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REBUILDING PLAN FOR PACIFIC BOUEFIN TUNA

WCPFC-NC10-2014/DP-07

UNITED STATES OF AMERICA

Rebuilding Plan for Pacific Bluefin Tuna

Proposal by the United States of America
for the Tenth Regular Session
of the WCPFC Northern Committee

Explanatory Note

This proposal responds to portions of Japan's "Draft Conservation and Management Measure to Establish a Multi-Annual Recovery Plan for Pacific Bluefin Tuna" (NC10-DP06). Japan's proposal includes a target and schedule for rebuilding the stock, as well as specific management measures aimed at achieving the rebuilding target. Both these aspects are important and require urgent action. However, to facilitate progress on both of them, we urge the Northern Committee to discuss the specific management measures separately from the rebuilding objectives.

Specific management measures will be required for the immediate future, starting in 2015. We do not propose here any specific management measures, but look forward to discussing Japan's proposed management measures.

This proposal focuses on establishing rebuilding objectives and a general strategy for achieving those objectives. It builds on the concept proposal introduced by the United States at NC9 (NC9-DP08). Our proposal and Japan's proposal share the aim of rebuilding the stock to a specific level within a specific period; the two proposals differ only in how far to rebuild the stock.

The rebuilding target and period proposed here are identical to those proposed by the United States at NC9. In addition to providing rebuilding objectives, this proposal includes a "rebuilding strategy" with a process for obtaining information from the ISC to support the development and implementation of effective conservation and management measures. Additionally, the proposal includes a principle that can be used by the WCPFC and the IATTC to address the difficult issue of finding a fair balance of conservation action on the two sides of the Pacific Ocean. These three elements of the proposal are described in more detail below.

Rebuilding objectives: The primary objective in any rebuilding plan is to rebuild the stock to a specified level ("rebuilding target") in a specified time ("rebuilding period"). As in NC9-DP08, the United States proposes a rebuilding target of 20% of the unfished spawning stock size, which is to be reached in ten years.

Given the WCPFC's hierarchical approach for setting reference points, and that the stock-recruitment relationship for Pacific bluefin tuna is not well known (in the latest stock assessment steepness was fixed at 0.999, and the ISC Pacific Bluefin Tuna Working Group noted that the estimate was highly uncertain), we firmly believe that the rebuilding target should be expressed in terms of the estimated unfished spawning stock size. A rebuilding target related to historical stock sizes (e.g., median historical SSB, as proposed by Japan), is not an appropriate application of the precautionary approach for fisheries management, particularly since the latest stock

assessment indicates that the Pacific bluefin tuna spawning biomass has been substantially depleted throughout much of the stock assessment period.

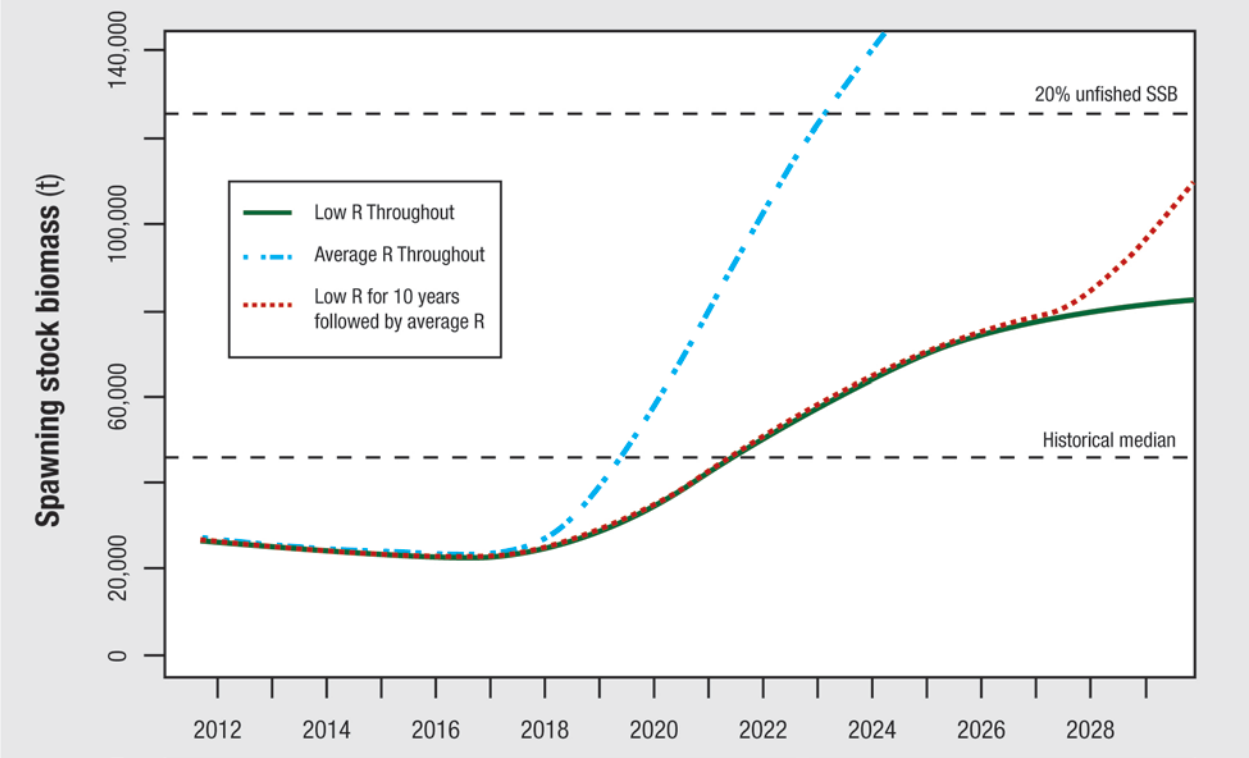
With respect to the specific proportion of the unfished spawning stock size that should be the rebuilding target, we note that Article 6.1 of the WCPF Convention, by reference to Annex II of the UN Fish Stocks Agreement, provides that "For overfished stocks, the biomass which would produce maximum sustainable yield [B_{MSY}] can serve as a rebuilding target." Twenty percent of the unfished spawning stock size has been recommended as a reasonable proxy for B_{MSY} for stocks with at least average resilience,[1] and it has been used as a reference point in place of B_{MSY} in various fisheries. It is being used by the Commission for the Conservation of Southern Bluefin Tuna as an interim rebuilding target (to be achieved by 2035). The International Commission for the Conservation of Atlantic Tunas is using B_{MSY} as the rebuilding target for Atlantic bluefin tuna (to be achieved by 2022, after a rebuilding period of 15 years). The WCPFC has adopted 20%$SSB_{F=0}$ as the limit reference point – as a proxy for B_{MSY} – for the three tropical tuna stocks and for South Pacific albacore.

With respect to the rebuilding period, we recognize the tradeoffs between the need to rebuild the stock quickly in order to lessen the risk of recruitment failure and the economic impacts of making rapid and large reductions in harvest rates. The projections prepared by the ISC in response to the request of NC9 are informative for the purpose of determining the appropriate balance (see Attachments 1 and 2).

The most restrictive harvest scenario (#6), which involves 50% cuts in juvenile catches from recently mandated levels across the Pacific Ocean, is the only scenario examined that is expected to rebuild the stock substantially within 10 or 15 years. The expected rebuilding path for harvest scenario #6 under each of the three recruitment assumptions considered by the ISC is shown in Figure 1. Also indicated in Figure 1 are the two rebuilding targets that have been proposed to date: the historical median SSB (estimated in the last assessment to be 43,000 mt) and 20% of the unfished SSB (estimated in the last assessment to be 124,000 mt).

[1] For example: Mace P.M. 1994. Relationships between common biological reference points used as thresholds and targets of fisheries management strategies. Can. J. Fish. Aquat. Sci. 51:110-122.

Figure 1. Expected Pacific bluefin tuna rebuilding trajectories under NC9's harvest scenario #6 and three alternative recruitment conditions (adapted from Figures A-C of ISC/14/PLENARY/10; see those figures for uncertainty and additional information).



As shown in Attachment 1, under the most pessimistic recruitment assumption (low recruitment throughout), there would be a 2% chance of the spawning stock rebuilding to 20%$SSB_{recent,F=0}$ within 10 years, and a 9% chance of doing so within 15 years. Under the slightly more optimistic recruitment assumption (low recruitment for 10 years, followed by average recruitment), the chances are 2% and 17%, respectively. Under the assumption of average recruitment throughout the projection period, the chances increase to 61% and 91%, respectively. Given these projections, the United States believes that planning to reach the rebuilding target in 10 years – although challenging if recruitment declines – is appropriate.

In addition to the rebuilding target and period, we also should consider the rebuilding trajectory (e.g., steady; fast then slow, or slow then fast). The rebuilding trajectories projected by the ISC for the candidate harvest scenarios identified by NC9, including those for harvest scenario #6 shown in Figure 1, are examples of trajectories that can be expected with management measures that do not change throughout the projection period. Management strategy #4 in section 2.2.1, which would require periodic adjustments to the management measures, is an example of a linear rebuilding trajectory. This proposal does not specify a desired rebuilding trajectory, but it would be beneficial to include such a trajectory as part of the rebuilding strategy. One advantage of a defined trajectory is that rebuilding progress could be evaluated periodically based on the most recent stock assessments, which would inform the NC whether the rebuilding strategy is operating as expected and help determine what refinements are needed.

In addition to the primary objective of rebuilding the Pacific bluefin tuna stock within a specific amount of time, this proposal includes secondary objectives related to fishing opportunities during the rebuilding period and equitability in the conservation burden. The United States understands that there are likely to be other secondary objectives that reflect the interests of other NC and IATTC members and participants.

Rebuilding strategy: This proposal would establish a process using the management strategy evaluation (MSE) approach for developing scientific advice in finding an appropriate balance between the long-term benefits from rebuilding the stock and the near-term costs associated with such rebuilding, as well as to account for scientific uncertainty in stock dynamics and other factors. MSE can help identify rebuilding strategies that meet the agreed upon rebuilding objectives and that are as robust as possible with respect to uncertainty and natural variation.[2]

MSE involves a series of steps to evaluate a set of candidate management strategies.[3] The managers are generally responsible for the steps of establishing the management objectives and associated performance measures, and for identifying candidate management strategies.

The scientists are generally responsible for the steps of developing an operating model and using it to simulate the application of the candidate management strategies into the future and evaluating how they perform with respect to the management objectives, using the specified performance measures. This proposal would establish the rebuilding objectives and associated performance measures, as well as an initial set of candidate management or harvest strategies to be evaluated. The ISC would be requested to undertake the remaining steps. It is emphasized that MSE is an iterative process, evolving as the managers identify new candidate management strategies and the scientists refine the stock assessment model and operating model. If this proposal is adopted by the Northern Committee and endorsed by the WCPFC, the IATTC could then consider embracing the rebuilding objectives, and if it does, the IATTC scientific staff would collaborate with the ISC in the remaining steps of the MSE.

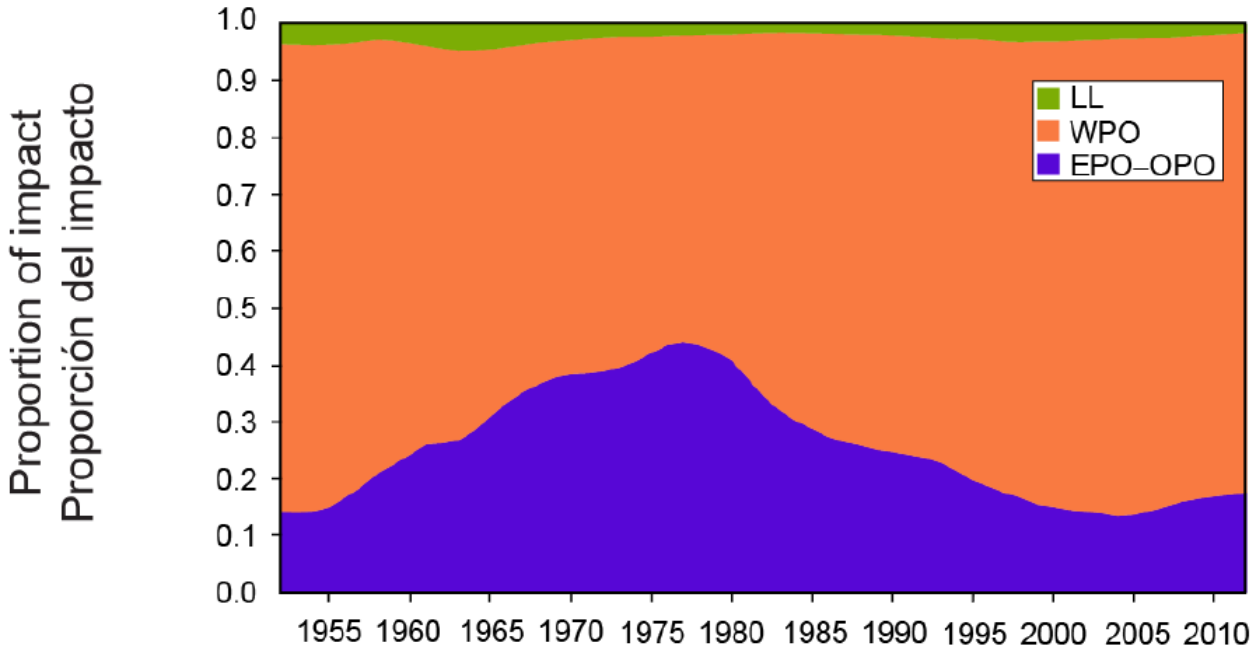
Coordination with the IATTC: Although the decisions of the WCPFC and IATTC reflect their commitment to work together to rebuild the Pacific bluefin tuna stock, coordination has been challenging. This situation is a result of logistical reasons (e.g., the respective timing of their meetings) and the challenge in finding a balance in conservation actions on both sides of the ocean that is perceived to be equitable by both organizations. This challenge is exacerbated by the two organizations choosing different management strategies (effort and catch limits in the WCPO; catch limits in the EPO), and the fisheries on each side having very different histories. This proposal seeks to resolve these difficulties by reaching an understanding in balancing conservation actions.

We propose to express that balance in terms of the proportion of total fishery impact to the spawning stock biomass of the respective fisheries in both sides of the ocean. We believe this is

[2] See Holland, D. S. (2010), "Management Strategy Evaluation and Management Procedures: Tools for Rebuilding and Sustaining Fisheries", *OECD Food, Agriculture and Fisheries Working Papers*, No. 25, OECD Publishing.
[3] See Punt, A. E. and G. P. Donovan. 2007. Developing management procedures that are robust to uncertainty: lessons from the International Whaling Commission. ICES J. Mar. Sci. (2007) 64 (4): 603-612.

an objective and appropriate measure. After examining the history of the relative impacts of the fisheries on the two sides of the ocean, as shown in Figure 2, we suggest that a balance of 75% impact in WCPO fisheries and 25% impact in EPO fisheries would be appropriate. It can be seen in Figure 2 that from 1950 to 2013 the proportional impacts of the WCPO-EPO fisheries have ranged from approximately 87%-13% to 55%-44%, and the breakdown in 2012 was approximately 82%-18%.

Figure 2. Impacts of longline fisheries, WCPO non-longline fisheries, and EPO purse seine and sport fisheries on the spawning stock biomass of Pacific bluefin tuna (Figure 19 in IATTC Document SAC-05-10a; a shorter history is available as Figure 6-4 of the ISC's "Stock Assessment of Bluefin Tuna in the Pacific Ocean in 2014").



Attachment 1. Projection results for harvest scenarios identified by the Northern Committee (Table 5-5 from the ISC's "Stock Assessment of Bluefin Tuna in the Pacific Ocean in 2014").

NC9's scenarios	Future recruit level		Within 10 years from 2014					Within 15 years from 2014					Mean yield in 2026 - 2028
			Probability achieving reference level at least one year					Probability achieving reference level at least one year					
	2014 - 2023 (10years)	From 2024	62KT (10%SSB0)	93KT (15%SSB0)	124KT (20%SSB0)	155KT (25%SSB0)	Historical Median(43KT)	62KT (10%SSB0)	93KT (15%SSB0)	124KT (20%SSB0)	155KT (25%SSB0)	Historical Median(43KT)	
No.1	Low	Low	0%	0%	0%	0%	4%	1%	0%	0%	0%	7%	13664.7
	Low	Middle	0%	0%	0%	0%	4%	3%	0%	0%	0%	14%	16320.9
	Middle	Middle	48%	24%	10%	4%	69%	76%	50%	28%	15%	90%	22932.5
No.2	Low	Low	1%	0%	0%	0%	5%	2%	0%	0%	0%	9%	13455.7
	Low	Middle	1%	0%	0%	0%	5%	4%	0%	0%	0%	17%	15817.9
	Middle	Middle	53%	30%	16%	8%	72%	80%	59%	40%	26%	92%	17572.0
No.3	Low	Low	1%	0%	0%	0%	9%	4%	0%	0%	0%	18%	13380.1
	Low	Middle	1%	0%	0%	0%	9%	8%	1%	0%	0%	29%	15447.2
	Middle	Middle	60%	36%	20%	10%	79%	87%	67%	48%	31%	96%	17019.4
No.4	Low	Low	1%	0%	0%	0%	2%	1%	0%	0%	0%	5%	13186.2
	Low	Middle	1%	0%	0%	0%	2%	2%	0%	0%	0%	9%	15834.0
	Middle	Middle	48%	27%	13%	5%	64%	77%	57%	37%	20%	87%	23565.0
No.5	Low	Low	3%	0%	0%	0%	16%	8%	1%	0%	0%	32%	14195.6
	Low	Middle	3%	0%	0%	0%	16%	16%	2%	0%	0%	46%	16225.3
	Middle	Middle	70%	43%	22%	10%	87%	92%	75%	52%	32%	98%	24219.0
No.6	Low	Low	51%	12%	2%	0%	85%	84%	39%	9%	2%	98%	17055.8
	Low	Middle	51%	12%	2%	0%	85%	90%	51%	17%	4%	99%	18767.5
	Middle	Middle	96%	83%	61%	38%	99%	100%	98%	91%	77%	100%	27453.9
No.7	Low	Low	6%	1%	0%	0%	31%	18%	2%	0%	0%	59%	14453.7
	Low	Middle	6%	1%	0%	0%	31%	30%	4%	0%	0%	73%	16502.3
	Middle	Middle	77%	49%	26%	13%	92%	96%	81%	59%	38%	99%	23316.9

Attachment 2. Harvest scenarios identified by the Northern Committee (from Attachment F to the report of NC9).

	Western and Central Pacific Ocean			Eastern Pacific Ocean
	Fishing effort in Pacific bluefin tuna fisheries	**Juvenile catches**	**Adult catches**	**Catches**
1	2002–2004 avg.	15% reduction from 2002–2004 avg.		5,500 mt/yr
2	2002–2004 avg.	15% reduction from 2002–2004 avg.	15% reduction from 2002–2004 avg.	5,500 mt/yr
3	2002–2004 avg.	15% reduction from 2002–2004 avg.	15% reduction from 2002–2004 avg.	4,675 mt/yr
4	2007–2009 avg.	15% reduction from 2002–2004 avg.		4,675 mt/yr
5	2002–2004 avg.	25% reduction from 2002–2004 avg.		4,125 mt/yr
6	2002–2004 avg.	50% reduction from 2002–2004 avg.		2,750 mt/yr
7	15% reduction from 2002–2004 avg.	25% reduction from 2002–2004 avg.		4,125 mt/yr

Proposed Conservation and Management Measure to Establish a Rebuilding Plan for Pacific Bluefin Tuna

The Western and Central Pacific Fisheries Commission (WCPFC):

Recognizing that the latest stock assessment of Pacific bluefin tuna, completed by the International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean (ISC) in 2014, indicates that the stock is in a severely depleted condition, with the spawning stock biomass in 2012 estimated to be less than six percent of the unfished size;

Adopts, in accordance with Article 10 of the WCPFC Convention the following rebuilding plan for Pacific bluefin tuna:

1. Rebuilding Objectives

1.1 The primary objective of this plan is to rebuild the Pacific bluefin tuna stock as follows:

- The rebuilding target is 20% of unfished SSB ($20\%SSB_{recent,F=0}$), to be reached within 10 years.

1.2 During the rebuilding period, secondary management objectives are to:

- Maintain fishing opportunities in all existing PBF-directed fisheries to the extent compatible with the primary objective;
- Maintain an equitable balance of conservation burden among members and between the WCPO and EPO.

2. Rebuilding Strategy

2.1 The WCPFC, based on the recommendations of the Northern Committee, will adopt conservation and management measures that have a reasonably high probability of achieving the rebuilding target within the rebuilding period and that achieve the secondary objectives to the extent possible. The Northern Committee may determine what level of probability is appropriate for this purpose, but it may be no lower than 50 percent.

2.2 In support of paragraph 2.1, the ISC is requested to evaluate – in collaboration with the IATTC scientific staff as appropriate – the expected performance of candidate management strategies with respect to the rebuilding objectives, as follows:

2.2.1 Candidate management strategies: The Northern Committee will periodically request the ISC to evaluate specific candidate management strategies based on the results of the most recent stock assessment, and appropriate projections/simulations. The ISC is invited to evaluate additional candidate management strategies as it sees fit. The Northern Committee initially requests that the following management strategies be evaluated (if paragraph 3.1 is agreed by the IATTC, the ISC may adjust the EPO

elements of each candidate management strategy as needed to attain, approximately, the distribution of fishery impact given in paragraph 3.1):

1. 2002-04 fishing effort in all WCPO PBF-directed fisheries; 50% of 2002-04 catches in all WCPO fisheries predominantly taking juveniles;[4] 2,750 mt/yr in EPO commercial fisheries.[5]
2. 50% of 2002-04 fishing effort in all WCPO and EPO PBF-directed fisheries; 50% of 2002-04 catches in all WCPO fisheries predominantly taking juveniles; 2,750 mt/yr in EPO commercial fisheries.
3. 50% of 2002-2004 catches in all WCPO and EPO PBF-directed fisheries.[5]
4. A harvest rule in which catches in each fishery are limited, with the limits reset every three years in concert with the latest stock assessment, and set such that the rebuilding target is achieved in the rebuilding period on an approximately linear trajectory, with the catch limits distributed among fisheries such that the distribution of impacts on SSB is as would be expected under management strategy #1.

2.2.2 Performance measures: To the extent possible, the ISC is requested to measure the performance of candidate management strategies in the following terms, at a minimum:

1. Probability of achieving the rebuilding target on schedule
2. Rebuilding ratio – that is, the ratio of the latest expected period of rebuilding to the rebuilding period specified in paragraph 1.1
3. Expected annual yield, by major fishery, over the rebuilding period
4. Expected annual fishing effort, by major fishery, over the rebuilding period
5. Inter-annual variability in yield and fishing effort, by major fishery, over the rebuilding period
6. Expected proportional fishery impact on spawning stock biomass of WCPO fisheries and of EPO fisheries

2.2.3 Management strategy evaluation: The ISC is encouraged to perform the evaluations as part of a formal management strategy evaluation (MSE). Recognizing that developing the operating model and other aspects of the MSE will take time and might require further dialogue between the Northern Committee and the ISC, while the MSE is in development the ISC is requested to perform the evaluations using the best means at its disposal.

3. Coordination with the IATTC

3.1 For the Northern Committee's purpose of recommending conservation and management measures and the ISC's purpose of evaluating candidate management strategies, the WCPFC believes that an equitable balance of conservation action between the WCPO and the EPO is one in which:

[4] For the purpose of this rebuilding plan, "juvenile" is defined to mean fish [less than 50 kg in size].
[5] For the fisheries in which F is not explicitly limited, the projections should be run such that F in the fishery is not allowed to exceed twice the 2010-2012 average level in that fishery.

- The fisheries in the WCPO account for [75 percent] of the total fishery impact on the spawning stock biomass, and
- The fisheries in the EPO account for [25 percent] of the total fishery impact on the spawning stock biomass.

3.2 If agreed by the IATTC, the WCPFC understands and expects that once the WCPFC or IATTC has adopted a binding measure for a given period, the other organization will, at its first opportunity, adopt a complementary measure for at least the same time period that would be expected to result, approximately, in the relative fishery impacts specified in paragraph 3.1.

4. Management after Rebuilding

4.1 Once the ISC and SC inform the Northern Committee and the WCPFC that the rebuilding target has likely been achieved, this CMM will no longer apply.

4.2 Management of the stock then will be guided by long-term objectives, reference points and a harvest control rule to be developed by the Northern Committee and approved by the WCPFC.