WESTERN PACIFIC REGIONAL FISHERY MANAGEMENT COUNCIL

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ACTION ITEM

Options for a Bigeye Tuna Conservation and Management Measure for the Western and Central Pacific Ocean for 2012 and Beyond

A. Introduction

Bigeye tuna is considered a single stock in the Pacific Ocean. However, management of this stock is separated into two management zones, the Western and Central Pacific Ocean (WCPO) and the Eastern Pacific Ocean (EPO)[1]. Bigeye is experiencing overfishing in the WCPO. In the EPO bigeye may be experiencing overfishing, and there is management concern within this area. The primary issue with bigeye overfishing in the western Pacific is the total fishing mortality from longline vessels targeting adults for sashimi and sushi markets, and purse seine vessels targeting skipjack for canning incidentally catching juvenile bigeye. Since the early 1990's, the purse seine fishery in the WCPO has experienced significant increases in number of vessels, catch, and effort, to the point that the WCPO now represents half of the world's tuna production. Purse seine fishing on FADs in the WCPO also experienced an increase in the same period and now more than half the total purse seine fishing effort is conducted on FADs, although the relative percentage see significant annual fluctuations and differences between national fleets.

Catch of bigeye by longline fisheries has dropped by more than the 30% target decrease in the conservation and management measure adopted by the Western and Central Pacific Fisheries Commission (WCPFC) for 2009-2011, while purse seine catches have not dropped to the same degree. In the eastern Pacific, the shift of bigeye catch from longline (which was the principal gear for many years) to purse seine has been even more dramatic. Purse seine catches of bigeye have continued to increase through the 2000-2010 period, while the average annual longline catch of bigeye in 2008-2010 dropped to the lowest level reported in statistics of the Inter-American Tropical Tuna Commission. It is clear in both oceans that longline fisheries are not the major drivers for the condition of the bigeye stock, but the longline fisheries have suffered the largest declines in catch under fishery controls of the two regional fishery management organizations.

The overfishing condition of bigeye tuna and the dichotomy between longline fisheries that target adult bigeye and purse seine fishery that incidentally catches juvenile bigeye is perhaps the most urgent tuna management issue in the Pacific, although the sustainability of all the tuna and tuna-like species is a long term management goal. Recent studies suggest that the high volume of purse seine caught bigeye is neither economically efficient nor sustainable, although this is less of a concern for those major skipjack producing countries in the Western Pacific. Moreover, if

[1] The WCPO and EPO are separated at the 150° W longitude.

purse seine catches of bigeye were reduced, the levels the Maximum Sustainable Yield (MSY) of bigeye would be higher and more adult fish would be available to the longline fishery. Currently bigeye tuna MSY in the WCPO is about 74,000 mt. In 2009, the total catch of bigeye in the WCPO was 118,023 mt. The estimated MSY for bigeye in the eastern Pacific is 80,963 mt, while the total catch of bigeye in the eastern Pacific was 81,391 mt.

Vessels flagged to the US, cooperating members, and cooperating non-members (CCMs) of the Western and Central Pacific Fisheries Commission (WCPFC) fish in the WCPO with purse seine and longline gear subject to the provisions of Conservation and Management Measure 2008-01. Under this measure, the catch of bigeye for Hawaii-based US longline vessels was capped at 3,763 mt per year for 2009-2011, or 90% of the 2004 catch of 4,181 mt. Prior to this cap, the volume of bigeye landed by the Hawaii base longline fleet had ranged from about 4,200 to 5,340 mt with an average of about 4,570 mt. Moreover, in 2006 and 2007, the fishery exceeded the 2004 bigeye catch which was the limit under the 2005-2008 WCPFC conservation and management measure.

CMM 2008-01 also stated that members and participating territories whose fleets caught less than 2,000 mt in 2004 were required to ensure that longline catches between 2009 and 2011 did not exceed 2000 mt annually. However, there was no longline catch limit established for bigeye tuna for small island developing states (SIDs) and participating territories (PTs) in the Convention Area if they were undertaking responsible development of their domestic fisheries. CMM 2008-01 does not define "responsible fisheries development."

The Hawaii-based longline fishery comprises two segments; a shallow-set fishery that targets swordfish and in which bigeye tuna makes up about 2% of the catch; and the deep-set longline segment targeting bigeye tuna which comprises about 55% of the total catch by weight and about 70% of the catch value. The fishery was required to stop landing bigeye tuna from the WCPO in 2009 and 2010 before the end of the calendar year. The 2009 closure was for 3 days at the end of December (December 29-31), but in 2010, the closure period extended from November 22 to December 31, or 39 days. Historically, the holiday season (Thanksgiving to Asian lunar New Year) is the period of peak market demand for bigeye tuna in Hawaii.

In October 2009, the Western Pacific Regional Fishery Management Council (Council) recommended that the US, at WCPFC7, pursue the concept of total allowable catches (TAC) for bigeye and other tunas in both purse seine and longline fisheries much as the U.S. was promoting when requesting that IATTC conduct a study of catch limits in the eastern Pacific. Under CMM 2008-01, only longline fisheries are subject output controls such as catch limits. The purse seine fishery is managed differently, focusing on input controls such as including a three month FAD closure in 2010 and 2011 and limits on fishing days for those nations that have adopted a vessel day scheme. Neither the FAD closure nor effort controls for the purse seine fishery has effectively reduced overall effort and more specifically, has not reduced the incidental catch of bigeye by the purse seine fishery. On the other hand, the total longline catch of bigeye has been

reduced by 30 percent in the WCPO in 2009 which is likely a combination of economic factors and the implementation of CMM 2008-01. The Council's proposal was not adopted by the US Delegation to WCPFC7. At the seventh regular session of the WCPFC (2010) eight proposals were advanced by different national delegations to replace CMM 2008-01, but none were adopted.

The annual measures in CMM 2008-01 expire in 2011. WCPFC must take action at its meeting in December 2011 (WCPFC 8) to replace CMM 2008-01. This white paper outlines the pros and cons of several options for a new conservation and management measure to replace CMM 2008-01. The options are generally intended to be in effect for three years (i.e., 2012-2014).

B. Options

The following options are proposed for consideration by the Council for the purposes of making management recommendations to the US Government in relation to the development of its position with regards to bigeye tuna conservation and management measure in the WCPO and the deliberations that are to take place at WCPFC 8. The options are concerned primarily from the perspective of ensuring that there is a sufficient amount of WCPO bigeye available to the Hawaii longline fishery (within the constraint of an overall WCPO conservation measure) to ensure that it can fish year around and thus prevent market dislocation and losses of economic values associated with or resulting from closure of the fishery during the year. The Council has strongly recommended that purse seine bigeye catches should be reduced by 90-95%, to the levels comparable to those in the late 1970s and 1980. If this occurred, the MSY of bigeye would be significantly increased and there would be no need to maintain reduced longline catch limits. Unfortunately, there has been a lack of real incentives in the purse seine fishery to reduce or eliminate bigeye catch in the Pacific. Further purse seine fishery interests and the Parties to the Nauru Agreement (PNA) may see little or no benefit to limiting the growth of the purse seine industry. It should be noted that the final US position on the conservation and management measure will have to consider the perspectives of the various US fisheries and seafood industries as well as the interests of its flag-associated island governments and people (i.e., the Participating Territories - Guam, American Samoa, and the Northern Marianas).

Another issue that must be resolved is whether the Pacific Island Parties will effectively apply measures in their own waters. Some CCMs have at least acted as if WCPFC CMMs only apply to fishing on the high seas and not to fishing in their own waters. This is inconsistent with the Treaty, but to the extent it occurs, it likely results in lower effectiveness of CMMs in the region. For purposes of this paper, it is assumed that the measures will be fully applied.

I. OPTIONS FOR LONGLINE FISHERIES

The following options are presented for consideration:

a. **Status quo: Maintain the provisions of Conservation and Management Measures 2008-01**

The Council would recommend that the U.S. support continuation of the current CMM 2008-01. If this proposal were adopted, it would maintain the current member-specific longline bigeye catch limits (Attachment F to CMM 2008-01); would allow CCMs with small fisheries to harvest up to 2,000 mt per year; would allow small island developing states and participating terrritories to harvest up to 2,000 mt per year; and would allow SIDs and PTs to harvest unlimited amounts of bigeye if undertaking responsible fisheries development. The longline fisheries of the major members have generally been declining in recent years, reaching the reductions intended by CMM 2008-01 for longline fisheries. Total longline catches would be expected to remain at or near current levels unless other CCMs increased their fishing activity or engaged in charter, lease, or other similar arrangements (which in fact may be happening). The Hawaii fishery would likely be subject to closure before the end of the calendar year, with resulting market dislocation and economic losses. If other longline fisheries are not adequately controlled, however, total catches could increase and the Hawaii market would be subject to takeover by foreign sources that were viewed as more reliable. This option results in a relatively high risk of stock conservation problems if there is no comparable reduction in purse seine effort and catches of juvenile bigeye and there is no increase in compliance with the measure.

b. **Maintain the Catch limits of Conservation and Management Measure 2008-01 but with the authority for CCMs (including Participating Territories) to trade or transfer longline bigeye allocations**

The Council would recommend that the U.S. support maintaining the current member-specific longline bigeye catch limits but that the measure be adjusted to allow CCMs (including PTs) to make some or all their bigeye allocations available to fisheries in other entities. If this proposal were adopted, there would be no changes in the 2,000 mt limits for entities with small fisheries, nor a limit on the ability of SIDs and PTs to engage in responsible fisheries development without a limit on their catches. However, the ability to trade or transfer catch limits would be held to a maximum of 2,000 mt for each entity. This approach would provide a mechanism by which Hawaii longline interests could work with U.S. territories or other interests to obtain additional fishing opportunities. This would allow year around fishing and prevent market dislocation and loss of economic values from the Hawaii fishery. As under the current measure, total longline catches in this option might increase somewhat from current levels if any entities developed new fisheries or engaged in charter, lease of other similar arrangements that expanded "domestic" fisheries. Further, total longline bigeye catch could increase if any trades or transfers were implemented, but this would be controlled in that the member-specific limits for the major fishery participants would not be increased so their fishing (or fishing under their allocations) would continue to be controlled by those member limits. The greater risk is that members with small fisheries would trade or transfer most or all of their allocations without being able actually

to control the catch by the receiving entity. There could be substantial record-keeping problems at the regional level. There would have to be firm rules regarding record keeping and reporting and about attribution of catches under any trade/transfer arrangements. Without controls, there would be a greater risk of overfishing due to increased longline catches. While the details are not available, there is apparently some such transfer arrangement being developed between two members at this time, one of which will be unable to harvest its full limit and the other of which is in need of additional fish. Whether this approach is actually acceptable under the current CMM is not clear, but the U.S. has not indicated it is prepared to support any such arrangement at this time. However such arrangement where tuna allocations can be traded or transferred are conducted within the membership of the International Commission for the Conservation of Atlantic Tunas (ICCAT) and thus are not without precedent within the tuna Regional Fishery Management Organizations.

c. **Maintain distant water fishing nations (DWFNs) longline bigeye catch limits and establish a longline bigeye cap of 2,000 mt for Small Island Developing States and Participating Territories with the ability to trade or transfer quota.**

Under this option, the Council would recommend that the U.S. support changes in the CMM that would maintain the current member-specific limits of CMM 2008-01; would allow CCMs (including PTs) whose fleets do not now catch 2,000 mt to expand their local fisheries to that level; and allow entities to trade or transfer some or all of their catch limits to other entities. Approval of this proposal would mean that the provision allowing unlimited fishing under a responsible fisheries development program would be eliminated. This approach would be similar to option b in terms of providing an opportunity for the Hawaii fishery to obtain additional fish and thus prevent early closure and avoid market dislocation and loss of economic values. Total longline catches could increase as in option b, but the ability to manipulate fisheries by use of the "unlimited" fishery exception for responsible fisheries development would be removed. Thus this option is less likely to result in large increases in catch. This option has the same risk as option b if members with small fisheries would trade or transfer most or all of their allocations without being able actually to control the catch by the receiving entity. There could be substantial record-keeping problems at the regional level. There would have to be firm rules regarding record keeping and reporting and about attribution of catches under any trade/transfer arrangements. Without controls, there would be a greater risk of overfishing due to increased longline catches. As noted above, the details are not available, but there is apparently some such transfer arrangement being developed between two members at this time, one of which will be unable to harvest its full limit and the other of which is in need of additional fish. Whether this approach is actually acceptable under the current CMM is not clear, but the U.S. has not indicated it is prepared to support any such arrangement at this time.

d. **Establish a 5000 mt longline catch limit for all CCMs with the option to trade or transfer bigeye limits**

Under this option, the Council would recommend that the U.S. support a change in the management measure to establish a constant harvest limit for all entities at 5,000 mt with the authority to trade or transfer quota. If adopted, this measure would expand opportunities for some entities and reduce opportunities for other members. It is anticipated that there would be some increase in overall longline catch, but not necessarily a significant increase. Entities whose allocations were cut could work with other entities to obtain more fish as needed, though this might increase their cost of fishing. Entities whose allocations were increased would benefit as they could either expand their fishing opportunities (as Hawaii longline likely would) or as they could obtain revenue from the trade or transfer of fishing opportunities. The Hawaii fishery would be able to ensure full year fishing, avoiding market dislocation and loss of economic values from an early closure.

e. Establish a WCPO bigeye total allowable longline catch set at 48,476 mt (based on the product of the 2005-2008 catch (68,277) and fishing mortality reduction of 29%)

Under this option, the Council would recommend that the U.S. support a change in the CMM to simply establish a single total allowable catch limit of 48,476 mt for bigeye in the longline fisheries in the WCPO. If adopted, this would ensure that the longline catch reduction intended by CMM 2008-01 would be achieved. Total longline catch would remain at or about the current level. There would be no constraints on fishery development in SIDs or PTs but these entities' fleets would have to compete for catch against established fleets. The effectiveness of this approach would be dependent on establishment of a very robust catch recording and reporting system in the region so that catches could be tracked and the fishery could be closed if the total catch limit were reached. It could result in a race for fish, with the prospect of the Hawaii fishery closing even earlier than under the current measure if catches by other entities expanded. However, if the Hawaii fishery were closed, so would be the WCPO fisheries of other fleets, so the competitive landscape would not change; however, there would be a risk of increased imports from other areas (e.g., EPO, Indian Ocean, non-members of WCPFC in far western Pacific such as Vietnam).

f. Continue current bigeye longline catch limits but apply them only in WCPO waters between 20 ° N and 10 ° S.

Under this alternative, the Council would recommend that the U.S. support action by the WCPFC to limit longline bigeye catches only in waters between 20° N. and 10° S. This would be parallel to the general application of measures restricting purse seine fishing in the WCPO. If adopted, this approach would provide greater opportunity to the Hawaii fishery, which would be limited to 3,763 mt per year in waters between 20° N. and 10° S but would not be limited in waters north or south of those latitudes. About 60% of the bigeye catch by Hawaii vessels is in waters north of 20° N. Thus this approach would greatly reduce the likelihood of the Hawaii fishery having to close before the end of the calendar year. There would be little added impact on the bigeye tuna stock. Relatively little fishing by distant water fleets occurs outside the area

with limitations, and in any event, the distant water fleets have overall reduced their catch to the extent that longline bigeye impacts are well controlled. There would be an added monitoring burden for the U.S. (and other nations) to be able to track catches inside and outside the control area. However, there would be no need for any catch limit transfer programs, though the measure could allow such transfers. By ensuring that the Hawaii fishery would not have to close, this measure would avoid market dislocation and the loss of employment and economic values associated with the Hawaii fishery.

The following chart is intended to help portray a summary of the pros and cons of the options:

a. Status quo: Maintain the provisions of Conservation and Management Measures 2008-01

Pros	Cons
Would not impose any additional regulatory burden or lower bigeye catch limits for the Hawaii longline fishing industry. Hawaii longline industry continued to operate through the 39 day closed period in 2010 periods, landing bigeye tuna from the EPO. US Territories maintain unlimited bigeye catch limits if undertaking "responsible fisheries development".	Existing measure does not provide Hawaii longline fishery enough bigeye catch to operate uninterrupted. Given the history of the fishery and year to year fluctuations in catch, the Hawaii longlinefishery needs an annual catch limit of about 5,000 mt of bigeye to avoid a WCPO closure and the associated negative social and economic impacts. The market is at risk if other, less controlled fishery sources are viewed as more reliable. It is believed that the Hawaii longline fishery is the only longline fishery in WCPO that has been regulated in accordance with CMM 2008-01; it appears that other countries continue to operate as normal or attribute catches to SIDs (e.g. China). Fishing in the EPO is not unrestricted for all fishing vessels as longliners >24 m are subject to a 500 mt catch limit. However, the catch limit in the eastern Pacific is still not large enough to offset the low catch limit for the WCPO. Further, IATTC may modify its future longline conservation measures for bigeye to be more restrictive due to concerns about the stock. . If this happens the Hawaii fishery could be constrained in both the EPO and WCPO for several weeks or months. Also, the IATTC has been urged by some to consider a longline capacity limit similar to the purse seine capacity control measure (which has not been effective) and potentially impose limits

Pros	Cons
	depending on the outcome of those investigations. The Hawaii fishery has traditionally fished close to the Main Hawaiian Islands (MHI) in the winter months to take advantage of seasonal peak in bigeye demand, a seasonal peak of bigeye abundance close to the MHI and shorter, lower cost trips. Continued uncertainty about the continuity of fishing opportunities stifles interest and investment in the Hawaii fishery (e.g. permit value has declined since 2004).

b. Maintain the Catch limits of Conservation and Management Measure 2008-01 but with the authority for CCMs (includingParticipating Territories) to trade or transfer longline bigeye allocations

Pros	Cons
US territories in the Western Pacific would be able to transfer or trade their bigeye catch to the Hawaii fishery or other longline fishing nations. Would provide a mechanism to ensure that Hawaii longline fishery has ability to operate all year as a result of trade or transfer of catch limit. Other tuna RFMOs such as ICCAT permit catch allocation transfers. Process and system already internationally accepted (e.g., US has lent bluefin quota to other nations) Funds from catch trades could be used for fishery development in the territories. Council has already taken action on an amendment to the Pelagics FEP to cap the US territories bigeye catch at 2,000 mt and affirm the ability to make up to 750 mt available toother US domestic longline fisheries via transfer or trade. Would benefit other Commission members such as Japan that have signaled inability to	WCPFC has no current mechanism for trading catches between member countries, and there may be opposition to trading by other member countries. Allowing unlimited catches and transfers of bigeye limits by SIDs and Participating Territories could be unsustainable for bigeye tuna—this would theoretically have to be eliminated for the measure to be effective. Anticipate strong opposition from the PICs (spell out) The Council FEP amendment contains minimum landing requirement in the ports of the territory transferring or trading their bigeye catches under domestic charter arrangements. However, if adopted as a WCPFC CMM an amendment to the FEP may not be necessary. Creates a potential monitoring and administrative burden. Present MCS measures not robust enough to ensure equitable implementation. May lead to 100% observer requirements on all participating longline vessels.

Pros	Cons
take full allocation and willingness to transfer part of their bigeye catch allocation to other countries—although no official mechanism occurs under the current measure.	

c. Maintain distant water fishing nations (DWFNs) longline bigeye catch limits and establish a longline bigeye cap of 2,000 mt for Small Island Developing States and Participating Territories with the ability to trade or transfer quota

Pros	Cons
US territories in the Western Pacific would be Territories are able to transfer or trade their bigeye catch. The Hawaii fishery could continue to fish after the US catch limit is reached if it received . Funds from catch trades could be used for fishery development in the territories. Council has already taken action on an amendment to the Pelagics FEP to cap the US territories bigeye catch at 2,000 mt and the ability to assign up to 750 mt to a transfer or trade with other US domestic longline fisheries. Other tuna RFMOs such as ICCAT permit catch allocation transfers and Japan has expressed interest in transferring WCPO bigeye catch to China. Would be more conservative than current measure since any SIDs or PTs that would need more bigeye catch would have to obtain it from another WCPFC member. in principle, this is analogous to the theory of the Vessel Day Scheme management system for the purse seine fishery operating in the waters of the PNA, in that vessels days can be traded amongst members.	Could pose a conservation risk (as does trhe current measure) because current allocation to metropolitan countries under CMM 2008-01 amounts to 90,614 mt. while the allocation to SIDS and PTs (all capped at 2000 mt) add 40,000 mt, with a grand total of 130,164 mt, which is twice the current MSY. All nations may have to take a significant cut in the initial allocation (including the US) and there will have to a reserve to address SID and PTs (that may or may not get used each year – both an opportunity and a challenge). WCPFC has no current mechanism for trading catches between member countries, and there may be opposition to trading by other member countries. SIDs and PTs may be opposed to a real catch limit being capped at 2,000 mt and the elimination of the provision for unrestricted bigeye catch if conducting responsible fisheries development. Creates a considerable monitoring and administrative burden. At present MCS measures not robust enough to ensure equitable implementation. May lead to 100% observer requirements on all participating longline vessels.

d. Establish a 5000 mt longline catch limit for all CCMs with the option to trade or transfer bigeye limits

Pros	Cons

Pros	Cons
A 5,000 mt longline bigeye allocation for the US Hawaii-based longline fishery would be sufficient in most years to maintain fishing throughout the year. CCMs without the capacity to harvest 5,000 mt of bigeye could open their waters to longline fishing as at present or trade some or part of their bigeye allocation to other fleets.	There are 26 countries, 7 territories and 9 cooperating non-members in the WCPFC. If each was assigned a 5,000 mt bigeye tuna catch limit this would amount to 210,000 mt or almost three times the current MSY of 73,734 mt for WCPO bigeye. Although a total longline catch of 210,000 mt is highly unlikely, the measure may lead to catches in excess of the MSY, especially if purse seine vessels continue to catch over 40,000 mt of bigeye annually. There would likely be strong opposition to any cap and trade scheme from those countries which have historically caught in excess of 5,000 mt. WCPFC has no current mechanism for trading catches between member countries, and there may be strong opposition to any trading schemes for bigeye since the overall total longline and purse seine WCPO bigeye catch is uncapped.

e. Establish a WCPO bigeye total allowable longline catch set at 48,476 mt (based on the product of the 2005-2008 catch (68,277) and fishing mortality reduction of 29%)

Pros	Cons
A total WCPO-wide longline bigeye cap of 48,476 mt meets the recommended advice from the Science Committee for a 29% reduction. Longline bigeye catches have been declining since 2004,and at the predicted rate of decline the a catch of 48,476 mt would be expected to be reached in 2013. A WCPO-wide single TAC does not penalize any specific country or fishing entity, which can continue fishing up to the point where a fleet-wide TAC is achieved.	Monitoring the fishery in real or near real time would be extremely difficult, especially where fleets cross between the WCPFC and IATTC areas of competence. Would impose a significant burden on those countries which lack the scientific and monitoring resources to provide real-time or near real-time catch data. Would impose significant additional burden on WCPFC science provider and WCPFC Secretariat to maintain catch data and circulate regular bulletins throughout the year about the cumulative catch to CCMs, and develop a procedure to close the fishery when the catch

Pros	Cons
	projection indicated that the TAC would be reached. Would create a race to the fish and may flood principal markets for bigeye and this may not necessarily coincide with seasonal peaks in market demand.

f. Maintain current bigeye longline catch limits but apply them only in waters of WCPO between 20 ° N and 10° degrees S.

Pros	Cons
Longline fishery impacts above 20 degrees N are relatively small. Imposes catch limits on longline fisheries within the zones of highest fishing mortality (Regions 3 and 4). May promote the continuity of the Hawaii based longline fishery throughout the year by enabling it continue fishing above 20 deg N	No guarantee that fish abundance and catchability of bigeye above 20 degree N will remain constant. May close fishing grounds around the Big Island which are important towards the end of the year, with high catch rates and shorter trip durations. Would impose significant monitoring burden on US which is already tracking bigeye east and west of 150 degrees W in addition to having to track catches north and south of 20 degrees N.

II. OPTIONS FOR PURSE SEINE FISHERIES

As with longline, the following options are presented for consideration:

a. <u>Establish annual bigeye catch limits by purse seine fleet that would over three years reduce the overall purse seine catch of bigeye by 30% in 2014.</u>

Under this option, the U.S. would recommend that the WCPFC establish "national" purse seine bigeye catch limits with the intent of reducing overall annual purse seine catch by 30% at the end of 2014 from the 2005-2009 average level. As with longline in the 2009-2011 period, this would be accomplished in a step-wise manner, i.e., reducing the annual catch limits by 10% per year for three years. If adopted and implemented, this measure would ensure that the purse seine catch of bigeye would in fact be reduced in line with the target recommended by the scientific advisors.

Each member and cooperating non-member would be required to take action to ensure that its fleet did not exceed its limit in any year; this could be done by whatever means the CCM decides is appropriate. Since the limit would be on bigeye catch, a fleet might be required to restrict its fishing year, its fishing areas, or its fishing strategies as needed to limit bigeye catches. There would be some added monitoring burden, though with full observer coverage, this should be manageable. This approach would most fairly treat the longline and purse seine fisheries in the same manner, i.e., mandatory reduction in bigeye catch.

b. Implement a sixth month closure on fishing on purse seine fishing on Fish Aggregating Devices (FADs) and other floating objects

Under this option, the U.S. would recommend that the WCPFC prohibit fishing on floating objects (FADs, manmade or natural) for six months per year. The current measure included a seasonal 60-day closure of the FAD fishery on high seas waters between 20° N. and 20° S. in 2009, with the potential for a fleet to be exempt if the CCM has taken action to limit its fleet's catch of bigeye in some other manner; and 90-day closures in 2010 and 2011. However, these have apparently not had the effect of reducing bigeye catch to the extent desired. Given the full observer coverage requirement, extending the closure period would not pose a significant new monitoring burden. If successful, this closure would further reduce bigeye catches, and possibly without any reduction in skipjack catch (the experience in 2009 suggested that skipjack catch actually increased as the average size of the fish caught was larger in unassociated schools than in FAD sets. However, it could be less efficient than the FAD set strategy, which allows an early FAD set with a very high probability of success at the start of the day. Data would need to be collected and evaluated to determine the effects and effectiveness of this approach so that adjustments could be made in the length of closure needed to achieve the 30% reduction in bigeye catch being targeted.

c. Implement mandatory gear modifications or fishing techniques to minimize the catch of bigeye by purse seine vessels around FADs (e.g. maximum number of net panels or set depth)

Under the option, the U.S. would recommend that the WCPFC adopt a measure that would require vessels to be equipped with and/or use gear in a manner that would reduce bigeye catch. Such gear modifications are still not proven, though there are some promising developments. However, in the absence of such requirements, it is not likely that work will move quickly in the direction of finding gear or techniques that will allow release of small bigeye (and yellowfin) while retaining skipjack, the mainstay of the purse seine fisheries. A variation of this might be to impose a longer FAD fishing prohibition but allow FAD fishing during the closure by a vessel using gear or techniques that have been determined at least to have lower bigeye retention rates, such as maximum depth of the set or special grids to facilitate escape of small fish. The end result should be a reduction in bigeye catch by the purse seine fleets, though this might result in some decrease in skipjack catches if the gear or techniques

required are ineffective or inefficient. It may also be that limiting sets at first light would reduce bigeye catch as some anecdotal evidence suggests that bigeye move away from floating objects when the sun rises and light begins to reach deeper waters.

The following tables are intended to summarize the pros and cons of each option:

a. Establish annual bigeye catch limits by purse seine fleet that would over three years reduce the overall purse seine catch of bigeye by 30% in 2014.

Pros	Cons
Bigeye catch limits for purse seine fisheries would provide an incentive for purse seiners to minimize bigeye catches. Stepwise reduction means that purse seine fleet is not significantly burdened in the first year of the measure but provides scope for fleets to progressively learn how to avoid catching bigeye when fishing for skipjack Purse seine bigeye catch limits may be more equitable since most of the conservation burden for bigeye currently is borne by the longline fleets. Reductions of purse seine bigeye catch would have a positive effect on the calculation of MSY and increase the volume of bigeye available to the longline fishery. This may ameliorate any race to the fish under a more stringent catch limit. If a purse seine fleet catches less than its allocated bigeye catch, this underage could be added to the same nation's longline bigeye catch total.	May affect purses seine fisheries well in advance of current practices. Would leave significant SKJ (and perhaps YFT) resources un-harvested. Potentially trading off 10,000 mt of BET for 100,000 mt of SKJ. Market disruptions, price increases and loss of high quality protein for many on the lower-socio-economic spectrum (social justice issues). Monitoring both the longline and purse seine fisheries in real or near real time would be extremely difficult. Requiring robust MCS measures such as e-forms and 100% observe coverage. Purse seine bigeye catches, though large relative to MSY are small relative to total purse seine catch, with potential for large error margins. Would impose a potentially disproportionate burden on those countries which lack the scientific and monitoring resources to provide real-time or near real-time catch data though this is offset to some extent by full observer coverage and reporting. Would impose significant additional burden on WCPFC science provider and WCPFC Secretariat to maintain catch data and circulate regular bulletins throughout the year about the cumulative catch to CCMs, and develop a procedure to close the fishery when the catch projection indicated that the TAC would be reached.

b. Implement a sixth month closure on fishing on purse seine fishing on Fish Aggregating Devices (FADs) and other floating objects

Pros	Cons
Elimination of sets associated with FADs and floating objects for six months each years would greatly reduce the volume of bigeye caught by purse seine fishing. Reducing FAD sets would be more equitable since most of the conservation burden for bigeye currently is borne by the longline fleets. Reductions of purse seine bigeye catch would have a positive effect on bigeye MSY and increase the volume of bigeye available to the longline fishery. This may ameliorate any race to the fish under a more stringent catch limit. Monitoring purse seiners for associated versus unassociated sets in real-time would be much easier than monitoring catch. Purse seine observer coverage is 100% in the WCPO.	Large-scale reduction of FAD and floating object associated fishing likely to be strongly resisted by some WCPFC member countries Korea and Taiwan, countries that traditionally have focus on school fish have recently increased number of FAD sets. Increased relative fuel prices suggest more as opposed to less FAD fishing. Some members such as PNG are heavily invested in FAD-based purse seine fishing in their EEZ waters. Plus, SIDS have maintained that the convention measures do not apply in, archipelagic, territorial or EEZ waters. (This is a generic problem; could even apply in longline if a member decides that catch limits by licensed fleets don't apply in their waters.) Even with 100% observer coverage , there are still significant data quality regarding species composition.

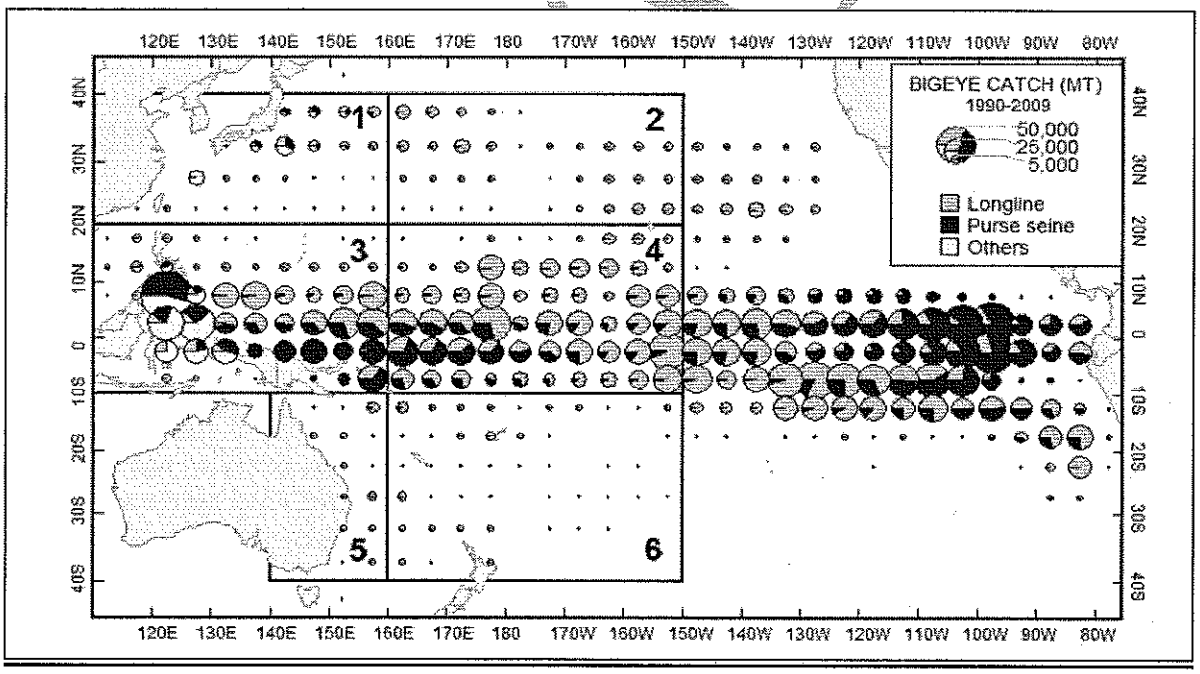
c. Implement mandatory gear modifications to minimize the catch of bigeye by purse seine vessels around FADs (e.g. maximum number of net panels or set depth)

Pros	Cons
Anecdotal evidence from purse seine skipper statements indicates that modifications to purse seine net depth (limit number of panels) would allow them to catch skipjack and yellowfin schools around FADs, while avoiding or selecting against bigeye. Anecdotal information also suggests that limiting sets at first light results in less bigeye catch Gear modification or restrictions on first light sets may be a less burdensome measures for purse seine fleet than effort limits, catch limits or limits on FAD sets. Observer deployment on purse seiners in the	Research on gear modifications or timing of sets is still at an early stage and may not yet be at a stage where it can be operationalized. It may be very difficult for observers to ensure that purse seine nets conform to limits on set depth. Gear modifications may be expensive with limited effects on bigeye catch. This may increase the cost of fishing or reduce the efficiency of the vessel/fleet.

Pros	Cons
WCPO is at 100% so monitoring of gear specifications and bigeye catches should not be burdensome for member countries and WCPFC. Reductions of purse seine bigeye catch would have an immediate positive effect on the calculation of MSY and increase the volume of bigeye available to the longline fishery. This may ameliorate any race to the fish under a more stringent catch limit.	

III. OTHER OPTIONS

a. Allow trade or transfer of some amount of EPO bigeye allocation to WCPO below the EPO bigeye tuna MSY, but only for those countries with membership of the WCPFC and IATTC and only for fleets operating in Regions 2 and 4 in the WCPO (see below) and in the IATTC area



Source Stock Assessment of Bigeye Tuna In The Western And Central Pacific Ocean. WCPFC-SC6-2010/SA-WP-04

Pros	Cons
Longline bigeye catches in the EPO are currently 50% below the recommended aggregate annual longline bigeye catch limit established by IATTC. Therefore they may be bigeye catch available to longliners operating in the WCPO, while still maintaining the sustainability of the stock Hawaii longline fleet fishes in both the EPO and the WCPO, primarily in Region 2 and the northern part of Region 4 where longline catches are moderate. Impacts to WCPO bigeye stock is likely to be lower as fishing mortality in Regions 2 and 4 is lower than in Region 3. Separation of EPO and WCPO is an artificial construct, whereas the bigeye stock is thought to be a single Pacific population with fish moving between the WCPO and EPO.	There is no mechanism for trading or transferring catch allocations between the two tuna RFMOs. Any proposed mechanism to make such a trade or transfer mechanism would need consensus of both tuna RFMOs which may be difficult to achieve. The RFMOs are having a difficult time cooperating on even the most basic of issues (e.g., cross endorsement of observers). Would likely be perceived as inequitable to those countries which are only members of WCPFC. EPO bigeye tuna catch is being fished slightly above MSY due to large purse seine catch, negating any transfer of catch for longline fishing in the WCPO. EPO bigeye stock status may need to improve for any trade between regions to be considered

b. <u>Establish firm bigeye tuna catch reductions in "other fisheries" in the WCPO</u>

Under this option, the U.S. would recommend that the WCPFC and its CCMs take action to ensure that bigeye catches in "other fisheries" would be reduced in the same degree as bigeye catches by purse seine and longline fleets.

Pros	Cons
Would address the very large catches of bigeye made by a mix of ring nets, handlines and pole-and line vessels in Philippine and Indonesian domestic fisheries, which have so far not been subject to any WCPFC conservation and management measures Trade sanctions may provide the incentive for Philippines and Indonesia to take action about limiting their fisheries catching large volumes of bigeye May result in faster achievement of the WCPFC objective of reducing overall bigeye	May result in measures that have an impact on Hawaii tuna handline fisheries unless there si some minimum catch level below whiah measures do not apply. Domestic fishery regulation is poor in both countries and the potential for compliance monitoring of any catch or effort limits is minimal Implementing trade sanctions with tuna RFMO fishery management may be unfeasible and counter to international trade agreements.

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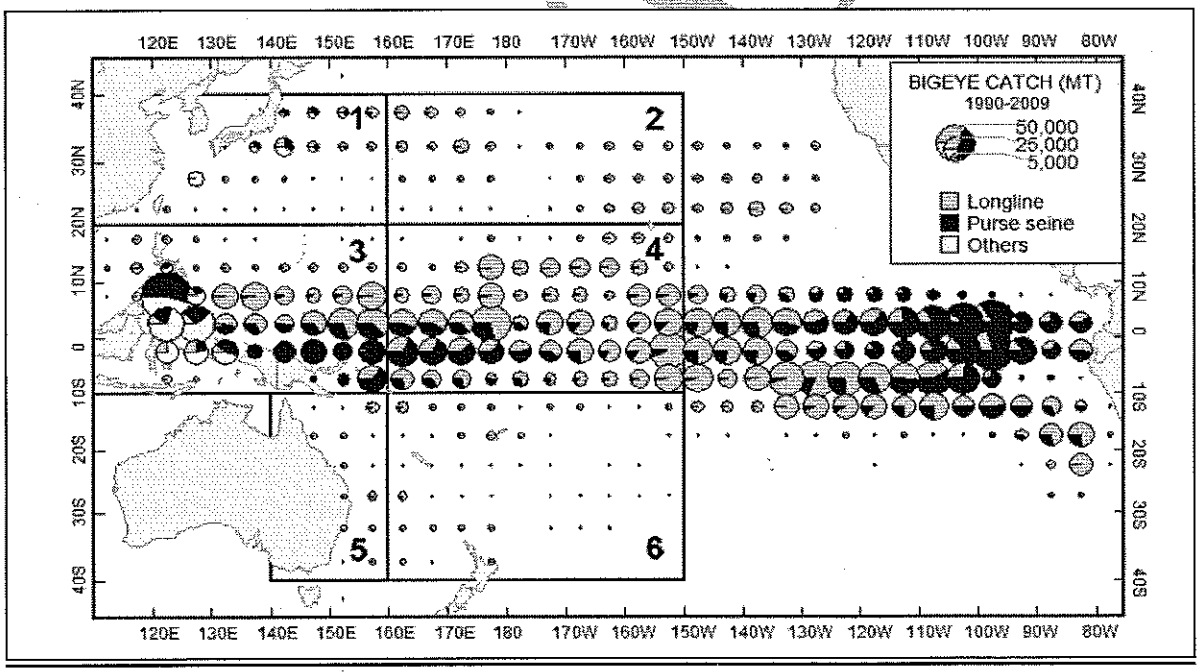

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Pros	Cons
mortality, eliminate overfishing, and possibly even building up of the stock to the benefit of all participants in the long run.	Limitation of domestic fisheries in countries with wide-spread endemic poverty levels is unlikely to attract support from Philippine and Indonesian Governments

C. Council Action

At its 151st meeting (June 2011), the Council may wish to recommend:

a. **Which options or options the US should develop and support for consideration for a new WCPFC bigeye tuna conservation and management measure after 2011**
b. **Other potential options for a bigeye tuna bigeye tuna conservation and management measure after 2011.**