INTER-AMERICAN TROPICAL TUNA COMMISSION

SCIENTIFIC ADVISORY COMMITTEE

FOURTH MEETING

La Jolla, California (USA)
29 April - 3 May 2013

DOCUMENT SAC-04-INF D

MANAGEMENT OPTIONS: TOTAL ALLOWABLE CATCH (TAC) SCHEME

1. INTRODUCTION

The assessments of bigeye and yellowfin tuna in the eastern Pacific Ocean (EPO) by the IATTC staff indicate that fishing mortalities are near or above the levels corresponding to their maximum sustainable yields (MSY)[1]. This situation is a source of concern for the Members of the Commission, whose fleets fish for tunas in the EPO, and since 2004 measures have been implemented to restrict purse-seine fishing effort and also to limit the catches of bigeye by large longline vessels (>24 m overall length). Each year, the purse-seine fishery for skipjack, bigeye, and yellowfin tunas in the EPO has been closed during two separate six-week periods, with each Member and Cooperating non-Members (CPC) deciding which of the two closure periods its fleet observes. Additionally, fishing for these species from 29 September to 29 October is forbidden within a specific equatorial area defined by the Commission. The measures that have been adopted also include specific catch limits for the four principal longline fleets, as well as restrictions for other longline fleets. Due to a number of factors, including political considerations, the negotiation of these measures was very complex, and the reaching of an agreement difficult.

Furthermore, in spite of the adoption in 2002 of Resolution C-02-03 on the capacity of the tuna fleet operating in the EPO, excess fishing capacity remains a concern in the region. The resolution provided a limit to capacity in the EPO that was greater than the capacity fishing at the time and the target capacity that had been determined by the Commission. The capacity of the purse-seine fishing fleet has been increasing in recent years. This excess of fishing capacity, as well as requests for additional capacity, makes it more difficult for Commission's Members to agree on and implement effective conservation and management measures. There is always a risk of lack of agreement on conservation measures for the subsequent year, and it is incumbent on the managers involved in the administration of the fishery to seek ways of avoiding such a situation.

The use of complementary management options, along with the established capacity limits and seasonal closures of the tuna fishery in the EPO, has been explored since 2006 at several meetings of the Scientific Advisory Committee (SAC) and through workshops on rights-based management sponsored by the IATTC and/or other agencies like the World Bank, the U.S. National Marine Fisheries Service (NMFS)

[1] See documents SAC-03-05 and SAC-03-06

and the International Seafood Sustainability Foundation (ISSF), with the participation of IATTC Members and experts on the issues of fishing capacity, buybacks, rights-based management, and other related areas. In addition to these workshops, a useful reference framework may be found in the analysis and practical experience regarding rights-based management within other tuna regional fisheries management organizations (tuna-RFMOs).

For instance, the Commission for the Conservation of Southern Bluefin Tuna (CCSBT) has developed a management procedure (MP) to be used to guide the setting of a global total allowable catch (TAC) to ensure that the spawning biomass of southern bluefin tuna reaches the recommended interim rebuilding target. CCSBT also set the parameters within which the MP will be implemented, including, *inter alia*, the period used to estimate the TAC, the basis for allocating the TAC among Members and cooperating non-Members, and the basis for reviewing the allocation with the entry of new Members and cooperating non-Members. The International Commission for the Conservation of Atlantic Tunas (ICCAT) has allocated the catches of swordfish and northern bluefin tuna mostly on the basis of actual fishing practices; it has also taken into account other factors such as coastal adjacency, economic need, and level of development but, in most cases, the effect of these factors on the allocations was minimal. The adopted scheme, which includes transferable rights among permit holders, appears to have been very successful in limiting fishing effort and managing the fishery. There are other multinational tuna fisheries in which catches have been allocated among participating nations through the use of units of fishing effort, as in the Western and Central Pacific Fishing Commission (WCPFC), where the scheme adopted was to allocate fishing effort, measured in fishing days, to Members of the Commission with emphasis on the resources available in national Exclusive Economic Zones (EEZs).

Likewise, Article V of the Antigua Convention recognizes "the sovereignty or sovereign rights of coastal States related to the exploration and exploitation, conservation and management of the living marine resources within areas under their sovereignty or national jurisdiction, and the right of all States for their nationals to engage in fishing on the high seas in accordance with UNCLOS[2]"; it also outlines a number of rights and responsibilities regarding the exploitation of the fish stocks covered by the Convention and stipulates that "the conservation and management measures established for the high seas and those adopted for areas under national jurisdiction shall be compatible in order to ensure the conservation and management of the fish stocks covered by [the] Convention". Although the Convention does not specifically refer to the rights of coastal and distant-water States in relation to the allocation of those resources, it specifies that one of the functions of the Commission is to "where necessary develop criteria for, and make decisions relating to, the allocation of total allowable catch, or total allowable fishing capacity, including carrying capacity, or the level of fishing effort, taking into account all relevant factors" (Article VII.1.l).

In this respect, it must be recalled that the capacity management system adopted by the Commission in its Resolution C-02-03, while striving to limit the overall capacity in the EPO, does not allocate or set limits to that capacity at the level of individual participants[3]. Similarly, the catch limits that Resolution C-12-01 establishes for longline catches of bigeye do not constitute an allocation. Considering this entire context and taking into account the complexity of the EPO fishery, which includes a variety of fishing gears and methods of operation requiring new and creative management regulations, this document analyzes the use of catch allocations as a management method that might be implemented in the EPO tuna fisheries, determining which of all available options would be the most beneficial and feasible. The proposal also takes into account the interests of the coastal States in either entering the EPO tuna fishery for the first time or expanding their existing fisheries, without prejudice to the need to prevent or eliminate the uncontrolled growth of the fleet.

2. THE USE OF F_{MSY} AS A BASIS FOR DEVELOPING LONG-TERM FISHING LIMITS FOR

[2] The United Nations Convention on the Law of the Sea

[3] Defined as States bordering the EPO and governments with fleets fishing for tunas in the area

THE ALLOCATION SCHEME

Document IATTC-82-INF-A, *"Evaluation of a total allowable catch system for the purse-seine and longline tuna fisheries in the Eastern Pacific Ocean"*, prepared for the 82nd meeting of the Commission in June 2011 contained a presentation and analysis of the possible alternatives, as well as the main obstacles for the adoption of allocation systems in the EPO tropical tuna fisheries, including the allocation of fishing capacity rights. Historically, the Commission has had limited success in resolving allocation issues because of the lack of clarity regarding which criteria can be used for assigning fishing rights in light of the considerable heterogeneity of the participants in the fishery. However, in all the alternatives that the document explored, the systems were built upon the determination of an overall catch quota for the EPO based on the use of the maximum sustainable yield (MSY), with regulation of the access to the fishery through the IATTC's Regional Vessel Register (RVR).

In Document IATTC-82-INF A, from which the following example is taken, the catch projected for 2011 when fishing at the level of fishing mortality (F) that produces the MSY (F_{MSY}) was used to define the overall catch quota. For 2010, the estimated MSY for yellowfin was 263,418 metric tons (t) (Document SAC-02-06), obtained by assuming that there is no stock-recruitment relationship and based on average fishing gear selectivity during 2008-2010, and for bigeye it was 80,963 t (SAC-02-07), obtained by assuming that there is no stock-recruitment relationship and based on an average selectivity pattern for all fisheries combined during 2008-2010. Table 1 shows the projected 2011 catch when fishing at F_{MSY} in 2011; it assumes the same relative fishing mortality in the purse-seine and longline fisheries as the 2008-2010 average, but rescales those mortalities to match the F_{MSY} level of mortality. Also included in the table is the estimated F multiplier[4] (defined as F_{MSY}/ average 2008-2010 F).

Table 1: Projected catches for 2011, in metric tons, based on F_{MSY} based catches; F multiplier included.

	Purse-seine	**Longline**	**Combined**	$\boldsymbol{F_{mult}}$
Yellowfin	240,059	5,669	245,728	1.13
Bigeye	64,915	24,293	89,208	0.93
TOTAL	304,974	29,962	334,936	
Percentage	91%	9%	100%	

The considered allocation scheme is for yellowfin and bigeye only, but not for skipjack, due to its high and variable productivity (*i.e.* annual recruitment is a large proportion of total biomass). Annual catches are highly variable, and the main concern with the species is the constantly increasing exploitation rate, although the data- and model-based indicators have yet to detect any adverse consequence of this increase. Because it appears that skipjack are apparently not fully utilized in the EPO, there is no control of the level of harvest in the proposed allocation system. Allocations for skipjack would be implicit in the allocation scheme.

Regarding the allocation of a TAC between the purse-seine and longline fleets, one option would be to simply divide the total catch of yellowfin and bigeye combined in proportion to the percentage of that catch taken by each fleet. Thus, based on the total catch shown in Table 1 of 334,936 t, 304,792 t (91%) would be assigned to the purse-seine fleet and 30,144 t (9%) to the longline fleet. A second option would be to divide the TAC by species, and allocate to the longline fleet the sum of the bigeye catch limits established in Resolution C-12-01 (54,381 t[5]) and the remainder to the purse-seine fleet: in that case, 274,886 t would be allocated to the purse-seine fleet, and 60,050 t (C-12-01 bigeye quota of 54,381 t, plus yellowfin TAC of 5,669 t) to the longline fleet. Note that calculations supporting the current closures specified in C-12-01 are based on the adjustment of existing fishing mortality by the purse-seine fleet and

[4] The number of times effort would have to be effectively increased to achieve the MSY in relation to the average fishing mortality during a given period (in this case 2008-2010).

[5] Excluding countries whose longline bigeye catch is limited to 500 t by Resolution C-12-01

they assume that the longline fleet catches will be more similar to those in Table 1 than to the longline catch limit established in C-12-01.

3. PURSE-SEINE ALLOCATION SCHEME

The scheme consists primarily of an overall purse-seine TAC for yellowfin and bigeye tunas combined in the EPO, which can be distributed among the CPCs. The Commission would have to determine which CPC may be considered eligible and qualified for receiving a catch allocation. The scheme is designed as a hybrid, comprised of individual transferable vessel quotas (ITQs), quotas for the EEZs of coastal States, and high seas quotas. Quotas for each of these three components act as constraints to fishing, as described in the sections below.

First, it must be taken in account that, in the EPO, about 40% of the purse-seine catch of tunas is made in areas under the jurisdiction of coastal states (EEZ) and about 60% on the high seas (Table 2), and that access to the tuna resources in the EEZs is subject to a fishing license issued by the coastal State. For these reasons, the allocation scheme should be based on that distinction between the amount of catches made in the EEZs and on the high seas. This scheme offers some advantages, such as avoiding the problem of allocating resources distributed inside the EEZs, and gives some property rights to the vessels.

As mentioned above, attempts were made on several occasions to define a system for allocation of catches or national capacity limits in the EPO[6]. However, it was not possible to reach agreement on such a system. The main difficulty was the lack of agreement on the criteria to be used for the allocation. In order to move forward in the discussion about which CPC should be qualified to be allocated TACs and which weighting factors should be assigned to the criteria for this allocation, a solution may be found in proposing only two criteria:

a) The fishing capacity, in cubic meters (m^3) of well volume, recorded in the RVR in the year immediately preceding the allocation; and

b) Historical catches during a three-year period.

These two criteria are used likewise for defining the TACs, both those to be allocated to the coastal States (EEZ-TAC) and those based on catches on the high seas outside the EEZs (HS-TAC). The same two criteria can be used subsequently to develop Individual Fishing Quotas (IFQs) to be allocated to the vessels.

In order to calculate the EEZ-TACs, the purse-seine catches would be separated into those made inside the EEZs (regardless of vessel flag) and those made by vessels of a single flag on the high seas. Because the size of the shares calculated on that basis would depend upon the years which were selected for determining historical participation in the fishery, national EEZ-TACs would be based on the annual average of that CPC's catches in the three most recent years for which catch data are available. Requests for new entrants to the fishery can be dealt with using the existing procedures of the RVR for controlling changes (see section 3.2).

The estimated purse-seine catches in an EEZ would be the TAC (EEZ-TAC) allocated to the coastal State. This EEZ-TAC would be reserved for use by the coastal State, which can choose, *inter alia*, to distribute it as an open fishery on a first-come, first-served basis; to assign a national IFQ proportionally to all vessels under its flag; to keep it for sale as licenses for vessels of other flags; or any other arrangements the coastal State may make, provided it ensures that the vessels are listed in the RVR and fulfill all the requirements established by Resolution C-02-03, as well as the relevant rules of the Agreement on the International Dolphin Conservation Program (AIDCP).

[6] Joseph and Greenough, 1979; IATTC 69th Annual Meeting, June 2002.

TABLE 2. Total retained purse-seine catches of yellowfin (YFT), bigeye (BET), and skipjack (SKJ) tunas within and outside EEZs in the EPO, in metric tons and percentages, 2000-2009

	In EEZs			%		Outside EEZs			%	
	YFT	BET	SKJ	YFT+BET	All	YFT	BET	SKJ	YFT+BET	All
2000	117919	7204	78925	35.4	36.6	152827	75513	124804	64.6	63.4
2001	142174	1742	21761	32.6	28.4	245098	52689	119307	67.4	71.6
2002	147244	2381	42712	32.4	31.0	269148	42426	117079	67.6	69.0
2003	190029	1692	91183	42.7	40.2	209427	48161	162749	57.3	59.8
2004	133533	740	61165	40.2	36.7	144476	55020	137207	59.8	63.3
2005	147512	1290	134011	46.9	48.3	117171	51183	134173	53.1	51.7
2006	91475	3865	111181	38.7	37.7	88807	62435	190325	61.3	62.3
2007	80384	2057	88183	35.1	38.9	100547	52026	115125	64.9	61.1
2008	89172	7037	147520	37.0	43.5	104797	59122	152557	63.0	56.5
2009	79743	3259	83643	27.2	30.4	163217	59234	158870	72.8	69.6
Avg	121919	3127	86028	36.8	37.2	159552	55781	141217	63.2	62.8

If a coastal State cannot utilize the entire TAC within its EEZ, then it has, under certain conditions, an obligation to provide access to other nations to utilize the surplus. This scheme does not consider allocation to small coastal longliners (,<24 m length overall), which catch yellowfin and/or bigeye that will be computed as part of the total catch in the EEZ and, consequently, as part of the EEZ-TAC. If the coastal state decides to use IFQs for its purse-seine fleet and maintain such small longline operations, then it is necessary to allocate an amount of the EEZ-TAC for this purpose or maintain a part of the tuna catches as a reserve for the small longliners. This reserve could be made up of the national IFQs forfeited by vessels that do not fish for tuna during the corresponding year.

The sum of all EEZ-TACs, as a percentage of the total catches, would be subtracted from the estimated overall purse-seine TACs for yellowfin and bigeye, and that amount of available tuna resource used as a basis for calculating the high-seas TAC (HS-TAC). The HS-TAC would be based on catches outside the EEZs, and would be calculated as follows:

purse-seine TAC * (percentage of catches outside EEZs) = purse-seine HS TAC; thus

Option 1 (Table 2 numbers): 304,974 x 63.19/100 = 192,172 t; or

Option 2 (C-12-01 numbers for longline): 274,886 x 63.19/100 = 173,700 t

The purse-seine HS-TAC of 192,172 t (173,700 t) would be applicable only to purse-seine vessels of IATTC capacity classes 5 and 6 (greater than 272 m^3 carrying capacity)[7]. Once defined, the harvesting rights to all or part of the allowable catch would be distributed among the CPCs, and then by each CPC as Individual Fishing Quotas (IFQ) among its qualified purse-seine vessels on the RVR active list. The Director would, by November 1 of each year, or any other agreed deadline, inform the Commission of the amount of the estimated IFQ for the following year and the list of vessels used in the calculation. Any vessel on the RVR assigned an IFQ but that did not fish for tuna in the EPO during that year would lose its right to be included in the calculation of the IFQs for the next year, unless a CPC, on behalf of any of its vessels, requests an exemption due to *force majeure* or extraordinary circumstances (see section 3.3 of this document), as agreed by the Commission.

3.1. Allocations of purse-seine IFQs

The HS-TAC would be applicable, through IFQs, to all catches by purse-seine vessels of IATTC capacity

[7] In this scheme, small purse seiners (<class-5) are not included in the allocation of the HS-TAC because their operations are limited to coastal waters.

classes 5 and 6 fishing for yellowfin, bigeye, and skipjack tunas in the EPO. Pole-and-line, class 1-4 purse seiners, small coastal longliners, and sportfishing vessels would not be subject to this TAC limit. The IFQ would be assigned equally to all purse-seine vessels, by species, regardless of operational differences among vessels.

Access to IFQs would be allowed only for authorized active vessels on the RVR, as defined in the current system established under Resolution C-02-03, and any purse-seine vessel fishing for tunas in the EPO not on the list of active vessels would be considered disqualified to participate in the shared TAC. The allocation of IFQs would follow a procedure similar to that used for Dolphin Mortality Limits (DMLs) under the AIDCP: each CPC would provide to the Director, prior to October 1 (or other such date as may be agreed) of each year, a list of qualified vessels under its jurisdiction that expect to operate in areas beyond national jurisdiction in the following year. Then the harvesting rights to all or part of the TAC would be distributed as IFQs under the responsibility of the vessels and the CPC for the exclusive use of its eligible vessels. As with DMLs, the duration of the IFQ is for one year. Additionally, with the aim of maintaining the fleet capacity stable, total or partial transfers of capacity of small purse seiners (< class-5) to class-5 and -6 purse seiners would not be allowed, including when a small purse-seine vessel was reactivated. The only exception to this rule would be the reactivation of the reserved fishing capacity under the jurisdiction of one CPC which would not have been previously assigned to a specific vessel.

The establishment of a system based on IFQs consistent with the purse-seine TAC limit requires that each CPC provide a list of vessels to the Director for estimating the IFQs, and all those vessels must comply with the requirements of the RVR and with a system for tracking and verification of tuna harvested in order to confirm the catches made under this system of allocations. The Director would, by an agreed deadline, inform the Commission of the estimated IFQ and of the list of vessels used in the calculation. Any vessel assigned an IFQ that did not fish for tropical tunas in the EPO during that year would lose its right to be included in the calculation of the IFQ for the following year, unless the corresponding CPC requested an exemption due to *force majeure* or extraordinary circumstances and the Commission approved the request. Therefore, qualified purse-seine vessels would be those that actually fished in the EPO during the year, and the application of this rule would eliminate any vessels without real fishing activity. This would have a real effect in the reduction of excess fishing capacity.

In 2010, 168 class-5 and -6 purse-seine vessels under the jurisdiction of IATTC CPCs, with a total capacity of 201,414 m^3, fished in the EPO. The IFQs for this fleet, based on the number of vessels and on their capacity, would be calculated as follows:

By number of vessels: IFQ/number of active class-5 and -6 purse-seine vessels = IFQ, thus:

Option 1: 192,172/168 = 1,143 t

Option 2: 173,700/168 = 1,033 t; or,

By total capacity: IFQ/total capacity of active class-5 and -6 purse-seine vessels = IFQ, thus:

Option 1: 192,172/201,414 = 0.954 t/m^3

Option 2: 173,700/201,414 = 0.862 t/m^3

This IFQ does not represent the total available catch for a single purse-seine vessel because part of its catches could have come from an EEZ, in which case the total catch by a vessel under an equal distribution of the EPO TAC, as defined under the first option described in section 2 of this document, could be:

By number of vessels: EPO TAC/number of active class-5 and -6 purse-seine vessels = Catch by vessel, thus: 304,974/168 = 1,815 t; or,

By total capacity: EPO TAC/total capacity of active class-5 and -6 purse-seine vessels = Catch by vessel, thus: 304,974/201,414 = 1.5 t/m^3.

3.2. Requests for purse-seine IFQs by inactive or first entry vessels

Any CPC may request that the Director assign IFQs to vessels under its jurisdiction which fished the previous year but are inactive (*i.e.* not on the active list of the RVR) and which, consequently, are not eligible for an IFQ at the time of the deadline for IFQ requests, but become eligible subsequently and want to fish during the year for which the IFQ is requested. Such IFQs could be assigned to reactivated vessels through a reserve of IFQs or by reallocating IFQs during the year. Such a reserve could be made up of IFQs forfeited by vessels with an IFQ assigned but which do not fish for tuna and/or qualify for a *force majeure* exception. After April 1 (or other agreed deadline) of each year, any IFQ which the Director determines will not be utilized or which has otherwise been forfeited could be reallocated to the vessels qualified under section 3.1 of this document. Such additional IFQs could be reallocated by the Director among qualified vessels, subject to any limitations and conditions adopted by the Commission. Unused full or partial IFQs expire at the end of the year and, consequently, could not be carried forward to the next year.

Since a purse-seine vessel must have fished in the EPO during the immediately preceding year in order to be considered a qualified vessel, an inactive vessel on the RVR without fishing activity in the EPO during the previous year (first entry vessel), would need to fish in the year preceding the request for an IFQ within an EEZ, fulfilling all the requirements and rules applicable to the specific EEZ-TAC. Other conditions would include having a carrying capacity equal to or greater than a class-5 purse-seine vessel, carrying an observer on board, and complying with all other applicable IATTC and AIDCP regulations and measures.

If a vessel fishes in the Western and Central Pacific and consequently does not fulfill the requirement of having fished in the EPO during the preceding year, but is covered by paragraph 12 of Resolution C-02-03[8], such vessel would be authorized to fish in the EPO without any assignment of an IFQ, but would be subject to compliance with the requirements of the aforementioned paragraph 12. For the following year, the vessel would be qualified to request an IFQ following its participation in the EPO fishery for a single trip under paragraph 12. Since those vessels are not in the active list of the RVR, they are not eligible for either an ITQ for the calendar year or to the transfer of an ITQ except when the vessel replaces an active vessel.

3.3. Transferability of IFQs

The transferability of purse-seine IFQs is also included in this new scheme, converting them to individual transferable quotas (ITQs). For purse-seine vessels, ITQs may be transferred only between qualified vessels and/or from an active to an inactive vessel. In the scheme there are no restrictions on transferability between class-5 and class-6 vessels. An ITQ transfer between qualified vessels means, practically, that a vessel can transfer only a portion of its ITQ to other vessels if it wants to be considered active and thus qualified to request a new ITQ the following year. The transfer of the total ITQ converts the vessel to inactive and, consequently, disqualifies it from requesting an ITQ for the following year.

The implementation of the transferable amount would be a decision of the corresponding CPC by notifying the Director; however, to be considered qualified, a vessel must be active in the EPO for at least a single trip of 45 days or more during the corresponding year, provided that the vessel complies with all other IATTC and AIDCP regulations and measures. Transfers would be allowed only for the amount of the vessel's annual ITQ or any other lesser portion for the balance of that calendar year. An ITQ is divisible into any unit providing that the vessel with the ITQ fulfills the requirement of fishing during a single trip as defined in this paragraph.

[8] "A limit of 32 US vessels authorized and licensed to fish in other areas of the Pacific Ocean under an alternative international fisheries management regime, and that may occasionally fish to the east of 150° West, shall be authorized to fish in the EPO."

An ITQ transfer between active and inactive vessels would be allowed only for the entire ITQ, which would mean that the inactive vessel would replace the active vessel, subject to the RVR rules, and the fishing rights would be transferred from one vessel to the other. In order to prevent vessels from accumulating ITQs, no vessel would be allowed to acquire an additional ITQ greater than the ITQ allocated to it for the year in question. For example, if the annual ITQ for each vessel were 300 t, the greatest ITQ that any individual vessel would be allowed to accumulate by transfer of total or partial ITQs from other vessels would be 600 t.

CPCs with qualified vessels that will transfer ITQs must ensure that this is done in a responsible manner and that individual vessels shall receive an ITQ only for the current year. The transfer of an ITQ does not transfer the right to the receiving vessel to apply for a transferred ITQ for the next year. Any vessel with an assigned ITQ that does not fish for tunas in the EPO during that year would lose its right to be included in the calculation of the ITQs for the next year, unless its ITQ was not transferred and the CPC in question had requested an exemption due to *force majeure* or extraordinary circumstances. Transshipments of tuna or tuna products between vessels with ITQs would be prohibited.

If an ITQ is transferred by a vessel to a vessel of a different flag, the CPC of the receiving vessel is responsible for enforcement and compliance related to the transferred rights. For all transfers, CPCs would, no later than March 1 (or other agreed date) of each year, notify the Director of transferred ITQs among its vessels. No vessel would be allowed to begin fishing for tunas in the EPO using the transferred ITQ until the Director has received such notification.

3.4. *Force majeure* or extraordinary circumstances requests

A CPC, on behalf of any of its vessels with an allocated ITQ, could request an exemption due to *force majeure* or extraordinary circumstances that rendered a vessel unable to go to sea during the year corresponding to the assigned ITQ. Such an exemption would be valid only one time for vessels with fishing activity during the immediate preceding year, in order to ensure that the ITQ is not reallocated or kept in reserve indefinitely. Requests for exemptions should be accompanied by evidence demonstrating that the vessel did not go to sea and by the facts on which the request for exemption were based. Vessels that request such an exemption would not be allowed to transfer any of their ITQ.

The procedure for such requests would be similar to that of the AIDCP. The Director sends the request and the supporting evidence to the other IATTC Members for their consideration, and the request is considered accepted unless a Member objects to it. If the request is approved, each Member should ensure that the vessel in question does not fish during the entire year, in the Convention Area or anywhere else.

4. CLOSURES

4.1. EEZ-TAC closures

If the EEZ-TAC limit for a coastal State (see section 3) were reached, all fishing by class-5 and -6 purse-seine vessels with observers on board, pole-and-line and coastal longline vessels operating under the jurisdiction of that State would cease in that EEZ immediately. In the event that annual catches by the purse-seine fishery exceeded the species-specific EEZ-TAC for yellowfin and bigeye, all sets on those species, individually or in mixed schools containing either species, would cease for that year, and the amount of those excess catches of bigeye and/or yellowfin tuna would be subtracted from the next year's EEZ-TAC.

The restriction on the fishing activities in a given EEZ includes the prohibition of FAD deployment, as of the date on which the purse-seine catch of yellowfin and bigeye reached the established EEZ-TAC for these species and, in addition, all FADs at sea within the EEZ would have to be collected. The Director would notify all CPCs about the dates and the measures adopted by the CPCs to implement the closures in their respective EEZs.

For small purse-seine (classes 1-4) and pole-and-line vessels, the principal source of information is the

logbook, and often catch data are not obtained by the IATTC staff until some six months after the end of the year. However, under this allocation scheme, their catches are part of the total amount of fish caught inside the EEZs and, consequently, will have to be monitored by the respective coastal State in order to avoid exceeding the corresponding EEZ-TAC. At the start of a closure period, class 1-4 purse-seine, pole-and-line and coastal small longline vessels at sea without an observer on board would be allowed to continue to fish without restriction until their current trips finished, and those in port would be prohibited from going out to fish. Since the catches of such vessels are relatively small, the effect of a large portion of these fleets arriving in port shortly before the beginning of the closure period with the intention of quickly unloading and returning to sea to make one more trip may not pose a major problem.

All catches of bigeye and yellowfin in excess of the corresponding EEZ-TAC would be subtracted from that EEZ-TAC for the following year. To increase the effectiveness of the closure of an EEZ, it is necessary to establish limits on incidental catches of tuna caught by any vessel allowed to continue fishing. During the closure of the fishery for bigeye and yellowfin, any vessel on the active list of the RVR could be permitted to fish for tunas not included in the TAC, such as skipjack, Pacific bluefin, albacore, and black skipjack tunas, bonito, billfishes, and sharks, but any bycatches of yellowfin and bigeye during these activities would be subject to regulation. The incidental catch of yellowfin and bigeye would be limited to 15% of the weight of the total catch for any individual trip made by purse-seine and coastal small longline vessels fishing for other species.

All vessels with bycatches of yellowfin and bigeye tunas would be required to both retain on board and also land all bigeye and yellowfin tuna caught, except fish considered unfit for human consumption for reasons other than size. A single exception would be the final set of a trip, where there may be insufficient well space remaining to accommodate all the tuna caught in that set. Obviously, it is not necessary to include skipjack in the incidental catch rule; however, fishing for skipjack associated with FADs should be strictly prohibited.

4.2. Closures for purse-seine vessels with ITQs

When a vessel's catch during the year reached its assigned annual ITQ, the restricted period for that vessel would begin. It could continue to fish for skipjack and yellowfin in the EPO for the entire year, provided that it fished only on unassociated or dolphin-associated tunas, subject to EEZ-TAC and HS-TAC and licensing restrictions. The regulations for vessels that have reached their ITQ would include the prohibition of FAD deployment and the requirement that all of a vessel's FADs at sea be collected in a verifiable manner. The vessel would be prohibited from setting on FADs until the end of the year, including FADs deployed by other vessels. This approach has the advantage of limiting sets on FADs as well as the number of FADs deployed, and maintains the fishery open for vessels with catches still available under their respective ITQs.

Notwithstanding these restrictions, a vessel that reached its annual ITQ could continue to fish in the EEZ of a coastal State, provided that the corresponding EEZ-TAC had not been reached, and further providing that the vessel fished without setting on floating objects and in compliance with the coastal State's regulations concerning access to the fishery. All excess catches of bigeye and yellowfin tuna by vessels with an assigned and/or transferred ITQ would be subtracted from the next year's ITQ for the corresponding vessel. A vessel which had been determined by the Commission to have engaged in a pattern of exceeding its ITQ for two years consecutively would not be qualified to receive an ITQ.

Each vessel with an ITQ can predict the approximate date by which it will reach its ITQ, based on the record of its catches. The information in the on-board observers' weekly catch reports gives the Director the elements necessary for determining when the restricted period for each vessel is expected to start. Additionally, the Commission's landing sampling program and the data provided by the processing companies could improve the timeliness and accuracy of the estimates of catches. The unloading weights would be considered the official record of a vessel's landings and override any estimates made at sea.

When a vessel reached its ITQ, the Director would notify the vessel and its flag State, which would then implement, respectively, the required changes in its fishing activities and the pertinent regulations. He would also establish a system for notifying all Members of the Commission of any such situations.

Most of the catches in the EPO are made by the purse-seine fleet. The IATTC has detailed and timely records of the catches of most of the purse-seine vessels that fish for yellowfin, bigeye and skipjack in the EPO because of data collected by the on-board observer program, which covers all size class-6 vessels (carrying capacity greater than 363 t).

Currently, the observer program does not include class-5 purse-seine vessels (272-363 t), but they would need to be included if they are to be eligible for an ITQ under this proposed allocation scheme. The other necessary element is that every participant have a national system for tracking and verifying tuna catches, consistent with the tuna tracking system established under the AIDCP, and vessels would not be considered qualified for an ITQ if their flag CPC did not have such a system in place.

4.3. Closures for large longline vessels

To limit longline catches of bigeye, Resolution C-12-01 establishes TACs for the four largest longline fleets, limiting their combined catches of the species in 2012 to 54,381 t[9]. In the proposed scheme, transfers between longline vessels of different flags would not be allowed, nor would transfers between purse-seine and longline vessels. The differences in the age-specific pattern of selectivity between the two fisheries and the large number of large longliners makes the definition of transferability difficult, and also changes in the selectivity modify the estimated MSY and, consequently, the allowable catch.

5. RESULT OF THE ALLOCATION SCHEME

The assessments of bigeye and yellowfin tuna indicate that, with fishing at the level of fishing mortality (F) that produces the MSY (F_{MSY}), the stock will fluctuate around the level capable of producing the MSY, the target specified in the Antigua Convention. The use of an allocation system based upon the estimated F_{MSY} could maintain the catches above or near the levels corresponding to their MSYs and afford the possibility of resolving the problem of possible overfishing of those stocks. This would make it feasible to maintain the fishery open during the whole year for vessels with IFQs, thus eliminating the measures currently used to restrict the purse-seine fishery.

The fulfillment of the yellowfin and bigeye TAC by purse-seine fisheries would be expected to differ , because the F multiplier differs between species. An important caveat regarding this scheme is that it assumes that vessels will not alter their behavior (such as species targeted, area fished, gear efficiency, DML request) as compared to their average behavior in recent years. The use of the two species for developing allocations under the proposed scheme has the additional advantage of avoiding the problems associated with species identification of small tunas, reducing the pressure on the observers to underestimate the catches of bigeye. Halting purse-seine sets of all types after reaching an EEZ-TAC in an area with a greater proportion of juveniles is expected to reduce catches of small bigeye and yellowfin, which is desirable from a yield-per-recruit standpoint.

Another caveat to the closure of the EEZs and/or beginning of the restricted fishing for vessels with ITQs is that the allocation scheme assumes that the average operational fleet capacity will remain at its 2008-2010 level of 219,541 m^3. For all size classes of purse-seiners, the capacity had decreased in 2010 to 209,870 m^3, increased slightly in 2011 to 213,237 m^3, and increased again in 2012 to 219,091 m^3, almost exactly the same as the 2008-2010 average. For longline fleets, as noted above, the number of vessels in the RVR is much greater than is required for catching the quota allocated to this gear. Additionally, the Commission is not informed about active longline vessels; however, it is known that the number of hooks has been increasing since 2008, but remains below the historical levels of the previous 20 years. Considering these circumstances, the proposed scheme can work well for purse-seine allocations in which

[9] Excluding CPCs whose longline bigeye catch is limited to 500 t by Resolution C-12-01

the limits allocated to this fishing gear by Resolution C-02-03 are continued.

When a purse-seine vessel has reached its ITQ, it will have the option of fishing in offshore areas for large yellowfin associated with dolphins, provided that it had a DML, or to fish within one of the EEZs, provided that the EEZ-TAC is not yet exhausted and that the vessel has a DML and a license to fish in the EEZ. Vessels will also have the options of either fishing for skipjack in unassociated schools or transferring their fishing activities to areas outside the EPO; however, unrestricted fishing for skipjack would be complicated by the fact that much of the catch is associated with yellowfin and bigeye, and transferring effort to other areas would cause problems because access to those fisheries is not unrestricted. Consequently, the ITQ scheme is an incentive to minimize the catches of bigeye and yellowfin if the vessels wish to operate during the whole year. Finally, the use of an allocation scheme such as the one proposed would remove all vessels without real fishing activity and this would have a real effect towards the reduction of excess fishing capacity.

Considering the number of CPCs and the many factors that could affect the catch, both inside and outside EEZs, it is easy to see how difficult it is to manage a system which includes EEZ-TACs and ITQs. For example, a fleet can exhaust its EEZ-TAC and continue to fish with its ITQs, or vice versa. The potential drawbacks to the application of EEZ-TACs and/or ITQs include complexities in the enforcement of closures and difficulties in estimating the catches in excess of the EEZ-TACs and/or ITQs. To address this problem, a procedure would need to be established to resolve cases of disagreement over the weight estimates. One such option is an additional scientific sampling of a disputed vessel's catches. Other potential problems include races to catch the largest portion possible of the EEZ-TAC before it is exhausted, and landing of catches outside the EPO.

In order for this approach to work, there must be transparency in the enforcement of the closures and a system for keeping track of compliance by vessels through review of VMS (Vessel Monitoring System) data by the Commission. Also, the Commission needs to define the sanctions for possible violations of the regulations or misuses of allocations under this scheme.