ISC International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean

22ND ISC Plenary Session Meeting Report

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ISC Chair and Vice-Chair

https://isc.ac.affrc.go.jp

NC18

October 3/4-5/6, 2022

Virtual Meeting

Outline

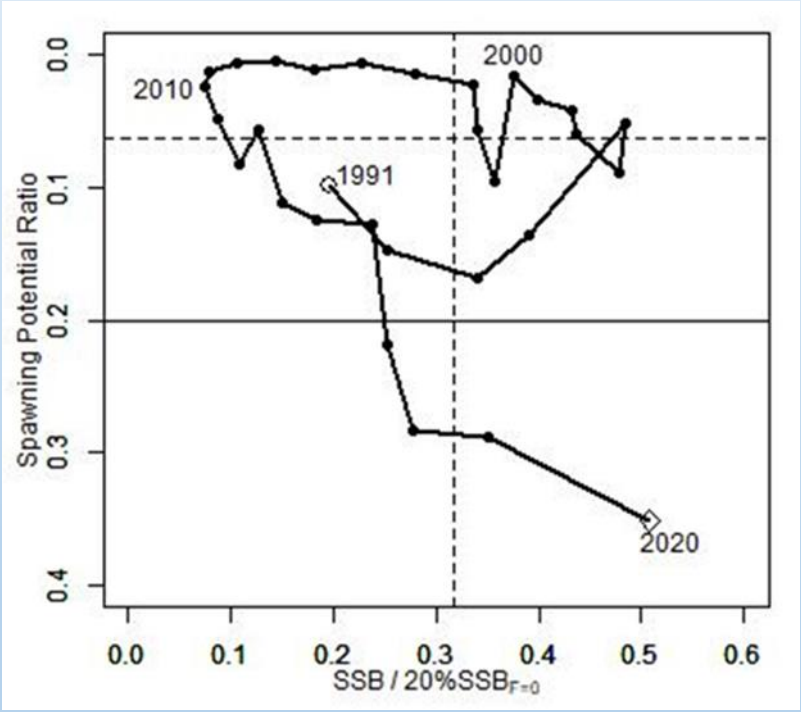
- In-person Plenary Session - July 12-18, 2022
- New stock status & conservation information for:
  - Pacific Bluefin Tuna update assessment
  - Blue Shark benchmark assessment
  - WCNPO Striped Marlin
- Stock status & conservation information for Species not assessed in 2022
- Statistics and Database Issues
- Administrative Activities
  - Peer review of stock assessments
  - Formalizing ISC
  - MOU/MOC Review
  - ISC Operations Manual
- Work plan – 2022/2023

Pacific Bluefin Tuna (PBF)

- Update assessment, 1952-2020
- Model structure same as 2020 assessment, minor changes and errors corrected, 2 years additional data inputs
- PBF spawning stock biomass (SSB) has gradually increased in the last 10 years, the rate of increase is accelerating and these biomass increases coincide with a decline in fishing mortality.
- Recovery of the PBF stock is occurring at a faster rate than anticipated when the Harvest Strategy to foster rebuilding (WCPFC HS 2017-02) was implemented in 2014.
- Under all projections scenarios tested, the second rebuilding target - 20%SSB_0 10 years after reaching the initial rebuilding target) with at least 60% probability - is achieved by 2029 with high probability.
- See presentation by PBFWG Chair/lead modeler***

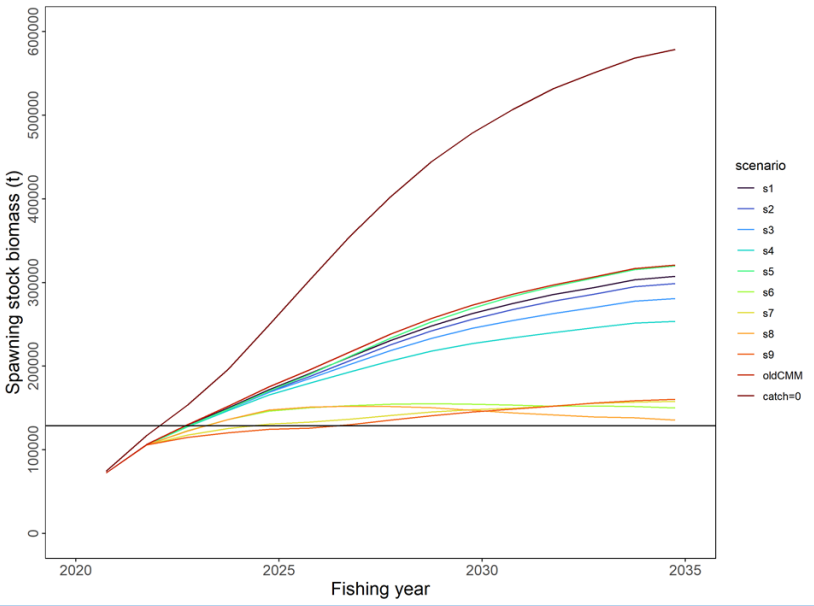
Stock Status

1. No biomass-based limit or target reference points have been adopted for PBF, but the PBF stock is overfished relative to the potential biomass-based reference points (20%SSB_0) adopted for other tuna species by the IATTC and WCPFC. On the other hand, SSB reached its initial rebuilding target (SSB_{MED} = 6.3%SSB_0) in 2019, 5 years earlier than originally anticipated by the RFMOs; and
2. No fishing mortality-based reference points have been adopted for PBF by the IATTC and WCPFC. The recent (2018-2020) $F_{\%SPR}$ is estimated to produce a fishing intensity of 30.7%SPR and is below the level corresponding to overfishing for many F-based reference points proposed for tuna species (Table 6 3), including $SPR_{20\%}$.



Conservation Information

1. The PBF stock is recovering from the historically low biomass in 2010 and has exceeded the initial rebuilding target ($SSB_{MED1952-2014}$) five years earlier than expected. The rate of recovery is increasing and under all projection scenarios evaluated, it is very likely the second rebuilding target ($20\%SSB_0$ with 60% probability) will be achieved (probabilities > 90%) by 2029. The risk of SSB falling below the historical lowest observed SSB at least once in 10 years is negligible;
2. The projection results show that increases in catches are possible without affecting the attainment of the second rebuilding objective. Increases in catch should consider both the rebuilding rate and the distribution of catch between small and large fish;
3. The projection results assume that the CMMs are fully implemented and are based on certain biological and other assumptions. For example, these future projection results do not contain assumptions about discard mortality. Although the impact of discards on SSB is small compared to other fisheries, discards should be considered in future harvest scenarios;
4. Given the uncertainty in future recruitment and the influence of recruitment on stock biomass as well as the impact of changes in fishing operations due to the management, monitoring recruitment and SSB should continue and research on a recruitment index for the stock assessment should be pursued; and
5. The results of projections from sensitivity models with lower productivity assumptions show that this conservation information is robust to uncertainty in stock productivity.

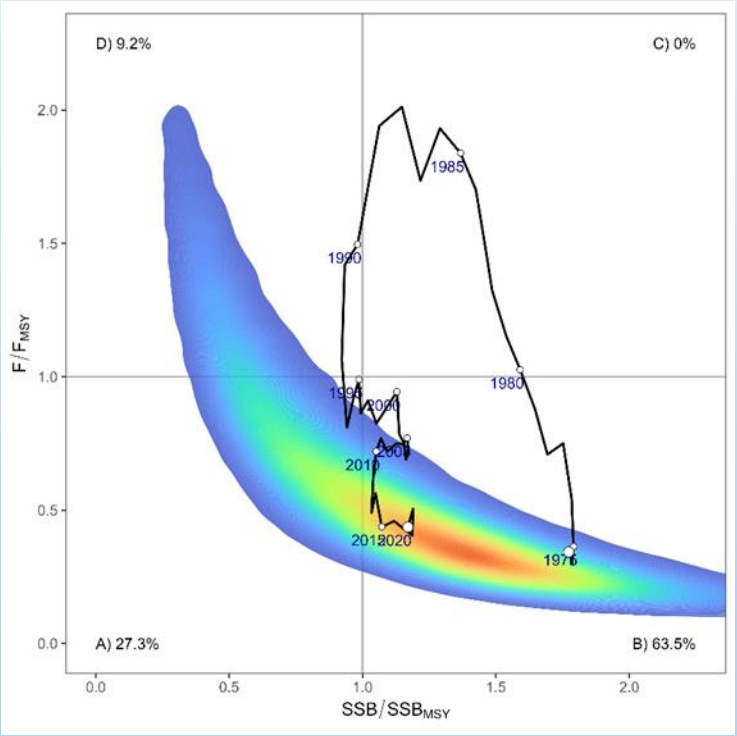


North Pacific Ocean Blue Shark (BSH)

- Benchmark Assessment, 1971-2020
- Model structure same as 2017 assessment, Beverton-Holt SR rather than low fecundity SR, model ensemble approach
- Model ensembles:
  1. Fitted to composite CPUE index based on 3 longline indices
  2. Fitted to Japan Kinkai shallow index
- SSB decline from the mid-1970s to 1990 and has since increased and stabilized around 100,000 t through the 2000s.
- Median estimates of current SSB are about SSB_{MSY}

Stock Status

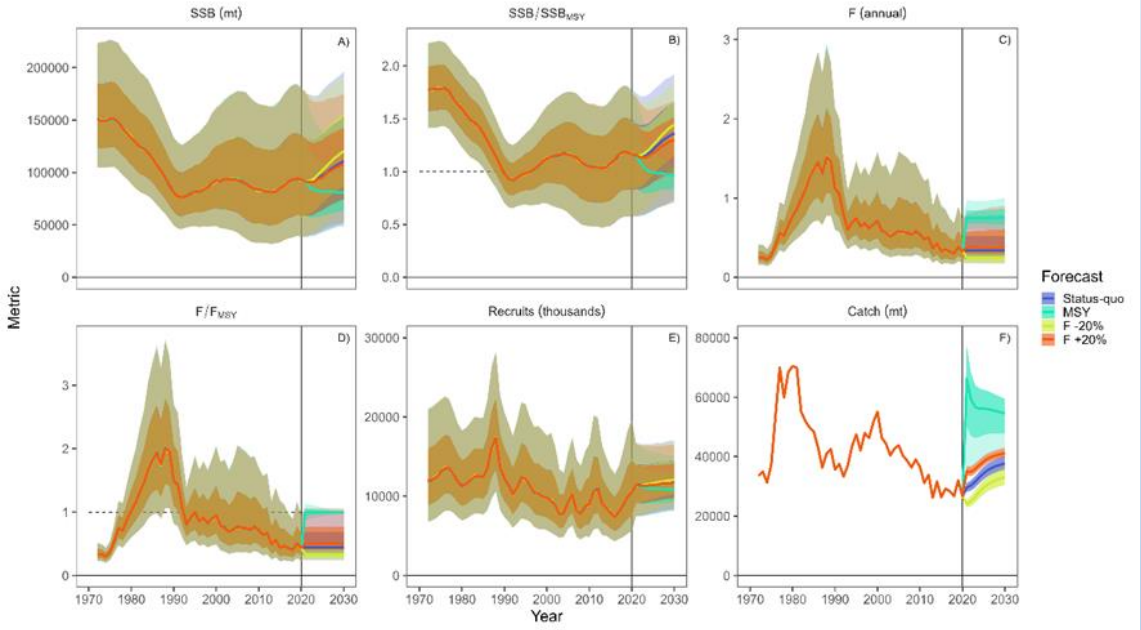
1. Target and limit reference points have not been established for pelagic sharks in the Pacific Ocean. Stock status is reported in relation to MSY-based reference points;
2. Median female SSB in 2020 was estimated to be 1.170 of SSB_{MSY} (80th percentile, 0.570 - 1.776) and is likely (63.5% probability) not in an overfished condition relative to MSY-based reference points;
3. Recent annual F ($F_{2017-2019}$) is estimated to be below F_{MSY} and overfishing of the stock is very likely (91.9% probability) not occurring relative to MSY-based reference points; and
4. The base case model results show that there is a 61.9% joint probability that NPO BSH stock is not in an overfished condition and that overfishing is not occurring relative to MSY-based reference points.



Conservation Information

1. Future projections in three of the four harvest scenarios ($F_{current}$ (2017-2019), $F_{current}$+20%, and $F_{current}$-20%) showed that median BSH SSB in the NPO will likely increase; the F_{MSY} harvest scenario led to a decrease in median SSB;

2. Median estimated SSB of BSH in the North Pacific Ocean will likely (>50 probability) remain above SSB_{MSY} in the next ten years for all scenarios except F_{MSY}; harvesting at F_{MSY} decreases SSB below SSB_{MSY}; and



3. There remain some uncertainties in the time series based on the quality (observer vs. logbook) and timespans of catch and relative abundance indices, limited size composition data for several fisheries, the potential for additional catch not accounted for in the assessment, and uncertainty regarding life history parameters. Continued improvements in the monitoring of BSH catches, including recording the size and sex of sharks retained and discarded for all fisheries, as well as continued research into the biology, ecology, and spatial structure of BSH in the North Pacific Ocean are recommended.

Special Notes

- Average annual catch of BSH by ISC members in 2017-2019 was 24,090 t. Catches in 2020 and 2021 were 23,816 t and 17,078 t, respectively. As ISC member countries account for at least 90% of the overall catch, these figures are believed to provide a reliable estimator of catch in North Pacific BSH.
- The decision to adopt an ensemble modeling approach instead of a single base-case modeling approach was made late in the assessment model development process when it became apparent that there was no clear best base-case model.
- The SHARKWG notes that uncertainty in stock status in the current assessment is likely still underrepresented as the model ensemble did not consider key uncertainties such as natural mortality or stock-recruitment resilience which are not well-known for many shark species. In the future the SHARKWG will ensure that the model ensemble is informed by the sensitivity analyses.

WCNPO Striped Marlin

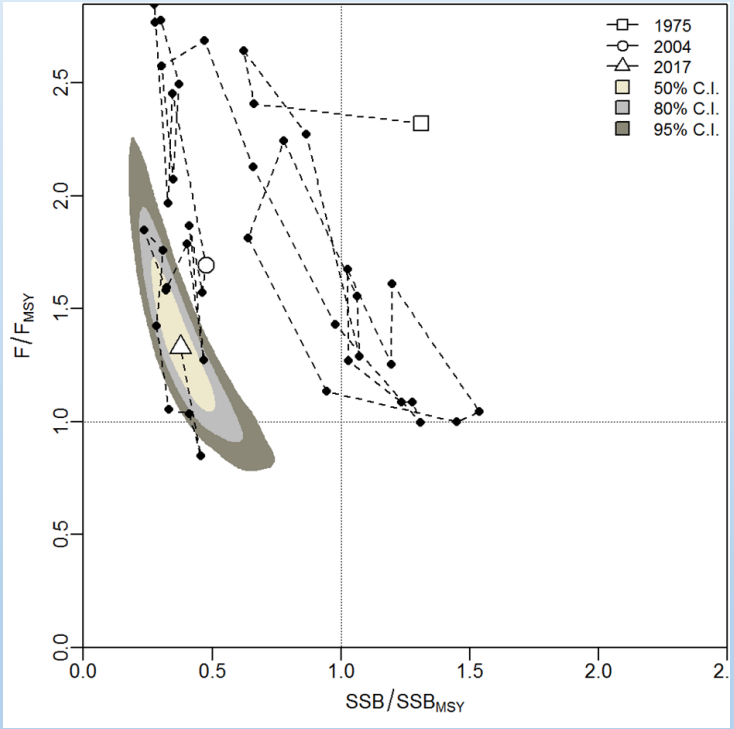
- Benchmark assessment planned for 2022
- BILLWG implemented several improvements to address data and model uncertainties, which were endorsed by ISC22.
- ISC considers this modeling to be a work in progress because of a significant issue with the choice of growth curve, which does not fully represent stock productivity.
- ISC22 approved work plan to explore the growth curve and complete a benchmark assessment
- ISC22 concluded that it cannot provide stock status and conservation information based on the 2022 work; information based on the 2019 assessment is provided until the new assessment is completed in 2023.

WCPFC18 Request

- *"WCPFC18 agrees that the rebuilding target for WCNPO striped marlin shall be based off the dynamic SSB_0 and requests the ISC to derive the appropriate time frame for calculating the dynamic SSB_0 by conducting a change point analysis on the recruitment time series to identify the appropriate time window, scaling the time frame based on the relative difference in mean generation times between tunas and striped marlin, or another appropriate methodology."*
- **RESPONSE:**
- Based on the results of the analyses requested, it was concluded that a 20 year period should be used to estimate dynamic B_0 reference points for this stock.
- Potential reference points will be reported as 20% of the $SSB_{F=0}$, where $SSB_{F=0}$ is averaged over the last 20 years (2001-2020)
- This time period corresponds to about 4 mean generation times for WCNPO MLS.
- Important to periodically evaluate whether the time window is still appropriate for dynamic B_0 calculations

Stock Status (2019 assessment)

1. There are no established reference points for WCNPO MLS; and
2. Results from the base case assessment model show that under current conditions the WCNPO MLS stock is likely overfished (>50% probability) and is likely subject to overfishing (>50% probability) relative to MSY-based reference points.

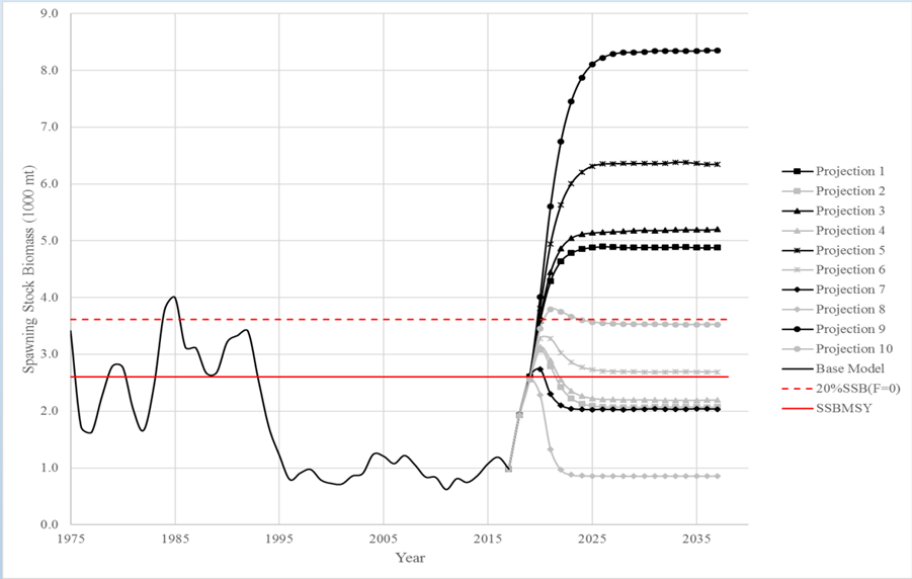


Conservation Information (2019)

1. In response to a request from NC15, both long-term and short-term recruitment scenarios were evaluated. The ISC concluded that the short-term recruitment model was the most appropriate model to use for conducting stochastic stock projections for WCNPO MLS because the time trend in the recruitment is not captured by the long-term recruitment scenario;

2. If the stock continues to experience recruitment consistent with the short-term recruitment scenario (2012-2016), then catches must be reduced to 60% of the WCPFC catch quota from CMM 2010-01 (3,397 t) to 1,359 t in order to achieve a 60% probability of rebuilding to 20%SSB_0=3,610 t by 2022. This change in catch corresponds to a reduction of roughly 37% from the recent average yield of 2,151 t. Note that the rebuilding target of 3,160 t identified in this statement is not expressed as a dynamic B_0 calculation; and

3. WCPFC18 requested that the BILLWG provide WCNPO Striped Marlin reference points for a rebuilding plan (Attachment L, WCPFC16 Summary Report) using a dynamic B_0 estimate of 20%$SSB_{F=0}$. The BILLWG concluded that WCNPO Striped Marlin reference points will be provided with reference to MSY and with reference to 20%$SSB_{F=0}$ averaged over the recent 20-year time frame (2001-2020).



Special Notes (2019)

- Retrospective analyses in 2019 showed that the assessment model appears to overestimate spawning potential in recent years, which may mean the projection results are ecologically optimistic.
- The WG achieved a base-case model (in 2019) using the best available data and biological information. However, the WG recognized uncertainty in some assessment inputs including drift gillnet catches and initial catch amounts, life history parameters such as maturation and growth, and stock structure.
- Overall, the base case model diagnostics and sensitivity runs show that there are some conflicts in the data. When developing a conservation and management measure to rebuild the resource, it is recommended that these issues be recognized and carefully considered, because they affect the perceived stock status and the probabilities and time frame for rebuilding of the WCNPO MLS stock.

Other Species

- No new information or assessments for:

Stock	Last Assessed
North Pacific Albacore	2020
Western and Central North Pacific Swordfish	2018
Eastern Pacific Swordfish	2014 (boundary change - part of WCNPO SWO and S EPO stock going forward)
Pacific Blue Marlin	2021
Western and Central North Pacific Swordfish	2018
North Pacific Shortfin Mako Shark	2018 – based on indicator analysis

- ISC22 Plenary reviewed and agreed to forward the stock status and conservation information adopted at ISC21 for these stocks

Statistics and Database Issues

- STATWG:
  1. Oversees maintenance of database and quality of data submissions;
  2. Maintains ISC website and functions; and
  3. Provides internal data sharing and responds to external data requests.
- STATWG will harmonize ISC data formats with those used by WCPFC and IATTC
- Data inventory is published annually on ISC website (https://isc.fra.go.jp/) by Oct 31 and stock assessment files archived by same date
- Process in development to handle external requests for data sharing and stock assessment file requests

Administrative Activities

- Peer review of stock assessments
  - Options discussed at ISC21 & ISC22
  - Proposal for ISC23 including scope, timing & cost
- Formalizing ISC
  - Currently no Secretariat (Office of the Chair) nor budget
  - Exploring Options, including Inter-agency agreements
- MOU/MOC Review
  - MOU with WCPFC-NC and MOC with IATTC
  - 3 year review clause for function
- ISC Operations Manual
  - Updated with language relating to Observers & functions (adding MSE)
  - Posted on ISC website (https://isc.fra.go.jp/)

ISC Leadership

Working Group	Chair	Vice-Chair
Albacore	S. Hawkshaw (2021-2024)	S. Teo (2020-2023)
Pacific Bluefin	S. Nakatsuka (2022-2025)	S.-K. Chang (2020-2023)
Billfish	H. Ijima (2022-2025)	Y.-J. Chang (2022-2025)
Shark	M. Kai (2021-2024)	M. Kinney (2021-2024)
Statistics	F. Carvalho (2021-2024)	M.K. Lee (2022-2023)*
ISC Plenary	J. Holmes (2020-2023)	S.-K. Chang (2020-2023)
* Intersessional election will be held		

- Requests for Science information & advice should be made in writing to the ISC Chair

Work plan – 2022/23

- Benchmark Assessments (Data preparation and Assessment Workshops)
  - North Pacific Albacore
  - WCNPO Swordfish
  - WCNPO Striped Marlin
- PBFWG - MSE Development and Assessment Improvement (2 Workshops)
- SHARKWG - Research and Assessment Improvements (1 workshop)
- STATWG - Steering Committee meeting & 1-d workshop at ISC23
- Administrative Matters
  - Peer review of stock assessments proposal
  - MOC/MOU function review
  - Formalizing ISC
- ISC23 Plenary
  - July 12-17, 2023
  - Japan

QUESTIONS?