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South West Pacific Longline Caught Albacore: Going, Going, Gone?

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Contents

Executive Summary	4
Trends in longline fishing in the Western and Central and Southern Pacific Ocean.....	6
The status of the southern Pacific albacore stock	12
Distortions to fleet economics	14
The status of other target species and bycatches	16
<i>Target species</i>	16
<i>Sharks</i>	17
<i>Turtles</i>	19
Fishery management measures	20
<i>The Measures</i>	20
<i>The effectiveness of the measures on the context of the longline fishery</i>	23
A critical assessment of fishery performance using Marine Stewardship Council guidance	25
Who cares and why	27
Recommendations	28
References.....	29



Executive Summary

WWF (World Wide Fund for Nature) recognises the legitimate aspirations of Pacific Small Island Developing States (SIDS) to increase the value from tuna fisheries in their exclusive economic zones. There is however, considerable concern about the rapid growth in the longline fleets from both the Peoples' Republic of China (PRC) and Chinese Taipei (i.e. as referred to in WCPFC) in the Western and Central Pacific amongst WWF, Western and Central Pacific Ocean (WCPO) fishery managers, and domestic vessel owners in these SIDS. Of the total South Pacific Albacore (SPA) catch of 75,000 tonnes (2010), Chinese and Chinese Taipei catch has increased from 24,000 (2000-2004) to 53,000 tonnes. This catch is derived from around 300 vessels registered in China and Chinese Taipei, but also a growing fleet of 300 plus vessels now fishing under charter, or reflagging to the Solomon Islands, Vanuatu, the Republic of the Marshall Islands (RMI), Federated States of Micronesia (FSM), Fiji, Cook Islands, Papua New Guinea (PNG) and Kiribati.

Growing China and Chinese Taipei fishing activity is believed to have increased both in response to a rapid building strategy of new cost efficient vessels, to economic incentives and support and to fleets transferring from the Indian Ocean, in response to the piracy problems there. As well as finding homes in Pacific Island Countries (PICs), these vessels are also increasing their effort on the high seas, which makes up around half of the total WCPO catch.

This growth in effort is leading to localised depletion of the adult stock, and increased effort south of 20°S, on the juvenile migrating stock, which is contributing to a reduction in biomass, and with the stock rapidly approaching MSY. Equally, all fleets are now experiencing significant reductions in catch per unit effort (CPUE) in response to an increase in adult fishing mortality. The effectiveness of the Western and Central Pacific Fisheries Commission (WCPFC) Conservation and Management Measure (CMM) 2005-02, as amended in 2010, to protect the southern Albacore stock, is now questionable, albeit that the scientists still maintain that the stock remains within biological limits.

This increase in effort will also likely have a significant impact on the other target species - bigeye and yellowfin tunas. The achievement in reducing effort by the Japanese and Korean longline fleet on these stocks could well be undermined by the increasing catches from China and Chinese Taipei. This increase in longline activity also poses an increasing threat to oceanic shark populations caught as bycatch and which now appear to be showing signs of rapid depletion. Similarly, fishery impacts on turtles and birds require constant monitoring.

Again, whilst fully supporting the legitimate aspirations of SIDS, within a robust and responsible sustainability framework to develop domestic fisheries – as required under CMM 2005-02/2010-05 - anecdotal industry evidence indicates that there is a serious

problem with over-licensing in a number of WCPO SIDS. WWF supports the efforts of the Forum Fisheries Agency (FFA), Te Vaka Moana, (TVM) and its member countries, the Parties to the Nauru Agreement (PNA), the Melanesian Spearhead Group (MSG), other PICS with target albacore fisheries, the Pacific Islands Tuna Industry Association (PITIA) and other non-aligned Parties to strengthen the management strategy for the albacore longline fishery and to address the related species interaction issues. Measures aimed at introducing effective capacity limits and effort management must be urgently addressed by WCPFC and the region's domestic fisheries managers.



Trends in Longline Fishing in the Western and Central and Southern Pacific Ocean

Longlining in the Southern Pacific Ocean now accounts for 9% of the total WCPO tuna catch. The Pacific longline fleet is made up of around 1,150 vessels, comprising several different groups:

1. domestic fleets operating from some of the Pacific countries (Australia, Fiji, French Polynesia, Cook Islands, New Caledonia, New Zealand, PNG, Samoa, Tonga and American Samoa);
2. distant water fleets operating from Japan, Korea, China and Chinese Taipei; and,
3. Chinese Taipei or Chinese owned and operating under charter¹, or flagged and registered into a number of PICs.

The distant water vessels fish on the High Seas and inside the Exclusive Economic Zones (EEZs) of Solomon Islands, Kiribati, Federated States of Micronesia, Republic of the Marshall Islands and Tuvalu, whilst charter vessels are active in the waters of the Solomon Islands, Vanuatu and Cook Islands and Fiji. That said the dynamics of fishing operations are changing rapidly. Table 1 below shows the number of longliners fishing in the WCPO.

Table 1: The WCPO Longline fleet by country

Country	2005	2010	2011 (est)
China	212	219	219
Chinese Taipei	133	90	90
Cook Islands	24	17	15
FSM	33	23	23
Fiji	103	104	109
French Polynesia	72	62	62
Japan	235	171	171
Kiribati			5
Korea	153	122	122
RMI	1	4	4
New Caledonia	23	18	18
New Zealand	57	44	44
Niue	7	5	5
PNG	46	27	27
Samoa	39	61	61
Solomon Islands	5	148	150
Tonga	13	5	5
USA	36	37	37
Vanuatu	73	65	65
Total	1,265	1,222	1,232

Source: WCPFC Year Book, 2010. 2011 data accessed from national sources, when available.

¹ A definition of charter in the context of the application of conservation and management measures is as follows: For the purposes of these measures, vessels operated under charter, lease or other similar mechanisms by developing islands States and participating territories, as an integral part of their domestic fleet, shall be considered to be vessels of the host island State or territory'. (WCPFC CMM 2008-01)

It is noteworthy that there may be various sources of data available, and the complexity of these data sets may cause significant problems for the implementation of CMMs, in future. Box 1 captures some of the distinguishing features of these inconsistencies.

Box 1: Vessel registration and licensing issues

The WCPFC Yearbook is derived from information received from the licensing authority. In specific cases, for example: Chinese Taipei, small scale longliners (<100 GRT) are not listed by the national authorities (Williams, SPC, pers comm, March 2012).

The FFA 'Vessels of Good Standing'² list records vessel by Flag state, and this data is used to support the PIC Vessel Monitoring System (VMS). However, some of these vessels will be licensed by the PIC management authority under charter arrangement and monitored as part of the FFA VMS system, whilst others will be monitored by the respective Cooperating Commission Member (CCM). For example, the Solomon Islands charter fleet includes vessels flagged from China, Chinese Taipei and Vanuatu (MFMR, 2011), but not from the Solomon Islands itself. Some of the vessels on the FFA register include those under 100 GRT, for example, 63 from Chinese Taipei, and 9 from China. Some of the vessels may only fish on the High Seas (Ramesh Chand, FFA, pers comm, March, 2012).

Other foreign flagged vessels from China, Chinese Taipei, Korea and Japan may re-flag into specific states e.g. Vanuatu, FSM, RMI, PNG and more recently Kiribati. The decision on flagging is usually linked to corresponding licence fees and whether alternative 'domestic charter' or a bilateral agreement provides for a better discount against other alternatives. Other license conditions such as landing into a PIC may also apply. For example, industry sources confirm that the Solomon Islands and Tonga also provide a discount in their licensing fees to vessels landing into domestic processing operations.

The WCPFC register³ lists a very large number of vessels (3,847) that are entitled to fish on the WCPO High Seas, but are not necessarily operational in the WCPO. Chinese Taipei for example lists 1,890 vessels, some of which are small scale and others are fishing in other Oceans. WCPFC CMM 2007-02 requires that all vessels operating on the High Seas (south of 20°N) are required to carry VMS. Indications from South Pacific Commission (SPC) data are that the number of active vessels is consistent with the FFA Vessels of Good Standing. Some of these vessels may be licensed by the PIC to fish inside their EEZ, but by the CCM, to fish on the high seas.

Industry sources allege that some vessels appear to also be licensed in more than one PIC and CCM. Some of the vessels that are flagged in Vanuatu may also hold Solomon Islands domestic licences, but may also hold Vanuatu licenses, and be licensed to fish

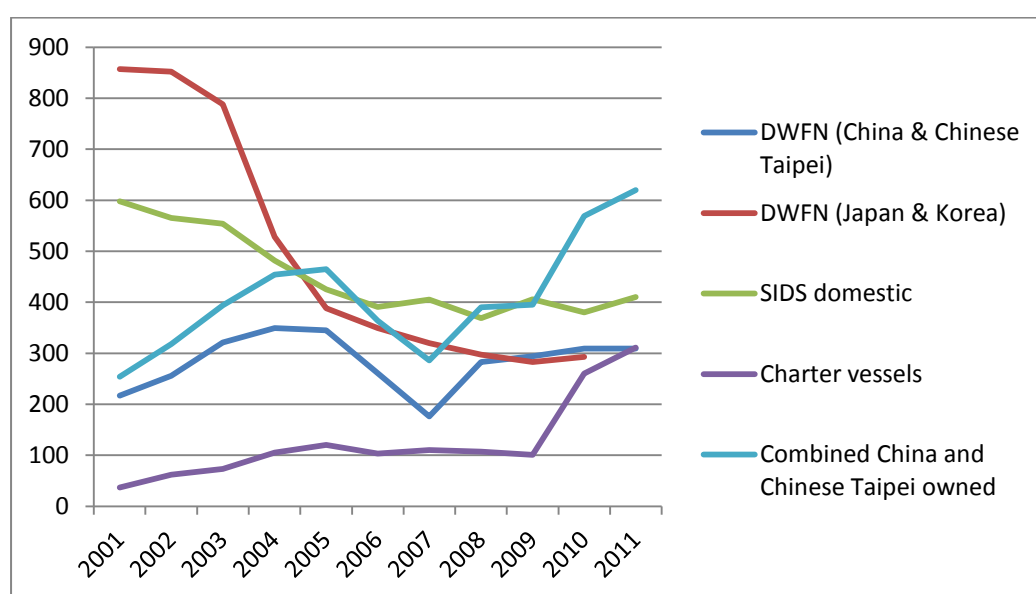
² <http://www.ffa.int/node/42>

³ <http://www.wcpfc.int/record-fishing-vessel-database>

on the high seas by the Vanuatu Government. The Solomon Island licensed vessels, flagged in China and Chinese Taipei may also fish in the High Seas under their respective flag state licenses (China and Chinese Taipei). Industry sources also believe that some Pacific Island States, may be issuing High Seas licenses and also state that making license information public is essential for responsible management.

Figure 1 extrapolates information of historic trends in vessel numbers, largely extracted from the WCPFC Yearbook, but in the case of charter vessels relies on industry sources to define the list of charter and reflagged vessels, with non-PIC ownership.

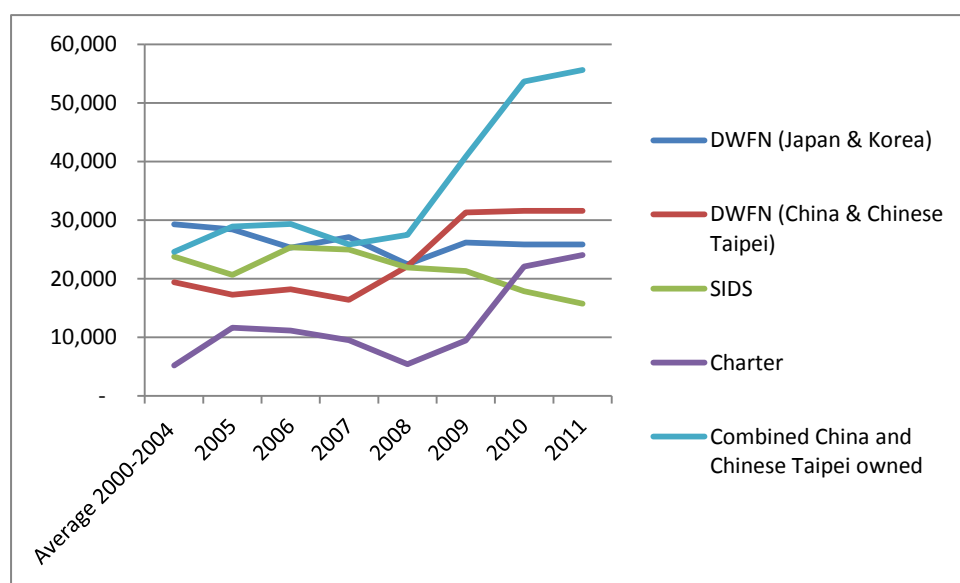
Figure 1: Changes in fleet composition (2001-2011)



Source: WCPFC Yearbook, and FFA vessels of Good Standing (2009-2011)

Catches by the longline fleet are broken down according to one of the three species target: albacore, yellowfin tuna and bigeye tuna, with an added assortment of bycatch. The Japanese and Korean vessels are dependent on yellowfin and bigeye tuna, whilst the South Pacific country longline fleets and longliners from China and Chinese Taipei are dependent on albacore with a bycatch of yellowfin and bigeye. It is this fishery that this report focuses on. The trends in albacore catch are summarised in Figure 2 below for each of the target species and vary by the aforementioned fishing groups.

Figure 2: Catch trends, 2000-2011⁴



Source: Extrapolated from SPC and PIC data

The major features from the fleet (Figure 1) and catch (Figure 2) trends are as follows:

- the steady reduction in Japanese and Korean fleet size (Figure 1); and albacore catches (Figure 2), runs parallel to their reduced catch and effort of yellowfin and bigeye;
- the reduction in domestic Pacific island fleet catches, largely in response to a decline in CPUE across the range of the fleets;
- the growth in Chinese and Chinese Taipei CCM fleet (by an estimated 300 or more) and catches from around 2007 onwards but a leveling off from 2009;
- the almost similar rate of growth by charter/foreign flagged vessels, with a lag of one year from the Chinese and Chinese Taipei increase, but a continued increase in these catches after the Chinese and Chinese Taipei national catches leveled off, with these companies using country charter agreements to ease their fishing access into PICs.

The large scale increase in vessel numbers is confirmed by the 881 (March 2012) 'Vessels of Good Standing' as compared with 671 vessels⁵ (June, 2009). Newer vessels are almost entirely from China and Chinese Taipei.

Box 2: Catch and effort data issues

There is evidence that the data from Chinese Taipei, Korea and China includes the catch from PIC charter vessels in their aggregate catch/effort data provisions to the WCPFC. The Solomon Islands notified the WCPFC Secretariat 480 (SC7) that a number of foreign-flagged vessels licensed to fish in the Solomon Islands waters should be

⁴ National catches derived from SPC information. Charter vessels identified from industry sources from FFA 'Vessels of Good Standing'. Charter vessel catches extrapolated from aggregate national catch data and estimates of Chinese Taipei and Chinese vessels in each country.

⁵ <http://www.ffa.int/node/42>

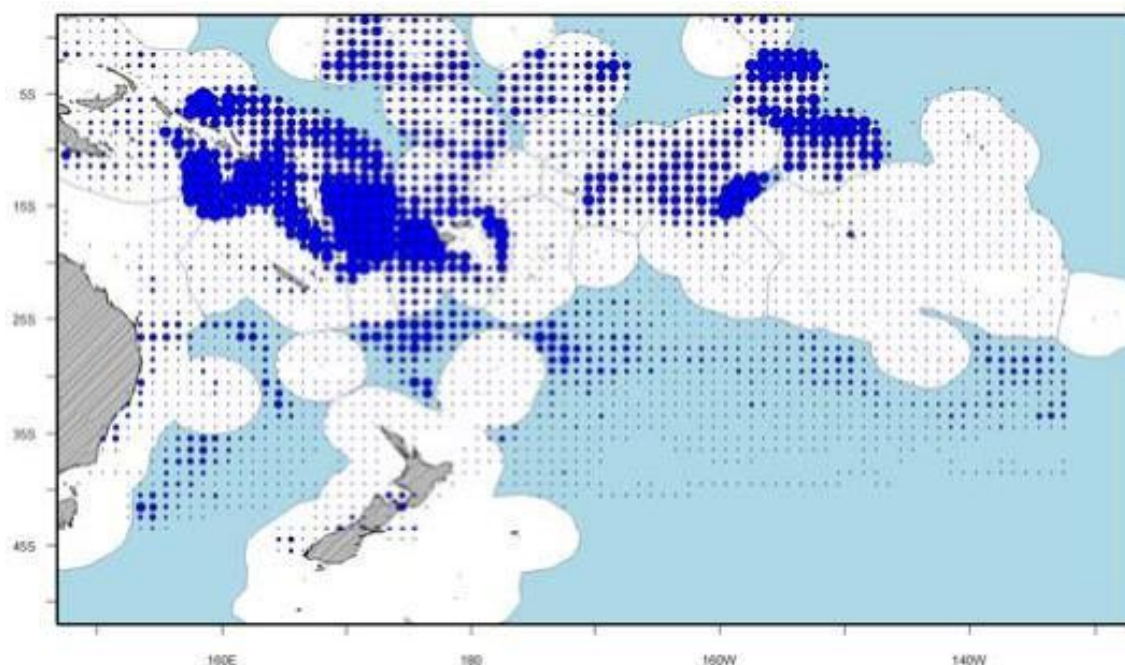
considered as chartered to the Solomon Islands. The flag states of these vessels were subsequently contacted and, in at least one case, there appears to be double-counting of catches of these chartered vessels in their annual catch estimates and aggregate catch/effort data which will need to be resolved.

Paragraphs 485 - 487 of the SC7 report also dealt with a specific issue between China and Kiribati. China claimed that the catches by their flagged vessels in Kiribati waters should be attributed to Kiribati, but Kiribati claimed that they had no charter arrangement with China(TCC7).

One clear issue on data relevance is that Chinese vessels need to be compliant with CMM 2005-02, which sets a requirement prohibiting additional effort from SIDS South of 20°S. They have circumvented the requirements to maintain effort at historic levels by transferring to SIDS flags.

Around two thirds of longline effort and albacore catch in the South Pacific comes from the EEZs (WCPFC8- 2011-IP/04). Activity in the southern High Seas has increased in recent years, but this is also evident in the EEZs, particularly in the Solomon Islands (110,000 VMS days). High seas increases can be noted in the High Seas areas I7 (15,000 VMS days), I8 (3,000 VMS days, and I 9 (3,500 VMS days)⁶, some of which is South of 20°S. As will be explained later, this demarcation line represents a chosen division between the adult (North) and juvenile (South) species.

Figure 3: Fishing effort by the albacore longline fleet in the WCPO



Source: WCPFC8- 2011-IP/04

⁶ I7 = high seas area to the east of Australia and New Zealand, I8 = high seas pocket between Fiji and Vanuatu, I9 = high seas pocket between the Cook Islands and French Polynesia

Some of the effort occurs inside the respective EEZs, but others, especially those vessels from Vanuatu, fish extensively on the High Seas (between 5,000-7,000 tonnes⁷), and in other country EEZs. Fiji based vessels also catch around 1,000 tonnes annually in the High Seas. It is not known whether this activity has flag state approval, but aside from the rapid increase in in-zone catches, high seas effort has increased significantly.

In addition to these features SPC reports additional catches by Chinese vessels south of 20° S.



⁷ SPC data

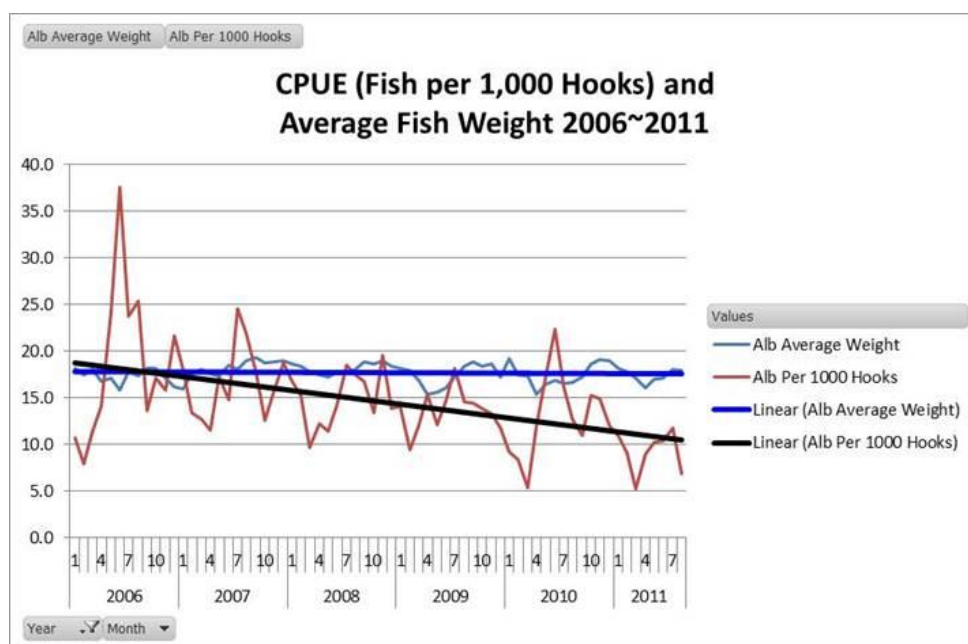
The Status of the Southern Pacific Albacore Stock

Mature albacore, above a minimum fork length (FL) of about 80 cm, spawn in tropical and sub-tropical waters between latitudes 10°S and 25°S during the austral summer (Hoyle, 2011). Juveniles are recruited to surface fisheries in New Zealand's coastal waters, and in the vicinity of the subtropical convergence zone (STCZ, at about 40°S) in the central Pacific, about one year later at a size of 45-50 cm FL. From this region, albacore appear to gradually disperse to the north, but may migrate seasonally between tropical and sub-tropical waters.

Current evidence (Hoyle, 2011) suggests that the stock is neither suffering from overfishing nor is it overfished. There is no indication that current levels of total catch are not sustainable with regard to recruitment overfishing, however there is evidence that the high level catches in recent years has led to a reduction in CPUE, and biomass estimates have continued to decline and catch is now close to Maximum Sustainable Yield (MSY) of 85,200mt, implying that if the catch is increased, then biomass will decrease to MSY. Industry report localised depletion.

Declines in overall biomass of the stock will influence abundance and catch rates. Figure 4 below confirms the impact on fishing already occurring in Fijian waters (Solander Pacific, 2011). These confirm both a contraction of the “aggregations” in size and smaller aggregations coming through and with bigger gaps (time) between them (Solander Pacific, 2011).

Figure 4: Example of longline catch and effort



Source: Solander Pacific.

It is also noteworthy that while current catch levels from the South Pacific albacore stock appear to be sustainable, given the age-specific mortality of the longline fleets, any significant increase in effort would reduce CPUE to low levels with only moderate increases in yields. CPUE reductions may be more severe in areas of locally concentrated fishing effort (WCPFC 2010-05).

In addition, while future increases in albacore catch are likely to be sustainable, SPC estimates of MSY are highly uncertain because of the extrapolation of catch and effort well beyond any historical levels. Projections demonstrated that longline exploitable biomass, and hence CPUE, would fall sharply if catch and effort were increased to MSY levels. Therefore, the economic consequences of any such increases should be carefully assessed beforehand.

The WCPFC has not adopted formal reference points. However stock assessments conducted by SPC use B_{MSY} and F_{MSY} as limit reference points and provide advice to the Commission in this context. In 2009 a special workshop on reference points was held by the WCPFC Scientific Committee's Methods Specialist Working Group. This was also superseded by identifying candidate limit reference points for the key target species in the WCPFC (WCPFC SC7-2011/MI-WP-01). It is expected that the Scientific Committee will make recommendations on appropriate provisional limit reference points for the key target species to the WCPFC in 2012. WWF notes, however, that reference points have been under consideration in the WCPFC since 2006 and, that while the Scientific Committee may make recommendations to the Commission in 2012 on appropriate reference points, there can be no certainty that the Commission will formally adopt them.



Distortions to Fleet Economics

Industry sources claim that there are distinct differences in net economic rents between the participants in the fishery. This has a significant bearing on the economic performance of the respective fleets, especially given the changes to CPUE. These distortions allow some groups to operate more profitably than others and to sustain the rents, thus stimulating further investment.

Rents may vary due to a number of reasons:

- Domestic owned vessels may be subject to domestic taxes, e.g. taxes on imported equipment, other inputs such as fuel and bait, and Value Added Tax; and,
- Distant water fleet subsidies for fuel and new builds

It is also noteworthy that the development of a smaller type longliner is fuelling the increase in Chinese and Chinese Taipei vessel numbers. (Box 3).



A Chinese Fishing Vessel © Richard Banks

Box 3: The dynamics in change towards smaller scale longliners

Dr. Ziro Suzuki, Tuna Scientist, ATuna, February, 2012

Newer vessels are now able to freeze on board at minus 60⁰, allowing them to capitalise on good quality yellowfin and bigeye bycatch for the sashimi market. A newer class of refrigerated containers, the 'super container' and the 'magnum container' allow product to be kept frozen at minus 60⁰ and minus 35⁰ degrees respectively. These containers can be carried on smaller container ships which are readily accessible in port hubs throughout the Pacific. This is likely to reduce the dependency on landings direct into Fiji, and give some favour to Honiara. This change

has also revolutionised the economics of the Albacore longline sector. Small long-line vessels have been rapidly increasing their catching ability in recent years, and are substantially cheaper to build. Such a vessel can be built for around US\$1m compared to US\$ 7.8 m for vessels larger than 40 m.

Charles Huffleft, Solander, OPRT, Dec, 2011

There has been a complete change in the demographics of surface longlining since the advent of super freezer (minus 60C) shipping containers and the introduction of more simple fishing gear. Previously, large super freeze fish carriers were needed to deliver to the market – these, now, have been replaced by super freeze containers which can be readily located in even the most isolated of Pacific ports. Thus, there has been a” revolution” in the transport system, paving the way for small vessel operation and mobility.

A typical vessel of less than 24 metres long can have a hold capacity of 130 cubic metres and can set in excess of 3000 hooks daily. These vessels can be mass produced in either fibreglass or steel and fitted with high speed industrial main engines. The effect is to provide for the creation of large efficient fleets that are highly mobile and can relocate worldwide at short notice.

Industry sources claim that China is offering economic incentives to remain on the Chinese flag and to create a catch history.

This new logistical and vessel infrastructure and the related changing fleet dynamics point to there being nowhere to hide for South Pacific Albacore.



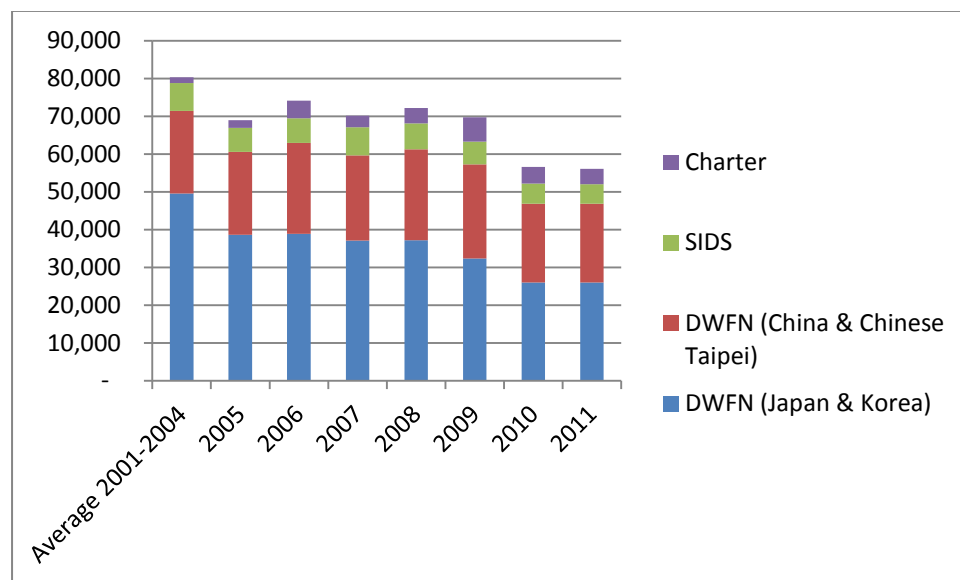
The Status of Other Target Species and Bycatch

Target Species

Aside from the changing status of albacore, increased effort has had some profound changes on other target species, most of which are subject to other management actions. Overall catches of yellowfin tuna (Figure 5) have declined by 30%. Japanese and Korean catches of yellowfin and bigeye demonstrate sharp reductions, but additional catch of yellowfin by the other groups has to date been minimal. In contrast, overall catches of bigeye have fallen by only 7%, with a decline in catch taking place up to 2008, the point at which Chinese and Chinese Taipei vessels started entering the fishery. The current catch trends for bigeye tuna (Figure 6) show an increase over and above 2005 catch levels, but below the average 2001-2004.

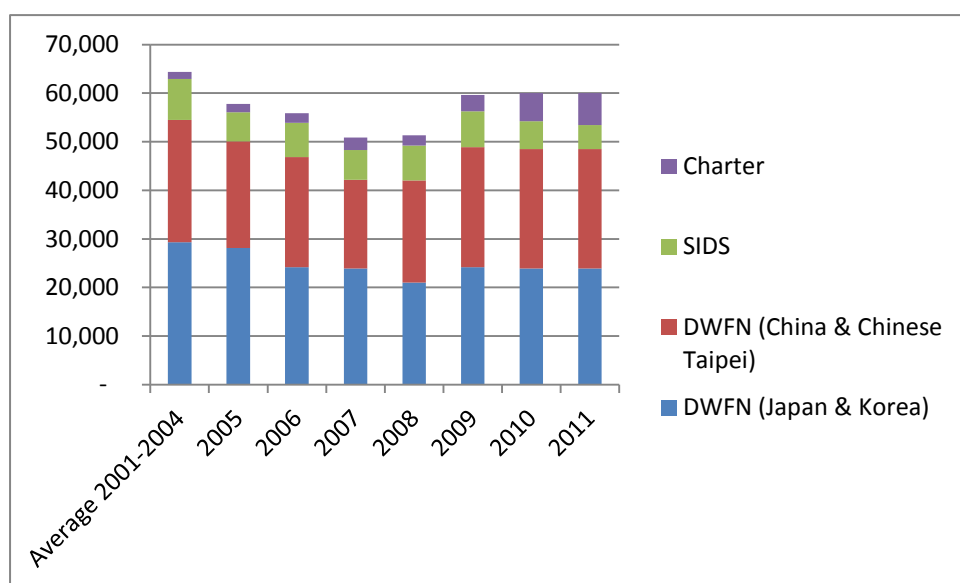
Conservation non-government organisations have produced a Compendium of Bycatch Conservation Management Measures to address the impacts of species bycatch in RFMOs. WWF urges WCPFC to draw on this in improving bycatch reduction measures for SPA.

Figure 5: Longline catches of yellowfin tuna up until 2011



Source: Extrapolated from SPC and PIC data

Figure 6: Longline catches of bigeye tuna



Source: Extrapolated from SPC and PIC data

Sharks



Grey Reef Shark © Cat Holloway / WWF-Canon

Other species are caught as a bycatch in longline fisheries, but the main area of concern is the oceanic shark species. The predominant species caught are blue sharks, silky sharks, oceanic whitetip, shortfin and longfin makos, with smaller numbers of pelagic threshers and hammerheads. Whilst these species are comparatively

small in percentage terms, the number of sharks caught is high. Lawson (2011) demonstrates an average 2 million sharks caught by long line gear, with corresponding sharp declines in CPUE estimated at 30% over the last 10 years. Clarke (2011) identified changes in exploitation patterns for many of the species caught in WCPO waters by the longline fishery.

From this analysis, there is increasing evidence that two of these shark species, oceanic whitetip (*Carcharhinus longimanus*) and silky sharks (*Carcharhinus falciformis*) are experiencing rapid declines. Even blue shark, previously judged to be fairly robust appears to be suffering from a decreasing reduction in average fish size⁸.

⁸ Fish size can indicate changes in the age and size composition of the population, in particular, a decrease in size is expected in a population under exploitation (Goodyear, 2003), cited in Clarke, 2011.

A risk assessment, undertaken by WWF (Table 2) identified various oceanic species at medium to high risk.

Table 2: Stock Conditions and/or Ecological Risk Assessments of Tuna Longline Bycatch

Species	Stock Condition	Ecological Risk Assessment (ERA Vulnerability)
Silky Shark (<i>Carcharhinus falciformis</i>)	Longline CPUEs are generally stable (Lawson, 2011). However, steep declines from peak abundances in 2006-2008 are observed in subsequent, recent years (Clarke, 2011). The longline fishery standardized trends were declining for both sexes in all regions, with statistically significant trends for both sexes in Fijian waters (SPC Region 5) (Clarke, 2011)	Productivity - High Susceptibility - Medium to High
Oceanic Whitetip Shark (<i>Carcharhinus longimanus</i>)	Longline catches indicate steep declines, falling by 70% since 1998 (Lawson, 2011). These indicate very steep declines. The estimated trends in median length were declining for both sexes for all regions, with statistically significant trends for females (Clarke, 2011).	Productivity - High Susceptibility - Medium
Pelagic Thresher (<i>Alopias pelagicus</i>)	Decreasing median size trends, particularly for females in Region 3 and for males and females in Region 4, both of which showed significant declines (Clarke, 2011).	Productivity - High Susceptibility - Medium
Shortfin Mako Shark (<i>Isurus oxyrinchus</i>)	Longline CPUE fallen by 10% since 2010 (Lawson, 2011). Male mako shark median lengths appear to be at or near the length at maturity, the entire 90% confidence interval for female mako sharks lies below the length at maturity. Observer data indicates trends toward decreasing size (Clarke, 2011).	Productivity - High Susceptibility - Medium to High
Longfin Mako	Longline CPUE fallen by 31% since 1998.	Productivity - High Susceptibility - Medium to High
Blue Shark (<i>Prionace glauca</i>)	Longline CPUEs fallen by 89% since 1998. Subject to localised depletion. Most but not all trends toward decreasing size (Clarke, 2011).	Productivity - Medium to High Susceptibility - Medium to High
Other species	Data deficient for Bigeye Thresher, Bronze Whaler, Great Hammerhead, Smooth Hammerhead and Scalloped Hammerhead. Scallop and Great Hammerhead sharks are classified by IUCN as endangered.	Productivity - High Susceptibility - Medium to High

Source: WWF, 2012, extracted from SPC and PIC data.

Turtles



Hawksbill Turtle © naturepl.com / Doug Perrine / WWF

In the WCPO five species are generally encountered in longline fisheries, namely: green (*Chelonia mydas*), loggerhead (*Caretta caretta*), leatherback (*Dermochelys coriacea*), hawksbill (*Eretmochelys imbricata*) and olive ridley (*Lepidochelys olivacea*) turtles. These species are

generally long lived and reach sexual maturity at between 6-30 years old (SPC, 2001).

Large turtles have few natural predators and longline bycatch can result in high levels of fishing mortality on the large sub-adults and adults (Lewison and Crowder, 2007). All of the species listed above are threatened with extinction and the IUCN (2008) lists olive ridley turtles as vulnerable; loggerhead and green turtles as endangered; and hawksbill and leatherback turtles as critically endangered.

Sea turtle capture rates are incredibly variable and reported positive capture rates from 0.002 to 0.032 turtles/1000 hooks have been reported (Table 3).

Table 3: Life status of marine turtles encounters observed in WCPO longline sets by sub-area (1990-2007)

Area	Observed sets	Turtles	Released (%)	Healthy	Injured/stressed	Barely alive	Not specified	Not specified	DEAD
WTP (10°N-10°S)	8,003	262	91%	27%	12%	5%	16%	4%	36%
WSP (10°S-35°S)	7,935	66	92%	62%	12%	5%	9%	3%	9%
WTEP (south of 35°S)	8,925	19	89%	26%	5%	0%	42%	21%	5%

Source: WCPFC SC5 2009 EBWP07

A range of mitigation actions are provided in CMM 2008-03 (Box 4).



Fishery Management Measures

The Measures

The principal measures that have been specifically laid down as conservation tools are highlighted in Box 4.

Box 4: Critical features of the WCPFC CMMs to Longline activity in the WCPO

CMM 2005-02/2010-05, Conservation and management measure for South Pacific Albacore

- The CMM was originally put in place to prevent vessels fishing northern albacore shifting effort to southern albacore.
- Restrictions apply to Commission Members, Cooperating Non-Members, and participating Territories (CCMs) for South Pacific albacore in the Convention Area south of 20°S above current (2005) or recent historical (2000-2004) numbers of fishing vessels.
- The CMM shall not prejudice the legitimate rights and obligations under international law of small island developing State and Territory CCMs in the Convention Area for whom South Pacific albacore is an important component of the domestic tuna fishery in waters under their national jurisdiction, and who may wish to pursue a responsible level of development of their fisheries for South Pacific albacore.
- CCMs that actively fish for South Pacific albacore in the Convention Area south of the equator shall cooperate to ensure the long-term sustainability and economic viability of the fishery for South Pacific albacore.
- CMM 2010-05 gives a commitment for strengthening the collection of data.
- This measure will be reviewed annually on the basis of advice from the Scientific Committee on South Pacific albacore.

CMM 2008-01, Conservation and Management Measure for Bigeye and Yellowfin tuna

- The total catch (20N-20S) of bigeye tuna by longline fishing gear will be subject to a phased reduction such that by 1 January 2012 the longline catch of bigeye tuna is 70% of the average annual catch in 2001-2004 or 2004⁹.
- The catch of yellowfin tuna is not to be increased in the longline fishery from the 2001-2004 levels

⁹ These require 70% reductions in bigeye tuna catch by the longline vessel bilateral partners, throughout the range of the fishery, from 29,248 for Japan; 21,449 for Korea; and 20,992 for Chinese Taipei (Appendix F, CMM 2008-1)

- Each member that caught less than 2,000 tonnes of bigeye in 2004 shall ensure that their catch does not exceed 2,000 tonnes in each of the next 3 years (2009, 2010 and 2011).
- Vessels operated under charter are considered to be vessels of the host island State or territory.
- The limits for bigeye tuna shall not apply to small island developing State members and participating territories in the Convention Area undertaking responsible development of their domestic fisheries.
- More generally, SIDS' domestic fleets are exempt from the provisions of CMM 2008-01, including the yellowfin tuna longline tuna catch limits.

CMM 2008-03, Conservation and management of sea turtles

- CCMs with longline vessels that fish for species covered by the Convention shall ensure that the operators of all such longline vessels carry and use line cutters and de-hookers to handle and promptly release sea turtles caught or entangled.
- CCMs with longline fisheries other than shallow-set swordfish fisheries are urged undertake research trials of circle hooks and other mitigation methods in those longline fisheries.

CMM 2010-07, Conservation and management measure for sharks

- Commission Members, Cooperating non-Members, and participating Territories (CCMs) shall implement, as appropriate, the FAO International Plan of Action for the Conservation and Management of Sharks (IPOA Sharks).
- CCMs shall advise the Commission on their implementation of the IPOA Sharks, including, results of their assessment of the need for a National Plan of Action and/or the status of their National Plans of Action for the Conservation and Management of Sharks.
- National Plans of Action or other relevant policies for sharks should include measures to minimize waste and discards from shark catches and encourage the live release of incidental catches of sharks.
- CCMs shall require their vessels to have on board fins that total no more than 5% of the weight of sharks on board up to the first point of landing. CCMs that currently do not require fins and carcasses to be offloaded together at the point of first landing shall take the necessary measures to ensure compliance with the 5% ratio through certification, monitoring by an observer, or other appropriate measures. CCMs may alternatively require that their vessels land sharks with fins attached to the carcass or that fins not be landed without the corresponding carcass.
- CCMs shall take measures necessary to prohibit their fishing vessels from retaining on board, transshipping, landing, or trading any fins harvested in contravention of this Conservation and Management Measure (CMM).

- In fisheries for tunas and tuna-like species that are not directed at sharks, CCMs shall take measures to encourage the release of live sharks that are caught incidentally and are not used for food or other purposes.
- CCMs shall take measures necessary to prohibit their fishing vessels from retaining on board, transshipping, landing, or trading any fins harvested in contravention of this Conservation and Management Measure (CMM).
- In fisheries for tunas and tuna-like species that are not directed at sharks, CCMs shall take measures to encourage the release of live sharks that are caught incidentally and are not used for food or other purposes.

Members of the FFA Sub-Committee on South Pacific Tuna & Billfish fisheries are in the process of discussing arrangements for zone-based management of the albacore fishery, along with the associated bycatch of yellowfin and bigeye tuna. Discussions relate to determining:

- catch shares, using a hybrid approach from which each country chooses the criterion that best suites them, from catch, CPUE, and EEZ biomass;
- the selection of reference points¹⁰, and most specifically the need to take account of economic reference points in order to prevent a decline in CPUE, where it is imperative to retain a healthy biomass, as per the northern longline fisheries;
- limits under collective or sub-regional longline zone-based management limits: including a longline VDS or a total allowable catch (TAC) option. Both would seek to apply 100% in-zone limits but more limited allocations to the high seas (in the range of 50%-70%).

The Sub-Committee resolved to set catch shares based on Part Allowable Effort (PAE) catch limits (tonnes), as opposed to vessel days. These were adjusted to suit the current albacore MSY of 85,000mt.

The Sub-Committee is scheduled to examine stock-based reference points and develop catch-based EEZ limits at their May/June 2012 meeting.

It is noteworthy that a flaw in the process is that the setting of limits on albacore, fails to take account of the yellowfin and bigeye bycatch, and at least some obligation to limit effort on these stocks.

¹⁰ In 2009 a special workshop on reference points was held by the WCPFC Scientific Committee's Methods Specialist Working Group; this was also superseded by identification of candidate limit reference points for the key target species in the WCPFC (WCPFC SC7-2011/MI-WP-01). It is expected that the Scientific Committee will make recommendations on appropriate provisional limit reference points for the key target species to the WCPFC, meeting in 2012. It is noteworthy however, that reference points have been under consideration in the WCPFC since 2006 and, that while the Scientific Committee may make recommendations to the Commission in 2012 on appropriate reference points, there can be no certainty that the Commission will formally adopt them.

The effectiveness of the measures on the context of the longline fishery

WCPFC CMM 2005-02/2010-05 - Conservation and management measure for South Pacific Albacore

Unlike the evaluation of CMM 2008-01, there has not been a study on the effectiveness of CMM 2005-2. The analysis above suggests the following:

- There has been some increase in effort by vessels south of 20°S, especially in the High Seas areas I7, I8, I9. Indications are that these are Chinese flagged¹¹ vessels which might include vessels operating from Fiji.
- It may also be the case that vessels operating under flags of China and Chinese Taipei and based in Vanuatu, have been fishing in the same area. These vessels are technically qualified as PIC registered, but clearly represent an increase in southern Albacore effort, which is against the spirit of the measure. This could also suggest that any CCM vessel could reflag to a PIC, to then conform to the measure.
- The South Pacific northern albacore is experiencing localised overfishing, and these problems are being exacerbated in country waters with high and growing levels of fishing activity, e.g. the Solomon Islands and Fiji, as shown in Figure 1 with a doubling in size of Chinese and Chinese Taipei vessels (both flagged and chartered). Effort could also easily be displaced to currently under-utilised waters such as the Tongan and smaller PIC EEZs. The economic distortions continue to allow growth in Chinese and Chinese Taipei vessels, with domestic vessels and companies clearly bearing the brunt of the localised overfishing.
- The worrying feature is that the growing number of charter vessels which qualify as domestic (WCPFC CMM 2009-08) could lead to a significant increase in effort, requiring management measures to be applied to SIDS, as opposed to the current exemption.
- The response has to be that zone based limits be established, that fall under the management responsibility of each PIC, along with a separate allocation for High Seas limits. Explicit Target and Limit Reference points are also required for the stock.

WCPFC CMM 2008-01, CMM 2008-01, Conservation and Management Measure for Bigeye and Yellowfin tuna

CMM 2008-01 shows that the longline catch of bigeye tuna of 61,676 tonnes (as reported by CCMs) is approximately 74% of the average catch for 2001-2004 (WCPFC8 -2011-43). The main reason for the reduction was the reduced catches reported by several of the major fishing nations – i.e. Japan and Korea. The limits for China will remain at 2004 levels pending agreement regarding the attribution of Chinese catch taken as part of domestic fisheries in the EEZs of coastal states. As can be seen from Figure 2, catches of

¹¹ Information sent to SPC/OFP confirms Chinese flagged effort South of 20°S.

yellowfin and bigeye tuna have increased by 4% and 18% respectively, for Chinese and Chinese Taipei owned vessels¹². It is noted that CMM 2009-08 states that the Commission will continue to work on the development of a broader framework for the management and control of chartered vessels. In particular, this work shall cover the issues of attribution of catch and effort by chartered vessels and the relationship between the flag State and the chartering Member or Participating Territory on control of, and responsibilities towards, the chartered vessels. WWF is unclear at this stage what progress has been made. Some domestic industry sources state that the license allocation system in some PIC countries, as well as fee structure, is not at all transparent.

As per the south pacific albacore stock, there are target and limit reference points set.

WCPFC CMM 2010-07, *Conservation and management measure for sharks*

Clarke, 2011 concluded that:

- Full implementation of a finning ban may not result in substantially reduced mortality for these species. The effectiveness of a ban on wire leaders in reducing shark mortality is dependent on the degree of implementation and enforcement of a ban on wire leaders, most likely requiring more comprehensive observer coverage.
- Only a small number of countries have introduced supporting actions including Palau, FSM, RMI, Cook Is, Samoa, Australia and French Polynesia. Fiji is now also considering whether to implement a shark sanctuary.
- There is no comprehensive, publically available reporting on compliance with the CMM.
- There is little to no accountability in RFMOs for non-compliance with the measures, including lack of sanctions.

Clarke, 2011 found, based on international studies, that the most effective policy in reducing shark mortality through non-retention policies could reduce shark mortality to 30-60% from current levels.

Industry observations state that crews are paid of their remuneration through shark fins, thus creating an incentive to fin, and ratios were kept within acceptable levels because some species (silky, oceanic whitetip and shortfin mako sharks) are retained for their commercial carcass value.

WCPFC CMM 2008-03, CMM 2008-03, *Conservation and management of sea turtles*

Protective measures for marine turtles include the use of de-hookers and line cutters. There has been no assessment of the implementation of the CMM, and whether the measures have been successful.

¹² Yellowfin = 23,500 to 25,000 tonnes, Bigeye = 26,600 to 31,200 tonnes.

A Critical Assessment of Fishery Performance Using Marine Stewardship Council Guidance

The table below uses the Marine Stewardship Council (MSC) Standards to assess the fishery's performance, highlighting the required outcomes in order to show whether the WCPO fishery is below the MSC standard. The assessment (undertaken for target and bycatch principles only) has been prepared by WWF based on the information defined in this report. Standards are defined as Meets, Above or Below standard. The analysis also provides what WCPFC would need to do in order to strengthen its fishery management system.

Table 4: Fishery Assessment using MSC standards

Status	Standard	Required action
TARGET SPECIES: ALB		
The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing.	Above	Precautionary action to ensure that management limits are set as the stock approaches MSY.
Limit and target reference points are appropriate for the stock.	Below	Explicit Target and Limit Reference Points should be set in management given localised overfishing and reduced CPUEs.
There is a robust and precautionary harvest strategy in place.	Below	A robust Harvest Strategy with Reference Limits set to at least BMSY and implemented across the range of the stock (North and South of 20°S). Monitoring systems also need to be in place that can demonstrate the effectiveness of the strategy. Apply clearly defined limits instead of blanket exemptions.
There are well defined and effective harvest control rules in place.	Below	Specific in zone and High Seas Limits set to cover capacity, effort/and or catch.
Relevant information is collected to support the harvest strategy.	Meets	Need to accurately attribute catch and effort data, especially in the context of Flag versus PIC records.
There is an adequate assessment of the stock status.	Above	CMM compliance reporting.

RETAINED SPECIES: YFT/BET		
The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species.	Below	All fishery participants are subject to the strategy. Apply clearly defined limits instead of blanket exemptions.
There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species.	Below	All fishery participants subject to control limits. Apply clearly defined limits instead of blanket exemptions.
Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species.	Above	
BYCATCH: SHARKS		
The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups.	Below	Bycatch mitigation measures implemented that are effective: Non retention. Strengthen in observer coverage. Strengthen reporting on the effectiveness of the measure.
ENDANGERED, THREATENED AND PROTECTED: TURTLES		
The fishery meets national and international requirements for protection of Endangered Threatened and Protected (ETP) species.	Below	Set turtle bycatch limits.
The fishery has in place precautionary management strategies designed to meet national and international requirements.	Meets	Strengthening in observer coverage. Strengthen reporting on the effectiveness of the measure.



Who Cares and Why

The impact of growth in fishing effort is directly felt by all those in this fishery. Domestic catchers from the principal interest group countries, Te Vaka Moana (TVM), Parties to the Nauru Agreement (PNA), French Territories and the Melanesian Spearhead Group (MSG) are all suffering declines in CPUE, thus directly impacting on the economics of the fishery.

The Fijian Tuna Boat Owners Association (FTBOA) is seeking MSC certification and the development and implementation of a clear harvest strategy is a fundamental step necessary for the responsible management of this fishery. Legitimate and responsible industry operators and WWF support this management measure being taken (Hufflett, PITIA, 2011) and governments must act.

FFA expresses significant concern about the albacore stock and reminds the CCMs of the reliance of the domestic longline fisheries on albacore. FFA has previously signalled the intention to develop zone based management arrangements that provide a better avenue for domestication and development of this fishery in line with numerous provisions of the WCPFC Convention. This should be supported, resourced and efficiently progressed to full implementation.

Main fishing nations, especially those that have conformed to the requirement to reduce effort in longline fishing (Japan and Korea) are experiencing similar problems but growth in other longline capacity (by China and Chinese Taipei) will impact on their main target species, bigeye and yellowfin tuna.

Pacific Islanders will be affected, long before the fishery reaches a formal position of being overfished, thus reducing economic rents to island Governments.

Conservation groups, buyers in key markets and their consumers are also concerned because of the potential for increasing impact on bycatch species, especially sharks and turtles.

Overall market demand in especially the higher value markets will be affected if there is strong evidence that the fishery is not demonstrably sustainable.



Recommendations

WWF highlights specific recommendations below which would strengthen the management of the South Pacific Albacore fishery.

Strengthen conservation management measures for South Pacific Albacore by:

- Establishing explicit MSY based Limit Reference Points;
- Setting catch and effort limits, which include PICs, and apply to the range of the fishery;
- Applying these limits to PIC EEZs and the High Seas;
- Ensuring clear definitions of CCM vessels status;
- Strengthening compliance and reporting systems of the CMM; and,
- Making licensing transparent.

Strengthen conservation management measure for Bigeye and Yellowfin tuna by:

- Applying clearly defined limits instead of blanket exemptions;
- Ensuring clear definitions of CCM vessels status; and,
- Strengthening compliance and reporting systems of the CMM.

Strengthen conservation and management measures for sharks by:

- Implementing a no retention policy;
- Addressing the livelihood/wage distortion issue related to shark catch;
- Increasing observer coverage; and,
- Strengthening compliance and reporting systems of the CMM.

Strengthen conservation and management measures for turtles by:

- Increasing observer coverage;
- Strengthening compliance and reporting systems of the CMM; and
- Undertaking a review of the effectiveness of longline mitigation measures.

As stated in WWF's Position Statement to WCPFC-8, 2012, WWF strongly urges the WCPFC to formally adopt limit and target reference points. The adoption of explicitly determined limit and target reference points for at least the four key tuna species, namely skipjack, albacore, yellowfin, and bigeye, is an absolute priority for the sustainable management of these resources in the WCPO.

WWF calls on the WCPFC to adopt harvest control rules that are well-defined, pre-agreed and contain mandatory actions for an agreed and determined course of management action in response to changes in indicators of stock status with respect to reference points.

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