**REFINING CANDIDATE REFERENCE POINTS AND HARVEST CONTROL RULES FOR PACIFIC BLUEFIN TUNA**

**Proposal by the United States of America**

**to the**

**Eighth IATTC and WCPFC-NC Joint Working Group Meeting**

**on the Management of Pacific Bluefin Tuna**

Candidate HCRs

The candidate HCRshapes are illustrated in Figures 1 and 2 where fishing mortality is controlled depending on stock status relative to the defined reference points.

For Figure 1, the Ftarget rate applies when the stock is larger or equal to the SSBthreshold with a probability of at least 50%, while Fmin rate applies when the stock is at or smaller than SSBlimit with a probability greater than [5-20%] as specified in the management objectives, and there is a linear transition in F for stock sizes between SSBlimit and SSBthreshold. Fmin would be defined as an F rate that is less than the F rate corresponding to the Ftarget.

For Figure 2, the Ftarget rate applies when the stock is larger or equal to the SSBthreshold with a probability of at least 50%. When the stock is lower than the SSBthreshold, there is a linear transition in F between SSBthreshold and the origin.

This HCR shall be tested with and without a limit that constrains changes in TAC between consecutive management periods of no more than 20%. This HCR shall also be tested with an allocation based on the recent exploitation pattern and with allocations tuned to reach the WCPO:EPO fishery impact ratio of 70:30 and 80:20.



**Figure 1**. Candidate HCR shape 1



Figure 2. Candidate HCR shape 2.

Candidate HCRs and Reference Points to Evaluate in the MSE

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **HCR Number** | **HCR Shape** | **Fmin** | **LRP** | **ThRP** | **TRP** |
| 1 | 1 | F10%FTarget | 15%SSBF=0 | 20%SSBF=0 | FSPR30% |
| 2 | 1 | F10%FTarget | 15%SSBF=0 | 25%SSBF=0 | FSPR30% |
| 3 | 1 | F10%FTarget | 15%SSBF=0 | 20%SSBF=0 | FSPR40% |
| 4 | 1 | F10%FTarget | 15%SSBF=0 | 25%SSBF=0 | FSPR40% |
| 5 | 1 | F10%FTarget | 20%SSBF=0 | 25%SSBF=0 | FSPR40% |
| 6 | 1 | FSPR70% | 10%SSBF=0 | 20%SSBF=0 | FSPR30% |
| 7 | 1 | FSPR50% | 10%SSBF=0 | 20%SSBF=0 | FSPR25% |
| 8 | 1\* | N/A\* | 20%SSBF=0 | 20%SSBF=0 | FSPR30% |
| 9 | 2 | N/A | Median SSB 1952-2014 | 20%SSBF=0 | FSPR20% |
| 10 | 2 | N/A | Median SSB 1952-2014 | 15%SSBF=0 | FSPR25% |
| 11 | 1 | F5%FTarget | 7.7%SSBF=0 | 15%SSBF=0 | FSPR30% |
| 12 | 1 | F5%FTarget | 7.7%SSBF=0 | 20%SSBF=0 | FSPR30% |

\* In this HCR, when %SSB F=0 is lower than ThRP (20%SSBF=0), fishing intensity will be controlled by the management measures that were taken for and succeeded in the recovery of the stock (i.e., WCPFC CMM2020-02 and IATTC Resolution C-18-01).

These new candidate HCRs and reference points replace those from the 2019 recommendation.