INTER-AMERICAN TROPICAL TUNA COMMISSION

90TH MEETING

La Jolla, California (USA)
23 June-1 July 2016

DOCUMENT IATTC-90-04d(i)

OPTIONS FOR MEASURES FOR THE CONSERVATION OF TUNAS IN THE EASTERN PACIFIC OCEAN, 2016

In Document SAC-07-08, prepared for the 7th meeting of the Scientific Advisory Committee (SAC) in May 2016, the IATTC scientific staff recommended that the current 62-day closure of the purse-seine fishery, established by IATTC Resolution C-13-01, be extended to 87 days. This recommendation was based on the staff's current assessments of bigeye (Document SAC-07-05a) and yellowfin (Document SAC-07-05b) tunas, which are similar to the 2015 assessments, and on the 10% increase in the capacity of the purse-seine fleet since 2014, which now stands at 255,972 cubic meters (m^3) of well volume.

For yellowfin, the staff's conclusion from this year's assessment is that fishing mortality (F) is below F_{MSY}, the level corresponding to the maximum sustainable yield (MSY), as is indicated by the base-case point estimate for the F multiplier[1] of 1.02 (SAC-07-05a, Table 1), which is slightly less than the 1.05 F multiplier for bigeye. As of 17 April 2016, the operative capacity[2] of the purse-seine fleet in the EPO is estimated to be about 11.2% greater than the previous three-year average, which means that the F multiplier, adjusted for capacity, is 0.92 and 0.94 for yellowfin and bigeye, respectively, and that the measures established in Resolution C-13-01 have fallen short of the intended effect of reducing the fishing mortality, adjusted for capacity, of both species to a level not exceeding the MSY. However, there is a considerable overlap between the target F multiplier of 1.0 and the 95% confidence intervals for the F multipliers of 0.92 and 0.94, indicating that the evidence supporting a conclusion that fishing mortality is above F_{MSY} is not definitive. Nonetheless, the staff considered that the results supported an increase in the purse-seine closure, from the 62 days specified in Resolution C-13-01 to 87 days (Document SAC-07-08).

At its meeting in May 2016, the SAC recommended that the staff present alternatives to the 87 days of closure. Some SAC members proposed changes to the provisions of Resolution C-13-01 (Appendix 1), but in the staff's opinion none of the proposals appreciably increase the effectiveness of C-13-01. The alternatives considered all include all of the measures specified in Resolution C-13-01, including continuing the 62-day closure of the purse-seine fishery, but applied to 2017-2019. Other options (*e.g.* fishing gear controls) are difficult to implement, and lack conclusive evidence that they can reduce the fishing mortality in a manner comparable to the four options listed below.

The staff considered the following four options as practical short-term alternatives to an additional 25 days of closure:

1. Reducing the capacity of the purse-seine fleet by 25,000 cubic meters (m^3).

[1] The ratio of the current fishing mortality ($F_{current}$, defined as the average fishing mortality for the three most recent years (2013-2015)) to the fishing mortality that will produce the MSY (F_{MSY}). An F multiplier of 1.0 means that $F_{current} = F_{MSY}$; if it is below 1.0, fishing mortality is excessive ($F_{current} > F_{MSY}$)

[2] The total well volume, in cubic meters, of all vessels actually operating in the EPO, regardless of whether they are on the IATTC Regional Register. This is the capacity used by the IATTC scientific staff for its assessments of the tuna stocks.

2. Catch limits for bigeye and yellowfin of 57,900 and 232,800 metric tons (t), respectively (including discards), the average annual catch of these two species by Class-6[3] purse-seine vessels during 2013-2015. The purse-seine fishery would be closed when the limit for either species was reached.

3. Catch limits for bigeye and yellowfin based on projections of catches, calculated as described below. As in the previous option, the purse-seine fishery would be closed when the limit for either species was reached.

   The catch limits (CLs) for 2016, for example, would be calculated by adjusting the average catch (C) during 2013-2015 by the ratio of the cumulative mid-year CPUE in 2016 to the average mid-year CPUE during 2013-2015. The CPUE is calculated as the cumulative catch in the IATTC weekly report (CWR) at the midpoint of the year divided by the sum of the weekly operative capacity during the first semester of the year (CPUE = CWR/sum(weekly capacity)). Thus:

CL2016 = [(C2013+C2014+C2015)/3]*CPUE2016/[(CPUE2013+CPUE2014+CPUE2015)/3]

4. A spatial closure in addition to the 30-day closure of the high-seas area specified in paragraph 5 of Resolution C-13-01 (the "*corralito*"). As discussed in Document SAC-07-07e, such a closure could be implemented in the area bounded by 120° and 150°W and 5°N and 5°S for 110 days[4], at a time when the temporal closures are not in effect. This option may not avoid the need for a yellowfin catch limit, since the spatial closure is considerably more effective for bigeye than for yellowfin.

Each of the four options listed above has advantages and disadvantages:

Option 1:

Advantages: The provisions of Resolution C-13-01 are adequate to maintain the fishing mortality at levels below that corresponding to MSY.

Disadvantages: The operative capacity of the purse-seine fleet in the EPO would need to be reduced.

Option 2:

Advantages: Catch limits are easy to understand; also, the IATTC has a long history of working with catch limits, and its existing weekly report system could be used to monitor the catch. If the fishing capacity decreases, this approach automatically reduces the duration of a closure because the catch will be lower (assuming no change in fishing efficiency). If the capacity added since 2014 is mainly directed at a single set type, then the species-specific quotas will automatically take that into account, given that the two species are typically caught in different types of set.

Disadvantages: A closure would start whenever either of the two species reached its catch limit: therefore, vessels targeting the species that had not reached its catch limit would have to stop fishing regardless. As often happens with catch limits, this could cause a race for fish, with vessels rushing to catch as much as possible before either limit was reached.

Option 3.

Advantages: This option has all the advantages of option 2. In addition, adjusting the catch limit for CPUE takes into account the changes in biomass from one year to the next, which reduces the chances of overfishing. This approach is similar to in-season catch increments used previously by the IATTC.

[3] Carrying capacity > 363 t

[4] Number of closure days = 365*0.06/0.2, where 0.2 is the expected reduction in fishing mortality of bigeye for a 365-day closure and 0.06 = 1-(bigeye *F* multiplier of 0.94). This calculation was confirmed by applying it to a closure during February-June, months historically and currently without closures.

Disadvantages: As for option 2. Additionally, a number of quantities in the formula for calculating the closure contain measurement error; furthermore, catchability might change over time, and the catch per unit of capacity may not be proportional to abundance.

Option 4:

Advantages: Allows fishing outside the closure area for the full 110 days of the closure. The closure area can be adapted to protect the species most in need of management.

Disadvantages: The two species are unlikely to be equally vulnerable within the closure area, so additional measures would be necessary for the less vulnerable species. Errors can occur with the choice of area and timing of the closure. Overall fishing effort would not be reduced, but it would be redistributed spatially; it is not clear to what extent this might cause local depletions, given the evidence for regional fidelity of yellowfin (and to a lesser extent, bigeye) in the EPO.

The following are relevant to the general topic of management options for the tuna fisheries in the EPO:

-	Plan for the Regional Management of Fishing Capacity	2005
PROP CAP-12 A-1	Draft resolution on freeze and reduction of purse seine capacity	2011
CAP-12 PROP B-1	Towards a new capacity management plan in the eastern Pacific Ocean	2011
CAP-11-04	Review of the Plan for the Regional Management of Fishing Capacity	2011
SAC-04-11	Individual-vessel quotas for purse-seine vessels that fish on fish-aggregating devices (FADs)	2013
SAC-04-INF D	Management options: total allowable catch (TAC) scheme	2013
SAC-04-INF B	Fishing capacity and efficient fleet configuration for the tuna purse-seine fishery in the eastern Pacific Ocean: an economic approach	2013
PROP IATTC-85 H-2	Draft resolution on management of fishing capacity	2013
PROP IATTC-85 H-1	Resolution on capacity management applicable to all fleet segments	2013
CAP-14-INF-A	A road map towards a capacity management plan in the eastern Pacific Ocean	2013
CAP-WS-04A	Target capacity for the tuna fleet in the eastern Pacific Ocean	2014

APPENDIX 1. Proposals to amend Resolution C-13-01

1. Proposals to modify the time period of the 62-day closures described in Resolution C-13-01, paragraph 3:

   "All purse-seine vessels covered by these measures must stop fishing in the Convention Area for a period of 62 days in 2014, 62 days in 2015, and 62 days in 2016. These closures shall be effected in one of two periods in each year as follows:

   2014 – 29 July to 28 September, or from 18 November to 18 January 2015.
   2015 – 29 July to 28 September, or from 18 November to 18 January 2016.
   2016 – 29 July to 28 September, or from 18 November to 18 January 2017."

Proposals:

1. Eliminate the second closure period, so that all vessels covered by the measures stop fishing from 29 July to 28 September.
2. Eliminate the first closure period, so that all vessels covered by the measures stop fishing from 18 November to 18 January.
3. Reduce the length of the two closure periods to 31 days each, and require all vessels covered by the measures to stop fishing for 31 contiguous days during each of the two closure periods (29 July-28 September and 18 November-18 January.)

2. **Proposal**: eliminate the exceptions described in paragraph 7 of Resolution C-13-01:

   a. "Notwithstanding the provision of subparagraph 6a and 6b, a request by a CPC, on behalf of any of its vessels, for an exemption due to *force majeure* rendering said vessel unable to proceed to sea outside said closure period during at least a period equivalent to the closure period prescribed in paragraph 3 above, shall be sent to the Secretariat
   b. In addition to the request for an exemption, the CPC shall send the evidence necessary to demonstrate that the vessel did not proceed to sea and that the facts on which the request for exemption is based were due to *force majeure*.
   c. The Director shall immediately send the request and the evidence electronically to the other CPCs for their consideration, duly coded in order to maintain the anonymity of the name, flag and owner of the vessel.
   d. The request shall be considered accepted, unless an IATTC Member objects to it formally within 15 calendar days of the receipt of said request, in which case the Director shall immediately notify all CPCs of the objection.
   e. If the request for exemption is accepted,
      i. the vessel shall observe a reduced closure period of 30 consecutive days in the same year during which the force majeure event occurred, in one of the two periods prescribed in paragraph 3, to be immediately notified to the Director by the CPC, or
      ii. in the event said vessel has already observed a closure period prescribed in paragraph 3 in the same year during which the *force majeure* event occurred, it shall observe a reduced closure period of 30 consecutive days the following year, in one of the two periods prescribed in paragraph 3, to be notified to the Director by the CPC no later than 15 July.

   This exemption applies to the vessels of fleets that observe either of the closure periods prescribed in paragraph 3."

3. **Proposal:** eliminate the purse-seine vessel capacity exemption described in paragraphs 1 and 4 of Resolution C-13-01:

   Paragraph 1. "These measures are applicable in the years 2014-2016 to all CPCs' purse-seine vessels of IATTC capacity classes 4 to 6 (more than 182 metric tons carrying capacity) that fish for yellowfin, bigeye and skipjack tunas in the Convention Area."

Paragraph 4. “Notwithstanding the provisions of paragraph 3, purse-seine vessels of IATTC capacity class 4 (between 182 and 272 metric tons carrying capacity) will be able to make only one single fishing trip of up to 30 days duration during the specified closure periods, provided that any such vessel carries an observer of the On-Board Observer Program of the Agreement on the International Dolphin Conservation Program (AIDCP). “