INTEREST AND INFLUENCE:
A SNAPSHOT OF THE WESTERN AND CENTRAL PACIFIC TROPICAL TUNA FISHERIES

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The author cautions that much of the analysis in this report is based upon fisheries statistics that were preliminary at the time of their analysis and therefore may include some inaccuracies, particularly in regard to longline catch estimates for 2010.

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EXECUTIVE SUMMARY

There are 89 States and territories that have some form of current or historical interest in the tropical tuna fisheries (i.e., bigeye, yellowfin, and skipjack) of the Western and Central Pacific Ocean (WCPO). However, only 14 of them ultimately control access to the most productive fishing grounds and the vessels that fish in them. All but one of these States are full members of the Western and Central Pacific Fisheries Commission (WCPFC), and all have some form of vested interest in the long-term sustainability of some part of the tropical tuna fisheries.

14 States or territories control access to the most productive tuna fishing grounds in the world. Understanding their interests is essential to driving successful conservation and management outcomes at WCPFC.

This paper studies the mix of interests in the WCPO tropical tuna fisheries. These interests are likely to influence each delegation’s national interest and drive negotiating positions to support or oppose certain measures, depending upon how they affect that State’s interests.

Given the complex nature of the WCPO tuna fisheries and their conservation challenges, it is important to understand these interests and consider how States might compromise their interests in an equitable manner that allows for the adoption of a new conservation and management measure for tropical tuna.

The largest markets in the world for fresh, frozen, smoked, and canned tuna are the United States, Japan, and Europe. All of these markets, to some degree, depend upon the WCPO tuna fisheries for their supply. In addition, markets in developing States are looking towards domestically produced and imported canned tuna to counter food insecurity and as a cheap form of protein. In this context, conservation and management decisions within the WCPFC, particularly in regard to skipjack and purse-seine fisheries, can quickly affect global markets and have significant repercussions on prices.

The WCPFC faces an increasingly complex and urgent challenge. The scientific assessments clearly indicate that urgent action is required to address overfishing and reduce fishing mortality for bigeye, halt any increases in fishing mortality for yellowfin, reduce fishing mortality of juvenile bigeye and yellowfin, and develop precautionary limits for skipjack. Despite its mandate, the WCPFC has repeatedly failed to adopt conservation and management measures that are sufficient to meet its own Scientific Committee’s recommendations.

The conservation challenge is complicated by the multigear, multispecies, and multinational characteristics of the WCPO tropical tuna...
fisheries. Skipjack, yellowfin, and bigeye are all caught by each gear in a tightly intermeshed manner that is difficult, if not impossible, to separate. Consequently, the fishery is inherently challenging to manage. This complexity is exacerbated by the substantially different biological characteristics of skipjack, yellowfin, and bigeye (i.e., highly resilient and productive skipjack compared to the longer-lived and less-productive bigeye). Further, since the mid-1990s, various studies have suggested that the profitability of the WCPO tuna fisheries could be increased through significant changes in fleet composition and reductions in total fishing effort.  

For the WCPFC to resolve the threat to bigeye, it must limit longline catches and restrict the operation of purse-seine vessels that are targeting highly productive skipjack that are not currently threatened by overfishing. Figure 1 illustrates the balance of interests for coastal States from skipjack to bigeye, while Figure 2 does the same for flag States. Figure 3 illustrates the balance of interests for coastal States from purse seine to longline, while 4 does the same for flag States.

From this analysis, the following interests can be identified:

- Seven of the core 14 States can be loosely referred to as ‘purse-seine/skipjack States’, six of which are part of the group of coastal States that dominate the control of the most productive purse-seine fishing grounds (Papua New Guinea, Kiribati, Tuvalu, Nauru, Federated States of Micronesia, and the Solomon Islands). These six States enjoy far greater benefits from the WCPO skipjack fisheries (compared to bigeye and yellowfin), purse-seine fisheries (compared to longline and other gears), and licensing revenue for access to their exclusive economic zones (EEZs) (compared to their vessel registry interests). These six States also have strong interests in the welfare of their artisanal coastal communities and aspirations to develop and expand their participation in the WCPO tuna fisheries.

- The seventh of the purse-seine/skipjack States is the United States. The United States is dominated by its vessel registry interests, which provide more than 80% of the benefits that the United States enjoys from the WCPO tuna fisheries (compared to the catch from within its EEZ). Although far less significant in the context of its overall interest, the United States catches substantial amounts of bigeye through its Hawaiian longline fisheries. As an established distant water fishing nation (DWFN), the United States has a strong interest in protecting its historical level of activity. The significance of its distant water fleet also gives the United States an interest in distributing the burden of conservation...
across all waters of the WCPO without special regard for EEZs or archipelagic waters.

The remaining seven core States have fishing interests across multiple gears, mostly longline and purse seine. They are Japan, the Philippines, Indonesia, Chinese Taipei, South Korea, China, and the Marshall Islands. These States must balance the costs and benefits of conservation measures across their own domestic interests when considering how best to address conservation challenges. These tensions are further complicated by broader interests held by Indonesia, the Philippines, and Japan in pole and line and other gears.

The European Union has a critical market interest and a far less significant distant water fishing interest. Nevertheless, its limited fishing interest in the WCPO tropical tuna fisheries appears to be dominated by purse-seine fleets that are highly dependent on fish aggregating devices (FADs). The EU does not represent any significant coastal State interests (the Pacific island territories of France and the United Kingdom are not represented by the EU). Consequently, the EU has an interest in supporting measures that distribute the burden of conservation across all waters of the WCPO without special regard for coastal State interests or development aspirations. Japan and the United States are also critical market States for the WCPO tuna fisheries but must balance these interests with significant distant water fishing interests and coastal interests.

In addition, the positions of those coastal States with mixed interests in multiple gears and species are further complicated by their significant flag State interests. This is particularly a challenge for Indonesia and the Philippines, which have extensive vessel interests that extend into the high seas. This significantly undermines any motivation that these States may have in supporting high seas closures or conservation measures that prioritise conservation reductions on the high seas over waters under national jurisdictions.

Given current levels of overfishing, a sustainable solution for bigeye will require that some or all States compromise their interests and carry some of the conservation burden. This raises important questions that are fundamental to conservation and management negotiations. It is arguable that overfishing of bigeye will continue until the WCPFC negotiates a measure that transparently recognises the benefits and costs, and equitably distributes the burden of conservation in a manner consistent with the WCPF Convention. It appears unlikely that the WCPFC will be able to develop and negotiate such a response across its plenary table without first agreeing on some form of framework for distributing the conservation burden. This framework will need to allow for a differential application of measures that recognises the divergent interests while allowing for sufficient reductions in fishing mortality. This should be within the limits set by precautionary reference points and guided by agreed harvest control rules that recognise the need to equitably distribute the burden of conservation.

Consequently, this paper suggests that the WCPFC should prioritise the adoption of target and limit reference points, and establish a new ‘discussion’ on how to resolve the distribution of the conservation burden. This paper suggests that ultimately the WCPFC should establish a transparent framework that defines the parameters and values for how it distributes the conservation burden. This framework should necessarily balance the interests of its members in a politically acceptable manner that is in accordance with international principles and standards relating to conservation and sustainable development.
FIGURE 1. Scale of Interests for Coastal States: From Bigeye to Skipjack (average 2008–2010)

FIGURE 2. Scale of Interests for Flag States: From Bigeye to Skipjack (average 2008–2010)

“The first instinct of most governments in the international arena is to protect and promote their own national interests.”

U.S. Ambassador David Balton
Deputy Assistant Secretary of State for Oceans and Fisheries

INTRODUCTION

The Western and Central Pacific Ocean (WCPO) stretches approximately 6,000 nautical miles, from the archipelagos of Southeast Asia to the remote atolls of Kiribati in the Central Pacific. This vast ocean is home to the world's most productive tuna fisheries, supplying global markets with skipjack, bigeye, yellowfin and albacore worth approximately US$4.6 billion. These fisheries are critically different from other tuna fisheries in that 87% of all reported WCPO tuna catches are harvested from waters under national jurisdiction. Unlike the high seas tuna fisheries of the Eastern Pacific, Indian Ocean and North Atlantic, the WCPO tuna fisheries are predominantly owned by a small group of developing coastal States.

In December 2004, the region came together and celebrated the establishment of the Western and Central Pacific Fisheries Commission (WCPFC) in Pohnpei, Federated States of Micronesia. All of the key coastal and distant water fishing States collaborated to establish the world’s most advanced regional fisheries management organisation with a mandate to ensure the long-term conservation and sustainable use of the WCPO tropical tuna fisheries.

Seven years later, the members of the WCPFC now face a critical juncture. In order to fulfil their mandate and ensure the long-term conservation and sustainable use of the WCPO tropical tuna fisheries, they must cooperate to reduce overfishing in complex fisheries that catch multiple species, utilise multiple gears, and occur in multiple jurisdictions.

This paper studies the mix of interests in the WCPO tropical tuna fisheries in order to better understand how these interests might influence the WCPFC’s ability to adopt measures for bigeye and yellowfin. As noted by Balton, the benefits from a fishery are a key influence on national negotiating positions. They influence each delegation’s national interest and drive negotiating positions to support or oppose certain measures depending upon how they impact on that State’s various interests. For the purposes of this analysis, the tropical tuna fisheries are defined as all fisheries in the WCPO that catch skipjack (*Katsuwonus pelamis*), bigeye (*Thunnus obesus*) or yellowfin (*Thunnus albacares*), regardless of whether the species is targeted or taken incidentally.

This analysis studies interests that are directly relevant to potential conservation and management measures. These include the interests and influences that each participating State has in particular species (bigeye, yellowfin, and skipjack) and particular gears (purse seine, longline), and more broadly, interests and influences related to access to fishing grounds; fishing vessels; food security; development aspirations; and markets.

The study analyses all reported catches from within the WCPFC Statistical Area (the perceived range of the stocks) and is based on the most recent data that were available at the time of the study. Data are sourced from the 2011 WCPFC Yearbook Excel database, the Value of WCPO Tuna Fisheries Excel database, and the WCPFC overview paper on the WCPO tuna fisheries. This covers
2008–10 catches that were reported in 2010 and published in 2011. Unless otherwise indicated, all subsequent figures were developed by the author using these databases.

It is important to note that these data sets are likely to contain inaccuracies due to gaps in data, non-reporting, and misreporting of catches by vessels and States. In addition, the undefined western and northern boundaries of the WCPFC also create uncertainties in these data sets as not all coastal States within the WCPFC Statistical Area consistently provide tuna catch reports to the WCPFC or the Secretariat of the Pacific Community (SPC) for fisheries within their waters under national jurisdiction.

The interests identified in the following analysis do not necessarily reflect the overall ‘national interest’ of a State. Many of the identified States will have multiple and diverse interests. While one consideration below might suggest that a State will oppose any conservation measure that negatively impacts its interests, another consideration might suggest otherwise. Such States will need to balance their interests when considering potential management responses. This paper does not pretend to determine the individual ‘national interest’ for each State. This is simply beyond the scope of a small report. Rather, the paper identifies some interests that may impact on, and complicate, the negotiation, adoption, and implementation of conservation and management measures for bigeye, yellowfin, and skipjack.
PART ONE: THE WCPO TUNA FISHERIES

A critical management challenge for the WCPFC is the unsustainably high level of fishing activity in the WCPO tropical tuna fisheries that catch skipjack, bigeye, and yellowfin either intentionally as a target species or incidentally. Catches in the WCPO tuna fisheries have increased since the WCPFC’s founding Convention was adopted in 2000, with record catches for each of the tropical tuna species in recent years. The record catch for skipjack was 1,821,770 metric tonnes (mt) in 2009, while the 2008 catches of yellowfin and bigeye were the highest on record (541,262 and 157,173 mt, respectively).15

Three types of fisheries are primarily responsible for most commercial catches of WCPO tuna. Purse seine is by far the most significant, catching approximately 1,820,844 mt in 2010. Longline fisheries caught 239,853 mt and pole and line caught 171,604 mt. Various other gears caught 143,829 mt (largely various fleets in Indonesia and the Philippines, with some small troll catches in New Zealand and Japan).16

Skipjack, bigeye, and yellowfin are distributed throughout the tropical and subtropical waters of the Pacific Ocean and migrate across numerous international boundaries. Consequently, they require international cooperation to ensure effective management across multiple jurisdictions. Skipjack and yellowfin also exhibit sufficient levels of residency to justify conservation measures that apply differentiated limits and regulations at subregional and national levels.17

All three tropical tuna species are highly productive and fast-growing.18 Skipjack are by far the most productive, with a biomass estimated to be greater than that of bigeye and yellowfin combined.19 Skipjack grow rapidly and sexually mature at around one year, and can weigh 5 kilograms and reach 80 cm in length by age 4.20 Most captures occur on skipjack ages 1 to 3.21 Most skipjack have had an opportunity to reproduce before capture, further strengthening the stock’s resilience to fishing.22 Yellowfin can weigh 30 kg and reach 120 cm by the time they reach maturity at approximately 2 years.23 Most captures occur on yellowfin 1 to 6 years old.24 Bigeye are longer-lived and slower to mature, taking approximately three years.25 Most captures occur on bigeye 1 to 10 years old.26

STATUS OF SKIPJACK (KATSUWONUS PELAMIS)

In 2011, the stock assessment for skipjack concluded that overfishing was not occurring, nor was the stock in an overfished state.27 However, the WCPFC Scientific Committee advised that catch rates will decline as the skipjack stock is fished down to levels near the biomass capable of producing the maximum sustainable yield (BMSY). The Scientific Committee also noted recent rapid changes in fishing mortality and biomass indicators relative to MSY, and recommended that the WCPFC consider developing restrictions on fishing for skipjack to limit declines in catch rates.28 Such declines would likely impact on the economic efficiency of the fishery and its profitability.

The assessments noted that the purse-seine fishery dominates equatorial catches of skipjack, but scientists continued to struggle to understand the factors impacting on purse-seine CPUE. The use of FADs and rapid changes in technology and catchability complicated efforts to define units of effort and better understand the fishery.29 In addition, there are questions about whether the current use of FADs undermines the potential yield of the stock due to the higher catches of small skipjack and concerns that the use of FADs may negatively affect the health and distribution of skipjack.30
In 2011, stock assessments indicated that the entire WCPO yellowfin stock was not experiencing overfishing. However, the assessments did note that significant regional differences existed in levels of fishing mortality, exploitation rates, and depletion and that the spawning biomass in the western equatorial region (where 81% of the total yellowfin catch is taken) had declined to approximately 31% of its unexploited level.31

The WCPFC Scientific Committee subsequently advised that yellowfin stocks are fully exploited and recommended against increases in fishing mortality. They indicated that Philippine and Indonesian surface fisheries have high levels of juvenile fishing mortality and that these fisheries, and purse-seine fishing on FADs, have the highest impact on yellowfin stocks, while purse-seine fishing on free-swimming schools has a moderate impact. These fisheries are having high impacts in the western equatorial region and, more generally, across the WCPO. The assessment also noted that Japanese coastal pole-and-line and purse-seine fisheries have a significant impact on biomass levels in their home region.32

Significantly, the Scientific Committee advised that high catches of juvenile yellowfin were reducing the potential yield of the yellowfin stock. Consequently, the Committee concluded that reductions in fishing mortality of juvenile yellowfin would increase MSY levels and the profitability of the fishery.33

The bigeye fishery is targeted almost entirely by longline vessels. However, the use of FADs by the purse-seine fishery has resulted in significant catches of juvenile bigeye. Stock assessments for bigeye were conducted and reviewed by the WCPFC Scientific Committee almost every year since its establishment. These assessments have consistently raised concerns about the levels of fishing mortality on bigeye. Each assessment has indicated that overfishing on bigeye was occurring,34 and each Scientific Committee recommended that fishing mortality be reduced.35

The 2011 assessment indicated a change from previous ones and noted that purse-seine fisheries and other surface fisheries now have an equal or greater impact on the overall bigeye stock compared to longline fisheries. This shift from longline as the dominant impact to purse seine reflects the significant increases in purse-seine effort in recent years. Purseseine fisheries and the Philippine and Indonesian domestic fisheries have a substantial impact in the western equatorial and, to a lesser extent, the eastern equatorial regions. The assessment also noted that Japanese coastal pole-and-line and purse-seine fisheries have a significant impact on biomass levels in their home region.36

Following the assessment, the 2011 Scientific Committee recommended a 39% reduction in fishing mortality on 2004 levels (or 28% on average of 2001-04). Alternatively, the Scientific Committee recommended a reduction of 32% from 2006–09 levels.37 As with yellowfin, the assessment found that high catches of juvenile bigeye were reducing the potential yield of the bigeye stock. Consequently, the Scientific Committee concluded that reductions in fishing mortality of juvenile bigeye would increase MSY levels and the profitability of the fishery.38

In summary, the scientific assessments suggest that bigeye stocks are experiencing overfishing and may be overfished, and that high levels of catches of juvenile
bigeye were undermining the productivity of the fishery, and its profitability. The assessments indicate that serious reductions are required across all gears, particularly in the surface and purse-seine fisheries.

**ECOSYSTEM ISSUES AND ASSOCIATED AND DEPENDENT SPECIES**

The WCPO tuna fisheries also impact more broadly on the WCPO oceanic ecosystem. There is considerable concern regarding these impacts, particularly in regard to associated and dependent species. Some nontarget species of fish and shark are captured incidentally and retained for subsequent use. Other nontarget species are captured incidentally but have little or no commercial value and are therefore discarded by the vessel. These discards can include seabirds, turtles, cetaceans, and sharks and various species of fish that may be of little interest to a fishing vessel focused on a specific market or processing factory.39

In the WCPO tuna fisheries, the purse-seine and longline gears have the largest incidental catch, while pole and line is far more selective and tends to take only small amounts of mahimahi, rainbow runners, and nontarget tunas (although pole and line can cause significant impacts if baitfish supply fisheries are not effectively managed).40 Key concerns for the purse-seine and longline fleets relate to the potential impacts of incidental catch on vulnerable species (i.e., seabirds, cetaceans, turtles, and sharks).41

The use of FADs by purse-seine fleets has also raised serious conservation concerns. Purse-seine sets on schools associated with FADs and logs will catch smaller fish, particularly juvenile yellowfin and bigeye, whereas sets on unassociated free-swimming schools (i.e., non-FAD sets) will catch larger skipjack and/or adult yellowfin.42 Proponents argue that...
FADs have increased the efficiency of purse seineing, while others note that the significant reduction in the size of fish caught undermines the efficiency gains.

In addition to their significant impacts on bigeye and high levels of juvenile catch, scientists have raised concerns that the use of FADs may be creating an ‘ecological trap’. An ecological trap is an event wherein growth is reduced due to individuals making poor habitat choices. Studies have suggested that tuna associated with FADs are less healthy than those in unassociated free-swimming schools. It has also been pointed out that the use of FADs is introducing further uncertainties into scientific assessments due to their impact on tuna behaviour.

**REDUCED PROFITABILITY**

Since the mid-1990s, various studies have suggested that the profitability of the WCPO tuna fisheries could be increased through significant changes in fleet composition and reductions in most, if not all, fleets. Among other things, these studies have suggested that fishing capacity is significantly above optimal levels, thereby reducing the profitability of the WCPO tuna fisheries. In addition, the current fleet composition (i.e., mix of gears) does not necessarily maximise the benefit from WCPO tuna fisheries. Catches of bigeye and yellowfin by purse-seine fishing vessels, particularly juveniles in schools associated with FADs, provide a smaller benefit to the overall value of the WCPO tuna fisheries than would be achieved if these fish had been allowed to mature and then be caught by longline. The overall benefit from the WCPO tuna fisheries would be significantly higher if these tuna were caught in a manner (such as by longline) that allowed their maximum value to be reached. If purse seiners had been prohibited from setting on schools associated with FADs and were able to otherwise avoid all catches of bigeye, then these fish may potentially have become available to the longline fishery for a far greater benefit to the overall value of the WCPO tuna fisheries.

Reducing overcapacity or changing fleet and species compositions would likely maximise the benefit from the WCPO tuna fisheries and deliver significant conservation outcomes. Bioeconomic modelling has indicated that reductions of 50 to 68% in fishing effort levels (particularly in purse-seine fleets) would significantly increase the profitability of the combined WCPO tuna fisheries and maximise the total resource rents across the whole region.

However, such reductions would also transfer benefits from States with significant purse-seine interests to those with significant longline interests. Bioeconomic modelling has found that the benefits from significant fleet restructuring and purse-seine reductions would be enjoyed disproportionately and that the actual outcomes could be detrimental to coastal States with significant purse-seine fisheries. Consequently, any resolution of overcapacity and fleet structures will likely require some mechanism to equitably distribute the reductions and benefits.
It is critically important that the skipjack, yellowfin, and bigeye fisheries are managed effectively throughout their range—within and between EEZs and on the high seas. Unrestrained exploitation in a particular EEZ or on the high seas has the potential to significantly affect catches elsewhere with potentially devastating consequences for developing coastal States, some of which have few alternative resources.

The intermeshed characteristics of the WCPO tropical tuna fisheries make it difficult for the WCPFC to sufficiently reduce fishing mortality of bigeye, and restrain fishing mortality for yellowfin, without significantly impacting on fishing activities for skipjack. For example, purse seiners primarily target skipjack, and to a lesser degree yellowfin, but also catch bigeye incidentally. While the incidental catch of bigeye by purse-seine fleets accounts for a very small percentage (1 to 3%) of the total purse-seine catch, it nevertheless has a significant impact on bigeye stocks due to the sheer size of this catch.

For the WCPFC to resolve the threat to bigeye, it must restrict the operation of purse-seine vessels that are targeting highly productive skipjack that are not currently threatened by overfishing. However, purse-seine fleets will receive little or no long-term sustainability benefit or increase in profitability if bigeye stocks rebuild. Longline fleets will directly benefit from conservation measures that rebuild bigeye stocks as this will increase the profitability of longline fleets through improvements to their CPUE.

This creates an inherently difficult and challenging problem to solve as ultimately the members of the WCPFC have little choice but to develop, negotiate, and implement conservation and management measures that affect a broad range of fleets and stakeholders and impact upon a diverse range of interests. Such conservation and management measures implicitly allocate a ‘conservation burden’ on participants in the WCPO fisheries. Each participating State must apply costs to its fleets through limiting fishing opportunities and regulating their activities. In order to implement these measures, governments must fund national institutions to implement national regulations and govern their implementation, while potentially increasing the management costs on their fleets through more complex and costly licensing arrangements. Depending upon its structure, the conservation and management measure will impact directly and indirectly on various participants: reducing benefits for some; limiting opportunities for others; and protecting or potentially even increasing benefits for some participants.

To further complicate matters, conservation and management measures may impact on developing States that depend significantly on these fisheries and have strong aspirations to further develop their benefits. Some of these States will have few other development and resource options and will be more heavily impacted by the conservation burden than other States with diverse resources, large institutions and substantial revenue streams from multiple economic activities. Consequently, the question of how the conservation burden is distributed is fundamental to conservation and management negotiations.
COASTAL AND FLAG STATE INTERESTS

This section studies the mix of interests in the WCPO tropical tuna fisheries in order to better understand how these interests might influence the WCPFC’s ability to adopt measures for bigeye and yellowfin. This analysis studies interests that are directly relevant to potential conservation and management measures. These include the interests and influences that each participating State has in particular species (bigeye, yellowfin, and skipjack) and particular gears (purse seine and longline) and, more broadly, interests and influences related to access to fishing grounds; fishing vessels; food security; markets; and development aspirations.

FIGURE 5.
Key tropical tuna coastal States by proportion of average 2008–2010 value of catch taken from EEZs

Coastal State interests in tropical tuna fisheries average 2008–2010 (US$millions)
Fourteen States collectively control almost all fishing activities that impact on skipjack, bigeye and yellowfin: Papua New Guinea, Indonesia, the Philippines, Japan, Kiribati, Solomon Islands, Nauru, Federated States of Micronesia, Tuvalu, the Marshall Islands, South Korea, Chinese Taipei, the United States, and China. Figure 5 identifies the key coastal States that control access to the most valuable fishing grounds in the WCPO tropical tuna fisheries and identifies their key interests by gear and species. Figure 6 identifies the key flag States that control the most productive fishing fleets and identifies their primary interests by gear and species. Together, these 14 ‘core’ States effectively control the WCPO tuna fisheries and are ultimately responsible for implementing conservation and management measures that directly limit or regulate fishing activities.

**FIGURE 6.**
Key tropical tuna flag States by proportion of average 2008–2010 value of catch

<table>
<thead>
<tr>
<th>Flag State</th>
<th>Interest (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>20%</td>
</tr>
<tr>
<td>Chinese Taipei</td>
<td>13%</td>
</tr>
<tr>
<td>Philippines</td>
<td>12%</td>
</tr>
<tr>
<td>Korea</td>
<td>12%</td>
</tr>
<tr>
<td>USA</td>
<td>9%</td>
</tr>
<tr>
<td>PNG</td>
<td>7%</td>
</tr>
<tr>
<td>Indonesia</td>
<td>12%</td>
</tr>
<tr>
<td>Philippines</td>
<td>12%</td>
</tr>
<tr>
<td>Japan</td>
<td>14%</td>
</tr>
<tr>
<td>Philippines</td>
<td>12%</td>
</tr>
<tr>
<td>Korea</td>
<td>12%</td>
</tr>
</tbody>
</table>

Flag State interests in tropical tuna fisheries average 2008–2010 (US$millions)
Skipjack. Papua New Guinea, Kiribati, Indonesia, and the Philippines control the most valuable fishing grounds for skipjack, followed by the Federated States of Micronesia, Solomon Islands, Japan, Nauru, Tuvalu, and the Marshall Islands. Japan is the dominant flag State for skipjack fisheries, followed by the Philippines, South Korea, Indonesia, the United States, Chinese Taipei, Papua New Guinea, China, the Marshall Islands, and Vanuatu.

Purse-seine fleets dominate the skipjack fisheries, although pole and line is still a significant gear for skipjack fisheries in Japan and Indonesia. Figure 7 identifies the top 10 coastal States that control access to the most valuable fishing grounds for skipjack and the top 10 flag States that control the most productive fishing fleets.

Yellowfin. Indonesia, Papua New Guinea, and the Philippines control the most valuable fishing grounds for yellowfin, followed by

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**FIGURE 7.**
Average value of skipjack catches by gear for coastal States in US$millions

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**FIGURE 7.**
Average value of skipjack catches by gear for flag States in US$millions
Kiribati, Japan, the Solomon Islands, Chinese Taipei, the Federated States of Micronesia, Nauru and Fiji. Indonesia, Japan, Chinese Taipei, and the Philippines are the dominant flag States for yellowfin, followed by the Solomon Islands, South Korea, Papua New Guinea, the United States, China, and Fiji.

Yellowfin is targeted by various gears, but particularly longline and purse seine. This can have significant ramifications for the value of the catch due to the substantially lower prices for purse seine (for canning) compared with longline (for fresh and frozen products). For example, while Chinese fishing fleets catch significantly less tonnage than U.S. fleets, China has a far higher proportion of longline catch, and the value of its entire yellowfin catch is therefore only slightly less than that enjoyed by the United States (which is predominantly a purse-seine catch). Figure 8 identifies the top 10 coastal and flag States for yellowfin and demonstrates that all of the States with a significant interest in yellowfin report some catch (generally the majority) by purse seine. The Philippines, Indonesia, and Japan also have significant catches by other artisanal gears and pole-and-line vessels.

FIGURE 8.
Average value of yellowfin catches by gear for coastal States in US$millions

Average value of yellowfin catches by gear for flag States in US$millions
Bigeye. Bigeye is targeted by longliners and some other small-scale gears but is also a significant bycatch within the purse-seine fishery. However, as discussed earlier, this bycatch provides far less benefit than that enjoyed by users of longline and other gears. Therefore, the analysis distinguishes between the interests of those States that benefit from targeted fishing for bigeye and have a positive interest in the species and those States that benefit from purse-seine activities but gain little from bycatch of bigeye.

Figure 9 demonstrates that Japan controls the most valuable fishing grounds for bigeye within waters under national jurisdiction and that it accounted for 13% of the value of bigeye fisheries (not including purse-seine bycatch). This was followed by Kiribati, Indonesia, the Marshall Islands, the United States, the Federated States of Micronesia, Palau, Australia, the Philippines, and French Polynesia. Japan, Chinese Taipei, South Korea, and China are the dominant flag States for bigeye fisheries, followed by the United States, Indonesia, Vanuatu, the Federated States of Micronesia, Australia, and Fiji.

FIGURE 9.
Top ten coastal States that impact and benefit from bigeye fisheries (proportion of average 2008–2010 total non-purse seine bigeye value)

Top ten flag States that impact and benefit from bigeye fisheries (proportion of average 2008–2010 total non-purse seine bigeye value)
Figure 10 identifies States that have a significant ‘negative’ interest in bigeye through their control over purse-seine fisheries that impact significantly on bigeye but receive little direct benefit. The term ‘negative’ is used in this context as this interest provides a liability with no benefit. These interests must be addressed but may require special consideration to motivate these interests and avoid inequitable outcomes.

Papua New Guinea and Kiribati, followed by Indonesia, the Philippines, the Federated States of Micronesia, Nauru, the Solomon Islands, Tuvalu, the Marshall Islands, Japan, and Tokelau all control fishing grounds with highly active purse-seine fisheries that impact significantly on bigeye for minimal benefit. Indonesia, Spain, the United States, the Philippines, Japan, Papua New Guinea, Chinese Taipei, Ecuador, South Korea, and the Marshall Islands all control purse-seine fleets that impact significantly on bigeye for minimal benefit.

**FIGURE 10.**
Top ten purse-seine coastal States that impact on bigeye for minimal benefits (proportion of average 2008–2010 total purse-seine bigeye value)

- PNG 24%
- Kiribati 22%
- Indonesia 12%
- Philippines 8%
- FSM 5%
- Nauru 3%
- Solomon Islands 2%
- Tuvalu 2%
- Marshall Islands 1%
- All other EEZs 1%
- Japan 0%
- Tokelau 0%

**Top ten purse-seine flag States that impact on bigeye for minimal benefits (proportion of average 2008–2010 total purse-seine bigeye value)**

- Indonesia 12%
- USA 11%
- Spain 11%
- Philippines 10%
- Japan 10%
- Korea 6%
- Ecuador 7%
- Chinese Taipei 7%
- PNG 9%
- Marshall Islands 4%
- All other flags 13%
Those States with the biggest ‘negative’ interest identified in Figure 10 have the most significant problem with bycatch of bigeye by purse-seine fleets. The European Union (Spain), Papua New Guinea, Ecuador, Nauru, Tuvalu, and the Solomon Islands all have a ‘negative’ interest in bigeye, and gain little or no positive benefit. Consequently, these States receive little benefit from conservation measures that improve the status of bigeye stocks. In the context of WCPFC negotiations, these States have an immediate interest in minimising application to purse-seine fleets and maximising the conservation burden on other gears that catch bigeye.

The United States, Japan, the Philippines, Indonesia, Chinese Taipei, South Korea, China, the Marshall Islands, Kiribati, Vanuatu, and the Federated States of Micronesia simultaneously have a positive and negative interest in bigeye to varying degrees. Given these potentially conflicting interests, these States may experience internal tensions as they negotiate and determine their national interest. Regardless of their ultimate interpretation of their national interest, these States will have some form of interest in bigeye conservation and management but must balance conflicting interests between purse-seine and longline fleets.

Fiji, Australia, Palau, and French Polynesia have solely positive interests in bigeye. These States have an interest in supporting conservation measures that ensure the sustainability of bigeye stocks while maximising the conservation burden on purse-seine fleets.

Interestingly, the States that have the most significant purse-seine impacts on bigeye are not necessarily those States with the largest interests in purse-seine fishing. Figure 11
identifies the top 10 coastal and flag purse-seine States.

Comparison with Figure 10 identifies some States with purse-seine interests that are not relatively significant purse-seine States but do impact significantly on bigeye nevertheless. The two most obvious are the European Union (Spain) and Ecuador, which individually account for 11 and 7%, respectively, of all bigeye purse-seine bycatch, but do not rate within the top 10 purse-seine States. On the other hand, South Korean purse-seine fleets account for only 6% of bigeye bycatch, despite their significantly larger share (14%) of the total purse-seine fishery.

In part, this is due to variances between fleets in the usage of FADs. For example, vessels registered in Spain and Ecuador have been highly dependent on FADs over much of the past decade, as have vessels flagged to the United States, El Salvador, the Marshall Islands, New Zealand, and the Solomon Islands. Korean fleets, on the other hand, report a far lower use of FADs. Similar distinctions arise for coastal States, although there is less differentiation between each State’s interests. FAD and log sets account for 40 to 70% of all purse-seine sets within the EEZs of Pacific island tropical coastal States. These characteristics have begun to alter since the full implementation of the three-month FAD closures by the Parties to the Nauru Agreement (PNA) for waters under their jurisdiction and the WCPFC more broadly. This has resulted in significant declines in FAD use by all fleets.

**COASTAL AND FLAG STATE INFLUENCE**

Figures 1 through 4 illustrate the gear and species interests for all States that reported catches between 2008 and 2010. Seven of the core 14 States that control the fishing grounds and fishing fleets can be roughly identified as ‘purse-seine/skipjack States.’ Most of these States are part of the group of coastal States that dominate the most productive fishing grounds (Papua New Guinea, Kiribati, Tuvalu, Nauru, the Federated States of Micronesia, and the Solomon Islands). Most of the benefits that these six States enjoy from the WCPO tuna fisheries come from skipjack (compared to bigeye and yellowfin), purse-seine fisheries (compared to longline and other gears), and licensing revenue for access to their EEZ (compared to their vessel registry interests).

These interests provide an incentive for these six States to support measures that distribute much of the conservation burden onto longline fleets. The dominant coastal State interests of these six States also encourage these States to support conservation measures that distinguish between high seas and EEZs.

The seventh of the purse-seine/skipjack States is the United States. The United States is dominated by its vessel registry interests, which provide significantly greater catches from the WCPO tuna fisheries, than the catch from within its EEZ. Although far less significant in the context of its overall interest, the United States also catches substantial amounts of bigeye through its Hawaiian longline fisheries. These interests provide incentives for the United States to support measures that minimise the conservation burden on its purse-seine DWFN fleets and its coastal longline fisheries. As an established DWFN, the United States also has a strong interest in protecting its historical level of activity and would be motivated to argue for measures that distribute the burden of conservation across all waters of the WCPO, without regard to waters under national jurisdiction.

The United States, the Solomon Islands, the Marshall Islands, the European Union, Ecuador, El Salvador, and New Zealand also have significant interests in purse-seine
fisheries that set on FADs. South Korean fleets on the other hand report a far lower use of FADs. Consequently, a conservation measure that proposes a FAD prohibition to address overfishing of juvenile bigeye will have far less impact on Korean interests than a generalised limit on purse-seine effort. Alternatively, heavily FAD-reliant purse-seine fleets may consider a generalised limit on purse-seine effort to affect their interests less significantly than a prohibition on the use of FADs. As noted above, similar questions arise for coastal States, although there is less differentiation and the coastal States have been actively pursuing a reduction in FAD usage through the PNA FAD closures.

The remaining seven core States have fishing interests that are more widely distributed across multiple gears, mostly longline and purse seine but also some pole-and-line and other artisanal gears. They are Japan, the Philippines, Indonesia, Chinese Taipei, South Korea, China, and the Marshall Islands. Each of these States is a significant flag State, while four of these also have significant coastal State catches. The Marshall Islands has a significant fleet that returns more benefit than the fisheries within its EEZ, and has a strong interest in skipjack but also has a moderate interest in yellowfin, and minimal interest in bigeye. China is evenly split as a flag State with moderate interests in bigeye, skipjack and yellowfin. Korea and Indonesia have strong skipjack interests balanced with moderate bigeye and yellowfin interests. The Philippines has a strong skipjack interest balanced with a moderate yellowfin interest. Chinese Taipei is dominated by yellowfin interests within its coastal waters, while its flag State interests are more evenly balanced between skipjack, yellowfin, and bigeye. Japanese interests are fairly evenly spread between the three species, favouring skipjack as a flag State and bigeye as a coastal State. These States must balance the costs and benefits of different conservation measures across their own domestic interests when considering how best to address conservation challenges.

The positions of the coastal States with mixed interests in multiple gears and species are further complicated by their significant flag State interests. This is particularly a challenge for Indonesia and the Philippines, which have extensive vessel interests that extend into the high seas. This significantly undermines any motivation that these States may have in supporting high seas closures or conservation measures that prioritise conservation reductions on the high seas over waters under national jurisdictions.

**DEVELOPMENT INTERESTS**

Conservation and management measures may also impact heavily on developing States that depend significantly on these fisheries and have strong aspirations to further develop their benefits. *Almost all of the key coastal States in the WCPO tropical tuna fisheries are developing States. These States are ultimately responsible for managing the majority of the WCPO tropical tuna fisheries and implementing conservation and management measures.* In addition to their rights and responsibilities over the fisheries within their EEZs, they have significant interests in various fishing activities and aspire to further develop their interests and benefits. Some of these States will have few other development and resource options and will be more heavily impacted by the conservation burden than other States with diverse resources, large institutions, and substantial revenue streams from multiple economic activities.

The special requirements of these developing States were a core issue in the negotiation of the WCPF Convention and were incorporated into its Article 30. The Pacific Islands Forum Fisheries Agency referred to this Article as the ‘foundation on which the Commission will be built’. Article 30.2 establishes the principle...
that the WCPFC must take into account the special requirements of developing States (and territories and colonies), particularly small island States. In this context, the WCPFC must consider: the vulnerability of these States and territories that depend on the fisheries, including food-security concerns; the need to avoid adverse impacts on, and ensure access to fisheries by, subsistence, small-scale and artisanal fishers and fishworkers, as well as indigenous people in these States and territories; and the need to ensure that measures do not result in transferring, directly or indirectly, a disproportionate burden of conservation action onto these States and territories. These special requirements, and the importance of marine resources to the sustainable development of these States, have also been recognised in other globally significant agreements, such as the Barbados Programme of Action for the Sustainable Development of Small Island Developing States and the World Summit for Sustainable Development’s (WSSD) Johannesburg Plan of Implementation.

In this context, the small island developing State members of the WCPFC have actively supported the insertion of an exemption in every WCPFC conservation and management measure to protect the development aspirations of small island developing States and territories in accordance with Article 30 of the WCPF Convention. Paragraph 6 of CMM 2008-01 exempts the domestic fisheries of these States from the conservation limits that are prescribed in the conservation measure.

FOOD SECURITY AND ARTISANAL FISHING INTERESTS

Many of the WCPO coastal States are home to coastal communities that depend heavily upon living marine resources for food security and employment in artisanal fisheries. Among the Pacific islands, the tuna fisheries represent an important source of protein. Scientists have recommended that Pacific island governments should increase local access to these tuna fisheries in order to partly meet increasing Pacific island food security requirements. Recent studies have estimated that 75% of Pacific island coastal fisheries will not meet projected food security needs due to a forecast 50% growth in population by 2030, limited productivity of coastal fisheries (exacerbated by overfishing), and inadequate national distribution networks.

Similarly, coastal communities within Vietnam, Indonesia and the Philippines also depend heavily on living marine resources for food security. Unfortunately, coastal fisheries resources throughout Southeast Asia are in severe decline due to overfishing. This is increasing poverty throughout artisanal fishing communities and reducing the contribution of fisheries to food security, among other things.

The following coastal States are home to coastal communities that depend upon WCPO tuna fisheries for food security and artisanal employment to some degree: Indonesia, Papua New Guinea, the Philippines, Japan, the Solomon Islands, New Caledonia, U.S. territories, Tokelau, Tuvalu, Palau, Nauru, Kiribati, the Marshall Islands, Samoa, Fiji, American Samoa, Vanuatu, the Cook Islands, French Polynesia, Niue, and Tonga. Many of the subsistence and artisanal fisheries that operate in these States and territories catch significant proportions of tuna. It bears noting that 11 of the 14 core States have interests in food security for their coastal communities.

The value of artisanal catches in some Pacific island States may exceed the value of commercial catches. For example, Kiribati received approximately AU$32 million in government revenue from distant water fishing access fees in 2008. However, the artisanal
fishing industry caught approximately 12,800 mt in 2008, valued at around AU$33.2 million. While much of this value was consumed locally and provided little revenue, the locally based artisanal fleets operated approximately 4,800 vessels (less than 7 meters) and directly or indirectly employed 20,000 people—roughly 20% of the entire Kiribati population.60

Many of the States with food-security interests must balance tensions between artisanal and commercial fishing interests. Many Pacific island States have implemented regulations to protect near-shore artisanal fisheries and prohibit distant water fleets from fishing within coastal exclusion zones. Nevertheless, artisanal communities throughout the WCPO region continue to express concerns at the perceived impacts of distant water fishing fleets on artisanal fisheries.61 These tensions are likely to increase if coastal fisheries continue their decline and increasingly transfer effort to near-shore skipjack tuna and anchored FADs.

Given their food security interests, these coastal States will suffer from conservation measures that limit artisanal catches or inequitably transfer any conservation burden onto artisanal communities. Furthermore, these States will have an explicit interest in ensuring that key fish stocks are sustained at a level to support continued food security for coastal communities.

MARKET INTERESTS

A number of States around the world, including many of the core 14, have a market interest in the WCPO tropical tuna fisheries through their consumption of tuna products. Figure 12 demonstrates the global nature of the market for WCPO tuna and illustrates the largest market States (dark red).

FIGURE 12. Map of market States with interest in WCPO tuna fisheries (includes processing States that import loins for processing and subsequent export).
Tropical tuna are processed into a variety of products, ranging from minimally processed fresh and frozen whole tuna (i.e., bigeye and yellowfin), through various loining stages to fully processed canned retail products (i.e., skipjack and yellowfin). Canned tuna is one of the most significant products that originate from the WCPO purse-seine fisheries. Processing of canned tuna occurs in two stages. Loining is where the fish is headed, gutted, de-boned, pre-cooked and prepared for canning. The loins are then canned and cooked a second time in an automated process.

The commodity chains that provide the raw tuna, through the processing stages, and into the final retail product are complex and globalised. Much of the product (particularly canned tuna) is traded through a small number of companies. Given the complexity of the global tuna commodity chain, and the highly globalised market, it is difficult to consistently determine exactly what proportion of each tuna product in each market originated from the WCPO tuna fisheries. Global market reports and industry studies do not break down import and export of retail or processed product by coastal State origin and only provide export data for processing States or ‘producer’ States. This can be misleading if interpreted incorrectly, as producer States may not include catches taken through access agreements inside EEZs by foreign vessels. For example, three of the core 14 States (Kiribati, Tuvalu, and Nauru) report little or no tuna export despite the significance of their coastal catches, because these catches are not landed.

This analysis works around this limitation by cross-referencing various industry reports and secondary literature, so as to determine where most WCPO catch goes for processing, and consequently which States have a significant interest in processing that is, in part, dependent upon tropical tuna sourced from the WCPO fisheries. However, it is not possible to consistently determine the exact proportion of the exported processed product that originated from the WCPO tuna fisheries. Within this limited context, the analysis identifies the world’s key processing States that land or import tuna from the WCPO, and then assesses their interest in processing by the significance of their total processed tuna exports. Given that these States import or land tuna from the WCPO, and the global significance of the WCPO tropical tuna fishery, the analysis makes an assumption that the State therefore has an interest in continuing supply from the WCPO tropical tuna fisheries for its processing operations.

The analysis also assesses import and export data for canned tuna and identifies those markets with the most significant interests. The assessment is based on imports of canned tuna for retail consumption. The connections to the WCPO tropical tuna fisheries are confirmed through the commodity chain, industry reports or secondary literature. For example, Thailand is identified as the world’s largest processor of canned tuna. Thailand is also the recipient of almost half of the WCPO’s purse-seine catch. Therefore, there is a reasonable assumption that markets which are supplied by Thailand canneries consume some amount of tuna from the WCPO.

**CANNING AND LOINING MARKET INTERESTS**

The WCPO tropical tuna fisheries are a critical source of raw product for tuna processing. A large number of intermediary ports and processing States, from Europe through Asia to the Americas, are increasingly impacted by landings and processing of tuna caught in the WCPO. Thailand is the most significant canning and loining processor of tuna caught
in the WCPO. Other States with canning and loining industries that land or import tuna (raw or loins) from the WCPO include: Japan, Philippines, Korea, China, Vietnam, Indonesia, American Samoa, Papua New Guinea, Ecuador, El Salvador, Mexico, Fiji, Solomon Islands, Marshall Islands, Tonga, Italy, and Spain.\(^6^8\)

Some WCPO States and territories also export various fresh, smoked and frozen products to global markets. Much of this requires minimal processing infrastructure compared to canning and loining, although some operations such as katsuoboshi\(^6^9\) require significant processing infrastructure. States with such processing and export interests include:\(^7^0\) Chinese Taipei, Korea, Japan, Vanuatu, Indonesia, Papua New Guinea, Thailand, Philippines, China, Fiji, Marshall Islands, USA, New Zealand, Niue, Palau, Vietnam, Australia, Solomon Islands, Federated States of Micronesia, Samoa, Cook Islands, and Tonga.

While it is not possible to assess the level of interest that these States have in processing WCPO tuna, it is fairly clear that Thailand, USA, Japan, China, Philippines, Korea, American Samoa, and increasingly Papua New Guinea and Indonesia all have significant interests in domestic processing operations that are highly dependent upon consistent supplies of skipjack and yellowfin. Consequently each of these States has a strong interest in the continued operation of the skipjack and yellowfin fisheries and their provision of cheap raw material for their factories. The interests within these States may suffer if conservation measures were to restrict supply seasonally (as could happen if the WCPFC were to adopt proposals to close the entire WCPO purse-seine fishery for 3 months a year),\(^7^1\) or increase the costs of raw materials, as may have occurred following the adoption of CMM2008-01.\(^7^2\) Similarly, these States would suffer if the WCPFC failed to address sustainability concerns for yellowfin. For those States with other coastal State interests, this may present internal tensions as these States balance their interests in a cheap supply for processing factories with an interest to increase access and licensing revenue through tightening supply and access.

**CONSUMER MARKETS**

The largest tuna markets in the world for fresh, frozen, smoked, and canned tuna are the USA, Japan, and Europe.\(^7^3\) All of these markets, to some degree, depend upon the WCPO tropical tuna fisheries for their supply. In addition, markets in developing States are looking towards domestically produced and imported canned tuna to counter food insecurity and as a cheap form of protein.\(^7^4\) Within this context, conservation and management decisions within the WCPFC, particularly in regard to skipjack and purse-seine fisheries, can quickly affect global markets and have significant repercussions on prices.\(^7^5\)

Within the European Union, the key markets for canned tuna that have some proportion originating from the WCPO tuna fisheries are the United Kingdom, Germany, Italy, European Union (Spain), Belgium, France,\(^7^6\) and the Netherlands.\(^7^7\) Other identifiable markets for WCPO sourced canned tuna include:\(^7^8\) Australia, Egypt, Libya, Canada, Saudi Arabia, South Africa, Korea, Mexico, Poland, Tunisia, Turkey, Iran, Syria, Israel, Argentina, and the United Arab Emirates.

These States each have a strong interest in the continued provision of cheap skipjack and yellowfin, and the long term sustainability of these fisheries. The market interests within these States may suffer if the WCPFC were to fail to address sustainability concerns for yellowfin, or were to adopt conservation measures that increased the costs of skipjack and yellowfin enough to impact on retail prices.
The largest markets for non-canned tropical tuna, primarily bigeye and yellowfin, but also some skipjack in smoked forms, are Japan, the United States, Europe, and other Northeast Asia States (South Korea, China, Chinese Taipei). In Europe, tuna is consumed mainly as steaks, while Americans consume tuna as steaks and sashimi. Japan primarily consumes tuna as sashimi.\textsuperscript{79} As above, it is not currently possible to consistently determine exactly what proportion of this trade originates from the WCPO tuna fisheries. However, given general references to exports of WCPO fresh, smoked, and frozen products to these markets, it is reasonable to state that these are important markets for fresh, smoked, and frozen tuna from the WCPO.\textsuperscript{80} Furthermore, there are a number of smaller domestic markets throughout the region for local landings of fresh and frozen tuna, and small but significant export markets to Australia, Canada, and New Zealand.\textsuperscript{81}

All the market States identified above have some level of interest in the continued sustainability of bigeye and yellowfin, but none more so than Japan. Japan’s overwhelming share of the sashimi market, and that market’s dependence on bigeye and high-grade yellowfin (in addition to other fisheries for bluefin), gives it a strong market-driven interest in the sustainability of bigeye and yellowfin. Japanese market interests would suffer if longline CPUE for bigeye and yellowfin were to decline, forcing prices to rise.

Much like the fishing interests discussed earlier, the market interests of the States identified above may conflict domestically in States that consume significant amounts of canned tuna, and significant amounts of fresh and frozen tuna, particularly in the case of Japan and the United States with their large markets for high-grade sashimi. The United States and Japan, and to a lesser extent South Korea, China, Chinese Taipei, and Europe, must balance the costs and benefits of different conservation measures across their own domestic market interests in canned tuna and sashimi when considering how best to address conservation challenges.
PART THREE: CONSERVATION AND MANAGEMENT CHALLENGES

The WCPFC faces an increasingly complex and urgent conservation and management challenge. The scientific assessments clearly indicate that urgent action is required to address overfishing and reduce fishing mortality for bigeye, halt any increases in fishing mortality for yellowfin, reduce fishing mortality of juvenile bigeye and yellowfin, and develop precautionary limits for skipjack.

The conservation challenge is complicated by the multigear, multispecies, and multinational characteristics of the WCPO tropical tuna fisheries. Each species of tropical tuna is caught by each gear in a tightly intermeshed manner that is difficult, if not impossible, to separate. Consequently, this makes the fishery inherently challenging to manage. This complexity is exacerbated by the substantially different biological characteristics of skipjack, yellowfin, and bigeye (i.e., highly resilient and productive skipjack compared to the longer-lived and less productive bigeye).

The complex and intermeshed nature of the WCPO tropical tuna fisheries makes it extremely challenging to address a specific management issue, such as overfishing of bigeye, with a narrowly focused management response. Consequently, the WCPFC and its members must develop, negotiate, and implement a conservation and management measure that includes a package of management options that will collectively achieve the conservation goal. The conservation and management measure must meet the following requirements.

1. **It must be consistent with the WCPF Convention and other relevant instruments. The conservation and management measure must.**
   a. be based on the best scientific evidence available;
   b. ensure the long-term conservation and sustainable use of the WCPO tuna fisheries and their optimum utilisation;
   c. maintain or restore stocks at levels capable of producing maximum sustainable yield, as qualified by relevant environmental and economic factors;
   d. adopt a precautionary approach;
   e. avoid adverse impacts on the marine environment and maintain the integrity of marine ecosystems;
   f. ensure that conservation and management measures do not result in transferring a disproportionate burden of conservation onto developing State parties and territories.

2. **In order for the conservation and management measure to be consistent with the best available scientific evidence (advice of the WCPFC Scientific Committee), the measure must.**
   a. reduce fishing mortality for bigeye by a minimum of 39% from 2004 levels, or 28% from average 2001–04 levels, or 32% from average 2006–09 levels;
   b. reduce fishing mortality of juvenile bigeye in order to increase potential yield and optimise utilisation;
   c. ensure no increase in fishing mortality for yellowfin in the western equatorial region;
   d. reduce fishing mortality of juvenile yellowfin in order to increase potential yield and optimise utilisation;
   e. implement precautionary limits on fishing activities for skipjack.
3. In order for the conservation and management measure to be consistent with the scientific advice and address the key impacts on the tropical tuna stocks, the measure must balance a mix of management options that:
   a. limit longline catches of bigeye;
   b. restrict purse-seine fishing activities;
   c. limit pole-and-line catches of yellowfin in the Japanese region;
   d. limit catches of bigeye and yellowfin within the Indonesian and Philippine fisheries.

CONSERVATION AND MANAGEMENT OPTIONS

The WCPFC can utilise a number of management options to meet these requirements. Each of these management options will support conservation and management objectives to varying degrees. However, each of these management options will also directly and indirectly impact upon the interests of WCPFC members to varying degrees. Key management options include:

- **Seasonal closures.** Some WCPFC members have supported the introduction of seasonal closures on the purse-seine fishery in order to reduce fishing effort, and therefore reduce fishing mortality of bigeye, yellowfin, and skipjack. The efficacy of this measure depends upon the degree to which the restriction truly removes the effort from the fishery. It is likely that fleets will respond through maximising non-fishing days (i.e., maintenance, transits, etc.) during seasonal closures in order to minimise reductions in fishing effort.

- **Area closures.** Some WCPFC members have supported the introduction of area closures to reduce fishing effort and thereby reduce fishing mortality of bigeye, yellowfin, and skipjack. CMM 2008-01 currently includes provisions that close two high seas pockets to purse-seine fishing. As with seasonal closures, the efficacy of this measure depends upon the degree to which the restriction truly removes the effort from the fishery. It is likely that fleets will respond through migrating to other fishing zones such as EEZs, archipelagic waters, and other high seas. It appears that such high seas closures will only reduce fishing mortality if the effort is physically removed from the region, rather than simply transferring to another area. The application of an area closure is likely to impact most on host coastal States if the area occurred within an EEZ, and on fleets that have historically fished within the area to be closed. High seas closures are likely to benefit coastal States that will experience increased competition for access. The use of high seas closures in a mix of measures offers opportunities for the WCPFC to comply with Article 30 and avoid disproportionate transfers of conservation burden onto developing coastal States.

There has also been some suggestion to close or restrict longline fishing in spawning areas. This has been identified as a potentially effective option, in combination with other measures that implement area closures for purse-seine vessels and reduce effort. The application of such a measure is likely to impact most on host coastal States (if the closure were to occur inside an EEZ) and on fleets that have historically fished within the area to be closed. As noted above, high seas closures would benefit coastal States that will experience increased competition for access.
**Gear restrictions.** CMM 2008-01 prescribes a three-month prohibition on the use of FADs by the purse-seine fishery. Recent assessments have indicated that this has been highly successful at reducing bigeye fishing mortality and has a strong impact on bigeye conservation. Assessments have also suggested that reductions in catches during the FAD closure may be offset by the larger average size of fish caught. Further restrictions and limitations on the numbers of FADs that can be set are likely to impact significantly on some fleets that have historically used FADs more than others, and also on some coastal States where the use of FADs is higher than elsewhere. Other gear restrictions are also feasible, including restrictions on purse-seine mesh size, time restrictions on deployment or retrieval, types of hooks, etc.

**Capacity limits.** Some WCPFC members have strongly argued for the implementation of capacity limits to reduce effort, thereby reducing fishing mortality and increasing profitability. The WCPO tropical tuna fisheries suffer from overcapacity in the purse-seine fleet, and to a declining degree in the longline fleet. Reducing this capacity to a sustainable level would remove overfishing pressures and increase the economic efficiency of the fishing fleets, thereby potentially allowing for higher access fees to be paid to coastal States. However, capacity limits can be undermined by effort creep where vessels become faster, larger, more powerful, and more effective at catching fish, thereby effectively increasing capacity. Some members have strongly opposed capacity limits due to concerns that this would limit development opportunities for developing coastal States and impose a disproportionate conservation burden on developing State Parties. In addition, such reductions in capacity could limit demand for access and potentially negatively impact on coastal State access revenue.

**Catch and effort limits.** CMM 2008-01 implements catch limits on the longline fishery for bigeye and yellowfin and effort limits on the purse-seine fishery through the endorsement of the PNA vessel-day scheme, and the commitment to consider the development of a compatible vessel-day scheme for the high seas and non-PNA EEZs. These two management options provide a relatively transparent management mechanism for directly limiting fishing mortality. The efficacy of these management options depends on the consistency of the catch and effort limits with the scientific advice, and the monitoring of their implementation to avoid misreporting and discards. Any exemptions or special conditions must be considered during the formulation of the measure to ensure that these do not inflate the total catch or effort beyond the recommended fishing mortality. It is critical that adequate monitoring mechanisms are implemented to ensure that all catches and effort are accurately reported. The allocation of catch limits to national fleets and effort limits to areas has largely avoided problems inherent with ‘Olympic’ limits, that motivate a race to fish, but further discussion is likely to be required to more fully allocate catches and effort for high seas fisheries. Such discussions can quickly become contentious given the lack of an agreed framework for the distribution of such limits, and the need to ensure that any allocation of limits does not result in a disproportionate burden of conservation onto developing State parties and territories. Other feasible effort limits can include further restrictions on transhipments-at-sea to reduce opportunities to continuously maintain fishing effort without interruption.
DISCUSSION

In summary, there are a handful of States that control access to the WCPO tropical tuna fisheries and have the power to manage the interests involved. These core 14 States control the most productive waters and the vessels that fish in them. All of these States have a vested interest to some degree in the long-term sustainability of some part of the fishery. However, there is no straightforward interest among these 14 States to resolve the current overfishing of bigeye because the interests of this group in bigeye are less influential due to complications from three factors.

First, each of these States has a dominant or at least strong interest in purse-seine fisheries for skipjack that complicates any interest in conserving bigeye. In addition, bigeye is simply worth less in overall value (across the WCPO tropical tuna fisheries) with fewer States holding an immediate interest in its conservation.

Second, longline fishers have historically reported much of their bigeye catch as originating from the high seas. In 2010, 87% of all WCPO tuna catches were taken from within waters under national jurisdiction, yet only 60% of longline fishing for bigeye was reported as occurring in these waters. Given that there appears to be no biological or oceanographic reason for this difference, it appears reasonable to assume that longline activities were focused more heavily on the high seas to reduce the costs of paying license fees to coastal States. Regardless of whether these reports accurately reflect the location of the fishing activity, the effect of this high seas focus is that there is very little incentive for coastal States to bear a significant conservation burden for bigeye.

It appears that the weak position of bigeye, and the unwillingness of members to compromise their interests, are key factors in the WCPFC’s failure to adopt a sufficiently strong conservation and management measures. Delegations have stated that compromises are required and that an equitable approach should be adopted. When negotiations begin in earnest, however, it appears that this spirit of compromise and equitable distribution is rarely applied.

In practice, individual WCPFC members have generally demonstrated a desire to distribute the burden of conservation elsewhere. For example, in 2008 the United States proposed that measures should be applied to EEZs and archipelagic waters, while arguing for special treatment for its purse-seine fleet. The Americans won special treatment for their fleet and subsequently increased the size of their purse-seine fishing fleet to a level far above their reported level of purse-seine effort between 2001 and 2004. This was subsequently identified in 2009 as a key reason for the ineffectiveness of CMM 2008-01. In response, delegations from Japan, China, Chinese Taipei, South Korea, and the Philippines complained in 2009 that the U.S. special treatment was unfair and that they were not prepared to accept any further burden of conservation on their longline interests unless this unfair treatment was addressed.

Japan has demonstrated similar behaviour on previous proposals for capacity limits that would entrench Japan’s historically high levels of fishing effort and place the majority of the conservation burden on developing States and new entrants by limiting their capacity at historically low levels.

Small island developing coastal States have demonstrated such behaviour with their drive to close high seas pockets and limit the application of measures to their EEZs and archipelagic waters. These States oppose any seasonal closure to purse-seine fishing across the entire WCPO and have successfully argued that CCM 2008-01 should incorporate their existing coastal State management arrangements for tuna and apply compatible measures to the high seas.
The Philippines and some other DWFNs attempted to protect their interests in high seas fisheries by opposing high seas closures in 2008, 2009, and 2010. This was particularly problematic for the Philippines due to the significant interests of its fishing fleets that fish both within its EEZ and in neighbouring high seas pockets.

South Korea has favoured measures that prohibit or heavily restrict the use of FADs over seasonal closures that would simply shut down the entire purse-seine fishery for a period of time. This is consistent with their fleet’s minimal use of FADs and their strong interest in purse-seine fisheries. On the other side of FAD negotiations, the European Union and other States have favoured seasonal closures over FAD prohibitions. This is consistent with their high usage of FADs. In addition, the 2010 proposal by the European Union to remove high seas closures and apply a purse-seine closure across the entire Convention Area is consistent with their dominant interests as a DWFN flag State (the European Union is not responsible for any coastal waters within the WCPO).

The reluctance shown by WCPFC members to compromise their purse-seine interests has also been demonstrated by Asian DWFNs and the United States in regard to their longline fleets. Although longline interests are not as influential as purse-seine interests, they are nevertheless moderate to strong within the Asian DWFNs, and significant within the U.S. EEZ surrounding Hawaii. For example, the United States successfully negotiated special conditions in 2008 that protected its longline bigeye interests and significantly reduced the conservation burden on U.S. longline interests.

After blocking longline reductions in 2007, Asian DWFNs reluctantly accepted that longline catch should be reduced by 30% in CMM 2008-01. Since then, they have opposed any further reductions in longline catch and argued that they will not compromise further until they believe that the burden of conservation is distributed more evenly.

Given current levels of overfishing, a sustainable solution for bigeye will require that some or all States agree to compromise their interests and carry some of the conservation burden. This raises important questions that are fundamental to conservation and management negotiations.

For example, given that the longline fishery will benefit from conservation reductions in bigeye mortality, should those States with significant interests in longline fisheries bear a greater share of the conservation burden than those States with minimal interests in bigeye longline fisheries that will receive no direct benefit from reductions in bigeye mortality?

When considering the distribution of the conservation burden, should the WCPFC value the shared nature of common rights to high seas fisheries less than the exclusive nature of sovereign rights over fisheries within EEZs? How might these rights be weighed against the absolute sovereignty that coastal States hold over fisheries within their archipelagic waters or territorial seas? Does the immobility of a coastal State’s rights over its EEZ grant it greater consideration compared to the flexibility of a DWFN’s rights? (A distant water fishing vessel is highly mobile and can relocate if overfishing in one region reduces a highly migratory stock below profitable levels. In contrast, a coastal State is vulnerable to overfishing in neighbouring EEZs and adjacent high seas and cannot move its EEZ to another region if stocks decline below profitable levels).

When considering matters of food security and the impact of conservation reductions, how should the WCPFC consider the diversity and choices of food enjoyed by distant markets compared to the limited options available to artisanal communities in coastal developing States? Should a consumer of luxury sashimi in New York or Tokyo be given equal weight to an artisanal community in Kiribati or the Philippines?
When considering how to reduce effort or catches of fishing fleets, should a historically high level of catch and fishing activity be prioritised, or penalised if it is considered more equitable to share benefits in turn? How should the development aspirations of developing States be recognised in practice?

The WCPFC does not currently discuss these questions, nor does it study the interests of its members, or the impact of proposed measures on these interests. Instead, the WCPFC addresses deeply political and economic arguments within a conservation science framework. This scientific framework then becomes politicized as members propose conservation arguments for measures that best protect their own interests, and refute conservation arguments for measures that compromise their interests. Ultimately, this undermines the conservation science while still leaving these political and economic questions unanswered.

CONCLUSION

Given the collective failure of WCPFC members to address overfishing of bigeye, it is arguable that overfishing will continue until the WCPFC negotiates a measure that transparently recognises the benefits and costs, and equitably distributes the burden of conservation in a manner consistent with the WCPF Convention. To date, the WCPFC has failed to successfully resolve the political aspects of this problem, and consequently, the members have proved to be unwilling to compromise their interests.

It is unlikely that the WCPFC will be able to develop and negotiate such a response across its plenary table without first agreeing on a conceptual framework that provides for differential application of measures to the degree necessary to recognise the divergent interests while allowing for sufficient reductions in fishing mortality. Consequently, this paper suggests that a new ‘discussion’ is required that allows for the development of such a conceptual framework. This discussion would move beyond the conceptual level of rights-based models and provide the concrete steps that explicitly determine what conservation burden each State would carry depending on its national characteristics.

The WCPFC is the only regional institution with a mandate to regulate all WCPO tuna fisheries across their entire range and ensure their long-term conservation and sustainable use. However, despite this mandate, the WCPFC has repeatedly failed to adopt conservation and management measures that are sufficient to meet its own Scientific Committee’s recommendations.

In 2008, the WCPFC celebrated significant achievements in negotiating a contentious conservation measure that broke new ground. In 2012, it will need to build significantly on these precedents and expand the application of the conservation measure so that it fully implements the requisite reductions in fishing mortality and overall effort.

“The decisions that we arrive at in order to achieve the long-term goal of sustained utilization of the region’s tuna resources will involve concessions from all those currently involved in the fishery. This is a fact of the situation. If the current levels of fishing are excessive and are not sustainable, steps will need to be taken to reduce the fishing effort in a way that does not unfairly disadvantage anyone that has a demonstrated long-term and dependent interest in the fishery.”

His Excellency Joseph J. Urusemal
President of Federated States of Micronesia, 2003 to 2007
REFERENCES

1 This estimate is based on analysis of vessel records, catch data and market sources. References for catch data and market sources are identified and discussed in the Executive Summary. Vessel registry sources were:


5 For selected readings, see:


Reid, C., M. Bertignac et al. (2006). Further Development of, and analysis using, the Western and Central Pacific Ocean Bioeconomic Tuna Model (WCPOTBM). Honiara, Solomon Islands. FFA and SPC.


8 Derived from Terawasi and Rodwell. Value of WCPOT Tuna Fisheries (Excel database).


12 Terawasi and Rodwell. Value of WCPOT Tuna Fisheries (Excel database).


14 For discussion of data uncertainties and problems with non-reporting and misreporting of catches by both vessels and States, see:


15 Data sourced from Terawasi and Rodwell. Value of WCPOT Tuna Fisheries (Excel database).

16 Data sourced from Terawasi and Rodwell. Value of WCPOT Tuna Fisheries (Excel database).

17 Sibert and Hampton suggested in 2003 that the restricted migratory behaviour of yellowfin could allow for restrictions to apply in one fishery and not in another distant fishery without undermining the conservation goal. Sibert, J., and J. Hampton. (2003). Mobility of Tropical Tunas and the Implications for Fisheries Management. Marine Policy. 27.


21 Gillett. Marine Fishery Resources of the Pacific Islands. p38.


26 Gillett. Marine Fishery Resources of the Pacific Islands. p38.


29 Hoyle, S., P. Kleiber et al. Stock Assessment of Skipjack Tuna in the Western and Central Pacific Ocean. Seventh Regular Session of the Scientific Committee to the Western and Central Pacific Fisheries Commission. Pohnpei, Federated States of Micronesia. 9-17 August 2011. WCPFC.


Langley, A., S. Hoyle et al. Stock Assessment of Yellowfin Tuna in the Western and Central Pacific Ocean. Seventh Regular Session of the Scientific Committee of the Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific. WCPFC.

Langley, A., J. Hampton et al. (2008). Stock Assessment of Bigeye Tuna in the Western and Central Pacific Ocean, including an Analysis of Management Options. Fourth Regular Session of the Scientific Committee to the Western and Central Pacific Fisheries Commission. Port Moresby, Papua New Guinea. WCPFC.


Davies, Hoyle et al. (2011). Stock Assessment of Bigeye Tuna in the Western and Central Pacific Ocean. Seventh Regular Session of the Scientific Committee of the Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific.


Davies, Hoyle et al. Stock Assessment of Bigeye Tuna in the Western and Central Pacific Ocean. Seventh Regular Session of the Scientific Committee of the Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific.


In response to these concerns, the WCPFC has adopted various resolutions and conservation and management measures. Example measures that were in force as of July 2010 include:


Moron, J., J.J. Areso et al. (2001), Statistics and Technical Information About the Spanish Purse Seine Fleet in the Pacific. 14th Meeting of the Standing Committee on Tuna and Billfish. Noumea, New Caledonia, 9-16 August. SPC.


Fonteneau, Pallares et al. The Effect of Tuna Fisheries on Tuna Resources and Offshore Pelagic Ecosystems.

Hallier and Gaertner. Drifting Fish Aggregation Devices Could Act as an Ecological Trap for Tropical Tuna Species.

Hallier and Gaertner. Drifting Fish Aggregation Devices Could Act as an Ecological Trap for Tropical Tuna Species.


For selected readings, see:

Campbell. Investing in Yellowfin Tuna: The Economics of Conservation.

Bertignac, Campbell et al. Maximising Resource Rent from the Western and Central Pacific Tuna Fisheries.

Reid, Bertignac et al. Further Development of, and analysis using, the Western and Central Pacific Ocean Bioeconomic Tuna Model (WCPOTBM).

Kompass and Tuong. Economic Profit and Optimal Effort in the Western and Central Pacific Tuna Fisheries.
Hannesson and Kennedy. Rent-Maximisation Versus Competition in the Western and Central Pacific Tuna Fishery.

49 Bertignac, Campbell et al. Maximising Resource Rent from the Western and Central Pacific Tuna Fisheries.

Kompass and Tuong. Economic Profit and Optimal Effort in the Western and Central Pacific Tuna Fisheries.

50 Reid, Bertignac et al. Further Development of, and analysis using, the Western and Central Pacific Ocean Bioeconomic Tuna Model (WCPOBTM).


54 Bell, Kronen et al. Planning the Use of Fish for Food Security in the Pacific.


57 No comprehensive dataset exists on the significance of tuna in terms of artisanal fisheries and food security to WCPO coastal States. Data is compiled from multiple sources, including:


Silvestre, Garces et al. South and South-East Asian Coastal Fisheries: Their Status and Directions for Improved Management. Conference Synopsis and Recommendations. p24.


Barclay and Cartwright. Capturing Wealth from Tuna: Case Studies from the Pacific.


For detailed discussion of commodity chains and markets for WCPO origin tuna, see: Campling, L., E. Havice et al. (2007). Pacific Island Countries, the Global Tuna Industry and the International Trade Regime: A Guidebook. Honiara, Solomon Islands. FFA.

Barclay, K., H. Parris et al. (2009). Tuna Trade Flows from the Coral Triangle. Sydney, Australia. TRAFFIC.


Trimarine, FCF and Itochu are globally integrated companies that control most of the trade in canned tuna from the WCPO. For additional details, see Campling, Havice et al. Pacific Island Countries, the Global Tuna Industry and the International Trade Regime: A Guidebook.

For example, the U.N. FAO Globeish Tuna Commodity Update provides summaries of tuna production by ocean (i.e., WCPO, Eastern Pacific, Indian, Atlantic) but does not subsequently designate ocean of origin in export and import data, nor does it provide any further detail on coastal State origin or subregion. Sabatini, P., and H. Josupeit. (2010). Tuna Commodity Update. Rome. FAO Globeish.


Personal notes from attendance at the fifth session of the WCPFC during a presentation by Michael McGowan from Bumble Bee Foods. 8 December 2008.


Trimarine. Tuna Markets and Seiner Capacity.

Katsuoboshi are hot-smoked, then mould-cured skipjack. Other related products (fushi mono) utilise similar treatments on yellowfin and mackerel species. Barclay, Parris et al. Tuna Trade Flows from the Coral Triangle. p49.

All listed States are identified (unless separately noted) as exporters of fresh and frozen tuna in Sabatini and Josupeit. Tuna Commodity Update. p56.

Japan is identified in Sabatini and Josupeit as a significant exporter of fresh and frozen tuna. It is also home to 90% of all katsuoboshi processing that utilises purse-seine- and pole-and-line-caught skipjack from the WCPO. Barclay, Parris et al. Tuna Trade Flows from the Coral Triangle. p49.


Fiji is identified in Sabatini and Josupeit with further details in Gillett. Domestic Tuna Industry Development in the Pacific Islands.


Chou. *Managing and Migrating Harvesting Capacity to Retain Profitability.*


France imports some canned tuna from Thailand, but most of its tuna appears to be imported from Indian and Atlantic ocean sources. Campling, Havice et al. *Pacific Island Countries: the Global Tuna Industry and the International Trade Regime: A Guidebook.* p325.


Each of these States imports significant levels of canned or loined tuna from identified processors of WCPO tuna (Thailand, the Philippines, Papua New Guinea), Sabatin and Josupeit. *Tuna Commodity Update.*


There may be other tuna markets where tuna from the WCPO are sold. However, these markets were either not recorded in FAO reports (enabling cross-referencing to demonstrate a link to tuna from the WCPO, or there is no documentation linking these markets to the WCPO. Markets where there is a discernible link include the following: Australia, Egypt, Libya, Canada, Saudi Arabia, South Africa, Korea, Mexico, which import significant levels of canned or loined tuna from identified processors of WCPO tuna (Thailand, the Philippines, Papua New Guinea or domestic operations). References are various tables in Sabatin and Josupeit. *Tuna Commodity Update.*


Catsari. *World Tuna Markets.* p91. Japan is by far the largest market for high-value sashimi tuna (300,000-400,000 metric tons (mt) per year), distantly followed by the United States (30,000-50,000 mt), South Korea (15,000-20,000 mt), China (6,000-10,000 mt), Chinese Taipei (5,000-8,000 mt) and Europe (4,000-8,000 mt). OPRT. (2010). *The Present and Future of the International Tuna Longline Fishing Industry,* RFMO Tuna Management Workshop. Brisbane, Australia, 29 June-1 July 2010. FFA. Slide 9.

For further references to WCPO fresh and frozen exports to USA, Europe and Northeast Asia, see Vera and Hipolito. *The Philippine Tuna Industry: A Profile.* p46.


Articles 2, 5, 6 and 30. WCPFC Convention.


These percentages vary slightly according to whether the calculation is based upon tonnage or value. As the majority of longline activity occurs on the high seas, the proportion of fishery taken from the high seas is higher if calculated by value than if calculated by tonnage. This is due to the higher price paid for longline catches of bigeye and yellowfin over purse-seine catches. Terawasi and Rodwell. *Value of WCPO Tuna Fisheries (Excel database).*

In 2009, the FFA commissioned a series of studies relating to monitoring, control and surveillance. These studies prioritised misreporting of catch by fishing vessels as one of the most significant challenges risks to the management of the WCPO tuna fisheries. FFA. *Safeguarding the Stocks: A Report on Analytical Projects to Support the Development of a Regional MCS Strategy for Pacific Oceanic Fisheries.*

For example, in 2008, at the start of WCPFC negotiations for CMM 2008-01, the U.S. delegation stated that ‘any proposed measure should ensure that the conservation burden is distributed equitably among Members of the Commission and among industry sectors. We emphasise that the criterion here is equitably, rather than equally’. United States. (2008). *Views of the United States on Conservation and Management Measures for Bigeye Tuna and Yellowfin Tuna.* Busan, South Korea. Fifth Regular Session of the Western and Central Pacific Fisheries Commission; 8-12 December 2008.

The United States argued that it should not be bound by the agreed reference points that limited purse-seine effort to the reported maximum in 2004, or the average effort between
2001 and 2004. Instead, the United States argued that its reference point should be set at the hypothetical limit of how many vessels it could have had fishing in the WCPO tuna fisheries during that time in accordance with the multilateral access treaty between the United States and the Pacific island States. This was despite the fact that the multilateral access treaty did not apply to many other members of the WCPO and did not entitle the Americans to any further rights over the high seas fisheries than any other State within the WCPO. See Paragraph 7. CMM 2008-01. Author's personal notes from observations of delegation statements at the Fifth Regular Session of the Western and Central Pacific Fisheries Commission. Busan, South Korea. 8-12 December 2008.


92 In 2005, Japan tabled a proposal to limit capacity and requested that 'there should be a fair starting line for all members for which management measures for bigeye and yellowfin tuna would apply in terms of capacity history'. Japan referred back to the 1999 Multilateral High-Level Conference Capacity Resolution as an indicative date that was before the expansion of purse-seine capacity by Chinese Taipei and supported Japanese historical strengths. Japan noted that it did not want to obstruct the development of developing coastal State's domestic industries but that this development should be sustainable and should not undermine the WCPO's conservation efforts. The author attended the Second Session of the WCPO. Author's personal notes from observations of Japanese delegation statements at the Second Regular Session of the Western and Central Pacific Fisheries Commission, Pohnpei, Federated States of Micronesia. 11-16 December 2005.

93 Author's personal notes from observations of delegation statements at the Fifth Regular Session of the Western and Central Pacific Fisheries Commission. Busan, South Korea. 8-12 December 2008.


95 Author's personal notes from observations of South Korean statements at the Second Regular Session (Pohnpei, Federated States of Micronesia, 11-16 December 2005), the Third Regular Session (Apia, Samoa, 11-15 December 2006), the Fourth Regular Session (Tumon, Guam, 3-7 December 2007), the Fifth Regular Session (Busan, South Korea, 8-12 December 2008), the Sixth Regular Session (Papeete, French Polynesia, 7-11 December 2008), and the Seventh Regular Session of the Western and Central Pacific Fisheries Commission (Honolulu, U.S., 6-10 December 2010).

96 Author's personal notes from observations of statements by Asian DWFNs at the Fourth Regular Session (Tumon, Guam, 3-7 December 2007), Fifth Regular Session (Busan, South Korea, 8-12 December 2008), Sixth Regular Session (Papeete, French Polynesia, 7-11 December 2008) and Seventh Regular Session of the Western and Central Pacific Fisheries Commission (Honolulu, U.S., 6-10 December 2010).


98 Article 2 of the WCPF Convention declares: 'The objective of this Convention is to ensure, through effective management, the long term conservation and sustainable use of highly migratory fish stocks in the Western and Central Pacific Ocean in accordance with the 1992 Convention and the Agreement'.

