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

The 19th Meeting of the ISC: Plenary Report

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ISC Chair and Vice-Chair
http://isc.ac.affrc.go.jp

NC15
September 3-6, 2019
Portland, OR, USA

Outline

- Participants
- Working Group Workshops & Activities
- Stock Status & Conservation Advice
- Interactions with Regional Organizations
- Administrative matters
- Future Activities

ISC19 Participants: July 2019, Taipei, Taiwan

- ISC Members
  - Canada
  - Chinese Taipei
  - Japan
  - Republic of Korea
  - United States of America
- Non-Voting Members
  - WCPFC
- Observers
  - Monterey Bay Aquarium
  - Western Pacific Fisheries Management Council

Working Group Workshops and Activities

Working Group Workshops and Activities

- Albacore Working Group
  - 26 February – 4 March 2019; Shimizu, Shizuoka, Japan; review initial MSE results, prepare for 4th MSE workshop, develop 2020 assessment workplan
- Pacific Bluefin Tuna Working Group
  - 18-22 March 2019, Jeju, Korea; discuss improvements to the assessment model, review fishery information for changes in recruitment or biomass, developed responses to requests from the Joint NC-IATTC PBF Working Group
- Billfish Working Group
  - 14-21 January 2018, Honolulu, USA; data preparation for MLS assessment
  - 8-15 May 2019, Honolulu, USA; benchmark assessment WCNPO MLS

Working Group Workshops and Activities

- SHARK Working Group
  - 8-14 November 2018, Kaohsiung, Taiwan; Improvements to fishery data, biological parameters, and modelling approach for BSH and SMA in the NPO; proposal to change the stock assessment cycles for BSH and SMA to 5 years.
- STATISTICS Working Group
  - 9 July 2019, Taipei, Taiwan; oversees maintenance of the ISC database and the quality of data submitted by members, (2) maintenance of the proper function of ISC website, and (3) coordination of internal data sharing and development of protocols for answering external data requests,

Working Group Workshops and Activities

- MSE Workshops
  - 4th ALB MSE, March 4-7, 2019, Yokohama, Japan; reviewed initial results with managers and stakeholders and compiled feedback
  - 2nd PBF MSE, May 20-21, 2019, San Diego, USA; enhance understanding and promote manager and stakeholder involvement in MSE process
- Ad-hoc Close-Kin Workshop
  - March 16-17, 2019, Jeju, Korea; progress on close-kin genetics in PBF including sample collection, marker development, and modelling; goal of this this project is close-kin mark recapture estimate of PBF abundance

Stock Status and Conservation Information

ISC Stock Assessments

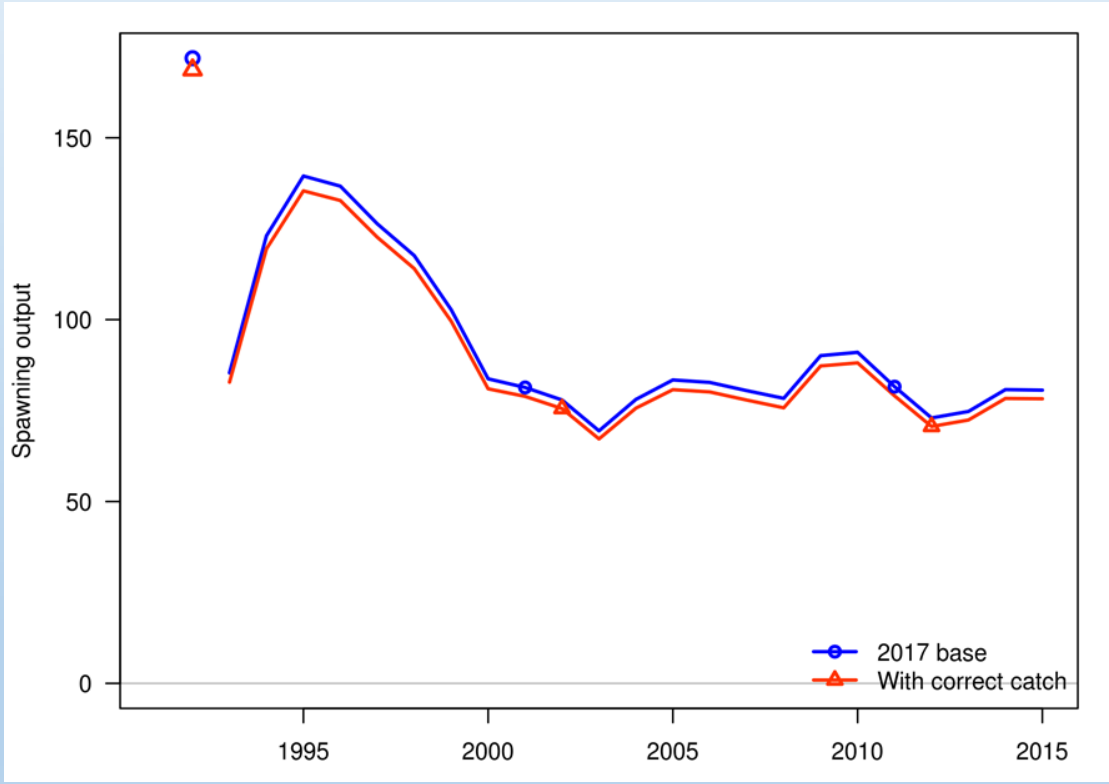
- Western and Central North Pacific Striped Marlin
  - Benchmark assessment; last assessment in 2012
- Albacore – data correction
- No Assessments
  - NPO Swordfish, Pacific Blue Marlin, Pacific Bluefin Tuna, Blue Shark, Shortfin Mako Shark

North Pacific Albacore Stock Status and Conservation Information

- Data error for 1 fleet in 2017 assessment
- Re-ran 2017 base case with corrected data
- No change to conclusions

Stock Status

- The stock is likely not overfished relative to the limit reference point adopted by the Western and Central Pacific Fisheries Commission ($20\%SSB_{current\ F=0}$);
- No F-based reference points have been adopted to evaluate overfishing. Stock status was evaluated against seven potential reference points. Current fishing intensity ($F_{2012-2014}$) is below six of the seven potential reference points, except $F_{50\%}$.



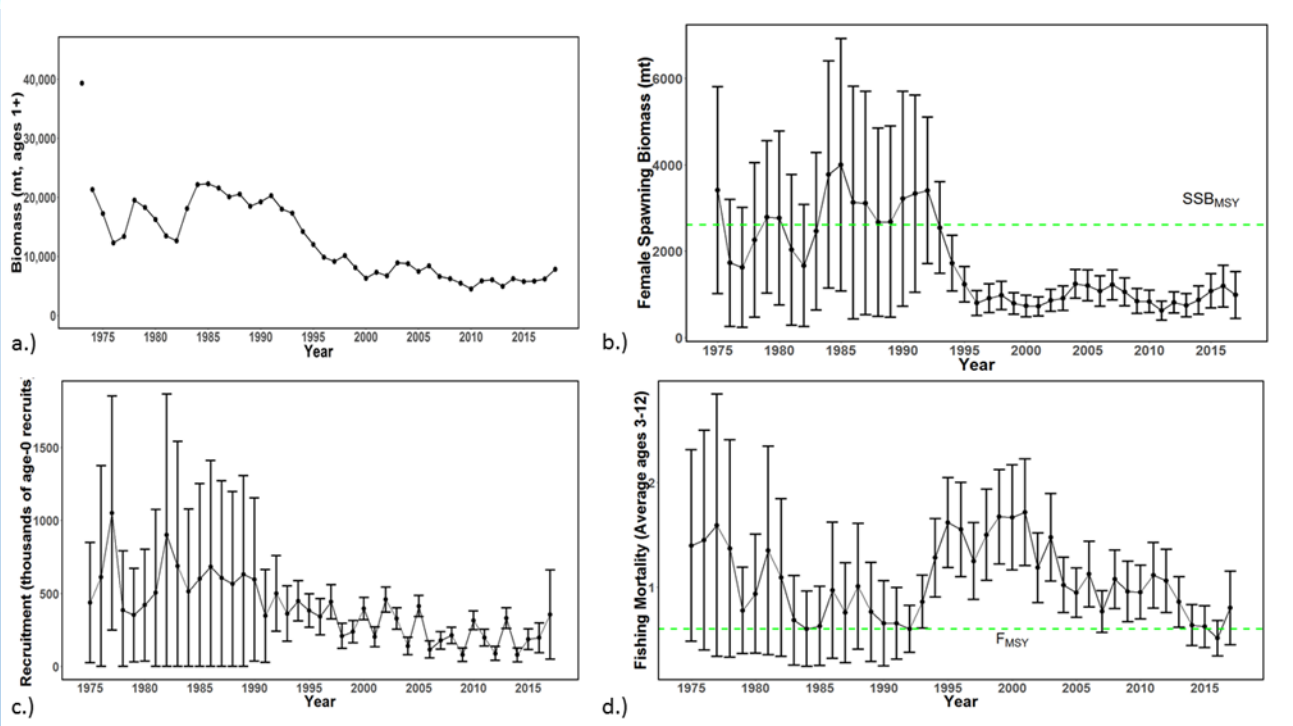
North Pacific Albacore Stock Status and Conservation Information

Conservation Information

1. If a constant fishing intensity ($F_{2012\text{-}2014}$) is applied to the stock, then median female spawning biomass is expected to undergo a moderate decline, with a < 0.01% probability of falling below the limit reference point established by the WCPFC by 2025. However, expected catches in this scenario will be below the recent average catch level for this stock.
2. If a constant average catch ($C_{2010\text{-}2014}$ = 82,432 t) is removed from the stock in the future, then the decline in median female spawning biomass will be greater than in the constant F intensity scenario and the probability that SSB falls below the limit reference point (LRP) will be greater by 2025 (30%). Additionally, the estimated fishing intensity will double relative to the current level ($F_{2012\text{-}2014}$) by 2025 as spawning biomass declines.

WCNPO Striped Marlin Stock Status and Conservation Information

- Benchmark Assessment, 1975-2017
- Biomass (age-1+) decreased from 17,000 t in 1975 to 6,000 t in 2017.
- SSB_{2017} = 981 t; SSB_{MSY} = 2,604 t
- SSB_{2017}/SSB_{MSY} = 0.37
- Fishing mortality has been above F_{MSY} in every year except 1984, 1992, and 2016
- $F_{2015\text{-}2017}/F_{MSY}$ = 1.07



TL – total biomass (age 1+); TR – spawning biomass; BL – recruitment (age-0); BR – F (avg age 3-12 yr)

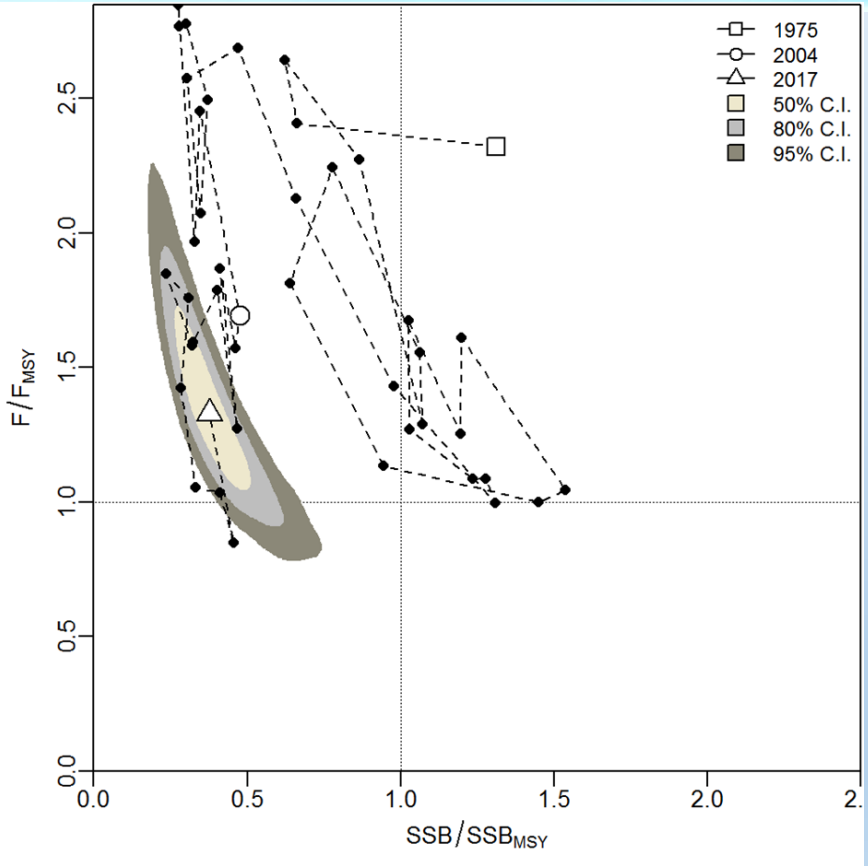
WCNPO Striped Marlin Stock Status and Conservation Information

Stock Status

1. There are no established reference points for WCNPO MLS.

2. Results from the base case assessment model show that under current conditions the WCNPO MLS stock is overfished and is subject to overfishing relative to MSY-based reference points.

- This conclusion is identical to the 2015 assessment conclusion on stock status



WCNPO Striped Marlin Stock Status and Conservation Information

Conservation Information

- Projection results under the long-term recruitment scenario show that the stock has at least a 60% probability of rebuilding to 20%SSB_0, the rebuilding target specified by NC14, by 2022 for all harvest scenarios, with the exception of the highest F scenario (Average F 1975-1977);
- However, if the stock continues to experience recruitment consistent with the short-term recruitment scenario (2012-2016), 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%SSB0=3,610 t by 2022. This corresponds to a reduction of roughly 37% from the recent average yield of 2,151 t;
- For the constant catch projection scenarios that were tested, it was notable that all of the projections under the long-term recruitment scenario would be expected to achieve the spawning biomass target by 2020 with probabilities ranging from 61% to 73% and corresponding catch quotas ranging from 3,397 to 1,359 t.

Special Comments

- 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.
- The base case model diagnostics and sensitivity runs show that that there are some unresolved conflicts in the data. These issues affect the perceived stock status and the probabilities and time frame for rebuilding.

Stock Status and Conservation Information – Other Species

No new information or assessments for:

1. Western and Central North Pacific Swordfish;
2. Eastern Pacific Swordfish;
3. Blue Marlin;
4. North Pacific Blue Shark;
5. North Pacific Shortfin Mako Shark; and
6. Pacific Bluefin Tuna

ISC19 Plenary reviewed and agreed to forward the stock status and conservation information adopted at ISC18 for these stocks, except for the omission of accompanying figures and tables and slight clarifying modifications if necessary.

Pacific Bluefin Tuna Responses to Joint IATTC-NC WG Requests

Two Requests

1. ISC to review the updated abundance indices, including recruitment index, up to 2017 to evaluate the need to change its scientific advice in 2018
2. ISC to conduct projections of additional harvest scenarios based on 2018 assessment and provide probability of achieving initial and 2nd rebuilding targets in accordance with paragraph 2.1 of HS2017-02

ISC Responses

1. After reviewing updated CPUE indices as well as Japanese recruitment monitoring, the ISC does not recommend changes to the conservation advice provided by ISC18 (in 2018). Some positive signs for the PBF stock were observed after the 2018 assessment, but they need to be confirmed by the 2020 stock assessment
2. The projection results show that increasing the catch limit of small PBF (<30 kg) in the WPO has the largest impact on the probability of achieving the interim and 2nd rebuilding targets relative to the base case model in the 2018 assessment. In addition, an overall increase in catch from the current limits, particularly a 15% increase, has the largest impact on achieving rebuilding targets (1st target 76%, 2nd target 85%) relative to the 2018 base case model (1st target 99%, 2nd target 96%) projections.

Pacific Bluefin Tuna Stock Status and Conservation Information

- Stock Status
  - No biomass-based limit or target reference points have been adopted to evaluate the overfished status for PBF. However, the PBF stock is overfished relative to the potential biomass-based reference points evaluated (SSB_{MED} and $20\%SSB_{F=0}$).
  - No fishing intensity-based limit or target reference points have been adopted to evaluate overfishing for PBF. However, the PBF stock is subject to overfishing relative to most potential fishing intensity-based reference points evaluated
- Conservation Information

Pacific Bluefin Tuna Stock Status and Conservation Information

- Conservation Information
  1. The projection based on the base-case model mimicking the current management measures by the WCPFC (CMM 2017-08) and IATTC (C-16-08) under the low recruitment scenario resulted in an estimated 98% probability of achieving the initial biomass rebuilding target (6.7%$SSB_{F=0}$) by 2024. This estimated probability is above the threshold (75% or above in 2024) prescribed by the WCPFC Harvest Strategy (Harvest Strategy 2017-02). The low recruitment scenario is more precautionary than the recent 10 years recruitment scenario;
  2. The Harvest Strategy specifies that recruitment switches from the low recruitment scenario to the average recruitment scenario beginning in the year after achieving the initial rebuilding target. The estimated probability of achieving the second biomass rebuilding target (20%$SSB_{F=0}$) 10 years after the achievement of the initial rebuilding target or by 2034, whichever is earlier, is 96%. This estimate is above the threshold (60% or above in 2034) prescribed by the WCPFC Harvest Strategy. However, it should be recognized that these projection results are strongly influenced by the inclusion of the relatively high, but uncertain recruitment estimate for 2016.

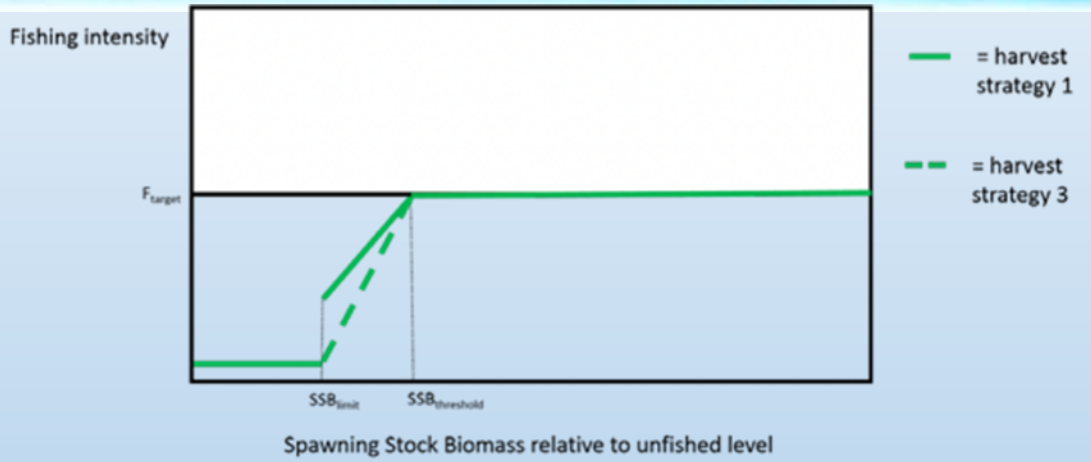
MSE and Other Activities

North Pacific Albacore MSE

- Preliminary MSE Results:
  1. A lower fishing intensity TRP (i.e. F_{50}), maintains the population at a higher level than F_{40} and F_{30}, requiring less management intervention and resulting in lower catch variability between years. However, lower fishing intensity results in lower overall catch. There was a clear trade-off between relative total biomass and relative catch.
  2. HCRs with a TRP of F_{40} have less closures and higher catch stability as compared to a TRP of F_{30}, resulting in comparable or higher catch despite lower fishing intensity.
  3. An LRP and threshold reference point closer to the TRP results in a higher frequency of management interventions, fishery closures and lower catch stability. An LRP closer to the desired target biomass set by the F-based TRP is more likely to be breached.

North Pacific Albacore MSE

- Preliminary Results Continued
  4. HS3 showed lower catch stability than HS1, but had fewer fishery closures.
  5. Harvest strategies with Total Allowable Effort (TAE) had a lower frequency of fisheries closures and higher catch stability than ones with Total Allowable Catch (TAC) control.



- Plans for future work, including changes in the MSE operating model were discussed; the ISC Plenary priority is the completion of the next benchmark assessment in 2020.

Second Pacific Bluefin MSE Workshop

- Held May 20-21, 2019, in San Diego, USA
- More challenging than the Albacore MSE due to more diverse fisheries and an unclear input mechanism
- Needs from the NC-IATTC Joint Working Group on PBF
  1. Identify the purpose of the MSE process,
  2. Develop terms of reference for the MSE process,
  3. Identify management objectives, and
  4. Identify candidate reference points and harvest control rules to evaluate.
- Methods for fostering simultaneous participation need to be developed for engaging stakeholders on both sides of the Pacific Ocean.
- The timing of the MSE process, including the delivery of results, needs to be specified, recognizing workload tradeoffs implied by the stock assessment schedule.
- An overall governance structure to manage the MSE process needs to be developed and implemented (who are the decision-makers?)

Ad-hoc PBF Close-kin Workshop

- Progress on sampling, DNA extraction and marker development varies among countries
- Single institution analyzing DNA samples would be an advantage in proceeding with an ISC CKMR program, but not feasible due to Intellectual Property concerns, varying states of progress
- No future work plan for the ISC CKMR project was established
- Each country will perform DNA extraction on samples collected to assess DNA quality and wait for any genotyping methodologies to be published for future analysis.

Interactions, Administration, Future Activities

Interactions with Regional Organizations

WCPFC

- Overview of Western and Central Pacific Ocean fisheries and stock status presented at ISC19
- Presentation of Pacific Bluefin tuna update assessment and North Pacific Blue Shark benchmark assessment at WCPFC-SC14 & WCPFC-NC14
- Received requests from Joint IATTC-NC PBF Working Group for additional projections and review of 2018 stock status and conservation information
- Completed initial MSE analysis for Albacore – March 4-7, 2019, in Yokohama, Japan
- Second stakeholder MSE meeting for PBF held in San Diego, USA
- requested projections and emergency rule presented at ISC Stakeholders Meeting & WCPFC-NC13

Interactions with Regional Organizations

PICES-ISC Collaboration (2015 – 2019)

- Goal of this WG is to incorporate climate variability into stock assessments and management decision making, via collaborations between scientists from PICES and the ISC.
- October 2018 PICES Annual Meeting – Convened Session S12: Applying ecosystem considerations in science advice for managing highly migratory species
- October 2019 PICES Annual Meeting - WG will be “Application of ecosystem-based fisheries management in the 21st century: progress and challenges in pelagic systems.” Dr. Barb Muhling of NOAA Fisheries (U.S.A.) will chair.
- WG will cease operating after the 2019 meeting.

Administrative Matters

Working Group Chairs

- Albacore – Hidetada Kiyofuji
- Pacific Bluefin – Shuya Nakatsuka
- Billfish – Hirotaka Ijima
- Shark – Mikohiko Kai
- Statistics – Vacant, but ISC Chair filling in temporarily

- Request for Science information and advice should be made in writing to the ISC Chair
- ISC20 Plenary – July 15-20, 2019; USA, location TBD.

Future Activities 2019-20

Stock Assessments

- North Pacific Albacore benchmark assessment
- Pacific Bluefin Tuna benchmark assessment
- North Pacific Blue Shark benchmark assessment – to be determined

Other Scientific Meetings

- Dec 2019 – SHARKWG, Shimizu; research & data preparation for BSH & SMA
- Jan 2020 – BILLWG, Taipei; research, data preparation for BUM assessment in 2021
- ISC-PICES WG34 – PICES Annual Meeting, October 2019, Victoria, Canada
- 2nd Round Albacore Tuna MSE Workshop – to be determined

Thanks and Questions?