | | | | | | | | | | |
| Philippines | 2,784,696 | 560,653 | 7,317,740 | 3,759,626 | 2,016,101 | | | | | | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| Seychelles | 4,375,885 | 3,080,822 | 3,400,912 | 3,876,173 | 21,366,998 | | | | | | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| Sierra Leone | | | | | | | | | | | | | | | |
| Somalia | | | | | | | | | | | | | | | |
| Sri Lanka | 121,441,429 | 116,173,257 | 145,167,205 | 150,323,057 | 176,697,025 | | | | | | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| Sudan | | | | | | | | | | | | | | | |
| Tanzania, United | | | | | | | | | | | | | | | |
| Rep.of | 774,399 | 2,388,937 | 2,444,933 | 2,607,116 | 2,607,116 | | | | | | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| Thailand | 1,489,193 | 1,041,600 | 1,061,363 | 784,881 | 765,787 | | | | | | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| United Kingdom | | | | | | | | | | | | | | | |
| Vanuatu | 916,919 | | 1,269,690 | | | | | | | | 0.00% | | 0.00% | | |
| Yemen | | | | | | | | | | | | | | | |
| **COOPERATING NON CONTRACTING PARTIES** | | | | | | | | | | | | | | | |
| Bangladesh | | | | | | | | | | | | | | | |
| Djibouti | | | | | | | | | | | | | | | |
| Liberia | | | | | | | | | | | | | | | |
| Senegal | | | | | | | | | | | | | | | |
| South Africa | 1,751,043 | 1,219,015 | 1,176,125 | 959,285 | 565,705 | | | 293685 | 836759 | 543543(7910)* | 0.00% | 0.00% | 0.00% | 0.00% | 1.40% |
| Other | 7,393,335 | 7,854,251 | 9,807,823 | 9,770,241 | 9,725,867 | | | | | | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| **Total** | **658,904,383** | **628,627,093** | **689,283,159** | **724,071,182** | **769,349,025** | **1,650,082** | **862,975** | **1,960,098** | **1,840,863** | **409,182** | **0.25%** | **0.14%** | **0.28%** | **0.25%** | **0.05%** |

NB: the ROS came into force mid-way through in July 2010 so annual coverage rates are expected to be relatively lower for 2010.

Portugal and Madagascar: the number of hooks are estimated based on the number of reported fishing days and previous hooks - fishing day ratios.

Japan: the data received by the Secretariat on the number of observed hooks for 2011-2012 are provisional, and will be revised by Japan in 2015

*South Africa: observed hooks are based on foreign fleets, other than the bracketed number in 2014 which was for a S. Africa flagged vessel.

Key: TOTAL EFFORT (#HOOKS): Total number of hooks set by longliners, by fishing fleet and year, including:

- Total effort available (green font)
- Total effort not available: total effort estimated using the nominal catches available and sampled effort or catch rates from other fleets or year periods (red font)

# APPENDIX C
## ESTIMATED OBSERVER COVERAGE FOR PURSE SEINE VESSELS

| | Total effort (no. fishing days) | | | | | Observed effort (no. fishing days) | | | | | Coverage | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **MEMBERS** | **2010** | **2011** | **2012** | **2013** | **2014** | **2010** | **2011** | **2012** | **2013** | **2014** | **2010** | **2011** | **2012** | **2013** | **2014** |
| Australia | 175 | 130 | 148 | 133 | 115 | | | | | | 0.00% | 0.00% | 0.00% | 0.00% | |
| Belize | | | | | | | | | | | | | | | |
| China | | | | | | | | | | | | | | | |
| –Taiwan,China | | | | | | | | | | | | | | | |
| Comoros | | | | | | | | | | | | | | | |
| Eritrea | | | | | | | | | | | | | | | |
| EU - France | 2801 | 3114 | 3052 | 3390 | 2662 | | 360 | 425 | 364 | | 0.00% | 11.56% | 13.92% | 10.74% | |
| EU - Portugal | | | | | | | | | | | | | | | |
| EU - Spain | 3531 | 3555 | 3684 | 3899 | 4224 | | | | | | 0.00% | 0.00% | 0.00% | 0.00% | |
| EU - UK | | | | | | | | | | | | | | | |
| Guinea | | | | | | | | | | | | | | | |
| India | | | | | | | | | | | | | | | |
| Indonesia | | | | | | | | | | | | | | | |
| Iran, Isl. Rep. of | 128 | 139 | 168 | 172 | 183 | | | | | | 0.00% | 0.00% | 0.00% | 0.00% | |
| Japan | 96 | 95 | 72 | 36 | 35 | | | | | | 0.00% | 0.00% | 0.00% | 0.00% | |
| Kenya | | | | | | | | | | | | | | | |
| Korea, Rep. of | | | 94 | 387 | 519 | | | | 33 | | | | 0.00% | 8.52% | |
| Madagascar | | | | | | | | | 14* | 118* | | | | | |
| Malaysia | 12 | | | | | | | | | | 0.00% | | | | |
| Maldives | | | | | | | | | | | | | | | |
| Mauritius | | | | 27 | 277 | | | | | | | | | 0.00% | |
| Mozambique | | | | | | | | | | | | | | | |
| Oman, Sultanate of | | | | | | | | | | | | | | | |
| Pakistan | | | | | | | | | | | | | | | |
| Philippines | | | | | | | | | | | | | | | |
| Seychelles | 2144 | 2166 | 1969 | 1670 | 1904 | | | | | | 0.00% | 0.00% | 0.00% | 0.00% | |
| Sierra Leone | | | | | | | | | | | | | | | |
| Somalia | | | | | | | | | | | | | | | |
| Sri Lanka | | | | 62 | | | | | | | | | | 0.00% | |
| Sudan | | | | | | | | | | | | | | | |
| Tanzania, United Rep.of | | | | | | | | | | | | | | | |
| Thailand | 137 | | | | | | | | | | 0.00% | | | | |
| United Kingdom | | | | | | | | | | | | | | | |
| Vanuatu | | | | | | | | | | | | | | | |
| Yemen | | | | | | | | | | | | | | | |
| **COOPERATING NON CONTRACTING PARTIES** | | | | | | | | | | | | | | | |
| Bangladesh | | | | | | | | | | | | | | | |
| Djibouti | | | | | | | | | | | | | | | |
| Liberia | | | | | | | | | | | | | | | |
| Senegal | | | | | | | | | | | | | | | |
| South Africa | | | | | | | | | | | | | | | |
| Other | | | | | | | | | | | | | | | |
| **Total** | **9,025** | **9,199** | **9,188** | **9,777** | **9,919** | **0** | **360** | **425** | **397** | **0** | **0.00%** | **3.91%** | **4.63%** | **4.06%** | **0.00%** |

NB: the ROS came into force mid-way through in July 2010 so annual coverage rates are expected to be relatively lower for 2010

*Madagascar: observers onboard foreign vessels

Key: TOTAL EFFORT (#FDAYS): Total number of days fished by tuna purse seiners, by fishing fleet and year, including:

Total effort available (green font)

Total effort not available: total effort estimated using the nominal catches available and sampled effort or catch rates from other fleets or year periods (red font)