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Recommendations to the 14th Regular Session of the Western and Central Pacific Fisheries Commission

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Overview

The Western and Central Pacific Fisheries Commission (WCPFC) has a mandate to sustainably manage and ensure long-term conservation of all highly migratory fish stocks, including tunas and sharks, in the western and central Pacific Ocean. However, the Commission's handling of some stocks falls short of that mandate and global expectations of best practices, despite a Convention that incorporates relatively modern principles of fisheries management.

The Conservation and Management Measures (CMMs) in place are inadequate to ensure that overfishing is ended or prevented. Management of many stocks is reactive rather than proactive. While some progress has been made on the conservation and management of sharks, much more is needed to ensure that both targeted and incidental catch of sharks is sustainable.

Ensuring sustainable fisheries in the WCPFC Convention Area requires strong conservation and management actions, strict compliance with measures already adopted, and mechanisms that promote transparency and accountability.

The Pew Charitable Trusts urges all Commission members, cooperating non-members, and participating territories—known collectively as CCMs—to cooperate and compromise in order to:

- Agree on and adopt “bridging measures” for tropical tunas and south Pacific albacore that sustainably manage these tunas while transitioning to management by harvest strategies.
- Adopt the rebuilding plan for Pacific bluefin recommended by the Northern Committee and ensure compliance with measures.
- Improve management of fish aggregating devices (FADs).
- Adopt electronic reporting and electronic monitoring standards for fishing vessels.
- Prohibit retention of thresher sharks.
- Prohibit retention of manta and mobula rays and adopt live release guidance for both.
- Continue work to develop a comprehensive shark CMM.
- Ban transshipment at sea until authorities can be certain that it does not contribute to illegal, unreported, and unregulated (IUU) fishing activity.
- Improve the effectiveness and transparency of the compliance monitoring scheme.
- Agree on and adopt a port State measures CMM to regulate minimum standards for port inspection of vessels believed to have engaged in IUU fishing or related activities in support of such fishing.
- Urge eligible CCMs to implement the “Flick the Switch” measure adopted in 2012, which allows their national waters to be monitored by the Commission’s Vessel Monitoring System (VMS).
- Amend Recommendation 2013-10 to require that all eligible fishing vessels obtain International Maritime Organization (IMO) numbers.
- Establish a procedure that permits vessels found to be engaged in IUU fishing to be added to the IUU vessel list between annual meetings.

Recommendations

Modernize management of tunas

Fisheries management in the western and central Pacific must consider the importance of the stocks to the region’s economies and the well-being of marine ecosystems by moving toward modern practices and developing more effective controls on purse seine and longline gears. Tuna catches in these waters totaled an estimated 2.7 million metric tons in 2016—the second-highest amount on record—and represented 56 percent of the global catch.¹ Healthy stocks such as skipjack—which accounted for 67 percent of the region’s catch—should be managed with a long-term view. Other stocks, such as Pacific bluefin (which is severely depleted) and Pacific bigeye (a stock of long-standing concern), require urgent action that goes beyond business as usual.

Adopt bridging measures that sustainably manage the tropical tunas and south Pacific albacore while transitioning to the harvest strategy approach

The Commission must move toward developing harvest strategies by agreeing on “bridging” measures for tropical tunas and south Pacific albacore. The measures are supposed to serve as a bridge to implementation of harvest strategies as opposed to the ad hoc, multi-annual decision-making of years past that occurred largely in response to changes in stock status.

The 2017 stock assessment of bigeye, which incorporated new growth data, provides a more optimistic view of the stock than before. It concludes that the stock is likely not experiencing overfishing and is at $0.32SB_{F=0}$, with a 16 percent chance of being below the limit reference point. The Commission should follow the advice of the Scientific Committee and not increase fishing mortality from current levels to maintain or increase the spawning biomass until members can agree on an appropriate target reference point for bigeye.

Well-crafted harvest strategies offer considerable advantages to governments, industry, and the stocks. They include clear objectives and harvest control rules (HCRs) that are tested for their performance in computer simulations. Effective harvest strategies can ensure the sustainability and long-term profitability of resources vital to the well-being of the economies, fishing industries, and people of many nations. They can offset natural variability, scientific uncertainty, and political influence while also allowing managers to act swiftly and efficiently without time-consuming and costly negotiations. To move toward this outcome, the bridging measure for tropical tunas at a minimum must:

- **Incorporate decisions already made on harvest strategies, including:**
 - **Limit reference points shall be 20 percent of the estimated average spawning biomass in the absence of fishing.**
 - **When developing HCRs in the future, the Commission will determine the acceptability of HCRs in which the estimated risk of breaching limit reference points is between 0 and 20 percent.**
- **Manage the skipjack purse seine fishery to achieve the interim target reference point of 50 percent of the estimated average spawning biomass of skipjack in the absence of fishing.**
- **Manage bigeye to avoid increases in fishing mortality and increase the current spawning biomass—which would decrease the probability that the stock is below the limit reference point—by:**
 - **Setting science-based longline catch limits that encompass all areas of the Convention Area where significant fishing is occurring.**
 - **Setting science-based FAD set limits in the purse seine fishery.**
- **Link decisions on harvest strategies to the WCPFC harvest strategy workplan and prioritize agreement on a target reference point for bigeye, given the concern for the stock, and ensure timely development of a target reference point for yellowfin.**

Support additional harvest strategy elements in the Commission workplan

The Commission must build on last year's progress to support efforts beyond the context of the bridging measures that are essential building blocks in developing harvest strategies for tunas. Reflecting the importance of these stocks, the Commission should adhere to the timelines in the workplan to:

- **Agree on a list of performance indicators, even if only on an interim basis, to model bigeye and yellowfin harvest control rules in the management strategy evaluation (MSE).**
- **Agree on actions necessary to conduct MSE as scheduled for skipjack, to support MSE for all other tuna stocks with appropriate budgets, and to ensure stakeholder outreach and capacity building to develop greater comfort with the harvest strategy approach.**
- **Adopt a precautionary target reference point for south Pacific albacore.**

Adopt the recommended rebuilding plan for Pacific bluefin and ensure compliance with measures

After years of stalemate, the Northern Committee reached agreement on a recommended rebuilding plan for Pacific bluefin at its meeting in August. The plan aims to rebuild the population to at least 20 percent of its unfished levels by 2034 and includes commitments to develop reference points and harvest controls and to test them using MSE. It also puts restrictions on how and when catch limits can be raised in the future, ensuring that if the species is slow to recover, management measures will be responsive to the state of the population.

This is a first step toward implementing a full harvest strategy for the severely depleted Pacific bluefin population, which is at just 2.6 percent of its historic size, but it is only the beginning of the needed efforts. In the past two years, both Japan and Korea have exceeded their catch limits for Pacific bluefin. If the recovery plan is to reach its goals and return the species to healthy levels, all members must commit to reducing future quotas to pay back these overages and to take all domestic actions needed to avoid exceeding these limits in the future.

In light of the outcomes of the Northern Committee meeting, Pew recommends that the WCPFC:

- **Adopt the recommended rebuilding plan and CMM for Pacific bluefin tuna.**
- **Note the recent catch limit overages and strongly urge all CCMs to implement the necessary domestic measures to prevent such overages in the future.**
- **Direct all CCMs to comply with the reporting requirements in CMM 2016-04.**
- **Commit to continuing to include Pacific bluefin on the WCPFC annual meeting agenda so the Commission can monitor the Northern Committee's progress in meeting rebuilding plan deadlines.**

Effectively manage fish aggregating devices

Bigeye tuna in the purse seine fishery are taken almost exclusively in sets on FADs, while the use of FADs contributes to the catch of non-target species, such as some species of sharks and turtles, as well as marine debris. Improving FAD management should be an urgent priority. The Commission neither limits the total allowable number of sets that can be made on FADs nor the number of FADs that can be deployed. It also lacks basic data on how many FADs are deployed or their fates (lost, abandoned, etc.).

Given the significance of the FAD fishery, the Commission should lead in FAD management. It took a step forward when it created the FAD Working Group, which held two meetings in 2016, but the group did not recommend FAD management options, a key part of its terms of reference, and did not meet in 2017.

An independent Global FAD Science Symposium, held in Santa Monica, California, in 2017, included experts familiar with the western and central Pacific Ocean. They agreed on a series of best practices for managing FADs in a tropical tuna purse seine fishery.² The WCPFC Scientific Committee recommended that the Commission take into consideration the examples of best practices when developing a framework for management of FADs within the Convention Area. Given the significance of FAD use, the Commission should follow the scientific advice and take steps to improve the data collection and management of FADs, including:

- **Agree to introduce a FAD buoy identification scheme as recommended by the Scientific Committee and the Technical and Compliance Committee, and agree to develop a physical marking scheme for the raft components of FADs, recognizing that FAD buoys are frequently swapped among rafts.**
- **Adopt the changes recommended by the Scientific Committee to the data fields to be filled out by observers and vessel operators to ensure that data is collected from all vessels involved in FAD activities, including support vessels. That will allow the Commission to better understand the number of FADs deployed, their fates, and construction methods.**
- **Agree to establish a clear process to improve FAD management, noting the best practices agreed to during the independent FAD Science Symposium related to:**
 - **Agreeing to management objectives for FAD use.**
 - **Shifting some fishing effort to free school fishing through market (such as certification schemes), policy (such as FAD set limits), or other incentives, which would have a positive impact for juvenile tunas and certain non-target species.**
 - **Establishing a cap on the number of FADs to avoid cherry-picking and reduce marine pollution, including beaching or grounding of FADs.**
 - **Using non-entangling FADs, which result in little to no risk of entangling sharks and turtles without decreasing catches of tunas.**

Adopt electronic reporting and electronic monitoring standards

Commission policies currently do not require sufficient and timely submission of critical fishing data or mandate that their accuracy is confirmed, which contributes to ineffective management of the tuna longline fisheries in the Convention Area. In 2014, fish caught by longliners in the western and central Pacific had an end value of almost US\$4 billion.³ Given the economic importance of that sector of the fishery, the Commission should act to safeguard its long-term sustainability by instituting regulations to address data gaps so that timely and accurate tracking of longline fishing catch and effort can be ensured.

Promising new technologies can make required reporting and monitoring faster, more accurate, and more reliable. Electronic reporting (ER) systems allow information on catches to be relayed in near real-time in a standardized format. In addition, proven electronic monitoring (EM) technology can be used to expand observer coverage requirements—without additional onboard personnel.

Technological advances, coupled with the increasing cost-effectiveness of ER and EM systems, can help improve fisheries management and ensure high levels of compliance with conservation and management measures. Near real-time electronic catch reporting improves accountability and accuracy, which benefits authorities, vessel owners, and scientists. Many WCPFC member countries have already embraced these technologies as effective management tools for their domestic fisheries. Pew calls on members of the WCPFC to:

- **Adopt the pending electronic observer reporting and transshipment declaration and notification standards and direct the ER and EM Working Group to oversee development of necessary EM standards.**
- **Require 100 percent electronic reporting to improve timeliness and accuracy of catch reporting.**
- **Require CMMs to report the level of observer coverage achieved for their carrier vessels, as mandated by CMM 2009-06.**
- **Commit to requiring 100 percent observer coverage on longline vessels, as now required on purse seine vessels, by complementing onboard human observers with electronic monitoring once standards have been adopted.**

Strengthen conservation and management of sharks

An unsustainable number of sharks—an estimated 63 million to 273 million—are caught and killed in commercial fisheries each year.⁴ Whether this catch is highly sought after or unintended and unwanted, managers must take immediate action to stop the decline in shark populations and mitigate the damage it causes to marine ecosystems.

Until measures are in place to ensure that both targeted and incidental catch of sharks is sustainable, harvest of these animals should be avoided. Those caught should be released alive whenever possible. Fishing gear that increases the likelihood of shark catch, such as wire leaders and shark lines, should be prohibited, and research should be done to determine the best means of avoiding shark catch.

If CCMs are to continue to target sharks, or to catch sharks as bycatch, then the Commission must enact management measures that reflect the precautionary principle. In instances where limited population data for shark species results in uncertain stock assessments, managers must implement precautionary measures, such as prohibitions or catch limits, that can safeguard these vulnerable stocks.

The Commission should also require that fins be naturally attached when sharks are landed. Adopting this global standard would allow for better enforcement of the WCPFC prohibition on shark finning.

Based on the advice of the WCPFC Scientific Committee, Pew calls on the Commission to:

Prohibit the retention of thresher sharks

Thresher sharks are among the most vulnerable of all shark families⁵ but have been subject to no management action in WCPFC fisheries. A Pacific-wide assessment presented at this year's Scientific Committee meeting shows that fishing mortality is likely to be above sustainable levels, particularly for bigeye threshers.

All three species of thresher shark were listed on the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in October 2016, meaning that all international trade or import of catch from international waters must be sustainable as of 4 October 2017. Management action is urgently needed, both to implement that listing and to respond to the new WCPFC scientific advice.

Pew urges the Commission to:

- **Ban the retention of all thresher sharks while prioritizing data collection on ongoing bycatch levels and post-release survival to inform future management strategies, including sustainable catch limits.**

Prohibit retention of manta and mobula rays and adopt live release guidance

The family Mobulidae, which includes manta rays and mobula rays, is extremely vulnerable to overfishing. Observer reports show that manta and mobula rays are often killed as bycatch in WCPFC purse seine fisheries; 284 metric tons were recorded from 1994 to 2009.⁶ At its recent meeting, the Scientific Committee adopted safe handling guidelines for these species that will facilitate live release. Furthermore, the Technical and Compliance Committee (TCC) recommended that the Commission adopt these safe release guidelines for manta rays and mobulids.

Pew urges the Commission to:

- **Ban the retention of manta and mobula rays and implement the Scientific Committee’s 2017 guidelines for safe release of such rays when caught incidentally in WCPFC fisheries.**

Continue work to develop a comprehensive shark CMM

At its 2016 meeting, the Commission initiated work to develop an overarching shark CMM to help the WCPFC better manage both targeted shark fisheries and incidental bycatch. This year, the Scientific Council started work on development of this measure, although additional effort is needed over the next year to refine it.

Pew applauds this initiative and encourages the WCPFC to continue efforts to develop a comprehensive shark CMM that would prioritize the following:

- **Banning wire leaders and shark lines in fisheries that are not declared as targeted shark fisheries to reduce the mortality of prohibited species.**
- **Ensuring that all targeted shark fisheries are subject to management plans that limit mortality to sustainable levels—especially for heavily exploited blue and mako sharks.**
- **Expanding observer coverage for longline fleets operating in the Convention Area.**
- **Adopting a “no data, no fish” measure for sharks, which would prohibit CCMs that do not submit landing data on key shark species from retaining shark catches.**

Continue efforts to stop illegal fishing

Ban transshipment at sea until authorities can be certain it does not contribute to IUU activity

A lack of effective regulations and monitoring means that illegal, unreported, and misreported transshipment of catch at sea, particularly within the longline sector, contributes significantly to IUU activity in the Commission area. Within the western and central Pacific alone, an estimated \$142 million a year of tuna and tuna-like product is involved in illegal, at-sea transshipment activities.⁷

The current WCPFC transshipment measure (CMM 2009-06) includes several exemptions and loopholes that increase opportunities for IUU transshipment. For example, activities in archipelagic waters are exempted from reporting requirements, meaning that transshipments that occur in hundreds of thousands of square kilometres within the Convention Area go unreported. In addition, activities in a country’s exclusive economic zone are governed by national legislation, which can be weaker than WCPFC reporting requirements. Finally, despite the intention of CMM 2009-06 to strictly limit transshipment at sea, more than 52 percent of non-purse seine vessels currently on the WCPFC Record of Fishing Vessels were allowed to transship on the high seas in 2016, up from 49 percent the previous year. At the same time, the WCPFC Convention says Commission members must encourage

their fishing vessels to conduct transshipment in port to support efforts to ensure accurate reporting of catches.⁸ However, over the past six years, both the number of transshipping events at sea and the number of fishing vessels involved in transshipping at sea have increased, making these activities the norm rather than the exception.

In addition, verification of reported transshipment activity remains difficult. Although all carrier vessels are required to have 100 percent observer coverage, the WCPFC Secretariat does not currently receive reports from these observers, nor does it maintain a database for this information. That means that observer reports of transshipments on the high seas cannot be compared or cross-verified with information provided directly from the vessel. The Secretariat also cannot audit these activities because vessels are not required to provide transshipping notifications and declarations to the Secretariat when transshipping occurs in port, within EEZs, or in archipelagic waters. As such, no single body, including the Secretariat, maintains a full and complete picture of this activity within the entire Convention Area from the point of catch to the point of offloading. Additional controls are needed to ensure that transshipment activities are legal and verifiable.

Pew calls on members of the WCPFC to:

- **Ban transshipment at sea until authorities can be certain it does not contribute to IUU activity.**
- **Direct the TCC to review the draft guidelines prepared by the Secretariat for determination of circumstances when it is impracticable for certain vessels to transship in port or in waters under national jurisdiction, as required in CMM 2009-06.**
- **Establish formal observer reporting processes, procedures, submission requirements, and standardized forms for observers on carrier vessels to ensure that every high-seas transshipment reported via declarations can be cross validated by the Secretariat as to species, quantity, and location.**
- **Improve transshipment reporting protocols to create a full and complete picture of this activity as it occurs, regardless of location, by requiring transshipment reports and declarations to be provided to the Secretariat wherever and whenever the activity takes place in the Convention Area.**

Improve the effectiveness and transparency of the compliance monitoring scheme

The Second Joint Meeting of Tuna RFMOs in 2009 recommended that the regional fisheries management organizations develop robust compliance review mechanisms so that the records of each member of the Commission could be examined on an annual basis. As a result, the WCPFC established a trial Compliance Monitoring Scheme (CMS) to ensure that CCMs meet their obligations. The CMS is designed to assess CCM compliance. It also helps to identify areas where technical assistance or capacity building may be needed and determine aspects of CMMs that require refinement or amendment for effective implementation.

That CMS measure, however, continues to operate on a short-term, trial basis. CCMs must make significant investments of time to assess CMM compliance each year and review and renew the measure itself.

Because the CMS is a critical component of the WCPFC compliance process, CCMs should make it permanent and remove the need for an annual review. In addition, the CMS does not include tangible penalties for non-compliance with Commission obligations and has been implemented in a manner that prohibits observers from being present for CMS reviews and discussions. In advance of the report of an independent CMS audit to be released in 2018, the Commission should agree to the following principles to improve the CMS in ways that fully and transparently support its conservation and management objectives:

- **The CMS should be a permanent measure to ensure greater predictability and certainty. That would allow the TCC to devote more time to reviewing issues of compliance, rather than the CMS itself.**
- **Penalties should be set for non-compliance to establish a more effective and efficient scheme with the proper level of deterrence.**
- **Observers should be permitted in CMS discussions in accordance with the WCPFC Convention's language on transparency and the practices of other tuna RFMOs. Such a step would be a recognition that transparency is critical to accountability and a fundamental principle of good practice in public resource management.**

Enhance CCM transparency and accountability

Adopt minimum standards for port inspections

Port State measures (PSMs) are cost-effective tools to monitor compliance with management arrangements and prevent illegal fish from entering the market. PSM proposals have been considered by the Commission for several years and were recommended as part of the WCPFC Performance Review in 2013. Recent efforts to adopt a CMM on Port State Measures to Prevent, Deter, and Eliminate Illegal, Unreported, and Unregulated Fishing have fallen short, but circumstances have changed in recent years. The Food and Agriculture Organization of the United Nations' Port States Measures Agreement entered into force in 2016, with a number of WCPFC members now party to the agreement, creating a strong basis to establish a regional scheme within the WCPFC.

Pew urges the Commission to:

- **Adopt a port State measures CMM as soon as possible to regulate minimum standards for port inspection of vessels believed to have engaged in IUU fishing or related activities in support of such fishing. If there is no agreement at the annual meeting, task a small working group to develop text on a port State measures CMM for consideration by the TCC in 2018 with formal adoption by the Commission next year.**

Urge eligible CCMs to implement the WCPFC9 'Flick the Switch' measure

Since its adoption in 2012, the WCPFC9 "Flick the Switch" measure has received wide support from member countries that belong to the Pacific Islands Forum Fisheries Agency (FFA).⁹ Implementing the measure meant that CCMs with coastal State waters in the Convention Area could have their own national waters monitored by the Commission's VMS. However, not all coastal State CCMs have "flicked the switch." Bringing in the remaining coastal State CCMs, including the remaining five FFA member countries,¹⁰ would maximize the usefulness of the Commission's VMS as a tool to eliminate illegal fishing. It would give authorities in all coastal State CMM countries the ability to monitor non-licensed vessels on the WCPFC authorized vessel list if they operated in their national waters. This type of effective monitoring would help close a major loophole for IUU fishing.

Pew urges the Commission to:

- **Encourage all coastal state CCMs, especially the FFA members, to adopt the WCPFC9 measure "Flick the Switch" to maximize the use of VMS and improve the transparency of fishing operations in the Convention Area.**

Amend Recommendation 2013-10 to require that all eligible fishing vessels obtain IMO numbers

Recommendation 2013-10 entered into force 1 January 2016 and required that all vessels of 100 gross tons/ gross registered tons or more obtain an IMO number. Member states have made great progress in providing IMO numbers for most active eligible vessels, although gaps remain. Member states are encouraged to ensure that none of their vessels that are required to have IMO numbers are fishing without this identification. IMO numbers should be clearly marked in all vessel records.

In August 2016, the IMO amended its guidance on eligibility criteria for IMO numbers. Fishing vessels of non-steel hull construction of 100 GT and above and all motorized inboard fishing vessels of less than 100 GT down to 12 metres in length overall that are authorized to operate outside waters under national jurisdiction are now eligible. This means that more than 2,000¹¹ additional vessels listed on the WCPFC record of vessels can now obtain an IMO number. Accordingly, the Secretariat is encouraged to amend Recommendation 2013-10 to include all eligible fishing vessels.

Pew urges the Commission to:

- **Amend Recommendation 2013-10 to require that all eligible fishing vessels obtain IMO numbers.**

Enhance the effectiveness of the IUU vessel list

Placing a vessel on WCPFC's IUU vessel list helps to highlight, and ultimately deter, unacceptable practices in the Convention Area. However, the list's effectiveness is diminished because vessels found to be engaged in IUU fishing can be added only once a year. As a result, these vessels operate unhindered until the Commission meets and CCMs put them on the list. The WCPFC permits vessels to be removed from the IUU vessel list between annual meetings. In the same spirit, the Commission should permit the listing of IUU vessels intersessionally.

Pew calls on members of the WCPFC to:

- **Establish a procedure that permits the addition of vessels found to be engaged in IUU fishing to the IUU vessel list between annual meetings.**

Endnotes

- 1 Peter Williams et al., "Overview of Tuna Fisheries in the Western and Central Pacific Ocean, Including Economic Conditions—2016," paper presented to the 13th annual meeting of the Scientific Committee, 2017, <https://www.wcpfc.int/node/29628>.
- 2 John Hampton, et al., "What Does Well-Managed FAD Use Look Like Within a Tropical Purse Seine Fishery?" paper presented to the 13th annual meeting of the Scientific Committee, 2017, <https://www.wcpfc.int/node/29549>.
- 3 Grantly Galland, Anthony Rogers, and Amanda Nickson, "Netting Billions: A Global Valuation of Tuna," The Pew Charitable Trusts" (2016), <http://www.pewtrusts.org/tunavalue>.
- 4 Boris Worm et al., "Global Catches, Exploitation Rates, and Rebuilding Options for Sharks," *Marine Policy* 40 (2013): 194–204, <http://www.sciencedirect.com/science/article/pii/S0308597X13000055>.
- 5 Nicholas K. Dulvy et al., "Extinction Risk and Conservation of the World's Sharks and Rays," *eLife* (2014), doi:10.7554/eLife.00590.
- 6 Western and Central Pacific Fisheries Commission, "Non-Target Species Interactions With the Tuna Fisheries of the Western and Central Pacific Ocean," WCPFC SC6-2010/EB-IP-8 (2010), http://www.wcpfc.int/system/files/WCPFC-SC6-2010-EB-IP-08_Non_target_spp_interactions.pdf.
- 7 MRAG Asia Pacific, "Towards the Quantification of Illegal, Unreported and Unregulated (IUU) Fishing in the Pacific Islands Region" (2016), <http://www.ffa.int/files/FFA%20Quantifying%20IUU%20Report%20-%20Final.pdf>.
- 8 Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean Article 29 (1), (2000).
- 9 Western and Central Pacific Fisheries Commission. "WCPFC9 Decision on Application of WCPFC VMS to National Waters of WCPFC Members" (6 February 2013), <https://www.wcpfc.int/system/files/WCPFC9-decision-24%288%29.pdf>.
- 10 The five countries are Fiji, the Marshall Islands, Papua New Guinea, Vanuatu, and Kiribati.
- 11 Tuna-org, "Global List of Authorized Tuna Fishing Vessels" accessed 28 August 2017, <http://www.tuna-org.org/GlobalTVR.htm>.

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