

## Kobe II Bycatch Workshop Background Paper

### MARINE MAMMALS

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#### 1. OVERVIEW

The bycatch of marine mammals in fisheries is a significant factor in long-term conservation and management of marine mammal stocks worldwide. It is estimated that tens to hundreds of thousands of these animals are killed each year through entanglement in fishing gear. Marine mammals interact with several gear types used in fisheries managed by tuna RFMOs. They are most commonly caught in purse seine, longline, and gillnet gear. With the exception of the EPO, accurate abundance and bycatch estimates for marine mammals are lacking in areas where marine mammal distribution overlaps tuna fisheries, making quantitative analysis of bycatch extremely difficult. Progress in quantifying tuna RFMO fishery impacts on marine mammal populations and related progress in mitigating or reducing the mortality has been slow, sporadic, and limited to a few specific fisheries or circumstances.

One notable exception is the work of the IATTC in conjunction with the AIDCP. The IATTC and AIDCP have extensive information on marine mammal populations, distributions and bycatch rates in IATTC purse seine fisheries and have adopted effective measures for reducing dolphin bycatch. In contrast, the remaining tuna RFMOs lack marine mammal population and bycatch data and, as a result, have not determined whether there is a need to adopt bycatch reduction measures for these species. In fact, much of what is known about marine mammal bycatch in fishing gear used by tuna fisheries has not been discussed by the RFMOs. Still, the data that exist within tuna RFMOs, their member nations, and other sources provide a suitable foundation for tuna RFMOs to begin discussions of how best to assess and address the conservation of those species of marine mammals that interact with high seas tuna fisheries.

The combination of a lack of information in most tuna RFMOs and a depth of expertise, understanding and reducing marine mammal interactions in purse-seine fisheries, offer opportunities for tuna RFMOs to closely collaborate with one another and with key IGOs to design and implement data-gathering programs. Working with these organizations, tuna RFMOs could also develop and adopt, if necessary, bycatch reduction measures, and monitor the effectiveness of, and compliance with, those measures.

#### 2. INFORMATION AND RESOURCES FOR ADDRESSING BYCATCH

##### 2.1. Type and Characteristics of Fishery Interactions

Marine mammal-fishery interactions have been documented mainly by onboard observer programs in longline and purse seine fisheries for tuna in some parts of the world. Information regarding marine mammal interactions in gillnet, trap, and harpoon fisheries for tuna is generally lacking, although the propensity of various marine mammals to become entangled in gillnets and trap fisheries has been documented for non-tuna fisheries. Bycatch of dolphins is most thoroughly documented in the tuna purse-seine fishery in the EPO. In the EPO, tunas are detected in three ways: 1) in association with floating objects (including FADs); 2) in association with herds of dolphins; and 3) as unassociated schools visible at the surface. If purse-seine vessels target tunas associated with dolphins, the net encircles both. Dolphins can drown if they become entangled in

the purse-seine mesh or trapped under canopies formed in the net. This interaction has been intensively studied over the last four decades. The IATTC, in conjunction with the AIDCP, has assembled the most comprehensive data set available on the nature and characteristics of dolphin interactions with tuna purse-seine fisheries, and has developed and implemented several technological measures and regulations that have substantially reduced dolphin bycatch in the EPO. Consequently, a great deal is known about the nature and characteristics of dolphin interactions with purse-seine fisheries and the mitigation measures needed to reduce the incidental capture and mortality of dolphins. This information is available for use by the other tuna RFMOs.

The association of yellowfin tuna and dolphins has been observed and documented in other oceans, but it is not well characterized or understood and only partially documented in some regions. In addition to tuna fishery interactions with dolphins, the ICCAT, the IOTC, and the IATTC have all documented purse seine fishers setting on tuna associated with large whales. The nets either encircle or are set next to the whales. However, outside of the EPO, little information exists regarding the frequency with which dolphins or whales are used to locate tuna, are encircled to capture tuna, or whether incidental capture occurs.

In nearly all of the tuna RFMOs there are reports of marine mammal interactions in the form of depredation on longlines. These reports include interactions with sperm, killer, false killer, and pilot whales, and Risso's dolphins depredating either bait, catch, or both. Bycatch can occur as a result of depredation events in longline fisheries via hooking and/or entangling of marine mammals (including mouth-hooking, ingestion of hooks, and entanglement of flippers or flukes). In most instances, the level of bycatch is unknown, nor is it known whether any mortality or injury resulting from such bycatch is dependent on the location of the hooking and/or the severity of the entanglement. The frequency of such events, the loss of catch due to depredation, the mortality levels, and the overall impact of these interactions on the affected marine mammal populations is poorly documented or understood. However, RFMO members have reported the bycatch (including mortality and serious injury) of whales and dolphins in longline gear in fisheries for tuna and swordfish in both the western Atlantic and central Pacific Oceans. This documented bycatch in these fisheries highlights the need to gather information to determine if this bycatch is sustainable, as well as to implement, if necessary, bycatch mitigation measures.

Although it has not been discussed within the tuna RFMOs, there is extensive information in the scientific literature about interactions with marine mammals in a variety of gillnet fisheries worldwide. It is generally accepted that, wherever gillnets are deployed, there is likely some degree of marine mammal bycatch. Gillnetting for tuna makes up a relatively small portion of the tuna fisheries within most RFMO convention areas, but represents a relatively large component of the fishing effort in certain areas of the IOTC convention area. In tuna gillnet fisheries off Sri Lanka, India, Yemen, Iran, and Pakistan, there is some indication that levels of marine mammal bycatch (e.g., spinner, spotted, common, Risso's, and bottlenose dolphins) may be substantial. The extent and ecological impact of this bycatch, however, is unknown due to the lack of marine mammal abundance and bycatch estimates. To date, the IOTC has not undertaken a systematic analysis of this issue.

Coastal gillnets may also be used to catch tuna within the IATTC and ICCAT convention areas; however, since these fisheries are not closely monitored by their respective RFMOs, virtually no information regarding marine mammal bycatch is available.

## **2.2. Species Population Status**

Marine mammal species with pelagic populations are difficult to census. This is primarily because of the large areas that must be surveyed to develop a reliable abundance estimate, but also because several pelagic marine mammals are either difficult to detect at the surface, spend

most of their time submerged, or both. Census efforts can be further confounded when pelagic marine mammals move in and out of the survey area in response to oceanographic conditions—introducing more variability into long-term observations. Detecting trends in these populations is challenging, and long time-series of observations are generally necessary to detect trends given the typical variability and imprecision in the estimates. The IATTC has access to the most comprehensive abundance estimates for offshore dolphin stocks, though those estimates are largely limited to species that frequently associate with tunas and have historically been set on by tuna purse-seine vessels. In the EPO, more than three decades of vessel surveys have yielded abundance estimates for spotted, spinner, and common dolphins, as well as several other associated marine mammal species. These population estimates have been and are still being used to detect trends in these offshore dolphin populations and serve as the basis for setting species-specific bycatch limits under the AIDCP to promote the conservation and recovery of offshore dolphins.

Estimates for other high-seas marine mammal stocks that may interact with pelagic tuna fisheries are generally lacking, making it difficult to conduct assessments of the impact of bycatch on marine mammals in these fisheries. In the northern Atlantic, ICES undertakes annual assessments of marine mammal stocks, but these assessments typically do not focus on marine mammal species known to interact with pelagic tuna fisheries. Individual RFMO members conduct abundance surveys and have estimates of some coastal marine mammal populations in their waters. However, these estimates are often outdated, and surveys have not been conducted with sufficient frequency or over a sufficient period of time to detect population changes.

### **2.3. Species Distribution**

Many marine mammal species have ocean-wide distributions, overlapping with globally distributed tuna fishing effort. Given the wide distributions of marine mammals and the tuna fleets with which they may interact, a large-scale perspective is required to accurately characterize the magnitude and extent of these interactions in all five tuna RFMOs.

Information that exists on the distribution of marine mammals is often derived from several sources such as fisheries observers and specially designed scientific survey cruises (including photographic mark-recapture studies). More recently, at-sea movement data have been collected through the use of satellite transmitters placed on the animals. Data from these transmitters provide information on an individual animal's location and activities, but may or may not be representative of the entire population's movements and distribution. However, over time, sample sizes will increase, improving the representativeness of such data to the whole population. Abundance surveys also provide information about the location of marine mammals, but these data typically represent brief periods of time and provide little detail about the distribution and habitat use of the animals within the survey area over the long-term.

Information on marine mammal distribution and how it overlaps with longline and purse-seine fishing effort is lacking in four of the five tuna RFMOs. As previously indicated, the exception is the IATTC, where offshore dolphin distribution data are available from abundance surveys and sightings data from the IATTC tuna fishery observer program. Again, this information pertains predominantly to purse-seine fisheries in the EPO. Because systematic observer coverage in the majority of the longline fisheries managed by tuna RFMOs is lacking, there is a greater reliance on logbooks to gather information on marine mammal distribution, interactions with the fishery and/or bycatches. Without more comprehensive information, tuna RFMOs are currently unable to assess the risk of marine mammal bycatch and are constrained in their ability to develop any needed conservation measures, let alone monitor the effectiveness of those measures.

## 2.4. Fishery Impacts

Bycatch estimates can be derived from either fishers' logbooks or fisheries observer programs. Three of the tuna RFMOs (ICCAT, IOTC, and IATTC) require that data on marine mammal-fisheries interactions be collected and reported via logbooks and/or onboard observers. Unfortunately, logbook records can be difficult to verify independently and have been shown to historically under-report bycatch. Several RFMOs employ observers to record bycatch, but overall observer effort across all tuna fisheries is low relative to the total fishing effort in most RFMOs. In the case of some longline fisheries, it is lacking altogether. As a result, of the five tuna RFMOs, only IATTC has developed and considered marine mammal bycatch estimates and, even then, only for a few species of offshore dolphins in the EPO. Member nations may have estimates of marine mammal bycatch in their coastal fisheries, but the extent of coverage varies widely within and between seasons. Therefore, without an RFMO-wide observer program with sufficient coverage and effective reporting to quantify marine mammal bycatch in tuna fisheries, RFMOs cannot adequately evaluate the impact of their fisheries on marine mammal populations.

## 2.5. Bycatch Mitigation Measures

Within the IATTC, several changes in both purse-seine gear and the procedures used during fishing operations have successfully reduced dolphin mortality. The IATTC's training of captains and crews also played an important role by providing both a forum for the discussion of new ideas and a means to communicate to all crews the standards that were expected to be met. Management actions cover a broad spectrum, such as total and species-specific quotas for dolphin mortality, prohibition of night sets, mandatory use of safety equipment, and gear of specified characteristics.

In the western Atlantic, fishers are attempting to reduce the bycatch of pilot whales and Risso's dolphins in tuna and swordfish fisheries, through the adoption of safe handling practices to facilitate live release or minimize the injury to bycatch species. Additional gear modifications and changes in fishing practices may further reduce the bycatch. In the central Pacific Ocean, marine mammal surveys and fisheries observer programs have shown that bycatch of false killer whales is relatively high and may be unsustainable in the tuna and swordfish longline fisheries around the Hawaiian Islands. The government, fishing industry, and researchers are working to devise mechanisms to reduce this bycatch to sustainable levels. In other parts of the world, such as in the western, central, and eastern Pacific Ocean, similar interactions with false killer whales and fisheries have been observed, and may benefit from the monitoring and mitigation measures developed through these efforts.

Outside of the tuna RFMOs, a variety of measures have been implemented in non-tuna gillnet fisheries to reduce marine mammal bycatch, including the use of pingers, night set restrictions, net length/panel restrictions, net tending requirements, and net extenders to allow nets to be set deeper in the water column. ICES has also studied the effectiveness of bycatch mitigation measures in bottom-set gillnets and is holding a workshop on this topic later this year. Marine mammal bycatch in gillnets used to capture tuna in the RFMOs has not been described, nor have bycatch mitigation methods used in other gillnet fisheries been tested to determine which measures would effectively reduce bycatch in gillnet fisheries managed by tuna RFMOs. To date, four tuna RFMOs have not discussed the estimation or mitigation of marine mammal bycatch in detail, nor have they reviewed other expert sources of information for reducing marine mammal bycatch in gillnet, longline, or purse-seine FAD fisheries. Information regarding mitigating marine mammal bycatch in these gear types is held by the IATTC, the FAO, and elsewhere.

### 3. RESEARCH AND MANAGEMENT TOOLS

#### 3.1. Research and Management Objectives

Considerable information is required to assess and mitigate the effects of fisheries bycatch on marine mammal populations worldwide. Although marine mammals are not explicitly referenced, the UN Agreement on Straddling and Highly Migratory Fish Stocks calls on fishing nations to assess the impacts of fishing on species belonging to the same ecosystem or associated with or dependent upon the target stocks. To date, research and assessment efforts by tuna RFMO and their members have focused largely on target stocks. Even the IATTC and AIDCP rely upon members to carry out marine mammal stock assessments and to estimate the impact of the EPO tuna purse seine fishery on marine mammal populations. Indeed, none of the five tuna RFMOs has a coordinated and/or comprehensive research plan or program to assess marine mammal populations and to estimate the number of interactions (either bycatch or depredation) in their fisheries.

In 1999, the IOTC endorsed a five-year research program on marine mammals and sharks depredation on tuna caught with longline gear, although no management steps to minimize these interactions have been adopted so far. Additional research and partnerships with RFMO member nations already engaged in assessing marine mammals and bycatch could address crucial data limitations and assist in the development of approaches to address uncertainty where information is lacking. The IATTC is testing the use of observer forms to produce a detailed description of different types of fishing gear (*i.e.* purse seines, gillnets, longlines, trammel nets) and gather information on interactions with bycatch species. The use of such standardized forms across tuna RFMOs could facilitate the estimation of bycatch as well as a better understanding of its causes, including how different gear types may be interacting with marine mammals and other bycatch species.

Specific management objectives can be used for establishing clear standards for bycatch reduction by the fishing industry and for identifying where specific techniques or decisions are or are not having the desired effect. As previously indicated, the IATTC and the AIDCP have implemented the most well-known and effective management measure for reducing marine mammal bycatch in EPO purse seine fisheries. For example, they established clear limits on dolphin mortality for individual vessels and the fishery as a whole. Compliance with these targets and a means to assess progress toward meeting these performance standards was possible because of both the high level (100 percent) of observer coverage in the EPO purse-seine fishery and the oversight structures adopted under the IDCP.

Quantifiable marine mammal stock mortality limits such as those in the IATTC, the AIDCP, and other regional intergovernmental legal instruments (*e.g.* ACCOBAMS and ASCOBANS) offer potential options for broader use. Data gaps in marine mammal population and bycatch estimates within the various convention areas currently constrain the tuna RFMOs' abilities to set priorities or specific targets (*e.g.* bycatch rate or number of animals) for bycatch reduction and/or mitigation. At this time, there has been no consideration within any of the other tuna RFMOs of management objectives specific to marine mammal bycatch reduction.

#### 3.2. Risk Assessment

ERA is used to assist managers in setting priorities for conservation action based upon areas of greatest need. Greatest need can be identified for species, geographic region, or economic value, among other criteria. ERA can identify data gaps, set priorities for marine mammal assessment and bycatch data collection, and foster data sharing between tuna and non-tuna RFMOs and with IGOs with data holdings and experience in risk assessment. Only ICCAT has conducted an ERA for marine mammals interacting with its fisheries, which it accomplished by conducting a survey

of its member nations. The survey focused on gillnet fisheries and revealed gaps in information, such as the extent to which gillnet fisheries operate in the Mediterranean Sea. ICES has also conducted analyses regarding marine mammal bycatch in the Mediterranean. These data are available to ICCAT members for their consideration. With more widespread use of EREs, the five tuna RFMOs may find that they are an effective tool to identify data gaps and set priorities for conservation and management actions.

Risk assessments include mechanisms to prioritize mitigation efforts and to address uncertainty. For example, the IATTC and the WCPFC prioritize actions to address bycatch. In these cases, the first step is to avoid bycatches; if they cannot be avoided, steps are to be taken to reduce bycatch. Moreover, all mortality associated with bycatch (including where it can or cannot be reduced) is to be minimized. Setting priorities such as these, even in the face of uncertainty, can help tuna RFMOs reduce risk and take action in a timely manner to prevent irreversible harm to populations of bycatch species.

As previously mentioned, detailed information on fishing effort in tuna RFMOs relative to marine mammal distribution and to bycatch events is largely unavailable. In addition, marine mammals can also be subject to mortality from other human activities (ship strikes, directed harvest, marine debris, contaminants, bycatch in recreational and artisanal fisheries, etc.). Therefore, a comprehensive assessment of the relative effects of fishery bycatch requires considerable demographic data and complementary information about other mortality sources. Without these data, there is some uncertainty, but this uncertainty need not impede or delay progress in conservation and management efforts. When there is uncertainty surrounding marine mammal bycatch, tuna RFMOs could prioritize data collection and bycatch mitigation for species at conservation risk and even for closely-related species where data are poor or are lacking altogether.

### **3.3. Monitoring and Reporting Schemes**

At-sea observation of interactions between fishing operations and bycatch species is the most effective way to collect information to assess and mitigate bycatch. Information derived from national and international observer programs has been essential to understanding and estimating levels of marine mammal bycatch in specific fisheries around the world. However, observer coverage is insufficient in nearly all tuna fisheries to quantify the level of marine mammal interactions with enough certainty to inform management decisions. While some individual members within all five of the tuna RFMOs require onboard observer coverage in longline fisheries, RFMO-wide scientific observer programs are not required in all fisheries. Still, the fisheries are observed at a variety of levels. As mentioned above, the IATTC has an extensive observer program to monitor bycatch of dolphins in EPO purse-seine fisheries. The CCSBT has a target of 10-percent observer coverage of member's longline fisheries, but members are not required to share observer data with the CCSBT. ICCAT requires 20-percent observer coverage for a portion of all vessels fishing for bluefin tuna, regardless of gear type, and 100 percent for all purse-seine vessels over 24 meters in length. WCPFC has adopted a target of five-percent observer coverage. In addition, later this year, ICCAT's Subcommittee on Ecosystems will seek to identify the minimum percent coverage required to estimate total levels of bycatch within ICCAT fisheries across all taxa. Similar exercises have not been conducted by the WCPFC or the CCSBT and, for longline fisheries, the IATTC. This year, the IOTC will initiate a regional observer scheme, which may include the observation of bycatch.

In order for observer programs to be effective at monitoring marine mammal bycatch, they must include standardized data recording protocols and must attain sufficient and representative coverage to allow for relevant statistical analyses, a better understanding of bycatch interactions, and documentation of interaction rates, as well as to provide a basis for fleet-wide extrapolations.

Observer monitoring schemes that provide for the assessment of marine mammal bycatch rates within the tuna RFMOs will require some level of standardization across RFMOs, as well as a formal process for data sharing. At present, most observer programs implemented by tuna RFMOs or their members are not comparable to one another nor sufficiently representative to estimate marine mammal bycatch rates throughout the relevant RFMO convention area. Perhaps more importantly, such programs are insufficient to inform our understanding of the nature of interactions in order to develop effective mitigation measures. The IATTC and the AIDCP, however, routinely evaluates the degree of comparability between the IATTC observer program and national observer programs. This approach may form a basis for comparisons between international and national observer programs in other tuna RFMOs.

#### **3.4. Periodic Review and Evaluation of Effectiveness**

Periodic review of conservation actions and evaluation of the efficacy of adopted bycatch mitigation measures are vital for assessing performance of those measures and for allowing decision-makers to adapt to the availability of new information. They are also helpful in assessing changes to the characteristics of marine mammal-fishery interactions, as well as the status and distribution of the bycatch species and fishery operations. Conservation and management measures adopted within the five tuna RFMOs often include some form of required review of the measures to determine if they have been proven effective and, in some cases, whether they should be amended based upon new information. Likewise, a periodic review can be used to determine the level of compliance with specific management actions. For example, under the AIDCP the International Review Panel (IRP) has an effective structure for the periodic review and evaluation of the effectiveness of the AIDCP's dolphin bycatch mitigation measures and for assessing compliance with those measures. The IRP meets at least semi-annually to review compliance with those measures, and progress toward the AIDCP's its bycatch mitigation goals. The structure of the IRP includes broad stakeholder involvement in evaluating the overall effectiveness of the measures in place, and has been instrumental in the substantial reduction of dolphin bycatch in the EPO.

#### **3.5. Education and Training**

Education and training are vital to the success of any bycatch mitigation strategy. They can stimulate collaborative research among scientists, managers, and the fishing industry. Scientists and managers benefit from a close cooperation with fishers to develop practical solutions and to adapt, and if necessary modify, those solutions to ensure their ongoing effectiveness. Fishers can also play a major role in developing and testing gear modifications. In some cases, solutions involve relatively minor changes in gear and procedures, such as a combination of proven technology and management approaches, to achieve the desired improvements. The imposition of regulations can also spur innovation. Although more often regulatory control is viewed as a disincentive for innovation rather than an incentive. Under the right circumstances education and training can help RFMOs develop incentives to encourage innovation and compliance, or change behavior.

Educational and training materials have been developed and used in RFMO member longline fleets to encourage the reduction of marine mammal bycatch. These include species identification guides and training in the safe handling and release of entangled marine mammals, which, by reducing mortality, form one aspect of bycatch reduction. However, none of the five tuna RFMOs currently require the application of safe handling and release procedures to reduce the mortality or injury of marine mammals in tuna longline fisheries.

#### **3.6. Independent Performance Reviews**

Three of the five tuna RFMOs (CCSBT, ICCAT, and IOTC) have completed independent

performance reviews, as called for by UN Fish Stocks Review Conference in 2006. In all three cases, the review panels noted the need for the RFMOs to make further progress toward the application of ecosystem-based considerations, such as the adoption of conservation and management measures for non-target species and for species dependent on or associated with target stocks, including data collection requirements for the catch of non-target species. All three reviews include findings and recommendations that would generally benefit marine mammals through the collection of a wide range of information, although there was no specific mention of marine mammals in the reports.

### **3.7. Coordination with Other Relevant RFMOs and IGOs**

ICES has a bycatch working group that deals primarily with marine mammal-related issues. It has developed an approach to marine mammal bycatch that may be useful to ICCAT, given the overlap in their areas of competence. Likewise, ACCOBAMS also undertakes assessments of whales and dolphins, although abundance estimates based on these assessments are still pending, and proposes bycatch mitigation measures. Additionally ASCOBANS and ACCOBAMS are developing standardized protocols for the collection of bycatch information. These protocols may be helpful to ICCAT for its investigations of interactions with whales and dolphins in the tuna fisheries of the Mediterranean.

## **4. INVENTORY OF EXISTING CONSERVATION MEASURES**

The table below provides an inventory of the conservation measures currently in place at each of the five tuna RFMOs, demonstrating where they contain similar provisions and how they are different from one another. This table does not indicate the extent to which the measures are being implemented.



<b>MARINE MAMMALS</b>					
	<b>CCSBT</b>	<b>IATTC /AIDCP</b>	<b>ICCAT</b>	<b>IOTC</b>	<b>WCPFC</b>
<b>Provision</b>	<b>Recommendation to Mitigate the Impact on Ecologically Related Species (2008)</b> (no explicit reference to marine mammals)			<b>Resolution 00/02</b>	
<b>4.1 Binding</b>	No	Yes	N/A	Yes	N/A
<b>4.2 Stated management objective</b>	Not explicit. (Use of ERS Rec. to mitigate incidental harm to ERS caused by fishing for SBT uncertain)	Yes, to reduce and eventually eliminate dolphin mortality			
<b>4.3 Implementation of IPOA</b>	No	N/A	N/A	N/A	N/A
<b>4.4 Prescribed vessel applicability and area of application</b>	No	Yes, for purse seine vessels larger than a fixed capacity	N/A	N/A	N/A
<b>4.5 Use of multiple mitigation measures</b>	No	Yes	N/A	N/A	N/A
<b>4.6 Standards for mitigation measures</b>	No	Yes	N/A	N/A	N/A
<b>4.7 Reporting and information sharing requirements</b>	Yes	Yes, requirement to report observer data	N/A	N/A	N/A
<b>4.8 Research and review of mitigation measures</b>	No	Yes, through the International Review Panel (IRP) and research through the Science Advisory Board (SAB)	N/A	Encourages participation in, and presentation of results of, a survey of predation of longline caught fish in 2001	N/A
<b>4.9 Estimate bycatch and/or assess impacts</b>	Yes (for ERS in general)	Yes, via 100% observer coverage	N/A	N/A	N/A
<b>4.10 Review for effectiveness and revision</b>	Yes	Yes, through the IRP	N/A	N/A	N/A
<b>4.11 Safe handling and live release</b>	No	Prohibition of brailing live dolphins	N/A	N/A	N/A
<b>4.12 Carcass retrieval</b>	No	N/A	N/A	N/A	N/A
<b>4.13 Collection and use of observer data</b>	Not explicit. No requirement to provide observer data	Yes, extensive use of observer data	N/A	Not explicit	N/A
<b>4.14 Reporting interactions and estimating bycatch</b>	Not explicit. (Use of ERS Rec. uncertain)	Yes, bycatch is estimated using observer data	N/A	N/A	N/A
<b>4.15 Compliance requirements</b>	No	Yes	N/A	N/A	N/A
<b>4.16 Consultation or cooperation w/ other RFMOs and IGOs</b>	Yes, to comply with WCPFC and IOTC measures when fishing for SBT in those areas.	N/A	N/A	N/A	N/A
<b>4.17 Support for developing nations</b>	No	N/A	N/A	N/A	N/A

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