REPORT OF THE TWENTY-SIXTH MEETING OF THE INTERNATIONAL SCIENTIFIC COMMITTEE FOR TUNA AND TUNA-LIKE SPECIES IN THE NORTH PACIFIC OCEAN

PLENARY SESSION

23-29 June 2026
Taipei City, Chinese Taipei

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Highlights of the ISC26 Plenary Meeting

The 26th ISC Plenary session was held in-person in Taipei City, Chinese Taipei, June 23-29, 2026. The meeting was attended by members from Canada, Chinese Taipei, Japan, Republic of Korea, Mexico and the United States as well as a representative from the Western and Central Pacific Fisheries Commission Secretariat (WCPFC). Observers from Monterey Bay Aquarium and WWF Japan were in attendance.

The Committee completed two major benchmark stock assessments in 2026 and made substantial progress on management strategy evaluation, independent peer review, and broader scientific priorities beyond individual stock assessments.

The Albacore Working Group (ALBWG) completed the 2026 North Pacific albacore benchmark assessment using Stock Synthesis 3 (v3.30.24) and an updated projection framework, reverting the 2023 JPLL fleet split back to a unified structure. The resulting assessment indicates the stock is virtually certain to be not overfished and virtually certain to be not experiencing overfishing relative to adopted reference points, with no exceptional circumstances triggered under WCPFC/IATTC harvest strategies. In response to an NC21 request, the ALBWG also prepared fleet-specific fishing intensity (F%SPR) estimates for the 2002-2004 and 1999-2015 reference periods, and identified priorities for future work including expansion of the JPLL CPUE standardization model's spatial domain.

The Pacific Bluefin Tuna Working Group (PBFWG) continued supporting the transition from rebuilding to long-term management. Following the March 2026 Joint Working Group (JWG) intersessional meeting, the PBFWG completed TAC calculations for the first management period under two new candidate harvest control rules (HCRs 17 and 18), using the estimation model updated with FY2023 data, and developed a draft Exceptional Circumstances Protocol modeled on the existing North Pacific albacore protocol. The group also began preliminary review of recommendations from the March 2026 external peer review of the 2024 benchmark assessment, conducted at Hokkaido University - the second such independent review of an ISC assessment. The review found the assessment represented a substantial methodological improvement and identified no major concerns precluding its use for management advice, while recommending continued development of reliable recruitment and abundance indices.

The PBFWG agreed to conduct the next benchmark assessment in 2030, with operating model reconditioning in 2031 and an MP review in 2032.

The Billfish Working Group (BILLWG) completed a new benchmark assessment of Pacific blue marlin (1971-2024) using an updated Stock Synthesis model, concluding the stock is virtually certain to be not overfished and virtually certain to be not subject to overfishing. The BILLWG also began technical development of a Management Strategy Evaluation for Western and Central North Pacific swordfish in response to an NC21 request, while flagging concerns about timelines and workload. The International Billfish Biological Sampling Program (IBBS) advanced from sample collection into coordinated international exchange and analysis, formalized through a new genetic-research MOU among Japan, the U.S., and Chinese Taipei. For shark stocks, the Shark Working Group (SHARKWG) continued intersessional work toward the next North Pacific blue shark benchmark, developing a conceptual model and discussing alternative assessment structures ahead of a virtual data review meeting in October 2026.

Across working groups, ISC26 reviewed and carried forward stock status and conservation information for Pacific bluefin tuna, blue shark, shortfin mako shark, North Pacific swordfish, and WCNPO striped marlin from prior assessments, with updated projections for striped marlin reflecting the new WCPFC catch distribution under CMM 2024-06. WCNPO striped marlin remains very likely overfished and likely subject to overfishing, with continued recommendations to keep catch at or below recent levels to support rebuilding.

Finally, the Chair encouraged the ISC to continue strengthening processes that support scientific credibility, including independent peer review, documentation and reproducibility, structured tracking of Working Group recommendations, discussion of advice for stocks not formally designated as Northern Stocks, and proactive data access for working groups as analyses grow more complex.

The next Plenary meeting will be hosted by the United States and is tentatively planned for June 23-28, 2027, with Working Group meetings June 21-22, at a location to be determined.

Photo

ISC26 Group, Taipei City, Chinese Taipei, June 23, 2026

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ACRONYMS AND ABBREVIATIONS

Names and FAO Codes of ISC Species of Interest in the North Pacific Ocean

FAO Code	Common English Name	Scientific Name
	TUNAS	
ALB	Albacore	*Thunnus alalunga*
BET	Bigeye tuna	*Thunnus obesus*
PBF	Pacific bluefin tuna	*Thunnus orientalis*
SKJ	Skipjack tuna	*Katsuwonus pelamis*
YFT	Yellowfin tuna	*Thunnus albacares*
	BILLFISHES	
BIL	Other billfish	Family *Istiophoridae*
BLM	Black marlin	*Makaira indica*
BUM	Blue marlin	*Makaira nigricans*
MLS	Striped marlin	*Kajikia audax*
SFA	Sailfish	*Istiophorus platypterus*
SSP	Shortbill spearfish	*Tetrapturus angustirostris*
SWO	Swordfish	*Xiphias gladius*
	SHARKS	
ALV	Common thresher shark	*Alopias vulpinus*
BSH	Blue shark	*Prionace glauca*
BTH	Bigeye thresher shark	*Alopias superciliosus*
FAL	Silky shark	*Carcharhinus falciformis*
LMA	Longfin mako	*Isurus paucus*
LMD	Salmon shark	*Lamna ditropis*
OCS	Oceanic whitetip shark	*Carcharhinus longimanus*
PSK	Crocodile shark	*Pseudocarcharias kamonharai*
PTH	Pelagic thresher shark	*Alopias pelagicus*
SMA	Shortfin mako shark	*Isurus oxyrinchus*
SPN	Hammerhead spp.	*Sphyrna* spp.

ISC Working Groups

Acronym	Name	Chair
ALBWG	Albacore Working Group	Sarah Hawkshaw (Canada)
BILLWG	Billfish Working Group	Michelle Sculley (U.S.A.)
PBFWG	Pacific Bluefin Working Group	Shuya Nakatsuka (Japan)
SHARKWG	Shark Working Group	Michael Kinney (U.S.A.)
STATWG	Statistics Working Group	Jenny Suter (U.S.A)

Other Abbreviations and Acronyms that may be Used in the Report

CDS	Catch documentation scheme
CIE	Center for Independent Experts
CKMR	Close-kin mark-recapture
CMM	Conservation and Management Measure
CPFV	Charter passenger fishing vessel
CPUE	Catch-per-unit-of-effort
CSIRO	Commonwealth Scientific and Industrial Research Organization
DWLL	Distant water longline
DWPS	Distant-water purse seine
EEZ	Exclusive economic zone
EPO	Eastern Pacific Ocean
F	Fishing mortality rate
FAD	Fish aggregation device
FAO	Fisheries and Agriculture Organization of the United Nations
FL	Fork length
HCR	Harvest control rule
HMS	Highly migratory species
H_{MSY}	Harvest rate at MSY
IATTC	Inter-American Tropical Tuna Commission
ISC	International Scientific Committee for Tuna and Tuna-Like Species in the North Pacific Ocean
ISSF	International Seafood Sustainability Foundation
LFSR	Low fecundity spawner recruitment relationship
LTLL	Large-scale tuna longline
LRP	Limit reference point
MSE	Management strategy evaluation
MSY	Maximum sustainable yield
NC	Northern Committee (WCPFC)
NRIFSF	National Research Institute of Far Seas Fisheries (Japan)
OFDC	Overseas Fisheries Development Council (Chinese Taipei)
PICES	North Pacific Marine Science Organization
PIFSC	Pacific Islands Fisheries Science Center (U.S.A.)
SAC	Scientific Advisory Committee (IATTC)
SC	Scientific Committee (WCPFC)
SG-SCISC	Study Group on Scientific Cooperation of ISC and PICES
SPC-OFP	Oceanic Fisheries Programme, Secretariat of the Pacific Community
SPR	Spawning potential ratio, spawner per recruit
SSB	Spawning stock biomass
$SSB_{F=0}$	Spawning stock biomass at a hypothetical unfished level
$SSB_{CURRENT}$	Current spawning stock biomass
SSB_{MSY}	Spawning stock biomass at maximum sustainable yield
STLL	Small-scale tuna longline

t, mt	Metric tons, tonnes
WCNPO	Western Central and North Pacific Ocean
WCPFC	Western and Central Pacific Fisheries Commission
WPO	Western Pacific Ocean
WWF	World Wildlife Fund for Nature – Japan
GRT	Gross registered tons

1 Introduction and Opening of the meeting

1.1 Introduction

The ISC was established in 1995 through an intergovernmental agreement between Japan and the United States (U.S.A.). Since its establishment and first meeting in 1996, the ISC has undergone a number of changes to its charter and name (from the Interim Scientific Committee to the International Scientific Committee) and has adopted a number of guidelines for its operations. The two main goals of the ISC are (1) to enhance scientific research and cooperation for conservation and rational utilization of the species of tuna and tuna-like fishes that inhabit the North Pacific Ocean during a part or all of their life cycle; and (2) to establish the scientific groundwork for the conservation and rational utilization of these species in this region. The ISC is made up of voting members from coastal states and fishing entities of the region as well as coastal states and fishing entities with vessels fishing for highly migratory species in the region, and non-voting members from relevant intergovernmental fishery and marine science organizations, recognized by all voting members.

The ISC provides scientific advice on the stocks and fisheries of tuna and tuna-like species in the North Pacific Ocean (NPO) to the Member governments and regional fisheries management organizations. Fishery data tabulated by ISC members and peer-reviewed by the species and statistics Working Groups (WGs) form the basis for research conducted by the ISC. Although some data for the most recent years are incomplete and provisional, the total catch of highly migratory species (HMS) by ISC members estimated from available information is more than 130,000 metric tons (t) annually and is dominated by tropical tuna species. Retained catches of priority NPO species monitored in 2025 by ISC members were 41,799 t of North Pacific albacore tuna (NPO ALB), 23,226 t of Pacific bluefin tuna (PBF), 7,105 t of North Pacific swordfish (SWO), 2,016 t of North Pacific striped marlin (MLS), 2,253 t of Pacific blue marlin (BUM), 1,942 t of North Pacific shortfin mako shark (SMA) and 40,268 t of North Pacific blue shark (BSH).[1] The total estimated retained catch of these seven species is 121,609 t, or approximately 102% of the 2024 total estimated catch of 118,772 t. Annual catches of priority stocks throughout their ranges reported by ISC members are shown in the catch tables at the end of this report.

1.2 Opening of the Meeting

The Twenty-sixth Plenary session of the ISC (ISC26) was convened in Taipei City, Chinese Taipei at 9:00 a.m. on 23 June 2026 by the ISC Chair, R. Ahrens. A roll call confirmed the participation of delegates from Canada, Chinese Taipei, Japan, Republic of Korea, Mexico (via remote access), U.S.A., and the WCPFC Secretariat (**ISC/26/ANNEX/01**). Individual observers from Monterey Bay Aquarium and WWF Japan were in attendance. ISC Member the Peoples Republic of China, as well as the non-voting members, the Fisheries and Agriculture Organization of the United

[1] FAO three-letter species codes are used throughout this report interchangeably with common names.

Nations (FAO), and Secretariat of the Pacific Community (SPC), while extended an invitation, did not attend the Plenary.

2 Adoption of Agenda

A list of meeting documents is contained in **ISC/26/ANNEX/02**. The proposed agenda for the session (**ISC/26/ANNEX/03**) was considered and adopted. Emily Crigler (USA) was assigned lead rapporteur duties.

A list of common abbreviations and acronyms used by the ISC is provided in the preface to this report.

3 Delegation Reports on Fishery Monitoring, Data Collection and Research

3.1 Canada

S. Hawkshaw presented the Canada National Report **(ISC/26/PLENARY/04)**. Canada's Pacific highly migratory species fishery consists of a commercial troll fishery targeting juvenile NPO ALB. This report summarized catch and effort, spatial distribution, biological sampling, bycatch, and research activities for the 2025 fishing season. In 2025, the Canadian fleet comprised 99 vessels operating primarily in the eastern Pacific Ocean, with activity occurring predominantly within the Canadian exclusive economic zone (EEZ). Access to the United States EEZ was unavailable in 2025 due to the absence of a bilateral fishing regime, and only limited effort and catch occurred in adjacent high seas waters. The provisional 2025 estimates of total catch and effort in the eastern Pacific Ocean are 1,726 metric tonnes (t) and 3,222 vessel-days (v-d), respectively, representing a 40% decrease in catch and a 3% decrease in effort relative to 2024. Catch per unit effort (CPUE) decreased to 0.49 t/v-d in 2025, the lowest overall rate for the fleet since 2017, suggesting reduced availability or accessibility of albacore during the 2025 season. Fishing activity remained highly seasonal and predominantly coastal, with most effort and catch occurring between July and September, peaking in August and spatial patterns followed historical trends. Environmental conditions appeared to continue to play a key role in this fishery, with approximately 87% of the catches occurring within sea surface temperature of 16-19 °C. Biological sampling efforts resulted in 11,221 fork length measurements from 40 vessels representing a sampling rate of 4.1%. The size composition remained consistent with previous years, ranging from 42 to 93 cm, with a mode at approximately 68 cm, indicating dominance of 2-year old fish. Bycatch levels were low overall, consisting of 164 fish and two seabirds. Notably, Pacific bluefin tuna bycatch increased relative to previous years, although individuals were primarily small in size, suggesting interactions with younger age classes. Canada is advancing the implementation of a fleet-wide vessel monitoring system (VMS), which is expected to improve spatial resolution of fishing activity, support compliance, and enhance analytical capacity for stock assessment. Monitoring of a small recreational albacore fishery is ongoing, with preliminary indications that its impact remains minor.

Discussion

Members discussed spatial patterns in the size composition of albacore catches in Canada and the factors that may influence these differences, including seasonal timing of the fishery. Members also sought clarification on the disposition of Canada's Pacific bluefin tuna catch. Canada noted that the catch is generally retained for domestic use or sold within the domestic market.

3.2 Chinese Taipei

R.-F. Wu presented the Chinese Taipei national report (ISC/26/PLENARY/05). Taiwanese tuna fisheries in the North Pacific Ocean mainly comprise tuna longline and distant water tuna purse seine fisheries, and other small-scale fisheries operating off waters of Taiwan, such as harpoon, set net, and gill net. More than 90 percent of tuna and tuna-like species catch of Taiwanese fisheries in the North Pacific Ocean are from tuna longline and distant water tuna purse seine fisheries. The tuna longline fisheries consist of large-scale tuna longline vessels and small-scale tuna longline vessels. The number of fishing vessels of these two fisheries were 60 and 869, and the catches of tuna and tuna-like species catches in the North Pacific Ocean were 6,849 tons and 27,323 tons in 2025, respectively. For the distant water tuna purse seine fishery, the number of fishing vessels was 18 with a catch of 99,755 tons in the Pacific Ocean in 2025. Fifty-nine observers were deployed on tuna longline vessels operating in the Pacific Ocean, including 25 on large-scale tuna longline vessels and 39 on small-scale ones in 2025 with 5 observers conducting 5 observation trips on a large-scale tuna longline and a small-scale tuna longline. Taiwanese scientists conducted 4 scientific projects on the stock status of tuna and tuna-like species, and the impacts of mitigation measures on the bycatch species in the Pacific Ocean under funding support from the Taiwan Fisheries Agency in 2025.

Discussion

Members discussed recent shifts in fishing distribution, fleet composition, and changes in catch patterns. Chinese Taipei explained that the westward shift in fishing activity was likely associated with recent La Niña conditions. Reported changes in vessel numbers reflected classification rather than fleet expansion. It was also noted that increased albacore catches were likely due to stable fishing effort combined with improved stock availability and changes in fishing behavior.

3.3 Japan

H. Kiyofuji presented the Japan National Report (**ISC/26/PLENARY/06**). Japanese tuna fisheries consist of the three major fisheries (i.e., longline, purse seine, and pole-and-line) and other miscellaneous fisheries like troll, driftnet, and setnet fisheries. This paper described the recent trend of the Japanese tuna fisheries in the North Pacific Ocean and updated the statistics given in the previous National Report for ISC25 (Matsubara et al., 2025). The total catch of tunas excluding skipjack caught by Japanese fisheries in the North Pacific Ocean was 64,814 metric ton (t) in 2024 and 66,288 t in 2025. The total catch of tunas including skipjack caught by

Japanese fisheries in the North Pacific Ocean was 249,168 t in 2024 and 188,303 t in 2025. The total catch of swordfish and striped marlin was 4,722 t in 2024 and 4,517 t in 2025. In addition to fisheries description, a brief description was given on Japanese research activities in 2025 for tuna and tuna-like species in the Pacific Ocean.

Discussion

Members discussed the spatial distribution of Japan's fisheries, as well as ongoing research activities, and potential environmental influences on fishing operations. Japan also described its long-term tagging activities and evolving research priorities, and responded to questions regarding proposed egg collection research. Members also discussed the potential influence of anticipated El Niño conditions on future fleet behavior, with Japan noting that any operational responses remain uncertain.

3.4 Korea

H. Kim presented the Korea national report (**ISC/26/PLENARY/07**). Korean distant water tuna and tuna-like fisheries in the Pacific Ocean consist of both longline and purse seine fishery. There were 90 active longline vessels and 22 active purse seine vessels in 2025. The number of longline vessels remained below 100 since 2015, and the number of purse seine vessels remained the same as the previous year. The two types of Korean fisheries harvested 34,642 t of tuna and tuna-like species in the North Pacific Ocean in 2025. The total catch of the longline fishery was 17,850 t, a 25% decrease over 2024, and the purse seine fishery harvested 16,792 t, a 40% decrease year-to-year**.** The longline fishery mainly targeted yellowfin and bigeye tunas, whose catch accounted for 49.1% and 40.7% of the total catch in 2025. The dominant species of the purse seine fishery was skipjack tuna (88.0%), followed by yellowfin tuna (7.0%) and bigeye tuna (5.0%). Compared to 2024, the catch proportions of yellowfin tuna and bigeye tuna increased, with the proportion of bigeye tuna showing a notable rise from 0.3% to 5.0%. Pacific bluefin tuna (PBF) is harvested by some coastal and offshore fisheries in the Korean waters. The offshore large purse seine fishery operates in the waters surrounding Jeju Island. In 2025, the PBF catch of the offshore purse seine fishery was 570 t, which accounted for 57.1% over the total catch. The PBF catch of the set net fishery was 437 t, which accounted for 43.2% over the total catch, and trawl fishery caught 4 t in 2025. In 2025, the catch of large PBF (30kg or greater) accounted for 85% of the total catch.

Discussion

Members discussed recent observations of Pacific bluefin tuna distribution and spawning, including the potential expansion of spawning areas and changes in set net catches. Korea provided clarification on available fishery data and suggested that increasing egg and larval abundance may be associated with stock recovery and changing migration patterns. Members emphasized the need for continued monitoring and research to better understand these trends and their potential implications for future stock assessments.

3.5 Mexico

Luis Daniel Carrillo Colín presented the Mexico National Report (**ISC/26/PLENARY/08**). In Mexico, the Mexican Institute of Sustainable Fisheries and Aquaculture Research (Instituto Mexicano de Investigación en Pesca y Acuacultura Sustentables, IMIPAS, formerly INAPESCA and INP) was established more than sixty years ago to systematically conduct scientific research on Mexico's marine resources and fisheries. The IMIPAS is responsible of providing the scientific bases for the management advice to the fisheries authorities in México and has established along its coastal states, in both the Pacific and Gulf of Mexico, 14 regional aquaculture and fisheries centers (CRIAPs) which are the centers and laboratories in charge of data collection, sampling, monitoring, and assessment of the main fisheries and aquaculture activities on a regional scale. Since 1992, the IMIPAS has incorporated into this effort the work of the National Tuna-Dolphin Program (Programa Nacional de Aprovechamiento del Atún y Protección del Delfín, PNAAPD of FIDEMAR), which closely monitors and studies the tuna fishery of its purse seine and longline national fleets. The data reported are based on the combined efforts of these different and unified groups.

<u>**Discussion**</u>

Members discussed recent increases in reported Pacific bluefin tuna catches, and historical albacore catch information. Mexico confirmed that historical albacore catches were taken by longline fisheries and that efforts were underway to improve historical data.

3.6 U.S.A.

F. Carvalho presented the U.S.A. National Report (**ISC/26/Plenary/09**). U.S. fishing fleets harvest highly migratory species (HMS), including tuna and tuna-like species, from the North Pacific Ocean (NPO) in the U.S. exclusive economic zones and in the high seas. Fisheries operate within the Eastern Pacific Ocean (EPO) and Western and Central Pacific Ocean (WCPO) from coastal waters of North America to the archipelagos of Hawaii, Guam, the Commonwealth of the Northern Mariana Islands (CNMI), and American Samoa. Small-scale gillnet, harpoon, pole-and-line, troll, and handline fleets operate primarily in coastal waters; while most of the tuna catches are from large-scale purse seine, albacore (*Thunnus alalunga*) troll, and longline fleets that operate both within the U.S. exclusive economic zone and on the high seas. In addition, thousands of small-scale troll and handline vessels operate in waters of the tropical Pacific; however, these fleets account for a small fraction of the total tuna catch. In 2025, notable fisheries patterns included reduced participation by the U.S. WCPO purse seine fleet relative to recent years, a southward expansion of Hawaii-based longline fishing effort, and an increased contribution of yellowfin tuna to longline catches compared to the recent five-year average.

In 2025, NOAA Fisheries continued research on Pacific tunas and associated species at its Southwest and Pacific Islands Fisheries Science Centers, often in collaboration with scientists from other organizations. Stock assessment research on tuna and tuna-like species was conducted primarily through collaboration with participating scientists of the International

Scientific Committee (ISC) for Tuna and Tuna-Like Species in the NPO and international Regional Fisheries Management Organizations. In 2025, two noteworthy studies investigated ways to improve stock assessments. Research studies were conducted on fisheries operating in the waters of the U.S. Pacific coast, Hawaiian Islands, U.S. territories, and the high seas. Studies investigated methodology to improve stock assessments, biology of tuna, tuna-like species, and bycatch species caught in these fisheries; the marine ecosystems where these fisheries occur; and the socio-economics of these fisheries. NOAA Fisheries scientists produced reports summarizing monitoring data collected for pelagic fisheries and fisher observations for small boat fisheries operating out of Hawaii, Guam, and the CNMI.

Discussion

Members discussed recent U.S. research on billfish recruitment patterns and advances in stock assessment methodology. Discussion focused on the spatial and seasonal characteristics of observed recruitment signals and their relevance to future assessments, as well as the potential application of new modeling approaches to improve CPUE standardization. It was noted that further work, including spatial CPUE analyses, is underway.

4 Report of the Chair

The ISC Plenary last met at ISC25 in Busan, Republic of Korea. The Committee and its Working Groups have completed a demanding and productive year of scientific work in support of tuna and tuna-like species management in the North Pacific Ocean. The year was marked by the completion of two major stock assessments, continued development of management strategy evaluation processes, progress on peer review and assessment improvement, and continued discussion of how ISC science can better address changing fisheries, evolving data streams, and climate-related uncertainty.

The Albacore Working Group completed a substantial body of work in support of the 2026 North Pacific albacore tuna benchmark assessment. The resulting 2026 North Pacific albacore assessment indicates that the stock is likely not overfished relative to the adopted threshold and limit reference points and is likely not experiencing overfishing relative to the F45%SPR target reference point. The Working Group also evaluated exceptional circumstances under the adopted harvest strategies of the WCPFC and IATTC and found no evidence that exceptional circumstances were present.

The Billfish Working Group also completed a major assessment cycle for Pacific blue marlin. The 2026 Pacific blue marlin assessment applied an updated Stock Synthesis model with data through 2024, along with updated biological parameters. The assessment concluded that Pacific blue marlin is likely not overfished and likely not subject to overfishing relative to MSY-based reference points. The assessment also highlighted the continued importance of improved life-history information, spatially representative data, standardized CPUE series, and transparent treatment of uncertainty in support of management advice for billfish stocks.

The Shark Working Group continued intersessional work to support the next North Pacific blue shark benchmark assessment. The Working Group reviewed new information from electronic tagging studies and developed a conceptual model and discussed alternative assessment structures, including pan-Pacific, regional, and spatial models.

The Pacific Bluefin Tuna Working Group continued to support the transition from rebuilding to long-term management of Pacific bluefin tuna. The Working Group addressed requests from the Joint IATTC and WCPFC-NC Working Group on the Management of Pacific Bluefin Tuna, including calculations for new candidate harvest control rules, updates on recruitment indicators, and development of an Exceptional Circumstances Protocol for the Pacific bluefin tuna management procedure. The group also discussed the implications of a potential two-year management cycle, the scheduling of future benchmark assessments, the need for periodic management procedure updates, and the value of a “health check” using the 2024 assessment model with updated data.

Independent review also remained an important component of ISC scientific credibility. In March 2026, an external review of the 2024 Pacific bluefin tuna benchmark assessment was conducted at Hokkaido University in Sapporo, Japan. This was the second external review of an ISC assessment. The review panel provided consensus recommendations addressing model structure, recruitment, natural mortality, weight-length relationships, abundance indices, data curation, and future research priorities. The review reinforced the importance of maintaining a rigorous, transparent, and independent review process for ISC assessments and highlighted the need to ensure that recommendations are tracked and incorporated into future workplans.

The ISC also continued to respond to management needs beyond individual stock assessments. The Billfish Working Group discussed development of a Management Strategy Evaluation for Western and Central North Pacific Ocean swordfish, including the need to identify operating models, candidate management procedures, performance indicators, key uncertainties, and an appropriate process for stakeholder engagement. The Working Group recognized the importance of responding to the Northern Committee request while also noting concerns about timelines, workload, and the need for management objectives to be clearly developed by managers. The IBBS program made substantial progress during the year, especially in assembling biological samples for maturity, growth, stock-structure, and potential CKMR work across swordfish, striped marlin, and blue marlin. Overall, the program has moved beyond basic sample collection into coordinated international sample exchange, analysis, and development of protocols for genetic use of shared samples.

As an independent, science-driven organization, the ISC remains committed to providing the best available scientific information for the conservation and sustainable use of highly migratory species in the North Pacific Ocean. The work completed this year demonstrates the strength of the ISC model: collaborative working groups, transparent technical exchange, rigorous assessment methods, and direct responsiveness to RFMO requests. At the same time, the work also illustrates the increasing complexity of the scientific advice being requested. Management strategy evaluation, exceptional circumstances provisions, climate change considerations, changing fleet distributions, and evolving fishery-dependent data streams all require sustained scientific capacity and continued investment.

Looking ahead, I encourage the ISC to continue strengthening the processes that support scientific credibility. This includes maintaining independent peer review of assessments and ISC functions, improving documentation and reproducibility, advancing open science practices, and ensuring that Working Group recommendations are carried forward in a structured and transparent way. I also encourage continued discussion of how the ISC should address advice for stocks that are not formally designated as Northern Stocks but are nevertheless assessed by the Committee and presented to regional management bodies. As stock assessments, life history studies, and innovative analytical approaches grow increasingly complex, so too do their data requirements; I encourage ISC Members to be proactive in ensuring that working groups have access to the data needed to deliver the best available science.

In my second year as Chair, I have come to appreciate the nature of the ISC even more. I am grateful to Fisheries Agency, Ministry of Agriculture for coordinating ISC26 on behalf of Chinese Taipei. I thank the Working Group Chairs, rapporteurs, analysts, data providers, reviewers, and all ISC members for their considerable effort and commitment over the past year. The completion of major assessments for North Pacific albacore and Pacific blue marlin, continued support for Pacific bluefin tuna management procedures, progress on swordfish MSE planning, and completion of the Pacific bluefin tuna peer review represent a substantial contribution to science-based fisheries management. These efforts provide essential advice to the RFMOs and help ensure that management decisions for North Pacific tuna and tuna-like species continue to be informed by the best available science.

5 Report of Species Working Groups and Review of Assignments

5.1 Albacore

S. Hawkshaw, Chair of the Albacore Working Group (ALBWG), presented the activities and report of the ALBWG (**ISC/26/ANNEX/04a,b**). The ALBWG conducted three intersessional meetings leading up to ISC26: a data preparation workshop in Yokohama, Japan (October–November 2025) with a virtual follow-up in January 2026, a stock assessment workshop at the Southwest Fisheries Science Center in La Jolla, USA (March 2026) with a virtual follow-up in April 2026 and a half-day in-person meeting in Taipei City, Chinese Taipei (June 2026) to review new stock status and conservation advice and to hold elections for the ALBWG Vice-Chair position. The primary deliverables were to deliver a new benchmark stock assessment of North Pacific albacore tuna (NPO ALB) and to develop science advice in response to RFMO requests. The ALBWG thanked Yuichi Tsuda (Japan) for his work as the Vice-Chair and Naoto Matsubara (Japan) was elected as Vice-Chair for their first term (2026-2029) in this leadership role.

Data Preparation Workshop (Oct–Nov 2025 / Jan 2026)

The ALBWG reviewed updated fishery data from Japan, Chinese Taipei, Canada, US, and non-ISC countries at the Data Preparation Workshop to support development of the 2026 stock assessment. The ALBWG noted a significant long-term contraction (~50%) of Japanese fishing grounds since the 1990s as an important consideration for the assessment. The ALBWG reviewed several analyses of CPUE standardization methods and identified candidate abundance indices to consider for use in the 2026 stock assessment. Additionally, the ALBWG discussed updates to biological sampling and data analyses, potential stock assessment model parameterization, assumptions, diagnostic tools, and potential sensitivity analyses for the stock assessment.

Stock Assessment Workshop (March–April 2026)

The ALBWG held a stock assessment workshop to develop the 2026 benchmark assessment for NPO ALB and provide updated science advice. The ALBWG refined the fleet structure and fishery definitions to better reflect data and fishery dynamics. Outstanding data issues (e.g., Vanuatu catch in numbers and US logbook errors) were resolved and updated datasets were incorporated into the assessment. The ALBWG used a stepwise modeling approach integrating catch, size composition, and abundance indices to develop a base case model. Time-varying selectivity was implemented, competing model structures were evaluated and diagnostic analyses confirmed that the base case model performed well. Multiple sensitivity runs (e.g., natural mortality, growth, selectivity, steepness) were defined to evaluate uncertainty and model robustness. Updated projection software and scenarios were reviewed by the ALBWG and recommended for use to evaluate future stock trajectories under different fishing intensities. Based on assessment results, the ALBWG developed updated stock status and conservation information for the NPO ALB stock, concluding that the stock is likely not overfished and not experiencing overfishing, with high probability of remaining above limit reference points under current or historical fishing levels. Key research priorities were identified by the ALBWG, including improving abundance indices, growth modeling, selectivity, fleet impacts, and biological data. The ALBWG also developed the science advice document in response to the NC21 request to provide estimates of the historical impact of each fleet group on the stock in terms of fishing intensity.

The ALBWG drafted a workplan leading up to the next scheduled stock assessment in 2029:

Date	Location	Task/Event
April 1, 2026	Virtual	Follow up meeting to finalize report
June 2026	La Jolla	IATTC SAC
June 21-30, 2026	Taiwan	ALBWG meeting/ISC26 Plenary
July 2026	Japan	NC22
August 2026	Samoa	SC22
Spring 2027	Canada	Modelling improvements workshop
Spring 2028	TBD	Modelling improvements workshop

Winter 2028	TBD	ALBWG workshop: Data Preparation
Spring 2029	TBD	ALBWG workshop: Stock Assessment 2029

NC21 Request — Fleet-Specific Fishing Intensity Estimates

NC21 requested that the ISC provide estimates of the historical impact of each fleet group on the stock in terms of fishing intensity (F%SPR) for the reference periods 2002–2004 and 1999–2015 using updated fleet groupings, to guide potential fleet-specific reductions in fishing intensity should SSB fall below the threshold reference point. In response the ALBWG prepared a science advice document (**ISC/26/ANNEX/04b/Attachment 5)** and a shiny app (https://connect.fisheries.noaa.gov/NPALB_harvest_strategy_tool/) to support implementation of the harvest strategies adopted by the WCPFC and IATTC. The science advice emphasizes that expressing fleet specific impacts in F%SPR provides a biologically consistent and comparable measure across fleets, accounting for differences in selectivity and contribution to spawning biomass, making it more appropriate than catch or effort alone. The resulting proportional impact estimates are recommended as suitable indicators for informing discussions on how fishing intensity reductions could be allocated among fleets if management thresholds are triggered, while noting that these estimates are conditional on historical stock and fishery dynamics and may change slightly with updated assessments and fleet groupings. The ALBWG also emphasizes that defining allocation rules is a management responsibility, but once established, these scientific results can be used to translate fleet-specific fishing intensity targets into practical management measures.

Discussion

Members discussed the process for tracking and prioritizing stock assessment research recommendations, the frequency of benchmark assessments, and the reporting of scientific advice to the Northern Committee. It was noted that research recommendations are documented in stock assessment reports and progress is generally driven by available scientific capacity rather than formal prioritization. Members also discussed the current three-year benchmark assessment cycle and agreed that references to existing annexes and working group reports are sufficient for conveying advice without duplicating information in the plenary report. **ISC26 endorsed the proposed response to the NC prepared by the ALBWG to be provided to the NC meeting in July.**

5.2 Pacific Bluefin Tuna

S. Nakatsuka, Chair of the Pacific Bluefin Working Group (PBFWG), reported on the working groups activities for the past year (**ISC/26/ANNEX/05**). The Pacific Bluefin Tuna Working Group convened for a single intersessional workshop at Hokkaido University in Sapporo, Japan (March 24–27, 2026), following the peer-review meeting (Agenda 9). Participants attended from Chinese Taipei, Japan, Mexico, the Republic of Korea, the United States, and IATTC. The meeting focused on three broad areas: advancing the Management Strategy Evaluation (MSE) process in response to requests from the Joint IATTC-WCPFC NC Working Group (JWG), planning for the next benchmark stock assessment, and reviewing updated abundance and recruitment indices. Shuya Nakatsuka and Shui-Kai Chang were re-elected as Chair (for 2nd 1-year extension) and Vice-Chair, respectively.

Management Strategy Evaluation and HCR Development

The WG opened with a review of discussions from the March 2026 JWG intersessional meeting. The JWG had put forward two new candidate harvest control rules — HCRs 17 and 18 — both based on a target fishing intensity of F27.5%SPR with a 2-year management cycle rather than the 3-year cycle assumed in all previously tested HCRs. The WG noted that while a shorter management cycle generally improves responsiveness to changes in stock dynamics, the performance of these new HCRs had not yet been tested in full MSE simulations. The WG acknowledged that a full simulation was infeasible before the July 2026 JWG meeting but agreed to conduct one once an MP is formally adopted. In the interim, the WG reviewed risk profiles for existing HCRs and found that HCRs with F targets greater than 30%SPR maintained a less than 10% risk of breaching 7.7% SSB_0, while those below 25%SPR exceeded that threshold under recruitment drop scenario of robustness test.

As requested by the JWG, TAC calculations for the first management period (TAC1) under HCRs 17 and 18 were completed using the estimation model updated with FY2023 data. Total TAC1 was calculated at 26,642 mt under HCR 17 (80:20 WPO:EPO impact ratio) and 28,388 mt under HCR 18 (70:30 impact ratio).

Exceptional Circumstances Protocol

The WG developed a draft Exceptional Circumstances Protocol (ECP) for the PBF MSE, using the existing North Pacific albacore protocol as a starting point. The draft ECP identifies three categories of triggers: stock and fleet dynamics (including SSB depletion, fishing intensity, longline CPUE trends, changes in selectivity or biological parameters, and a sustained recruitment drop), application failures (where the estimation model or stock assessment becomes unreliable), and implementation deviations (where realized catch differs substantially from MP prescriptions). The WG agreed that the Chinese Taipei longline CPUE would serve as a key indicator for monitoring stock trends against simulated MSE trajectories, and that the Real-Time Recruitment Monitoring (RTM) index would be used to detect persistent low recruitment trends.

Abundance and Recruitment Indices

Updated abundance indices for the Chinese Taipei longline fishery were presented using both GLMM and delta-GLMM and VAST approaches, both showing consistent trends: a decline from 2003 until around 2011–2012, and a marked recovery since 2020.

On the recruitment side, updated results from the Japanese Real-Time Recruitment Monitoring (RTM) troll survey around the Goto and Tsushima Islands were presented through the 2025 fishing season. The preliminary 2025 index value was the highest on record, though it was noted that data collection was still incomplete at the time of the meeting. The WG recognized the RTM's value in providing more timely recruitment information than the longline index, and encouraged continued methodological development including improving the automated targeting filter for conventional operations. Although the RTM index is yet be endorsed to be included in the stock assessment, the WG concluded that there is no indication of serious recruitment decline in recent years.

In response to the request from JWG on those three topics above, the WG prepared a draft Response to the Joint IATTC and WCPFC-NC Working Group on the Management of PBF, which appears as Appendix 4 of ISC/26/ANNEX/05.

Assessment Planning and Peer Review Response

A substantial portion of the meeting was devoted to preliminary review of draft recommendations from an external peer review of the 2024 stock assessment that convened immediately prior to the PBFWG meeting. The WG worked through recommendations across several biological and structural areas, prioritizing responses and assigning responsibilities. It was noted that formal response to the recommendations needs to be developed once the final peer-review report is presented.

Regarding the broader scheduling of assessment and MSE work, the WG agreed to conduct the next benchmark assessment in 2030, followed by operating model reconditioning in 2031 and an MP review in 2032. In the interim, the WG agreed to conduct a "Health Check" in 2027 using the 2024 assessment model updated with the latest data, which will also be used to evaluate the internal consistency and performance of the recruitment index.

Work Plan

The WG agreed to hold a virtual data preparatory meeting in fall 2026 and a face-to-face Health Check meeting in early 2027, as well as a half-day meeting at the ISC26 Plenary to review catch information and discuss the collaborative aging research program.

<u>Discussion</u>

Members acknowledged the Working Group's increased workload associated with the development of the management strategy evaluation and ongoing scientific requests, and expressed support for adoption of a management procedure for Pacific bluefin tuna by the Joint Working Group at its upcoming July meeting. **ISC26 endorses the proposed responses to the JWG prepared by the PBFWG to be provide to the JWG meeting in July.**

5.3 Billfish

M. Sculley, Chair of the Billfish Working Group (BILLWG) provided a summary of working group activities over the past year (**ISC/26/ANNEX/06a,b**). The Billfish Working Group (BILLWG) conducted two intersessional workshops leading up to ISC26: a data preparatory meeting in Yokohama, Japan (January 13–19, 2026), and a stock assessment meeting in Honolulu, Hawaii (April 28 – May 4, 2026). Participants included scientists from Chinese Taipei, Japan, the United States, SPC, and IATTC. The primary deliverable for the cycle was a new benchmark stock assessment for Pacific blue marlin (BUM; *Makaira nigricans*). The WG also advanced the International Billfish Biological Sampling Program (IBBS) across all three target species and initiated early planning for a North Pacific swordfish MSE in response to an NC21 request. The WG also met during the ISC Plenary meeting to plan for the upcoming 2027 WCNPO MLS stock assessment, including discussing a data request to WCPFC to produce a joint CPUE time series.

International Billfish Biological Sampling Program (IBBS)

Substantial progress was reported across all three IBBS member countries. Japan has reached its predetermined sampling targets for swordfish gonads, otoliths, and spines, though spatial gaps remain south of 30°N and in areas east of Hawaii where fishing activity is limited. Striped marlin samples remain below targets, particularly for small (<100 cm EFL) and large (>210 cm EFL) size classes despite intensified collection efforts since 2024. The US reported 1,426 individual billfish sampled in 2025 across over 600 fishing trips, with supplemental efforts targeting the gap between Hawaii and the US mainland and large tournament-caught blue marlin on the Big Island. Chinese Taipei has collected a total of 125 BUM, 207 MLS, and 247 SWO specimens, primarily through observer and port-based sampling, with coverage remaining limited east of 160°W. All three countries conducted sample exchanges during the year.

On the analytical front, revised aging work for striped marlin in the western North Pacific using a combination of otolith daily increments and fin spine cross-sections yielded faster growth estimates than previously reported, suggesting earlier studies may have misidentified false annuli. The WG agreed to inquire whether Fish Ageing Services Australia could support otolith-based age estimation for MLS as an independent validation approach. For swordfish, histological analysis of 913 gonads collected between 2020 and 2024 found that mature and spawning females were primarily distributed south of 30°N and active from January through August, highlighting the need for intensified sampling in tropical waters to improve maturity estimates. US maturity work for striped marlin is on track for completion in 2026 in time for the planned WCNPO MLS assessment in 2027.

A formal Memorandum of Understanding for genetic research using IBBS samples was agreed and signed by the three IBBS partners (FRA/Japan, PIFSC/USA, and NTU/Chinese Taipei). The MOU establishes a framework for stock structure, CKMR, and related genetic research, requiring a project-specific annex to be approved by all parties prior to any sample exchange. A unified sample preservation protocol will be developed to ensure cross-laboratory comparability.

Pacific Blue Marlin Stock Assessment

A new benchmark assessment of Pacific blue marlin was completed for the period 1971–2024 using Stock Synthesis 3 (v3.30.24.1). The assessment treated BUM as a single pan-Pacific stock, consistent with recent genetic studies and the broad movement patterns documented through tagging data. A key biological advance was the adoption of newly published sex-specific two-stanza growth curves (Chang et al., 2025), which replaced the two competing growth models used in the 2021 ensemble approach. Updated sex- and age-specific natural mortality schedules based on Lorenzen scaling with the Hamel and Cope maximum-age approach were also adopted, with the meta-analysis approach retained as a sensitivity run.

Abundance indices were updated for all three main fleets. For the Japanese longline, a habitat model-based CPUE was developed for the full domain. The Taiwanese DWLL CPUE was standardized using a spatio-temporal delta-lognormal generalized linear mixed modeling framework and split into three time periods to account for changes in data availability. A sharp increase in 2024 nominal and standardized CPUE across both fleets was driven largely by high catches of small fish in the western Pacific. The Hawaii-based longline index was restricted to deep-set operations only, which account for the majority of BUM catch and have more consistent gear characteristics over time. A species distribution model presented by WHOI provided additional context on BUM habitat preferences, confirming the dominant role of sea surface temperature in driving distribution and supporting the hypothesis of a single stock with broad tropical range.

Catch data were assembled for 12 harvest fleets covering Japan, Chinese Taipei, the US, and various-flag WCPFC and IATTC fleets, with the model starting in 1971. The WG resolved a catch reporting discontinuity in the Taiwanese STLL series around 2000 — attributable to the inclusion of foreign-port landings in official statistics beginning that year — and recommended a sensitivity run to explore the effect of this step change. The Japanese fleet series was simplified by combining early and late coastal/offshore longline fleets given consistency in size distributions over time.

Stock status findings indicated that the Pacific blue marlin stock has declined substantially from unfished levels, with spawning stock biomass (SSB) estimated to have fallen from approximately 133,000 mt in 1971 to a low of around 38,900 mt in the mid-2000s, with modest recovery to approximately 47,000 mt by 2024. The stock is estimated to be above SSBMSY and 20% SSB_0. Fishing mortality in recent years (F2021–2023) was below FMSY, indicating that overfishing is not currently occurring. Under recent fishing levels, SSB is projected to continue recovering over the next decade.

NC21 Request — North Pacific Swordfish MSE

NC21 tasked the BILLWG to begin technical work on a management strategy evaluation (MSE) for Western and Central North Pacific Ocean swordfish (WCNPO SWO) and to develop a detailed MSE workplan to be presented to NC22 in July 2026. The US indicated it would provide additional capacity for this work, and preliminary work was presented to the WG by a consultant (Adrian Hordyk, Blue Matter Science) during the data preparatory meeting. A full workplan was drafted and presented to the BILLWG at the stock assessment meeting, and the WG agreed to provide two options for a workplan to NC22, noting that the WG preferred option 1, which would allow for preliminary results to be provided to NC23. The WG noted that funding for the MSE would expire in 2028 and further work on the MSE after NC24 would be limited.

Work Plan

The next scheduled activities include the 2027 WCNPO striped marlin stock assessment, for which a new maturity ogive from the US and growth curve from Japan for MLS are expected to be ready by Fall 2026. The WG will continue IBBS sampling and biological analyses across all three species, with particular emphasis on filling geographic gaps and advancing the age validation work for MLS and BUM. The WG will also continue technical development of the WCNPO SWO MSE, pending input from NC22.

Discussion

Members commended the BILLWG for its scientific contributions, including progress on the IBBS project, while recognizing the significant workload associated with upcoming stock assessments and potential Management Strategy Evaluation activities. Discussion highlighted the need to balance future work requests with available capacity and resources to ensure the BILLWG can effectively deliver its scientific priorities.

5.4 Shark

M. Kinney, Chair of the Shark Working Group (SHARKWG), provided a summary of SHARKWG activities over the past year (**ISC/26/ANNEX/07**). The Shark Working Group (SHARKWG) worked intersessionally to conduct a literature review of blue shark (BSH; Prionace glauca) biology, life history, ecology, and fisheries interactions in order to develop a conceptual model for North Pacific (NPO) blue shark. The WG held two 2-hour virtual meetings where the group discussed the results of the literature review and developed the conceptual model. The WG also discussed future meeting plans leading up to the BSH data prep meeting (tentatively scheduled for January 2027). Participants included members from The Inter-American Tropical Tuna Commission (IATTC), Japan, Mexico, Taiwan, and the United States of America, as well as guests from Chile and the South West Fisheries Science Center.

In addition, Jhen Hsu, a US member of the SHARKWG, provided an overview of the conceptual model development, and reviewed its main topics: stock structure, reproduction, growth and longevity.

Conceptual Model

A draft conceptual model was presented for group discussion. Key points raised included: (1) the number and spatial extent of pupping grounds may be underestimated due to gear selectivity and survey coverage rather than reflecting true distribution; (2) coastal pupping appears supported by data from both the US and Mexico in the east, while a longitudinally extended pupping ground that expands further from the coast was suggested in the western-central North Pacific based on wide-ranging experimental data; (3) vertical habitat partitioning by sex and maturity stage—particularly deep-water affinity of large mature females—may affect catchability in fisheries-dependent data and should be reflected in the model; and (4) the relative contribution of eastern and western pupping grounds to overall recruitment is currently unknown. The group reached consensus on a single draft conceptual model for the current meeting, but it was agreed that multiple conceptual model configurations may be appropriate given data uncertainties.

Work Plan

The WG agreed to provide updated spatially explicit catch and size information for blue sharks ahead of a virtual data review meeting in Oct 2026. The Oct meeting will focus on discussions of what changes to the data could be useful for the data prep meeting planned for Jan 2027 in Japan.

Discussion

Members discussed progress on the conceptual model and preparations for the next shark stock assessment, including approaches to refining fleet structure, addressing spatial data gaps, and improving representation of key life history stages. The SHARKWG emphasized the importance of balancing model improvements with available time and data to ensure a robust and feasible assessment.

6 Stock Assessment for Albacore Tuna in the North Pacific Ocean

P. Kuriyama, ALBWG lead modeler, summarized results of the benchmark NPO ALB stock assessment (**ISC/26/ANNEX/08**). There were four main changes to the base case model compared to the previous assessment in 2023. 1) The F10 JPLL index was recalculated with data from 1996-2024 and an expanded area that matched the spatial definitions in the stock assessment rather than that defined in the historical Japanese longline data. 2) Two JPLL fleets for juvenile and adult fleets (i.e., F1 and F2) in the 2023 assessment were combined into one fleet here (F1 in 2026 assessment) and modeled with time-varying age-based selectivity because having two fleets in the 2023 assessment did not improve fits to the size data and did not remove the need for time-varying selectivity. 3) Time-varying age-based selectivity was estimated with two-dimensional autoregressive selectivity patterns rather than assuming arbitrary time blocks, due to improved fits to length composition data and improved model stability. 4) Size composition data from China longline (CNLL) and Vanuatu longline (VULL) were included and fitted in this assessment. However, selectivity was only estimated for one CNLL fleet (CNLL Area 3 and 5), while CNLL Area 2 and 4 and VULL selectivities were mirrored to Taiwan longline (TWLL) selectivity. As a model sensitivity, the 2023 assessment model was updated with 2026 data (to the extent possible) to illustrate the impact of these structural changes.

During the modeling period (1994-2024), the total reported catch of NPO ALB reached a peak of about 119,000 t in 1999 and then declined in the early 2000s. Catches since 2021 have been about 45,000 t, although catches in 2020 were roughly 75,000t. Surface gears (e.g., troll, pole-and-line), which primarily harvest juvenile ALB, have typically accounted for the majority of the ALB catch.

All NPO ALB catch and size composition data from ISC member (Canada, Chinese Taipei, Japan, Korea, and the U.S.A.) and non-member countries were compiled for the assessment. The fleet structure was similar to the 2020 assessment, which differs from the fleet structure in the 2023 assessment. Specifically, the 2023 assessment had JPLL fleets operating in Areas 1 and 3 (A13) during Quarter 1 (Q1) separated into juvenile and adult fleets. The 2026 assessment reverts to the 2020 fleet structure with just one fleet for JPLL A13 Q1. The fleet structure was revisited during the development process, as the fits to the length composition data were not notably improved when juveniles and adults were modeled separately. Four relative abundance indices (standardized CPUE) were provided by Japan, the USA, and Chinese-Taipei. Based on a thorough review of all fishery data and preliminary model runs, the ALBWG fitted the base case model to one abundance index: the standardized CPUE of the JPLL fleet operating in Area 2 during Quarter 2 (F10 index; 1996-2024). This index was chosen because it represented the best information on trends for adult age-classes of female ALB, had good contrast, and age-structured production model (ASPM) analyses indicated the index was informative on both population trends and scale. Previous assessments used an index from the JPLL fleet in the same area but from Quarter 1, which is the primary ALB-targeting season. However, a re-examination of the data indicated that trends in the adult age-classes of female ALB were likely better represented by the CPUE in Quarter 2, which is also the primary spawning season.

The NPO ALB stock was assessed using a length-based, age-, and sex-structured Stock Synthesis (SS; Version 3.30.24) model over the 1994-2024 period. Biological parameters such as growth and natural mortality (M), were the same as for the 2017, 2020 and 2023 assessments. Sex-specific growth curves were used because of sexually dimorphic growth, with adult males attaining a larger size-at-age than females after maturity. Sex-specific M-at-age vectors were developed from a meta-analysis, with a sex-combined M that scaled with size for ages 0-2, and sex-specific M fixed at 0.48 and 0.39 yr-1 for age-3+ females and males, respectively. The steepness of the Beverton-Holt stock-recruitment relationship was assumed to be 0.9, based on two prior analyses. The base case model was fitted to the F10 index and all representative size composition data in a likelihood-based statistical framework.

All but one fleet (U.S.A. longline in Areas 2 and 4) were assumed to have dome-shaped length selectivity patterns Some fleets had high year-to-year variability in the size composition data. For these fleets, age-based selectivity was estimated in addition to length-based selectivity. The goal was to account for age-based changes in juvenile albacore availability and movement. Time-varying age-based selectivities were estimated for four surface fleets (JPPL and EPO surface) in order to further improve fits to the size composition data. The base model converged on a maximum likelihood estimate with a positive, definite Hessian matrix and had good ASPM diagnostics. Maximum likelihood estimates of model parameters, derived outputs, and their variances were used to characterize stock status. Several sensitivity analyses were conducted to evaluate changes in model performance or the range of uncertainty resulting from changes in model parameters, including growth, natural mortality, stock-recruitment steepness, selectivity patterns, and data weighting.

An ASPM diagnostic analysis showed that the estimated catch-at-age and fixed productivity parameters (growth, mortality, and stock-recruitment relationships with and without annual recruitment deviates) were able to explain trends in the primary index. Based on these findings, the ALBWG concluded that the base case model was able to estimate the stock production function and the effect of fishing on the abundance of the NPO ALB stock. Similar to the 2020 and 2023 assessments, the link between catch-at-age and the primary index adds confidence to the data used and the results of the assessment. Due to the moderate exploitation levels relative to productivity, the production function was weakly informative about NPO ALB stock size. It is important to note that the primary aim of estimating the female SSB in this assessment was to determine whether the estimated SSB was lower than the adopted limit and threshold reference points. Since the lower bound is better defined, it adds confidence to the ALBWG's evaluation of stock condition relative to these reference points.

The WCPFC and IATTC are the tuna RFMOs that manage the NPO ALB stock in the WCPO and EPO, respectively, and have adopted similar harvest strategies and biological reference points for this stock (WCPFC HS 2023-01; IATTC Resolution C-23-02). These harvest strategies include target, threshold, and limit reference points. The target reference points are F45%SPR, which is the fishing intensity that results in the stock producing a SPR of approximately 45%. The threshold and limit reference points are $30\%SSB_{current,\ F=0}$ and $14\%SSB_{current,\ F=0}$, respectively, which are 30% and 14% of the current, dynamic SSB under zero fishing, and hence fluctuates with changes in recruitment. Importantly, three of the management objectives in the harvest strategies are to: 1) maintain SSB above the limit reference point, with a probability of at least 80% over the next 10 years; 2) maintain depletion of total biomass around historical (2006-2015) average depletion over the next 10 years; and 3) maintain fishing intensity at or below the target reference point with a probability of at least 50% over the next 10 years. In addition, both RFMOs have current management measures (WCPFC CMM 2019-03; IATTC Resolution C-05-02) that maintain albacore fishing effort at or below the average effort levels during the 2002-2004 period.

Two 10-year projection scenarios, constant F2021-2023 and randomly resampled scenarios, were used to evaluate the impacts of fishing on the management objectives of IATTC and WCPFC. The randomly resampled F scenarios had F-at-age that were randomly sampled from 2005-2019. This 2005-2019 period was chosen as representative of the variability in F-at-age on NPO ALB, after both IATTC and WCPFC put in place current management measures (WCPFC CMM 2019-03; IATTC Resolution C-05-02) that maintain albacore fishing effort at or below the average effort levels during the 2002-2004 period.

Future recruitment was sampled from a distribution consistent with the expected recruitment variability (σ_R = 0.48) of the recruitment time series (1994-2024) in the base case model. The sex-specific F-at-age time series was estimated from the base case model and used to remove ALB from the appropriate age and sex in the projected populations. Projections started in 2025 and continued for 10 years through 2034. The projected female SSB, fishing intensity, SSB/14%$SSB_{current,F=0}$ ratios, and total biomass (age-1+) were calculated for each projection. Four hundred (400) initial populations were simulated by sampling from a multivariate normal distribution consistent with the estimated N-at-age in 2024 and its variance-covariance matrix. Each initial population was subsequently projected using 400 runs for 10 years. Each run used a random 10-year recruitment vector that was resampled from the distribution of expected future recruitment, which incorporated uncertainty in the stock-recruitment relationship, and expected recruitment variability. Depending on scenario, the F-at-age used was either based on the average F-at-age during the 2021-2023 period, or randomly resampled from the 2005-2019. The projected F-at-age included the uncertainty in the F-multipliers but not the estimated selectivity. A total of 160,000 (400 x 400) runs were performed for each projection scenario.

The ALBWG notes that the uncertainty in growth and natural mortality and the simplified treatment of the spatial structure of NPO ALB population dynamics are important sources of uncertainty in the assessment.

The adopted harvest strategies of WCPFC and IATTC for NPO ALB included provisions for the identification and evaluation of exceptional circumstances that may warrant suspension or modification of the current strategies. Consistent with this requirement, the ALBWG evaluated the adopted criteria for identifying exceptional circumstances for NPO ALB, including indicators related to stock and fleet dynamics, application of the stock assessment, and implementation of management measures. Based on the information available and the evaluation criteria, the ALBWG found no evidence to indicate that exceptional circumstances were present with respect to the conservation and management of the stock.

Discussion

ISC26 reviewed the results of the 2026 North Pacific albacore stock assessment and discussed several aspects of the assessment methodology, key assumptions, sources of uncertainty, and implications for future work.

Members asked whether a juvenile abundance index had been fully evaluated for inclusion in the assessment, including whether diagnostic analyses had been conducted. The ALBWG explained that these juvenile indices were examined during model development and sensitivity analyses, and were generally found to be consistent with the primary adult index. However, they were not included in the base model because they did not provide substantial additional information beyond the adult index, and were subject to limitations such as high variability and relatively sparse temporal coverage. As a result, the assessment retained a single primary index of abundance. The ALBWG noted that continued evaluation of juvenile indices remains an area for future research.

Members discussed the primary drivers of changes in stock status estimates relative to the 2023 assessment. The ALBWG explained that the revised Japanese longline abundance index (F10) had the greatest influence on assessment results. This update incorporated additional years of data and expanded the spatial definition of this fleet to better align with the stock assessment areas. Changes to fleet structure and selectivity modeling were considered less influential on the overall assessment outcomes.

Questions were raised regarding the inclusion of China and Vanuatu longline catch and size composition data in the new assessment. The ALBWG noted that multiple options were considered for inclusion of the size composition data from these fleets and that the adopted approach (use of aggregated "super-year" size composition data and mirrored selectivity) represented a compromise to incorporate available data while limiting potential biases given the uncertainty about sampling protocols. Sensitivity analyses indicated that inclusion of these data had little effect on stock status relative to biological reference points, although some influence on biomass estimates was observed. The ALBWG noted that they will continue to investigate the details of data from countries that do not directly participate in the ISC through engagement with data providers prior to future assessments.

Members also discussed the unusually high Japanese pole-and-line catches observed in 2020. Potential explanations included strong recruitment, changes in stock distribution that increased availability to the fleet, and shifts in fishing behavior associated with changes in skipjack availability or operational conditions during the COVID-19 period. The ALBWG noted that further investigation of these factors by Japan would be valuable.

Several members raised questions regarding the recent increase in estimated biomass and strong recruitment signals. The ALBWG expressed confidence in the overall trend of increasing biomass, noting that similar signals were evident across multiple indices of abundance; however, uncertainty remains regarding the magnitude of recent increases, particularly due to uncertainty in recruitment estimates during the terminal years of the assessment.

Discussion also addressed the implementation of two-dimensional autoregressive (2D-AR) selectivity modeling. Members questioned whether increased selectivity flexibility could confound recruitment estimates. The ALBWG acknowledged this possibility but noted that the degree of time-varying selectivity in the assessment was relatively limited and unlikely to be a primary driver of recruitment estimates. Further investigation into the interaction between selectivity and recruitment estimation was identified as a priority for future research.

Clarification was sought on the use of the Quarter 2 Japanese longline abundance index as the primary index of abundance, given that Quarter 1 has historically represented the primary fishing season. The ALBWG noted that this change was made in the 2023 stock assessment given that the Japanese longline fleet targets adult albacore in Quarter 2, this provides a better representation of adult female abundance and improves model performance.

Broader discussion addressed issues related to stock structure and spatial assumptions. While acknowledging increasing interest in spatially explicit approaches, members agreed that currently available data, given current limitations in movement data and spatially resolved indices, are insufficient to support a fully spatial assessment model. Continued evaluation of fleet definitions, spatial structure assumptions, movement dynamics, and data collection protocols was identified as a priority for future research.

Members discussed the evaluation of exceptional circumstances criteria and noted that fishing intensity estimates in recent years are lower than the lower uncertainty range that was simulated by the most recent management strategy evaluation scenarios. The ALBWG concluded that there was no evidence to indicate the presence of Exceptional Circumstances at this time. Members noted, however, that continued divergence between observed stock trends and simulated expectations, even if in a positive direction, should be continue to be monitored. While this divergence is currently in a direction consistent with improved stock status, persistent or increasing divergence from management strategy evaluation simulations could indicate that underlying assumptions (e.g., productivity, fishery dynamics, or implementation of management measures) may no longer fully represent system dynamics, and may warrant future review of harvest strategy assumptions. The ALBWG highlighted that the harvest strategy does include a provision for a formal review of its performance by the ISC to be completed by 2030 and 2033.

The ISC26 Plenary adopted the 2026 NPO ALB benchmark stock assessment, including evaluation of exceptional circumstances, and considers it to be the best available scientific information to be used to support stock status and conservation recommendations for the stock.

ISC26 recommended requesting further clarification from the WCPFC Northern Committee about their expectations for the review of the performance of the North Pacific albacore Harvest Strategy to be completed by the Northern Committee and the ISC by 2030 and 2033.

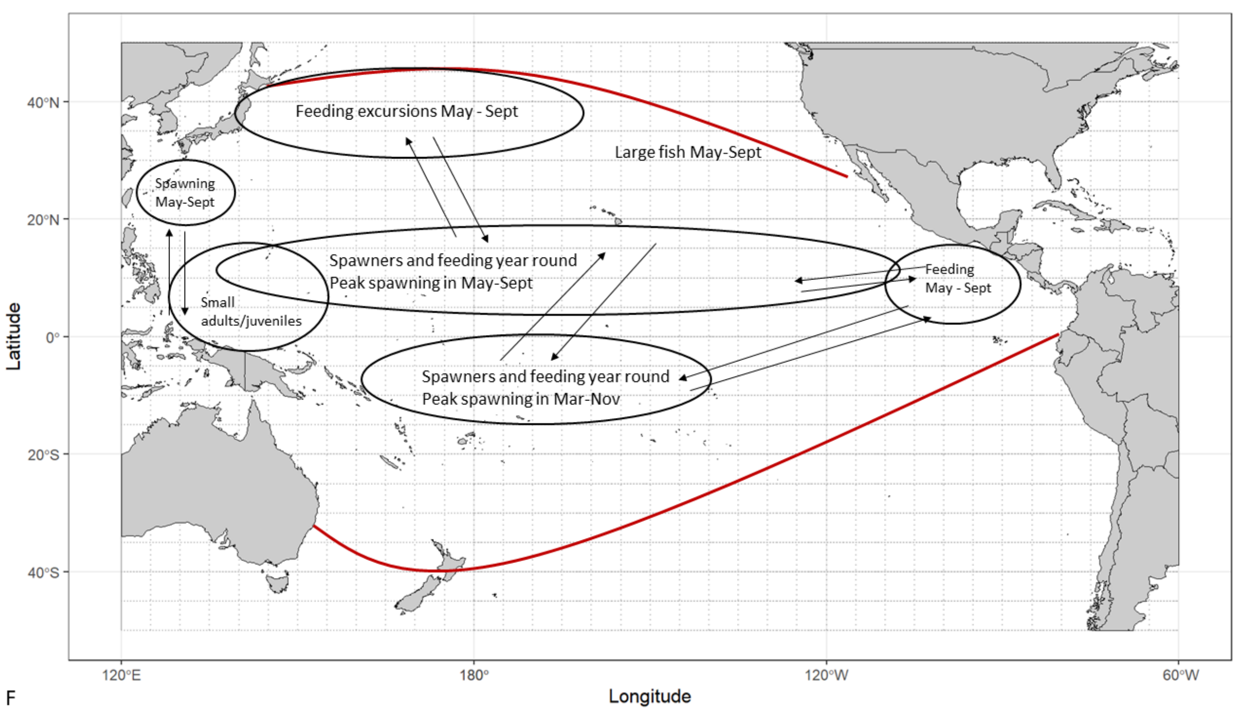
ISC26 recommended that the response developed by the ALBWG to the request made by NC21 for ISC to provide science advice on interpreting historical impacts of fleets fishing for NPO ALB in terms of fishing intensity be provided to NC22, including the Shiny application developed by the ALBWG, to support discussions about the implementation of the harvest strategy.

7 Stock Assessment of Blue Marlin in the Pacific Ocean

The Pacific blue marlin (*Makaira nigricans*) is assessed as a pan-Pacific stock caught primarily in tropical and sub-tropical waters (**Figure 7-1**). All available fishery data from ISC Members, the Inter-American Tropical Tuna Commission (IATTC), and the Western and Central Pacific Fisheries Commission (WCPFC) were used for this stock assessment. For modeling observations of catch-per-unit-effort (CPUE) and size composition data, it was assumed that there was instantaneous mixing of fish throughout the stock area on a quarterly basis.

Pacific blue marlin catches increased from 9,345 mt in the first year of the assessment (1971) to a maximum of 27,161 mt in 1995 (**Figure 7-2**). Catches were highly variable from 1996–2015, ranging from 18,287 to 27,073 mt and averaging about 22,150 mt. Since 2016, catches of Pacific blue marlin declined by almost half to less than 13,000 mt in 2023, and catch increased to an estimated 17,738 mt in 2024. Overall, longline gear has accounted for the vast majority of Pacific blue marlin catches (>80%) with Japanese fleets dominating the catch before 2000, and Chinese Taipei and other longline fleets dominating thereafter.

Catch and size composition data were compiled from ISC members (Japan, Chinese Taipei, and United States), other WCPFC members, and other IATTC members (**Table 7-1**). Standardized CPUE data used to measure trends in relative abundance were provided by Japan, Chinese Taipei, and U.S.. The size composition of Pacific blue marlin catches was included in the model for several fishing fleets, including data compiled from longline, driftnet, and purse seine gear. Life history parameters for sex-specific growth, longevity, and natural mortality were updated for this stock assessment. The value for the Beverton-Holt stock-recruitment steepness (*h*) in the base model was 0.87. An age-structured assessment model was fit to relative abundance indices (CPUE) and size composition data in the likelihood-based integrated statistical modeling framework Stock Synthesis (SS3). A large number of sensitivity analyses were conducted to evaluate the influence of the model specification and data streams on population biomass and fishing mortality trajectories. Model specifications and input parameters investigated in the sensitivity analyses included natural mortality, stock-recruitment steepness, growth, maturity, uncertainty in the input data (e.g., spatial definitions of CPUE indices, additional error added to input CPUE data, the first year of catch estimates, over- or under-estimation of catch, or the inclusion of size composition data in terms of either weight or length), and variations in model structure (e.g., fleet selectivity and catchability, initial catch and fishing mortality, and estimation of recruitment deviations from the stock-recruitment relationship).



F

Figure 7-1. A diagram of the conceptual model developed by the ISC Billfish Working Group for female Pacific blue marlin (*Makaira nigricans*). Arrows show general exchange of fish, not directed movement. The red boundary represents approximate habitat range of Pacific blue marlin.

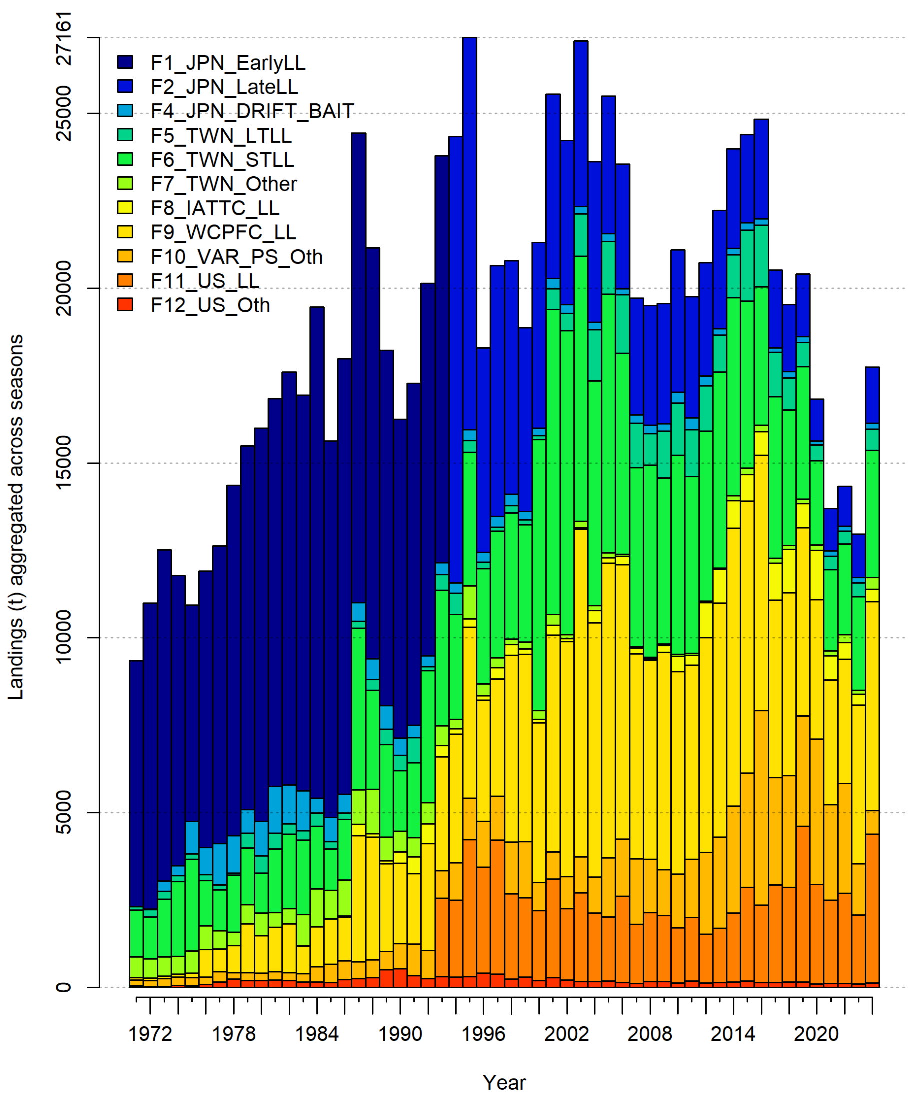


Figure 7-2. Total annual catch of Pacific blue marlin (Makaria nigricans) 1971–2024 by fleet in the 2026 stock assessment. See Table 1 in the stock assessment report for descriptions of each fishing fleet.

Table 7-1. Reported catch (mt and numbers) used in the stock assessment along with annual estimates of total catch (mt), population biomass (age-1 and older, mt), female spawning stock biomass (SSB, mt), relative female spawning stock biomass (SSB/SSB_{MSY}), recruitment (thousands of age-0 fish), fishing mortality rate (F as exploitation rate of total biomass), relative fishing mortality rate (F/F_{MSY}), and spawning potential ratio of Pacific blue marlin (*Makaira nigricans*).

Year	2019	2020	2021	2022	2023	2024	Mean[1]	Min[1]	Max[1]
Estimated total Catch (mt)	20,407	16,827	13,692	14,336	12,958	17,738	18,967	9,345	27,161
Population Biomass	101,913	99,122	98,388	100,637	108,435	127,300	148,355	98,388	217,857
Spawning Stock Biomass	39,065	39,099	40,365	42,117	43,633	47,244	71,486	38,868	133,084
Relative Spawning Stock Biomass	1.23	1.24	1.28	1.33	1.38	1.49	2.22	1.23	4.03
Recruitment (age 0)	737	673	727	1,044	1,386	931	936	614	1,410
Fishing Mortality Rate	0.20	0.17	0.14	0.14	0.12	0.14	0.14	0.04	0.23
Relative Fishing Mortality Rate	0.78	0.66	0.54	0.55	0.46	0.54	0.55	0.20	0.90
Spawning Potential Ratio	0.26	0.30	0.37	0.36	0.41	0.37	0.39	0.21	0.70

[1] During 1971–2024

Stock Status

The base model indicated the Pacific blue marlin stock was likely not overfished and likely not subject to overfishing. Estimates of population biomass (age 1 and older) for the Pacific blue marlin stock declined from 183,150 mt in 1993 to 123,300 mt in 1999, with a steady further decline to average 102,490 mt in 2021–2023, and a terminal year increase to an estimated 127,300 mt in 2024 (**Figure 7-3**). Estimated fishing mortality rate (F, expressed as exploitation rate of biomass) increased through the 1970s–1990s, and fluctuated around 0.20 before declining to 0.12 in 2023 and 0.14 in 2024. Fishing mortality rates have been below F_{MSY} for the entire assessment period. The recent spawning stock biomass of 42,038 mt (average for 2021–2023) was greater than SSB_{MSY} (SSB_{MSY} = 31,651 mt) and the recent F of 0.13 (average for 2021–2023) was 50% below F_{MSY}. The base model indicated under current conditions the Pacific blue marlin stock was virtually certain to be not overfished (>99% probability) and was virtually certain to be not subject to overfishing (>99% probability) relative to MSY-based reference points (**Figure 7-4.** Kobe plot of the timeseries of estimates of mature female spawning stock biomass (SSB) and fishing mortality rate (as exploitation of biomass) relative to MSY values (SSBMSY and FMSY, respectively) of Pacific blue marlin (*Makaira nigricans*) during 1971–2024. The earliest white symbol indicates 1971, subsequent years are labeled in 5-year increments. Shading indicates 50% (innermost), 80%, and 95% confidence intervals of terminal year (2024) stock status.).

MSY-based biological reference points and a depletion-based reference point (20% of virgin population mature female biomass; denoted $20\%SSB_0$) were computed for the base model

(**Table 7-2**). The point estimate of annual catch at F_{MSY} was 24,306 mt and at $20\%SSB_0$ was 24,119 mt. The point estimate of the female SSB to produce MSY (mature female biomass) was 31,651 mt. The point estimate of F_{MSY}, the fishing mortality rate to produce SSB_{MSY} was 0.26 (when F is calculated as exploitation rate of total biomass) or 0.22 (when F is calculated as average F for ages 1–10). $F_{20\%SSB0}$, the fishing mortality rate to maintain the population at $20\%SSB_0$ was 0.23 (F as exploitation rate of total biomass) or 0.20 (average F for ages 1–10). The corresponding equilibrium value of spawning potential ratio (SPR) at SSB_{MSY} was 19.6%; SPR corresponding to $20\%SSB_0$ was 23%.

Based on these findings, the following information on the status of the Pacific BUM stock is provided by the ISC26 Plenary:

1. **No target or limit reference points have been established for BUM by the IATTC and the WCPFC;**

2. **Spawning stock biomass was estimated to be 42,038 mt in 2021-2023, or about 33% above SSB_{MSY} and 9% above $20\%SSB_0$;**

3. **Fishing mortality on the stock averaged roughly F = 0.13 during 2021-2023, or about 50% below F_{MSY} and 56% below $F_{20\%SSB0}$; and**

4. **Blue marlin stock status relative to MSY-based reference points, overfishing was virtually certain to be not occurring (>99% probability) and Pacific BUM is virtually certain to be not overfished (>99% probability).**

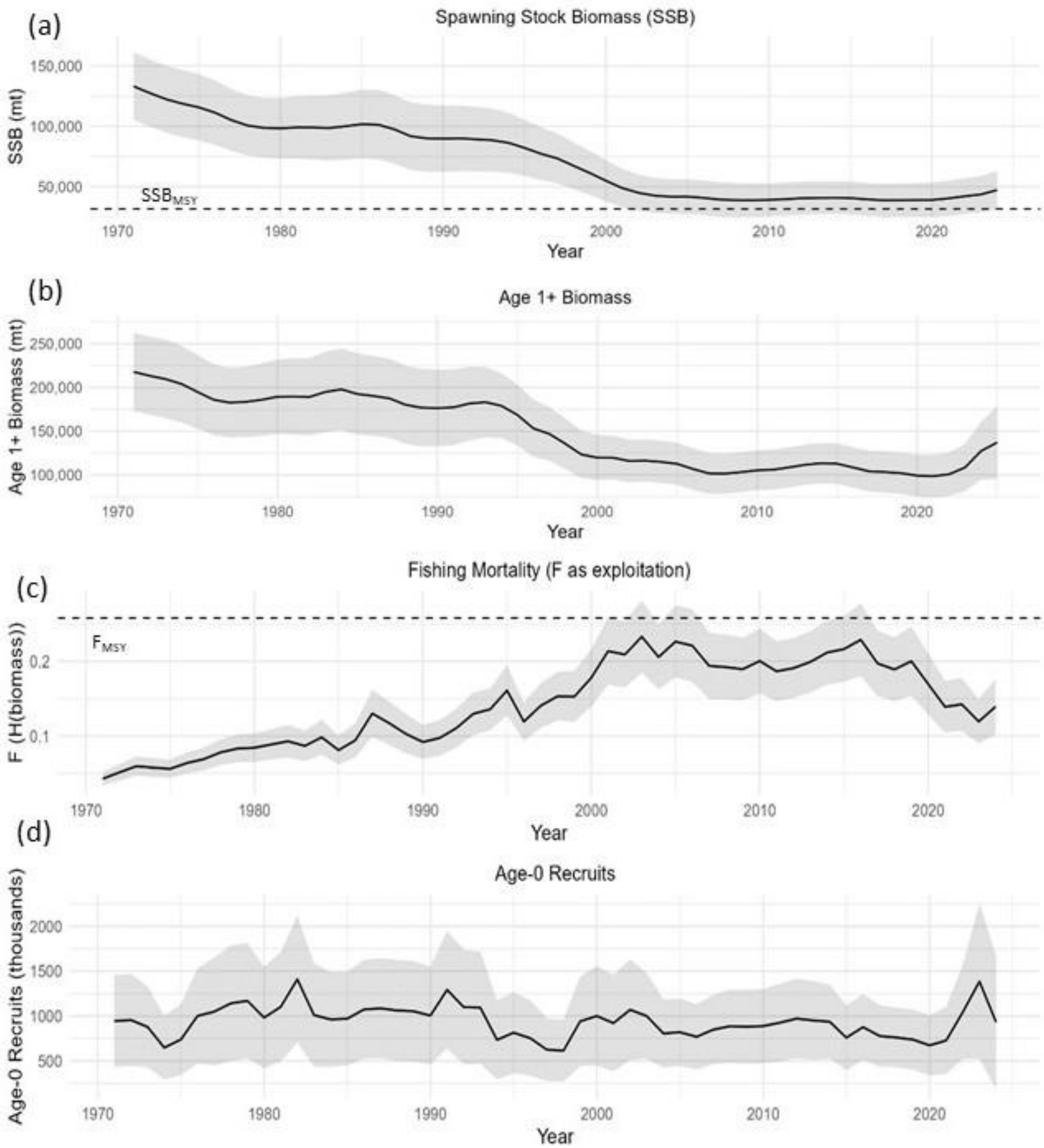


Figure 7-3. Annual estimates of (a) female spawning stock biomass, SSB; (b) population biomass (age 1+); (c) fishing mortality rate (F) as exploitation rate of biomass; and (d) recruitment (age-0 fish) for Pacific blue marlin (Makaria nigricans). The solid line represents the maximum likelihood estimates by year for each quantity, the shaded areas are 95% confidence intervals, and dashed lines indicate the static SSB_{MSY} and F_{MSY} reference points.

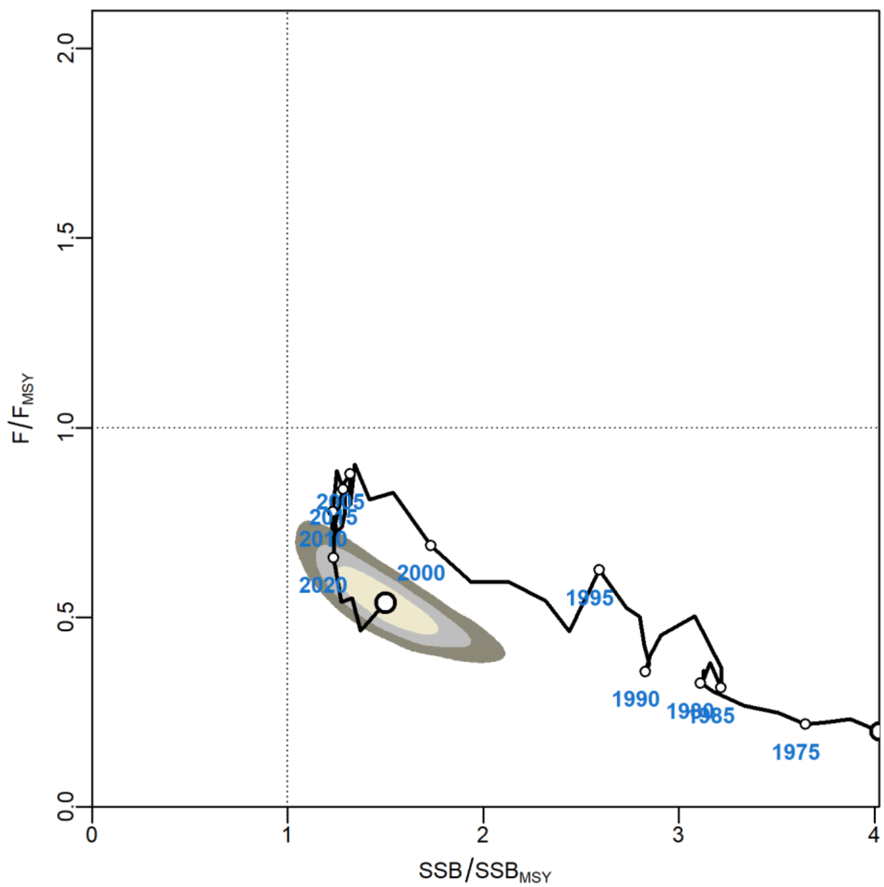


Figure 7-4. Kobe plot of the timeseries of estimates of mature female spawning stock biomass (SSB) and fishing mortality rate (as exploitation of biomass) relative to MSY values (SSB_{MSY} and F_{MSY}, respectively) of Pacific blue marlin (*Makaira nigricans*) during 1971–2024. The earliest white symbol indicates 1971, subsequent years are labeled in 5-year increments. Shading indicates 50% (innermost), 80%, and 95% confidence intervals of terminal year (2024) stock status.

Table 7-2. Estimated biological reference points derived from the base model for Pacific blue marlin (*Makaira nigricans*) where F is the fishing mortality rate, expressed as exploitation rate of biomass or instantaneous annual F of ages 1–10. SPR is annual spawning potential ratio, SSB is spawning stock biomass (mature female biomass), SSB_0 is virgin unfished SSB, and MSY is maximum sustainable yield.

Reference Point	Estimate
F as exploitation(biomass)	
F_{MSY}	0.26
$F_{20\%SSB0}$	0.23
F_{2003}	0.23
$F_{2021–2023}$	0.13
Average F ages 1–10	

Reference Point	Estimate
F_{MSY}	0.22
$F_{20\%SSB0}$	0.20
F_{2003}	0.20
$F_{2021–2023}$	0.11
Spawning Stock Biomass (SSB, mt)	
SSB_0	192,529
SSB_{MSY}	31,651
$20\%SSB_0$	38,506
SSB_{2003}	42,652
$SSB_{2021–2023}$	42,038
Catch (C, mt)	
C_{MSY}	24,306
$C_{20\%SSB0}$	24,119
C_{2003}	27,073
$C_{2021–2023}$	13,662
Spawning Potential Ratio (SPR)	
SPR_{MSY}	0.196
$SPR_{20\%SSB0}$	0.230
SPR_{2003}	0.209
$SPR_{2021–2023}$	0.381

Conservation Information

Future projections for Pacific blue marlin were conducted using SS3, without incorporating recruitment deviations or applying a log-bias adjustment in the projections. Projections were reported as the median value from 100 bootstrapped input dataset model runs for each scenario. Projections started in 2025 and continued through 2034 under fishing mortality levels corresponding to four harvest scenarios: (1) $F_{High} = F_{2003}$, the highest fishing mortality rate estimated for the entire time series (1971–2024); (2) F_{MSY}; (3) $F_{Recent} = F_{(2021–2023)}$, corresponding to the average fishing intensity (SPR) over 2021–2023; and (4) $F_{30\%SPR}$, corresponding to SPR = 30%. The results show the projected female SSB and catch biomass under each of these scenarios (Table 7-3; **Figure 7-5** & **Figure 7-6**). Under the F_{Recent} scenario, projected catches remained below 2024 levels for several years, then increased to about 80% of MSY by 2034, while biomass increased to well above SSB_{MSY}. In contrast, the F_{MSY} scenario showed increased catch to above the historical maximum, followed by a decline to MSY as biomass decreased. The remaining scenarios produced intermediate trajectories with catches initially increasing and later declining as stock biomass is reduced. The most stable catch trajectory was observed under $F_{30\%SPR}$, with projected annual catches remaining approximately constant at 23,000 mt.

The lack of sex-specific size data for all but one fishing fleet, and the simplified treatment of the spatial structure of Pacific blue marlin fishing fleets and population dynamics remain as two important sources of uncertainty for improving future assessments.

Based on these findings, the following conservation information is provided for the Pacific BUM stock by the ISC26 Plenary:

1. **There is no evidence of fishing mortality exceeding FMSY or substantial depletion in spawning potential or spawning stock biomass relative to MSY level; and ;**

2. **The Pacific blue marlin stock has produced annual removals of 13,690–20,400 mt since 2019, corresponding to approximately 53–84% of the MSY catch. The stock may be able to support somewhat higher removalss.**

3. **The results show that projected female spawning biomass is expected to increase or remain stable under the $F_{status\ quo}$ and $F_{30\%}$ harvest scenarios and decline to SSB_{MSY} under the High F and F_{MSY} harvest scenarios. The probability that the stock is overfished or overfishing occurring by 2034 under each harvest scenario is low.**

Table 7-3. Projected median values of Pacific blue marlin (*Makaira nigricans*) spawning stock biomass (SSB, mt) and catch (mt) in 2025–2034 under 4 constant fishing mortality rate scenarios: (1) F_{High} = F_{2003}, which is the highest fishing mortality rate (F) estimated for the model time series; (2) F_{MSY}; (3) F_{Recent} = $F_{(2021–2023)}$ which is the F corresponding to the average fishing intensity (SPR) from 2021–2023; and (4) $F_{30\%SPR}$ which is the F corresponding to SPR = 30%.

Year	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Scenario 1: F_{High}										
SSB	53,390	50,126	47,384	45,292	43,642	42,530	41,649	40,950	40,418	39,970
Catch	28,998	27,390	26,414	25,647	25,233	24,833	24,506	24,263	24,129	24,001
Scenario 2: F_{MSY}										
SSB	51,646	46,467	42,614	40,069	38,360	37,143	36,262	35,680	35,140	34,765
Catch	32,992	30,396	28,563	27,326	26,518	25,875	25,437	25,110	24,899	24,705
Scenario 3: F_{Recent}										
SSB	56,574	60,297	62,837	65,475	67,469	69,089	70,349	71,131	71,741	72,218
Catch	16,158	16,873	17,505	18,102	18,566	18,930	19,147	19,293	19,408	19,514
Scenario 4: $F_{30\%SPR}$										
SSB	54,642	54,136	53,702	53,663	53,502	53,386	53,290	53,090	53,045	53,019
Catch	23,256	23,050	23,009	22,901	22,902	22,874	22,861	22,873	22,863	22,874

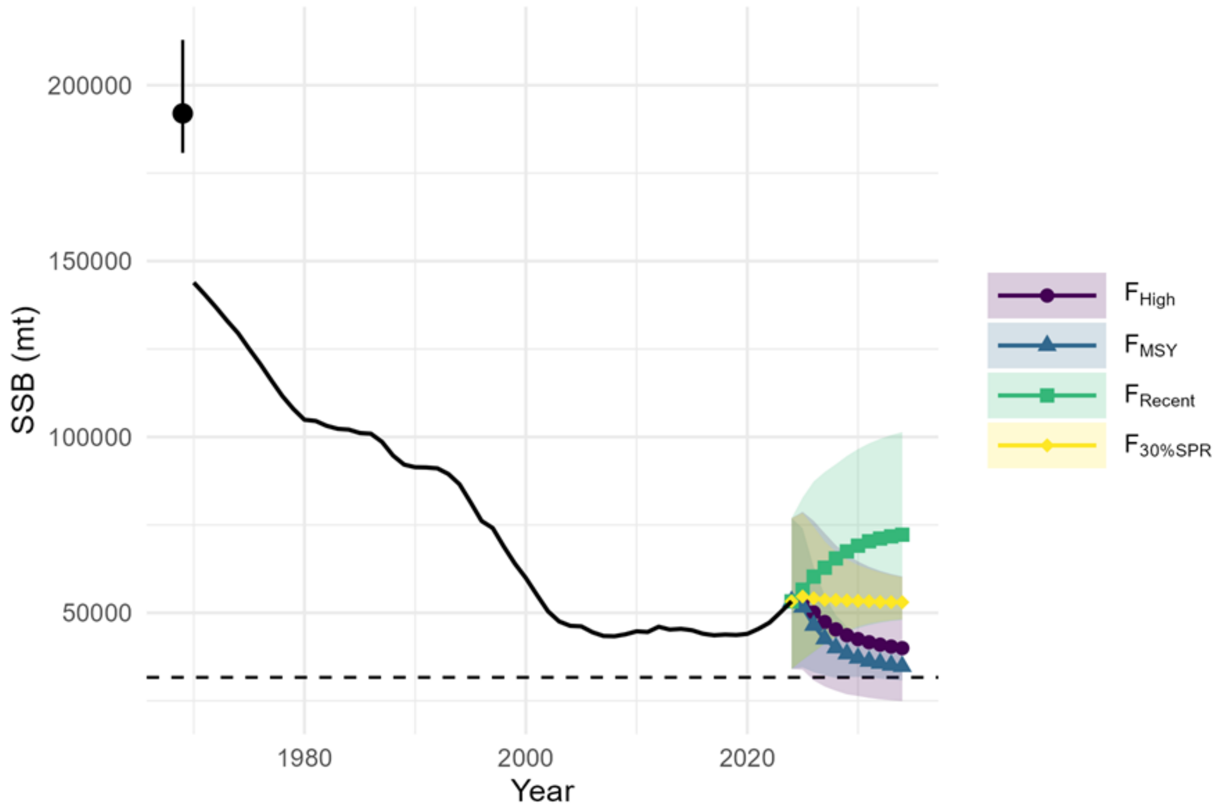


Figure 7-5. Historical and projected trajectories of spawning stock biomass (SSB) from the Pacific blue marlin (*Makaira nigricans*) base case model based on 4 constant fishing mortality rate (F) scenarios: (1) $F_{High} = F_{2003}$, which is the highest F estimated for the model time series; (2) F_{MSY}; (3) $F_{Recent} = F_{(2021–2023)}$ which is the F corresponding to the average fishing intensity (SPR) from 2021–2023; and (4) $F_{30\%SPR}$ which is the F corresponding to SPR = 30%. Dashed line indicates the spawning stock biomass at MSY.

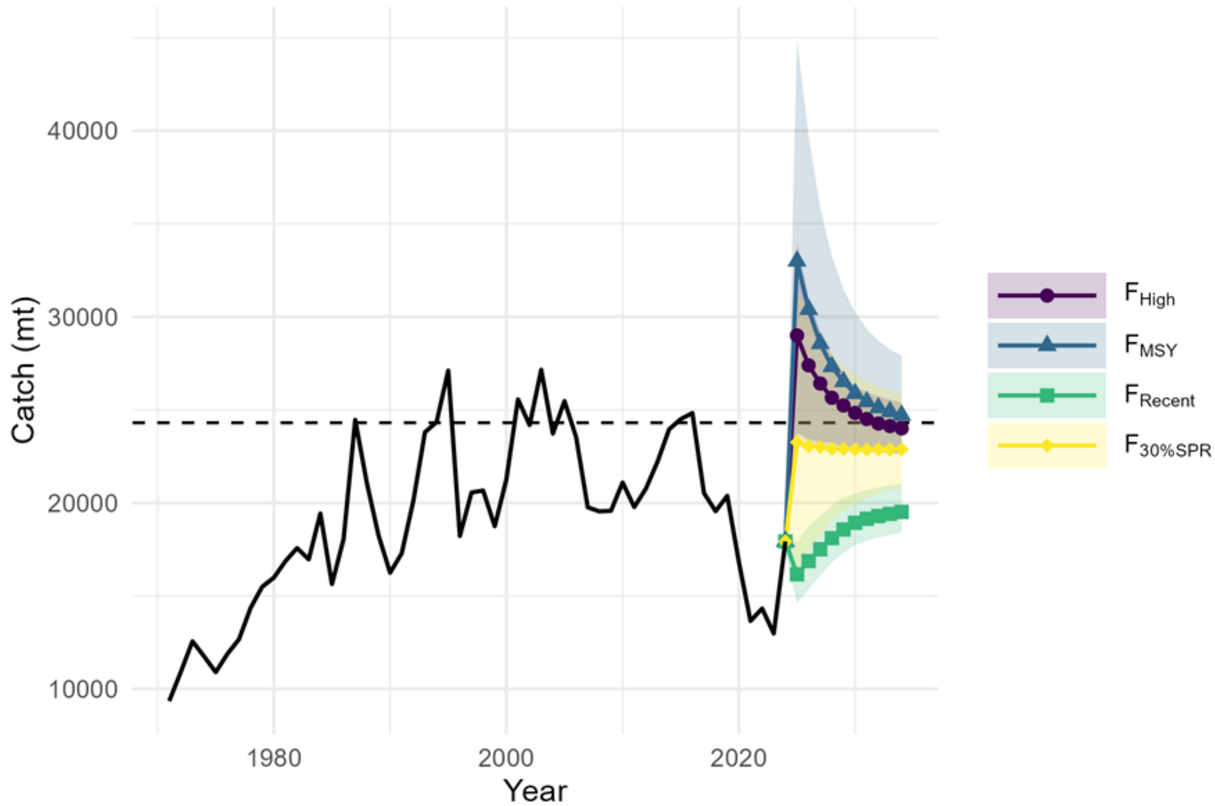


Figure 7-6. Historical and projected trajectories of catch from the Pacific blue marlin (*Makaira nigricans*) base case model based on 4 constant fishing mortality rate (F) scenarios: (1) F_{High} = F_{2003}, which is the highest F estimated for the model time series; (2) F_{MSY}; (3) F_{Recent} = $F_{(2021–2023)}$ which is the F corresponding to the average fishing intensity (SPR) from 2021–2023; and (4) $F_{30\%SPR}$ which is the F corresponding to SPR = 30%. Dashed line indicates MSY.

Discussion

ISC26 reviewed the results of the 2026 Pacific blue marlin stock assessment and discussed the assessment framework, key sources of uncertainty, model diagnostics, and priorities for future assessment development.

Members sought clarification regarding the conceptual model developed during the data preparatory meeting and the extent to which the spatial and demographic structure identified in that process was incorporated into the final assessment. The Working Group explained that considerable effort had been devoted to developing a more spatially explicit conceptual assessment framework, including east-west spatial divisions, latitudinal structure, sex-specific information, and more realistic representation of spawning dynamics. However, when these approaches were explored during model development, substantial conflicts emerged among the available CPUE indices, particularly between eastern and western Pacific abundance trends. Given the limited time available between the data preparatory meeting and assessment workshop, the Working Group concluded that there was insufficient opportunity to fully resolve these issues and therefore reverted to an assessment structure similar to that used in previous assessments. The Working Group noted that while the resulting assessment represents the best scientific information available, the unresolved conflicts among data sources remain an important area for future investigation.

Members discussed model diagnostics, including apparent misfits and failures of runs tests for several size composition datasets. The Working Group noted that these diagnostics were useful indicators of areas where model assumptions and data may be in conflict, but emphasized that failures of runs tests alone should not be interpreted as evidence that the assessment results are unreliable. Members noted that the overall integrated model diagnostics were generally acceptable and that the assessment adequately captured the principal trends in the available data. Discussion highlighted the importance of continuing to investigate the underlying causes of residual patterns and data conflicts in future assessments.

Considerable discussion focused on the updated growth model and revised biological parameters adopted for the assessment. Members noted that the updated growth curve, supported by extensive sampling and age validation using bomb radiocarbon methods, represented a substantial improvement over previous assessments. The Working Group explained that changes in growth, longevity, and natural mortality influenced estimates of spawning biomass and population scale. Although sensitivity analyses demonstrated that stock status estimates were influenced by these assumptions, the Working Group expressed confidence in the revised biological parameters and noted that the stock status determination remained positive across alternative model configurations.

The Plenary also discussed differences in stock status between Pacific blue marlin and striped marlin. The Working Group explained that the difference largely reflected contrasting life histories and fishery selectivity patterns, with blue marlin generally being harvested after reaching maturity whereas a substantial proportion of striped marlin catches consist of immature individuals. Members agreed that improved biological information would continue to refine understanding of stock productivity and status in future assessments.

Members discussed the challenges associated with standardizing abundance indices for a non-target species. The Working Group noted that blue marlin is caught by longline fleets targeting tunas and swordfish, which have shown substantial changes in spatial distribution and fishing practices over time, creating difficulties in distinguishing changes in blue marlin abundance from changes in fishing behavior. Particular attention was given to the contraction of some longline fisheries in the eastern Pacific Ocean and the implications for CPUE standardization. Members agreed that further work on abundance index development, including additional spatio-temporal standardization approaches and improved treatment of changing fishery distributions, represents a high priority for future assessments.

The Plenary discussed uncertainty associated with stock structure and spatial dynamics. While the assessment continues to assume a Pacific-wide stock with quarterly mixing, members noted that the conceptual model and available biological information suggest greater spatial complexity than currently represented in the assessment. The Working Group indicated that improved data and additional analytical development would be necessary before more spatially explicit assessment approaches could be implemented. Members agreed that future work should focus on developing data and analytical frameworks that better align with the conceptual understanding of Pacific blue marlin population structure and movement dynamics.

The Plenary also discussed the lack of sex-specific size composition data, which was identified as a major source of uncertainty in the assessment. Members noted that improved collection of sex-specific biological information across fisheries could substantially improve future assessments and help support more realistic representations of growth, selectivity, and reproductive dynamics. Additional discussion highlighted the limited availability of fisheries and biological data from portions of the western and southern Pacific and the potential value of increased collaboration with WCPFC members and SPC to improve data coverage throughout the stock's range.

ISC26 recommended the following future work in advance of the next Pacific blue marlin benchmark stock assessment:

- **Continue development of abundance indices, including evaluation of spatio-temporal standardization approaches and methods to account for changing fishery distributions;**
- **Further investigate the spatial structure, movement dynamics, and stock structure assumptions underlying the assessment, with the objective of improving alignment between the conceptual model and future assessment frameworks;**
- **Continue evaluation of model diagnostics, CPUE conflicts, and size composition residual patterns to better understand sources of uncertainty and improve future assessment performance;**
- **Consider future development of integrated approaches that better align CPUE standardization, size composition data, and assessment model structure with the conceptual understanding of Pacific blue marlin spatial ecology and fishery dynamics;**

ISC26 further noted that the next assessment is expected to benefit from the improvement identified above, as well as from the relevant methodological advances arising from the 2024 WCNPO MLS assessment review.

ISC26 recommended increased collaboration with WCPFC members and SPC to improve the availability of fishery-dependent and biological data from areas of the Pacific currently underrepresented in the assessment.

ISC26 encouraged members to continue to improve the collection and availability of sex-specific size composition and biological data for blue marlin across fisheries to reduce uncertainty in growth, selectivity, and reproductive parameter estimation in future stock assessments.

The ISC26 Plenary adopted the 2026 Pacific blue marlin stock benchmark stock assessment and considers it to be the best available scientific information to be used to support stock status and conservation recommendations for the stock.

8 Stock Status and Conservation Information

8.1 Stocks Assessed in 2026

8.1.1 North Pacific Albacore

S. Hawkshaw, ALBWG Chair, noted that a stock assessment was conducted in 2026 (**ISC/26/ANNEX/08)**.

Stock status

Estimated summary biomass (males and females at age-1+) declined at the beginning of the time series until 2004 (**Figure 8-1**). Subsequently, the summary biomass fluctuated without a clear trend until 2018, after which the biomass increased to values higher than those at the beginning of the model time period. It should be noted that the high summary biomass estimates since 2018 also had increasing uncertainty (**Figure 8-1**). These high summary biomass estimates can be largely attributed to several strong recruitment estimates in 2017 (~297 million fish; 95% CI: 215– 381million fish), 2019 (~292 million fish; 95% CI: 187 to 396 million fish), and 2022 (~314 million fish; 95% CI: 93-536 million fish) (Figure 6.1-1). However, it should be noted that the recruitment estimates in the last 5 years (2020-2024) were highly uncertain and should be treated with caution. Estimated female SSB exhibited a similar trend to the summary biomass, albeit with a lag of several years, and showed an initial decline until 2007 followed by fluctuations without a clear trend through 2020 (**Figure 8-1**).

The average fishing intensity during 2021 – 2023 was estimated to be $F66_{\%SPR}$ (95% CI: $F74_{\%SPR}$ – $F57_{\%SPR}$), which was relatively moderate and resulted in a population with an SPR of approximately 66%. Instantaneous fishing mortality at age (F-at-age) was similar in both sexes through age-5, peaking at age-4 and declining to a low at age-6, after which males experienced higher F-at-age than females up to age 14 (**Figure 8-2**). Juvenile albacore aged 2 to 4 years comprised approximately 76% of the annual catch-at-age in numbers between 1994 and 2024 (**Figure 8-3**) due to the larger fishery impact of surface fisheries (primarily troll, pole-and-line), which remove juvenile fish, relative to longline fisheries, which primarily remove adult fish (**Figure 8-4**).

Stock status is depicted in relation to the target ($F45_{\%SPR}$), threshold ($30\%SSB_{current,F=0}$), and limit ($14\%SSB_{current,F=0}$) reference points (**Figure 8-1**; **Table 8-1**). The estimated female SSB has never fallen below the threshold and limit reference points since 1994, albeit with large uncertainty in the terminal year (2024) estimates. The historical fishing intensity was estimated to have exceeded the target reference point for most years between 1997-2018. However, the estimated fishing intensity has been declining since 2019 and has been below the target reference point for the last six years. Even when alternative hypotheses about key model uncertainties such as growth were evaluated, the point estimate of female SSB in 2024 (SSB2024) did not fall below the threshold and limit reference points (**Figure 8-5**). Estimated average fishing intensity during 2021-2023 (F2021-2023) did not exceed the target reference point under the alternative hypotheses (**Figure 8-5**; **Table 8-1**). Average fishing intensity from 2021-2023 also did not exceed the average fishing intensity during 2002-2004 (**Table 8-1**).

The SSB2024 was estimated to be approximately 60% (95% CI: 38 – 83%) of $SSB_{current,F=0}$ and 2.01 (95% CI: 1.26 – 2.76) times greater than the estimated threshold reference point (**Table 8-1**). The estimated current fishing intensity (F2021-2023) was estimated to be $F66_{\%SPR}$ (95% CI: $F74_{\%SPR}$ – $F57_{\%SPR}$) and was lower than both the $F45_{\%SPR}$ target reference point and the average fishing intensity during 2002 – 2004 (**Table 8-1**). Based on these findings, the following information on the status of the north Pacific albacore stock is provided:

1. **The stock is virtually certain (>99%) not to be overfished relative to the threshold ($30\%SSB_{current,F=0}$) and limit ($14\%SSB_{current,F=0}$) reference points adopted by the WCPFC and IATTC, and**
2. **The stock is virtually certain (>99%) to be not experiencing overfishing relative to the target reference point ($F45_{\%SPR}$).**

Conservation Information

The constant fishing intensity scenario showed that the current fishing intensity (F2021-2023) is expected to result in female SSB increasing to 109,384 t (95% CI: 82,915 – 136,573 t) and a $SSB/SSB_{current,F=0}$ ratio of 0.83 by 2034. Over the next 10 years, there was: 1) a 100.0% probability of the female SSB remaining above the $14\%SSB_{current,F=0}$ LRP for all 10 years; 2) a 86.5% probability of the total biomass (age-1+) depletion being above the average of 2006 – 2015 for any year; and 3) a 95.3% probability of the fishing intensity remaining at or below the $F45_{\%SPR}$ TRP for any year (**Figure 8-6**). For the second scenario, the period 2005–2019 was chosen because IATTC and WCPFC implemented the current management measures (WCPFC CMM 2019-03; IATTC Resolution C-05-02) that maintains albacore fishing effort at or below the average effort levels during 2002–2004 but before recent declines in F after 2020. If future fishing intensity is similar to the 2005 – 2019 period, it is expected to result in female SSB increasing to 67,340 t (95% CI: 47,082 – 87,597 t) and a $SSB/SSB_{current,F=0}$ ratio of 0.52 by 2034. Over the next 10 years, there was: 1) a 99.1 % probability of the female SSB remaining above the $14\%SSB_{current,F=0}$ LRP for all 10 years; 2) a 79.9 % probability of the total biomass (age-1+) depletion being above the average of 2006 – 2015 for any year; and 3) a 48.8% probability of the fishing intensity remaining at or below the $F45_{\%SPR}$ TRP for any year (**Figure 8-7**).

Based on these findings, the following conservation information is provided:

1. **If fishing intensity over the next 10 years is maintained at the current fishing intensity (F2021-2023), then female SSB is expected to increase to around 83% of $SSB_{current,F=0}$ (109,384 t) by 2034, with a 100.0% probability that female SSB will remain above the**

$14\%SSB_{current,F=0}$ LRP for all 10 years and the harvest strategy management objectives of the IATTC and WCPFC (IATTC Resolution C-23-02; WCPFC Harvest Strategy 2023-01) will likely be met; and

2. **If fishing intensity over the next 10 years is similar to the 2005 – 2019 period, then female SSB is expected to decrease to around 52% of $SSB_{current,F=0}$ (67,340 t), with a 99.1 % probability that female SSB will remain above the $14\%SSB_{current,F=0}$ LRP for all 10 years and the harvest strategy management objectives of the IATTC and WCPFC (IATTC Resolution C-23-02; WCPFC Harvest Strategy 2023-01) will likely be met.**

Table 8-1. Estimates of maximum sustainable yield (MSY), female spawning stock biomass (SSB), fishing intensity (F), and reference point ratios for north Pacific albacore tuna for: 1) the base case model; 2) one important sensitivity model due to uncertainty in growth parameters; 3) a model representing an update of the 2023 base case model to 2026 data; and 4) a model representing uncertainty in the specification of initial fishing mortality.SSB_0, $SSB_{current,F=0}$, and SSB_{MSY} are the expected female SSB of a population in the equilibrium, unfished state; in the current, dynamic, unfished state; and at MSY, respectively. The Fs in this table are indicators of fishing intensity based on spawning potential ratio (SPR) and calculated as %SPR. SPR is the ratio of the equilibrium SSB per recruit that would result from the estimated F-at-age relative to that of an unfished population. Depletion is calculated as the proportion of the age-1+ biomass during the specified period relative to an unfished age-1+ equilibrium biomass. The model representing an update of the 2023 base case model is similar to but not identical to the 2026 base case model due to changes in data preparation and model structure. †A value of >1 for the depletion ratio indicates higher age-1+ biomass in 2024 relative to the 2006–2015 period. §Higher %SPR values indicate lower fishing intensity levels. ¶Values of >1 for ratios of $F_{\%SPR}$ to $F_{\%SPR}$-based reference points indicate fishing intensity levels lower than the reference points.

Quantity	Base Case	Growth CVold=0.06	Update of 2023 base case model to 2026 data*	Initial Conditions initF F20 F24
MSY (t)	106,578	86,675	113,793	100,322
SSB_{MSY} (t)	19,360	15,878	20,524	18,316
SSB_0 (t)	139,466	113,685	147,874	131,221
SSB_{2024} (t)	84,209	49,547	96,362	73,236
$SSB_{current, F=0}$ (2024 estimate)	139,777	107,072	151,193	129,224
$SSB_{2024}/SSB_{current, F=0}$	0.60	0.46	0.64	0.57
$SSB_{2024}/30\%SSB_{current, F=0}$	2.01	1.54	2.12	1.89
$SSB_{2024}/14\%SSB_{current, F=0}$	4.30	3.31	4.55	4.05
† $Depletion_{2024}/Depletion_{2006-2015}$	1.45	1.40	1.61	1.45
§ $F_{\%SPR,\ 2021-2023}$ (%SPR)	65.6	51.9	68.0	62.2
§ $F_{\%SPR,\ 2013-2023}$ (%SPR)	50.3	36.7	53.6	46.6
¶ $F_{\%SPR,\ 2021-2023}/F_{\%SPR,\ MSY}$	4.03	3.17	4.18	3.80
¶ $F_{\%SPR,\ 2013-2023}/F45_{\%SPR}$	1.12	0.82	1.19	1.04

Quantity	Base Case	Growth CVold=0.06	Update of 2023 base case model to 2026 data*	Initial Conditions initF F20 F24
¶ $F_{\%SPR,\ 2021\text{-}2023}/F45_{\%SPR}$	1.46	1.15	1.51	1.38
¶ $F_{\%SPR,\ 2021\text{-}2023}/F_{\%SPR,\ 2002\text{-}2004}$	1.87	2.13	1.78	1.95

FIGURES

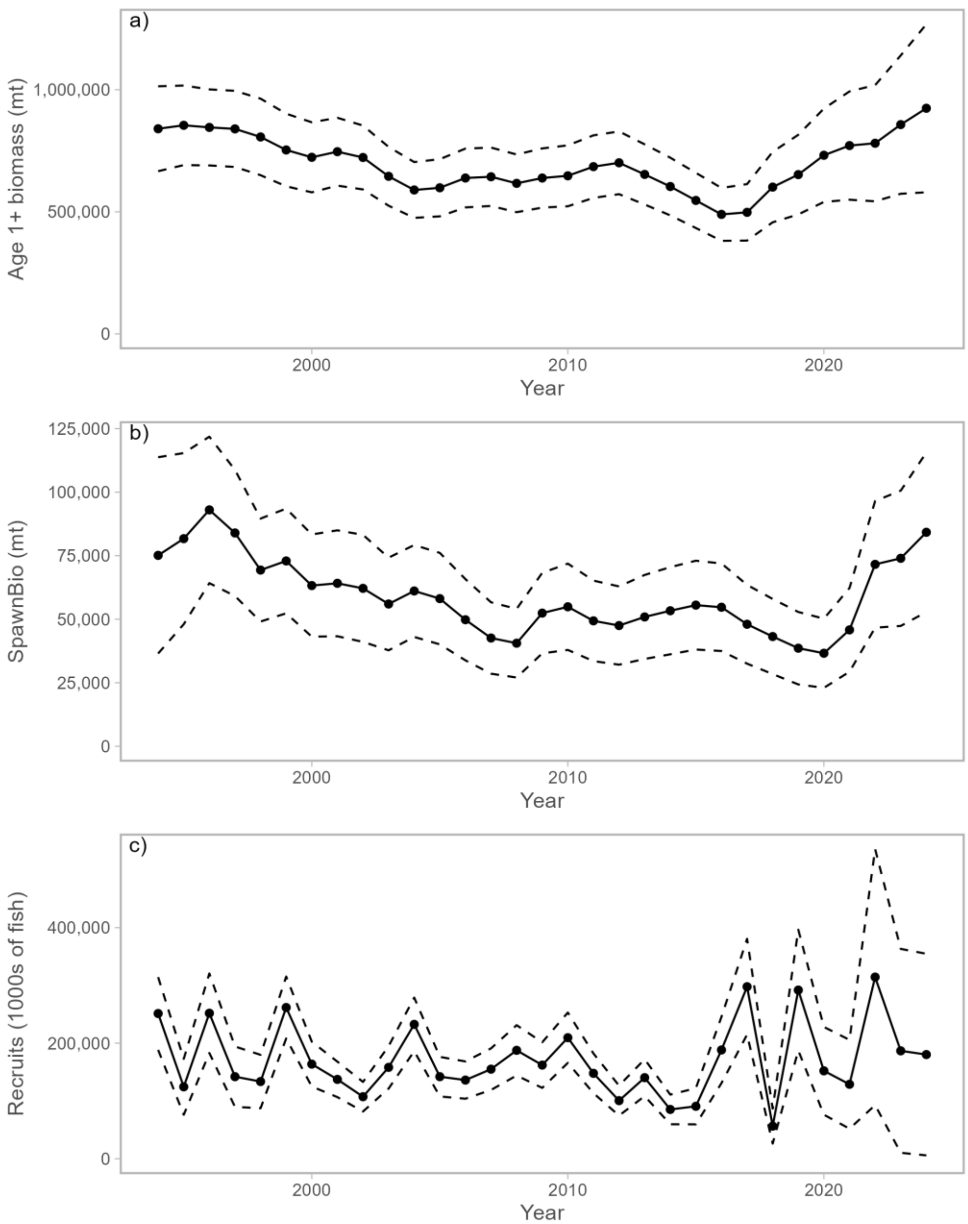


Figure 8-1. Maximum likelihood estimates of (a) age-1+ biomass, (b) female spawning biomass (SSB), and (c) age-0 recruitment of north Pacific albacore tuna (Thunnus alalunga). Dashed lines indicate 95% confidence intervals.

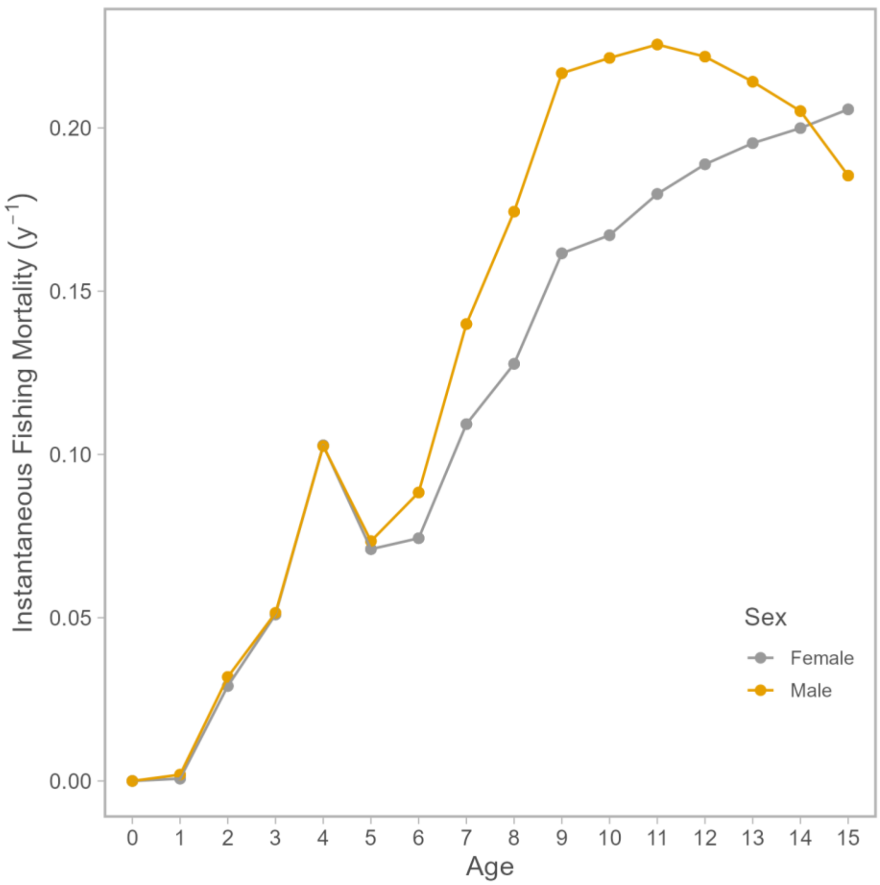


Figure 8-2. Estimated sex-specific instantaneous fishing mortality at age (F-at-age) for the 2026 base case model, averaged across 2021-2023.

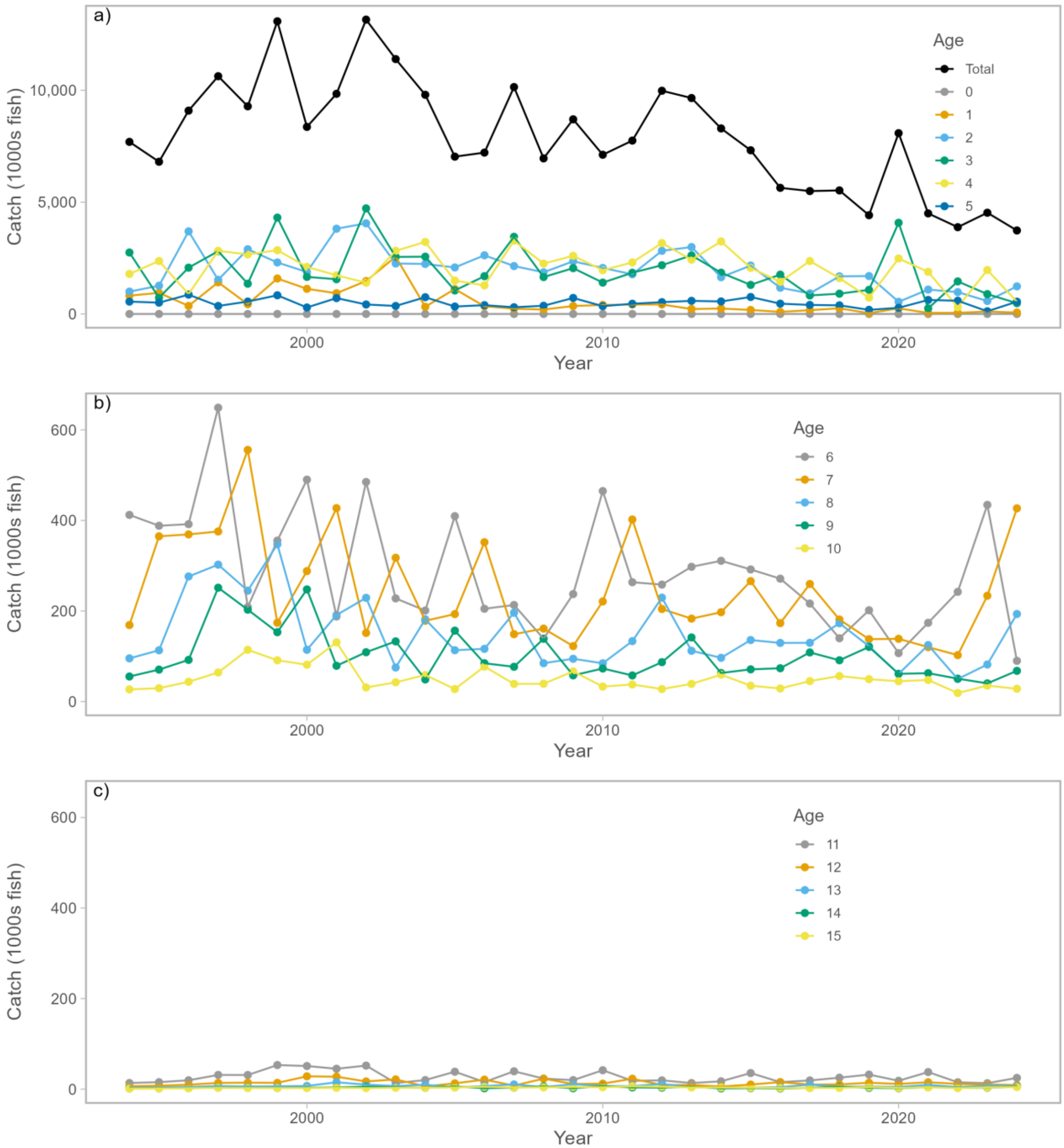


Figure 8-3. Historical catch at age of north Pacific albacore estimated by the 2026 base case model. Panels are arranged for the total catch and ages 0-5 (top), 6-10 (middle), and 11-15 (bottom). Note the difference in y-axis scale between the top panel and middle and bottom panels.

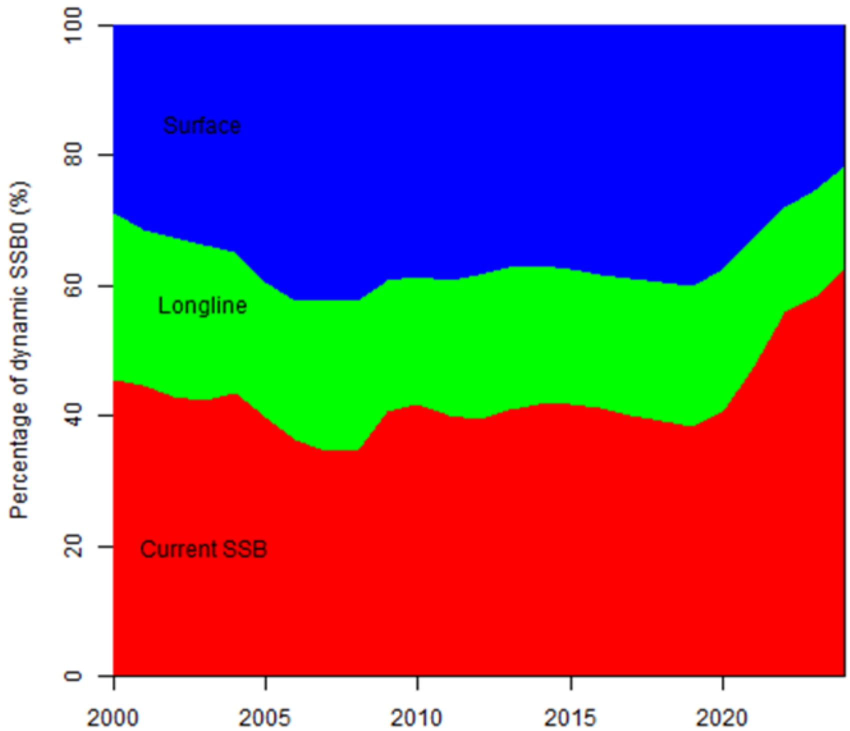


Figure 8-4. Fishery impact analysis on north Pacific albacore showing female spawning biomass (SSB; red) estimated by the 2026 base case model as a percentage of dynamic, unfished female SSB (SSB_(current,F=0)). Colored areas show the relative proportion of fishing impact attributed to longline (green) and surface (blue) fisheries (primarily troll and pole-and-line gear, but including all other gears except longline).

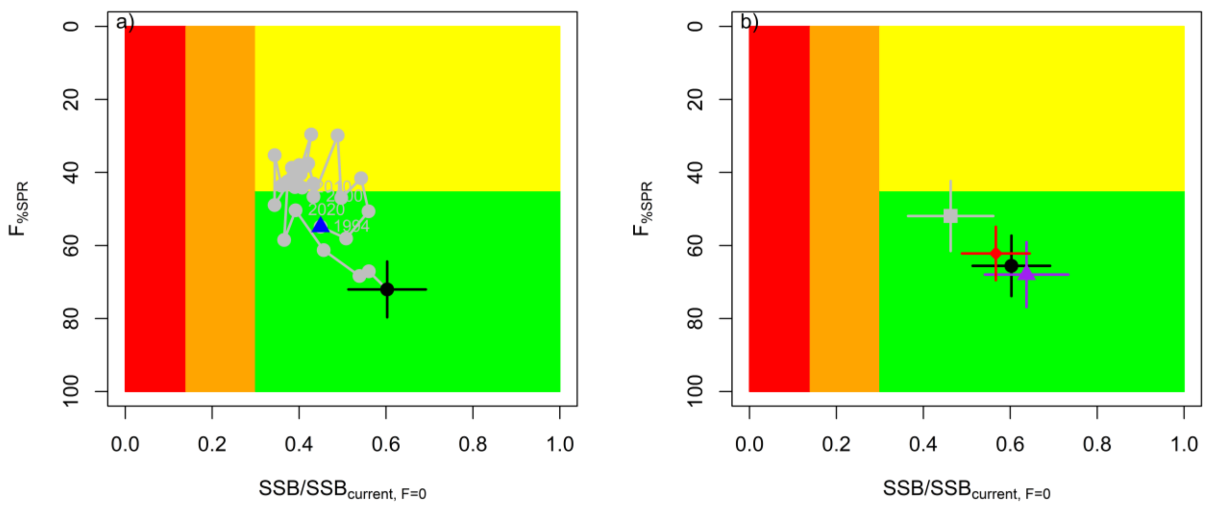


Figure 8-5. (a) Stock status phase plot showing the status of the north Pacific albacore (*Thunnus alalunga*) stock relative to the biomass-based threshold ($30\%SSB_{current,F=0}$) and limit ($14\%SSB_{current,F=0}$) reference points, and fishing intensity-based target reference point (F45%SPR) over the modeling period (1994 – 2024). Blue triangle indicates the start year (1994) and black circle with 95% confidence intervals indicates the terminal year (2024). (B) Stock status plot showing current stock status and 95% confidence intervals of the base case model (black circle), a sensitivity run an important sensitivity run of CV = 0.06 for Linf in the growth model (gray), an important sensitivity run with two initial fishing mortality parameters (red), and a model representing an update of the 2023 base case model to 2026 data (purple). Red zones in both panels indicate female SSBs falling below the limit reference point while the orange zones indicate female SSBs between the threshold and limit reference points. Green zones indicate female SSBs above the threshold reference point and fishing intensity levels below the target reference point. Yellow areas indicate female SSBs above the threshold reference point and fishing intensity levels above the target reference point. The Fs in this figure are indicators of fishing intensity based on spawning potential ratio (SPR) and calculated as %SPR. SPR is the ratio of the equilibrium SSB per recruit that would result from the estimated F-at-age relative to that of an unfished population. A higher %SPR indicates lower fishing intensity. Current fishing intensity values and SSB/SSBcurrent,F=0 ratios in (B) were calculated as the average during 2021-2023 (F%SPR, 2021-2023) and 2024 (SSB2024/SSBcurrent, F=0), respectively. The model representing an update of the 2023 base case model is similar to but not identical to the 2023 base case model due to changes in data preparation and model structure.

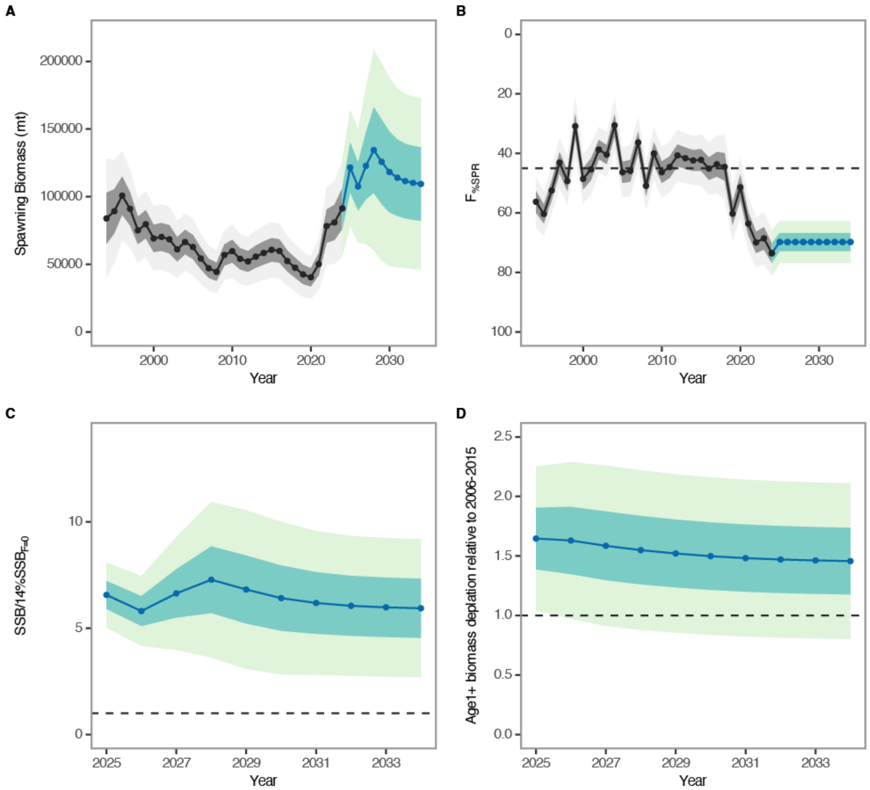


Figure 8-6. Future projection results under a constant fishing intensity (F2021-2023) harvest scenario. Solid lines indicate mean values, uncertainty ranges indicate 60% and 95% confidence intervals, and the dashed line is the reference point, respectively. (A) Annual changes in spawning biomass; (B) Interannual changes in fishing mortality (F%SPR); (C) Projected ratios to the limit reference point thresholds; and (D) Projected ratios to management targets for the total biomass.

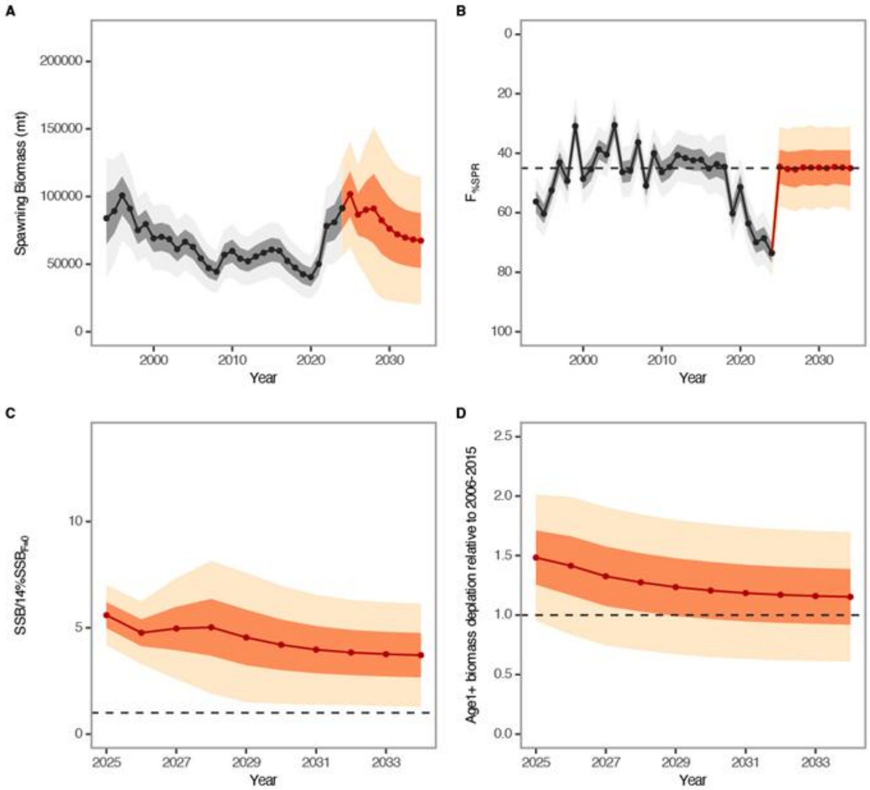


Figure 8-7. Future projection results under a randomly F (2005-2019) scenario. Solid lines indicate mean values, and uncertainty ranges indicate 60% and 95% confidence intervals, and the dashed line is the reference point, respectively. (A) Annual changes in spawning biomass; (B) Interannual changes in fishing mortality (F%SPR); (C) Projected ratios to the limit reference point thresholds; and (D) Projected ratios to management targets for the total biomass.

8.1.2 Pacific Blue Marlin Stock Status and Conservation Information

M. Sculley, BILLWG Chair noted that a stock assessment was conducted in 2026.

Stock Status

The base model indicated the Pacific blue marlin stock was likely not overfished and likely not subject to overfishing. Estimates of population biomass (age 1 and older) for the Pacific blue marlin stock declined from 183,150 mt in 1993 to 123,300 mt in 1999, with a steady further decline to average 102,490 mt in 2021–2023, and a terminal year increase to an estimated 127,300 mt in 2024 (Figure 6.6.3). Estimated fishing mortality rate (F, expressed as exploitation rate of biomass) increased through the 1970s–1990s, and fluctuated around 0.20 before declining to 0.12 in 2023 and 0.14 in 2024. Fishing mortality rates have been below F_{MSY} for the entire assessment period. The recent spawning stock biomass of 42,038 mt (average for 2021–2023) was greater than SSB_{MSY} (SSB_{MSY} = 31,651 mt) and the recent F of 0.13 (average for 2021–2023) was 50% below F_{MSY}. The base model indicated under current conditions the Pacific blue marlin stock was virtually certain to be not overfished (>99% probability) and was virtually certain to be not subject to overfishing (>99% probability) relative to MSY-based reference points.

MSY-based biological reference points and a depletion-based reference point (20% of virgin population mature female biomass; denoted $20\%SSB_0$) were computed for the base model. The point estimate of annual catch at F_{MSY} was 24,306 mt and at $20\%SSB_0$ was 24,119 mt. The point estimate of the female SSB to produce MSY (mature female biomass) was 31,651 mt. The point estimate of F_{MSY}, the fishing mortality rate to produce SSB_{MSY} was 0.26 (when F is calculated as exploitation rate of total biomass) or 0.22 (when F is calculated as average F for ages 1–10). $F_{20\%SSB0}$, the fishing mortality rate to maintain the population at $20\%SSB_0$ was 0.23 (F as exploitation rate of total biomass) or 0.20 (average F for ages 1–10). The corresponding equilibrium value of spawning potential ratio (SPR) at SSB_{MSY} was 19.6%; SPR corresponding to $20\%SSB_0$ was 23%.

Based on these findings, the following information on the status of the Pacific BUM stock is provided by the ISC26 Plenary:

1. **No target or limit reference points have been established for BUM by the IATTC and the WCPFC;**
2. **Spawning stock biomass was estimated to be 42,038 mt in 2021-2023, or about 33% above SSB_{MSY} and 9% above $20\%SSB_0$;**
3. **Fishing mortality on the stock averaged roughly F = 0.13 during 2021-2023, or about 50% below F_{MSY} and 56% below $F_{20\%SSB0}$; and**
4. **Blue marlin stock status relative to MSY-based reference points, overfishing was virtually certain to be not occurring (>99% probability) and Pacific BUM is virtually certain to be not overfished (>99% probability).**

Conservation Information

Projections started in 2025 and continued through 2034 under fishing mortality levels corresponding to four harvest scenarios: (1) $F_{High} = F_{2003}$, the highest fishing mortality rate estimated for the entire time series (1971–2024); (2) F_{MSY}; (3) $F_{Recent} = F_{(2021–2023)}$, corresponding to the average fishing intensity (SPR) over 2021–2023; and (4) $F_{30\%SPR}$, corresponding to SPR = 30%. Under the F_{Recent} scenario, projected catches remained below 2024 levels for several years, then increased to about 80% of MSY by 2034, while biomass increased to well above SSB_{MSY}. In contrast, the F_{MSY} scenario showed increased catch to above the historical maximum, followed by a decline to MSY as biomass decreased. The remaining scenarios produced intermediate trajectories with catches initially increasing and later declining as stock biomass is reduced. The most stable catch trajectory was observed under $F_{30\%SPR}$, with projected annual catches remaining approximately constant at 23,000 mt.

The lack of sex-specific size data for all but one fishing fleet, and the simplified treatment of the spatial structure of Pacific blue marlin fishing fleets and population dynamics remain as two important sources of uncertainty for improving future assessments.

Based on these findings, the following conservation information is provided for the Pacific BUM stock by the ISC26 Plenary:

1. **There is no evidence of fishing mortality exceeding FMSY or substantial depletion in spawning potential or spawning stock biomass relative to MSY level; and;**

2. **The Pacific blue marlin stock has produced annual removals of 13,690–20,400 mt since 2019, corresponding to approximately 53–84% of the MSY catch. The stock may be able to support somewhat higher removals.**

3. **The results show that projected female spawning biomass is expected to increase or remain stable under the $F_{status\ quo}$ and $F_{30\%}$ harvest scenarios and decline to SSB_{MSY} under the high F and F_{MSY} harvest scenarios. The probability that the stock is overfished or overfishing occurring by 2034 under each harvest scenario is low.**

8.2 Stocks Assessed Prior to 2026

8.2.1 Pacific Bluefin Tuna Stock Status and Conservation Information

S. Nakatsuka, PBFWG Chair, noted that the last stock assessment was conducted in 2024, and the next assessment is planned for 2027 and they recommended the stock status and conservation information for PBF presented at ISC24 with minor updates and the omission of accompanying figures and tables. The ISC26 Plenary reviewed and agreed to forward the stock status and conservation information adopted at ISC24, which was based on the 2024 stock assessment (see Section 6.2.2, pp. 26-28 in the **ISC24 Plenary Report**).

The base-case model results show that: (1) spawning stock biomass (SSB) fluctuated throughout the assessment period (fishing years 1983-2022); (2) the SSB steadily declined from 1996 to 2010; (3) the SSB has rapidly increased since 2011; (4) fishing mortality ($F_{\%SPR}$) decreased from a level producing about 1% of SPR[2] in 2004-2009 to a level producing 23.6% of SPR in 2020-2022; and (5) SSB in 2022 increased to 23.2% of $SSB_{F=0}$[3], achieving the second rebuilding target by WCPFC and IATTC in 2021. Based on the model diagnostics, the estimated biomass trend throughout the assessment period is considered robust. The SSB in 2022 was estimated to be 144,483 t (Table 1 and Figure 6), more than 10 times of its historical low in 2010. An increase in immature fish (0-3 years old) is observed in 2016-2019, likely resulting from reduced fishing mortality on this age group. This led to a substantial increase in SSB after 2019. The method to

[2] SPR (spawning potential ratio) is the ratio of the cumulative spawning biomass that an average recruit is expected to produce over its lifetime when the stock is fished at the current fishing level to the cumulative spawning biomass that could be produced by an average recruit over its lifetime if the stock was unfished. $F_{\%SPR}$: F that produces % of the spawning potential ratio (i.e., 1-%SPR).

[3] SSBF=0 is the expected spawning stock biomass under average recruitment conditions without fishing.

estimate confidence interval was changed from bootstrapping in the previous assessments to normal approximation of the Hessian matrix.

Historical recruitment estimates have fluctuated since 1983 without an apparent trend. Stock projections assume that future recruitment will fluctuate around the historical (1983-2020 FY) average recruitment level. Previously, no significant autocorrelation was found in recruitment estimates, supporting the use of randomly resampled recruitment from the historical time series. In addition, now that SSB has recovered to 23.2%$SSB_{F=0}$, the PBFWG considers the assumption that the future recruitment will fluctuate within the historical range to be reasonable. The PBFWG also confirmed that the distributions of historical recruitment from the updated long-term model (1952-2022) and the present base-case model (1983-2022) are comparable.

Stock Status

PBF spawning stock biomass (SSB) has increased substantially in the last 12 years. These biomass increases coincide with a decline in fishing mortality, particularly for fish aged 0 to 3, over the last decade. The latest (2022) SSB is estimated to be 23.2% of $SSB_{F=0}$ and the probability that it is above 20%$SSB_{F=0}$ is 75.9%. **Based on these findings, the following information on the status of the PBF stock is provided by the ISC26 Plenary**:

1. **No biomass-based limit or target reference points have been adopted for PBF, but the PBF stock is not overfished relative to 20%$SSB_{F=0}$, which has been adopted as a biomass-based reference point for some other tuna species by the IATTC and WCPFC. SSB of PBF reached its initial rebuilding target (SSB_{MED} = 6.3%$SSB_{F=0}$) in 2017, seven years earlier than originally anticipated by the RFMOs, and its second rebuilding target (20%$SSB_{F=0}$) in 2021; and**
2. **No fishing mortality-based reference points have been adopted for PBF by the IATTC and WCPFC. The recent (2020-2022) F%SPR is estimated to be 23.6% and thus the PBF stock is not subject to overfishing relative to some of F-based reference points proposed for tuna species, including F20%SPR.**

Conservation Information

After the steady decline in SSB from 1996 to the historically low level in 2010, the PBF stock has started recovering, and recovery has been more rapid in recent years, coinciding with the implementation of stringent management measures. The 2022 SSB was 10 times higher than the historical low and is above the second rebuilding target adopted by the WCPFC and IATTC, which was achieved in 2021. The stock has recovered at a faster rate than anticipated when the Harvest Strategy to foster rebuilding (WCPFC HS 2017-02) was implemented in 2014. The fishing mortality (F%SPR) in 2020-2022 is at a level producing 23.6%SPR. According to the requests from WCPFC and IATTC, future projections under various scenarios were conducted. The projection scenarios and their results, including projected yield are shown in Tables 3, 4, and 5 and Figure 14. In addition, the results of additional projections which were requested by the IATTC-WCPFC NC JWG are provided in Appendix 2 of the stock assessment report (**ISC/24/ANNEX/13**).

Based on these findings, the following information on the conservation of the PBF stock is provided by the ISC26 Plenary:

1. **The PBF stock is recovering from the historically low biomass in 2010 and has exceeded the second rebuilding target (20%$SSB_{F=0}$). The risk of SSB falling below 7.7%$SSB_{F=0}$ (interim LRP for tropical tunas in IATTC) at least once in 10 years is negligible;**
2. **The projection results show that increases in catches are possible. However, the risk of falling below the second rebuilding target will increase with larger increases in catch;**
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. Discard mortality may need to be considered as part of future increases in catch; and**
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. Research on a recruitment index for the stock assessment should be pursued, and maintenance of a reliable adult abundance index should be ensured. In addition, accurate catch information is the foundation of good stock assessment.**

8.2.2 Blue Shark

M. Kinney, SHARKWG Chair, noted that the last stock assessment was conducted in 2022, and the next assessment is planned for 2027 and they recommended the stock status and conservation information for NPO BSH presented at ISC22 be carried forward in subsequent Plenary meetings. The ISC26 Plenary reviewed and agreed to forward the stock status and conservation information adopted at ISC22, which was based on the 2022 stock assessment (see Section 6.3.1 pp. 52-54 in the ISC22 Plenary Report).

Stock status

The median of the annual spawning stock biomass (SSB) from the model ensemble had a steadily decreasing trend until 1992 and a slightly increasing trend until recent years. The median of the annual F from the model ensemble gradually increased in the late 1970s and 1980s and suddenly dropped around 1990, which slightly preceded the high-seas drift gillnet fishing ban, after which it has been slightly decreasing. The median of the annual age-0 recruitment estimates from the model ensemble appeared relatively stable with a slightly decreasing trend over the assessment period except for 1988, which shows a large pulse. The historical trajectories of stock status from the model ensemble revealed that North Pacific BSH had experienced some level of depletion and overfishing in previous years, showing that the trajectories moved through the overfishing zone, overfished and overfishing zone, and overfished zone in the Kobe plots relative to MSY-based reference points. However, in the last two decades, median estimates of the stock condition returned to the bottom-right quadrant of the Kobe plot.

Based on these findings, the following information on the status of the NPO BSH stock is provided by the ISC26 Plenary:

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 (SSB_{2020}) was estimated to be 1.170 of SSB_{MSY} (80th percentile, 0.570 - 1.776) and is likely not (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

Stock projections of biomass and catch of NPO BSH from 2020 to 2030 were performed assuming four different harvest policies: $F_{current}$ (2017-2019), F_{MSY}, $F_{current}$+20%, and $F_{current}$-20% and evaluated relative to MSY-based reference points.

Based on these findings, the following conservation information for NPO BSH is provided by the ISC26 Plenary:

1. **Future projections in three of the four harvest scenarios ($F_{CURRENT}$ (2017-2019), $F_{CURRENT}$+20%, and Fcurrent-20%) showed that median BSH SSB in the NPO will likely increase (>50% probability); the F_{MSY} harvest scenario led to a decrease in median SSB.**

2. **Median estimated SSB of BSH in the NPO will likely (>50 probability) remain above SSB_{MSY} in the next 10 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 versus 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 Note

1. 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.

8.2.3 Shortfin Mako Shark

M. Kinney, SHARKWG Chair noted that the last stock assessment was conducted in 2024, and the next assessment is planned for 2029 and they recommended the stock status and conservation information for NPO SMA presented at ISC24 be carried forward. The ISC26 Plenary reviewed and agreed to forward the stock status and conservation information adopted at ISC24, which was based on the 2024 stock assessment (ISC24 Plenary Report see Section 6.4.3 pp. 46-48).

Stock Status

The current assessment provides the best scientific information available on North Pacific shortfin mako shark (SMA) stock status. Results from this assessment should be considered with respect to the management objectives of the WCPFC and the IATTC, the organizations responsible for management of pelagic sharks caught in international fisheries for tuna and tuna-like species in the Pacific Ocean. Target and limit reference points have not been established for pelagic sharks in the Pacific Ocean. In this assessment, stock status is reported in relation to maximum sustainable yield (MSY).

A BSPM ensemble was used for this assessment; therefore, the reproductive capacity of this population was characterized using total depletion (D) rather than spawning abundance as in the previous assessment. Total depletion is the total number of SMA divided by the unfished total number (i.e., carrying capacity). Recent D ($D_{2019-2022}$) was defined as the average depletion over the period 2019-2022. Exploitation rate (U) was used to describe the impact of fishing on this stock. The exploitation rate is the proportion of the SMA population that is removed by fishing. Recent U ($U_{2018-2021}$) is defined as the average U over the period 2018-2021.

During the 1994-2022 period, the median D of the model ensemble in the initial year D_{1994} was estimated to be 0.19 (95% CI: credible intervals = 0.08-0.44), and steadily improved over time and $D_{2019-2022}$ was 0.60 (95% CI = 0.23-1.00). Although there are large uncertainties in the estimated population scale, the best available data for the stock assessment are four standardized abundance indices from the longline fisheries of Japan, Taiwan, and the US; and all four indices indicate a substantial (>100%) increase in the population during the assessment period. The population was likely heavily impacted prior to the start of the modeled period (1994), after which it has been steadily recovering. It is hypothesized that the fishing impact prior to the modeled period was likely due to the high-seas drift gillnet fisheries operating from the late 1970s until it was banned in 1993, though specific impacts from this fishery on SMA are uncertain as species specific catch data are not available for sharks. Consistent with the estimated trends in depletion, the exploitation rates were estimated to be gradually decreasing from 0.023 (95% CI = 0.004-0.09) in 1994 to the recent estimated exploitation rate ($U_{2018-2021}$) of 0.018 (95% CI = 0.004-0.07). The decreasing trends in estimated exploitation rates were likely due to the increase in estimated population size being greater than increases in the observed catch.

The median of recent D ($D_{2019-2022}$) relative to the estimated D at MSY (D_{MSY} = 0.51, 95% CI = 0.40-0.70) was estimated to be 1.17 (95% CI = 0.46-1.92). The recent median exploitation rate ($U_{2018-2021}$) relative to the estimated exploitation rate at MSY (U_{MSY} = 0.05, 95% CI =0.03-0.09) was estimated to be 0.34 (95% CI = 0.07-1.20). Surplus production models are a simplification of age-structured population dynamics and can produce biased results if this simplification masks important components of the age-structured dynamics (e.g., index selectivities are dome shaped or there is a long time-lag to maturity). Simulations suggest that under circumstances representative of the observed SMA fishery and population characteristics (e.g., dome-shaped index selectivity, long lag to maturity, and increasing indices), the BSPM ensemble may produce biased results. Representative simulations suggested that the $D_{2019-2022}$ estimate has a positive bias of approximately 7.3 % (median). The trajectories of stock status from the model ensemble revealed that North Pacific SMA had experienced a high level of depletion prior to the start of the model and was likely overfished in the 1990s and 2000s, relative to MSY reference points.

Based on these findings, the following information on the status of the NPO SMA is provided by the ISC26 Plenary:

1. **No biomass-based or fishing mortality-based limit or target reference points have been established for NPO SMA by the IATTC or WCPFC;**

2. **Recent median depletion ($D_{2019-2022}$) is estimated from the model ensemble to be 0.60 (95% CI = 0.23-1.00). The recent median $D_{2019-2022}$ was 1.17 times D_{MSY} (95% CI = 0.46-1.92) and the stock is likely (66% probability) not in an overfished condition relative to MSY-based reference points;**

3. **Recent harvest rate ($U_{2018-2021}$) is estimated from the model ensemble to be 0.018 (95% CI = 0.004-0.07). $U_{2018-2021}$ was 0.34 times (95% CI = 0.07-1.20) U_{MSY} and overfishing of the stock is likely (95% probability) not occurring relative to MSY-based reference points;**

4. **The model ensemble results showed that there is a 65% joint probability that the North Pacific SMA stock is not in an overfished condition and that overfishing is not occurring relative to MSY based reference points; and**

5. **Several uncertainties may limit the interpretation of the assessment results including uncertainty in catch (historical and modeled period) and the biology and reproductive dynamics of the stock, and the lack of CPUE indices that fully index the stock.**

Conservation Information

Stock projections of depletion and catch of North Pacific SMA from 2023 to 2032 were performed assuming four different harvest policies: $U_{2018-2021}$, U_{MSY}, $U_{2018-2021} + 20\%$, and $U_{2018-2021} - 20\%$ and evaluated relative to MSY-based reference points. Based on these findings, the following conservation information is provided:

1. **Future projections in three of the four harvest scenarios ($U_{2018-2021}$, $U_{2018-2021} + 20\%$, and $U_{2018-2021} - 20\%$) showed that median depletion in the North Pacific Ocean will likely (>50% probability) increase; only the U_{MSY} harvest scenario led to a decrease in median depletion.**

2. **Median estimated depletion of SMA in the North Pacific Ocean will likely (>50% probability) remain above D_{MSY} in the next 10 years for all scenarios except U_{MSY}; harvesting at U_{MSY} decreases D towards D_{MSY}.**

3. **Model projections using a surplus production model may oversimplify the age structured population dynamics and as a result could be overly optimistic.**

8.2.4 North Pacific Swordfish

M. Sculley, BILLWG Chair noted that the last stock assessment was conducted in 2023, and the next assessment is planned for 2028 or 2029 and they recommended the stock status and conservation information for NPO SWO presented at ISC23. The ISC26 Plenary reviewed and agreed to forward the stock status and conservation information adopted at ISC23, which was based on the 2023 stock assessment (see Section 6.5.2, pp. 35-42 in the ISC23 Plenary Report).

Stock Status

Estimates of population biomass fluctuated around an average of 80,800 t during 1975-2021 and was estimated to be 88,800 t in 2021. Initial estimates of female spawning stock biomass (SSB) averaged around 27,600 t in the late 1970s. SSB was at its highest level of 35,778 t in 2021 and was at its minimum of 22,415 t in 1981. Overall, spawning stock biomass has been relatively stable for the entirety of the assessment period. Estimated F (arithmetic average of F for ages 1 – 10) decreased from 0.17 year^{-1} in 1978 to a minimum of 0.09 year^{-1} in 2021. It averaged roughly F=0.09 yr^{-1} during 2019-2021 or about 51% of F_{MSY} with a relative fishing mortality of F/F_{MSY} = 0.49 in 2021. Fishing mortality has been below F_{MSY} since the beginning of the assessment time period and has had a declining trend with the exception of a high peak in 1998 coinciding with high catch by the U.S. longline fleet. Recruitment (age-0 fish) estimates averaged approximately 838,000 individuals during 1975-2021. While the overall pattern of recruitment varied, there was no apparent trend in recruitment strength over time. Overall, total annual catch is declining, CPUE is increasing, and recruitment is relatively stable.

WCPFC16 established a limit reference point for the exploitation rate of NPO SWO of F_{MSY}. $SSB_{F=0}$ was set to equal the average of the last 5 years dynamic B_0 assuming no fishing during those years. NPO SWO reference points will be provided with reference to MSY and with reference to 20%$SSB_{F=0}$.

Based on these findings, the following information on the status of the NPO SWO stock is provided by the ISC26 Plenary:

1. **When the status of NPO SWO is evaluated relative to MSY-based reference points, the 2021 SSB of 35,778 mt is 220% of SSB_{MSY} (16,000 mt) and the 2019-2021 average F is about 49% below F_{MSY}; and**

2. **Relative to MSY-based reference points, overfishing is very likely not occurring (>99% probability) and the NPO SWO stock is very likely not overfished (>99% probability).**

Conservation Information

Projections started in 2022 and continued through 2031 under five levels of fishing mortality. The 5 fishing mortality stock projection scenarios were: (1) F at 20%$SSB_{(F=0)}$ which was calculated from the mean dynamic SSB in the 5 years, (2) $F_{(2008-2010)}$ which are the reference years for the proposed CMM for NPO SWO, (3) F_{Low} at $F_{30\%SPR}$, (4) F_{MSY}, and (5) F status quo (average F during 2019-2021). Results show the projected female spawning stock biomass and the catch biomass under each of the scenarios.

Based on these future projections, the following conservation information for NPO SWO is provided by the ISC26 Plenary:

1. **The NPO SWO stock has produced annual yields of around 11,500 mt per year since 2016, or about 2/3 of the MSY catch amount;**

2. **NPO SWO stock status is positive with no evidence of F above F_{MSY} or substantial depletion of spawning potential; and**

3. **It was also noted that retrospective analyses show that the assessment model appears to underestimate spawning potential in recent years.**

8.2.5 WCNPO Striped Marlin

M. Sculley, BILLWG Chair noted that the last stock assessment was conducted in 2023 and the next assessment is planned for 2027 and they recommended the stock status and conservation information for WCNPO MLS presented at ISC23 which was based on the 2023 stock assessment (see Section 6.7.2, pp. 46-49 in the ISC23 Plenary Report). In addition, the WG updated projection runs for the WCNPO MLS rebuilding analysis to reflect the catch distribution by country from the CMM 2024-06. The conservation information reflected the updated information.

Stock Status

Estimates of population biomass from the base case fluctuated around an average of 11,300 t during 1977 2020 and was estimated to be 7,300 t in 2020. Initial estimates of female SSB averaged around 4,700 t during the 1977-1979 period. SSB was at its highest level of 5,096 m t in 1977, and declined to lowest level, 1,080 t, in 2011. The time series of SSB during 2011-2020 averaged about 1,200 metric tons (Table 4), or about 33% of the dynamic 20 year 20%$SSB_{F=0}$ and about 42% of SSB_{MSY} (Table 5). Overall, SSB exhibited a strong decline during 1992-1998 and has stabilized to an average of about 1,400 t through the 2000s. Estimated fishing mortality (arithmetic average of F for ages 3-12) increased from 0.53 yr^{-1} in 1977 to a peak of 1.42 yr^{-1} in 1998, and subsequently declined to 0.58 yr^{-1} in 2020. It averaged roughly F=0.68 yr^{-1} during 2018-2020 or about 28% above $F_{20\%SSBF=0}$ and 8% above F_{MSY}, with a relative fishing mortality of $F/F_{20\%SSBF=0}$ = 1.09 in 2020. Fishing mortality has been above $F_{20\%SSBF=0}$ and F_{MSY} since the beginning of the assessment time period but has had a declining trend since 1998. Recruitment (numbers of age 0 fish) estimates averaged approximately 366,000 during the 1977-2020 period. While the overall pattern of recruitment from 1977 to 2020 varied, there was an apparent declining trend in recruitment strength over time with higher recruitments observed during the 1977-1992 period and lower recruitments from 2000 to the present.

Recruitment from 2001 to 2020 averaged about 225,000 age 0 fish, which was 60% of the 1977 2020 average. The WCPFC has requested that the BILLWG to provide estimates of stock status for WCNPO MLS relative to biological reference points based on 20% of a dynamic SSB_0 estimate ($SSB_{(F=0)}$), where SSB_0 is the moving average of the last 20 years SSB_0 estimates. Despite the relatively large L_{50}/L_{inf} ratio for WCNPO MLS, the stock is expected to be highly productive due to its rapid growth and high resilience to reductions in spawning potential. Recent recruitments have been lower than expected and have been below the long term average since 2000. Although fishing mortality has decreased since 2000, two decades of low recruitment combined with consistent landings of immature fish have inhibited increases in spawning biomass since 2001.

Based on these findings, the following information on the status of the WCNPO MLS stock is provided by the ISC26 Plenary:

1. **When the status of WCNPO MLS is evaluated relative to dynamic $20\%_{SSBF=0}$ based reference points, the 2020 spawning stock biomass of 1,696 t is 54% below 20%$SSB_{F=0}$ (3,660 t) and the 2018-2020 fishing mortality is about 28% above $F_{20\%SSB(F=0)}$; and**

2. **Therefore, relative to 20%$SSB_{F=0}$ based reference points, the WCNPO MLS stock is very likely to be overfished (>99% probability) and is likely to be subject to overfishing (>66% probability).**

Conservation Information

Stock projections for WCNPO MLS were conducted using two deterministic scenarios for future recruitment: the expected stock recruitment relationship and the average recruitment in the last 20 years (2001-2020). Projections started in 2021 and continued through 2040. Five levels of fishing mortality with the two recruitment scenarios and the ten catch levels with only the 20-year average recruitment scenario were applied for projections. The five fishing mortality scenarios were: F status quo (average F during 2018 2020), F_{MSY}, F at $20\%_{SSBF=0}$, F_{High} at the highest 3-year average during 1977-2017 (1998-2000), and F_{Low} at $F_{30\%}$. The ten catch level scenarios were: No catch (F=0), 500 t catch, 1,000 t catch, 1,500 t catch, 2,000 t catch, 2,300 t catch, 2,400 t catch, 2,500 t catch, 3,000 t catch, and 3,500 t catch.

Twenty results show the projected female spawning stock and catch biomasses under each scenario. When recruitment is assumed to be consistent with the stock recruitment relationship, then only two fixed F scenarios result in the WCNPO MLS stock rebuilding beyond SSB_{MSY} and $20\%SSB_{F=0}$: F_{Low} and $F_{20\%SSB(F=0)}$. In contrast, when recruitment is assumed to be the average over the last 20 years (2001-2020), none of the fixed F scenarios result in the stock rebuilding to or beyond $F_{20\%SSBF=0}$ and only one scenario, F_{Low}, resulted in the stock rebuilding above the SSB_{MSY} level (Figure 20b). Constant catch scenario results are different than the constant F projection results. At catch levels less than 2,400 t, the projections show that the WCNPO MLS stock rebuilds beyond the SSB_{MSY} and $20\%SSB_{F=0}$ levels by 2040.

The assumed recruitment levels for projections vary substantially for the two scenarios, with the average recruitment from the stock recruitment curve around 350,000 individuals per year and the recruitment from the low recruitment scenario around 225,000 individuals per year. In the past, the WG has recommended that management measures consider the low recruitment scenarios as the projections using the stock recruitment curve do not consider the long-term declining trend in recruitment (ISC21). If spawning biomass rebuilds to the target, which is about equal to the average spawning biomass observed during the 1977-1989 period, then recruitment may be expected to return to the high levels observed during the 1977-1989 period or about 2-fold higher than current recruitment. The WG intends to provide additional stochastic ensemble projection results considering model uncertainty, as requested by WCPFC16. One of the important axes of uncertainty will be the assumptions on future recruitment.

Based on these findings, the following information on the conservation of the WCNPO MLS stock is provided by the ISC26 Plenary:

1. **It is recommended that catch should be kept at or below the recent level (2018-2020 average catch = 2,428 t); and**

2. **The results of deterministic projections show that when catches are 2,400 t, or less, the stock is expected to recover above SSB_{MSY} and near the 20% $SSB_{F=0}$ reference level by 2040, or sooner at the lower catch levels under a low recruitment regime (3,660 t). Recent catches have been lower than 2,400 t and new projections suggest the possibility for a more rapid recovery. However, the 2,400 t limit and additional reductions are still recommended to meet the WCPFC rebuilding plan target, based on the updated rebuilding analysis provided in this report.**

Special Comments

While the WG agreed upon a base case model for WCNPO MLS, there is concern about the reliability of the base case results for providing conservation advice due to uncertainty in growth, Japanese driftnet catches and initial conditions of the model. The ISC22 Plenary requested that the WG continue working on the 2022 WCNPO MLS base case model, with a focus on the growth parameters, particularly incorporating the Richard's four parameter growth curve directly into the SS3 model, for presentation to ISC23. The WG concluded that a revised von Bertalanffy growth curve rather than the Richard's curve was the best information available at this time for use in the 2023 base case model, while highlighting the suite of sensitivity runs to show the sensitivity of the model to changes in the growth curve; see the list and description of the sensitivity runs in Table 12 in **ISC/23/ANNEX/14**). The sensitivity runs show that the growth curve assumption may affect the interpretation of stock status. The WG also noted a concern that the estimation of initial F and thus the virgin biomass scale is largely affected by the selection of the growth curve, as the initial catch remains uncertain.

The WG recognized that substantial uncertainties have been discussed and documented in this stock assessment report (**ISC/23/ANNEX/14**). The high seas drift net catch data are highly uncertain owing to availability of limited records, life history parameters, such as growth, have been estimated from limited data, and stock is subject to mixing with other management areas, as revealed by genetic analyses. The WG evaluated the fit of several growth assumptions to the data and other diagnostics. The WG found that the stock assessment results showed large differences in estimated biomass among various growth curves. Future improvements of the growth curve are expected due to incoming data from the ongoing International Billfish Biological Sampling program, which will be followed by continued biological research and model development to address other sources of uncertainty.

9 Report on the review of the 2024 Pacific bluefin tuna assessment

R. Ahrens, ISC Chair, presented the independent peer review of the 2024 Pacific bluefin tuna stock assessment that was conducted from 20–23 March 2026 at Hokkaido University in Sapporo, Japan.

The review panel found that the assessment represented a substantial methodological improvement over previous assessments, particularly through the use of a shortened 1983–2022 base-case time series, improved treatment of CPUE indices, improved retrospective performance, and clear documentation of model development and unresolved uncertainties. The panel concluded that the assessment was generally well constructed, used appropriate diagnostic tools, and provided a defensible characterization of recent stock trends.

The panel did not identify major concerns that would preclude use of the assessment for management advice. However, it identified two primary areas requiring attention before the next benchmark assessment. First, the treatment of growth and variability in length-at-age should be improved because recent recruitment estimates increasingly depend on translating juvenile length-composition data into age structure. The loss or truncation of recent abundance indices has increased the role of size-composition data, making assumptions about growth, cohort structure, and length-at-age variability especially consequential for estimates of recruitment, spawning biomass, and projection uncertainty. The panel recommended further evaluation of spatial and temporal variation in growth, inclusion of additional age-length data when available, sensitivity analyses to alternative growth assumptions, and consideration of model structures that better represent within-year spawning and cohort mixing.

Second, the panel emphasized the need to develop and maintain reliable recruitment and adult abundance indices. The Japanese troll recruitment index was truncated after 2010 because of management-related changes in catchability, leaving recent recruitment largely informed by juvenile length compositions and model assumptions. The Japanese longline adult index was also discontinued after 2019 because individual quotas altered fishing behavior, leaving the Taiwanese longline index as the only operative adult abundance index in the terminal period of the assessment. The panel considered development of a robust juvenile abundance index to be among the highest priorities for the 2027 assessment cycle and also recommended urgent evaluation of whether quota constraints could affect the continuity of the Taiwanese longline CPUE index as the stock continues to rebuild.

The panel supported continued development of several research programs that could improve future assessments, including real-time troll monitoring, larval survey indices, spatiotemporal CPUE standardization, close-kin mark-recapture, expanded biological sampling, and improved collection and use of age, maturity, weight, and discard information. The panel also recommended additional work on fleet structure, selectivity, data weighting, uncertainty estimation, diagnostic reporting, and communication of assessment results to management audiences. In particular, future reports should distinguish clearly between conclusions that are robust, conclusions that are conditional on base-case assumptions, and areas where caution is warranted because recent trends depend on limited or changing data sources.

Overall, the review panel commended the PBF Working Group for the quality of the assessment, the transparency of the documentation, and the responsiveness of the assessment team during the review. The assessment was considered suitable for providing management advice, while the recommendations were intended to strengthen future assessments by improving biological inputs, replacing or supplementing lost abundance information, and better characterizing uncertainty during a period of rapid stock rebuilding and changing fishery management conditions.

Discussion

The Plenary welcomed the successful completion of the independent external peer review of the Pacific bluefin (PBF) stock assessment and recognized it as a significant milestone for both the PBFWG and the ISC. The review demonstrated ISC's commitment to transparency, scientific rigor, and continuous improvement, while directly responding to requests for independent scientific review from managers, the WCPFC Scientific Committee and external stakeholders. The Vice Chair of the ISC thanked the United States for providing financial support, Japan for hosting the review, the peer review chair for facilitating the process, and the PBFWG for its extensive preparation and collaboration. Members emphasized that the successful completion of the peer review demonstrated ISC's leadership in advancing best scientific practices and highlighted the value of independent peer review in strengthening future stock assessments.

The PBF stock represents a successful example of science-based fisheries management, and Members supported the continued development of alternative abundance indices to ensure assessment robustness as the stock continues to rebuild.

10 Pacific bluefin tuna Working Group response to the review

H. Fukuda presented some of the current efforts of the PBFWG addressing recommendation from the independent review including the development of a new juvenile abundance index and collaborative research on growth.

Discussion

As the peer review report was only recently finalized, a formal written response was still under development. However, the PBFWG had already begun evaluating the recommendations, noting that the two principal themes identified by the review—improved growth characterization and development of new recruitment indices—were already established research priorities. To facilitate systematic follow-up prior to the next data preparation meeting, the PBFWG compiled all recommendations into a tracking spreadsheet organized by topic, responsible scientists, timelines, and implementation status.

The Plenary discussed several ongoing research initiatives aimed at addressing peer review recommendations. Japan presented progress on a real-time recruitment monitoring program using charter vessels to develop standardized recruitment indices through spatio-temporal CPUE analyses. The PBFWG noted that the reliability of this new recruitment index will continue to be evaluated now that the current time series is becoming sufficiently long to be validated . Members also received an update on international collaboration to improve ageing methods, including a recent workshop involving scientists from Japan, Chinese-Taipei, the United States, and other institutions to standardize otolith preparation, age reading procedures, and growth estimation. Future work will continue comparing ageing results among laboratories and evaluating potential growth differences between the western and eastern Pacific to support upcoming benchmark assessments.

Chinese Taipei reported that recently implemented domestic management measures are not expected to have a significant effect on the longline CPUE series, as preliminary analyses indicate that fishing behavior has remained largely unchanged. Chinese Taipei emphasized the importance of maintaining the continuity and quality of the CPUE index and noted that the increased Pacific bluefin tuna quota allocated by the WCPFC has allowed the fishery to continue operating throughout the normal fishing season. As a result, in response to a recommendation from the 2024 PBF assessment peer review, a research quota is not considered necessary at this time to maintain continuity of the CPUE series used in future stock assessments. Korea advised that new information on spawning grounds and recruitment, including egg and larval density observations in the Korean EEZ, will be made available to support future Pacific bluefin tuna assessments.

Members discussed which peer review recommendations could reasonably be addressed before the next health check assessment in 2027. Given ongoing commitments to Management Strategy Evaluation and management procedure development, many of the more substantial recommendations will likely be addressed by the 2030 benchmark assessment rather than the next health check update. The PBFWG expects the next health check to largely retain the current model structure while incorporating updated data and evaluating the new recruitment index if sufficient evidence supports its inclusion. Members encouraged the PBFWG to conduct sensitivity analyses evaluating the influence of the new recruitment index on terminal-year recruitment estimates and recommended that future health check reports clearly identify which peer review recommendations had been implemented. The PBFWG was also encouraged to develop a comprehensive response matrix documenting recommendations that had been completed, partially completed, or deferred for the next benchmark assessment.

ISC26 supported continued implementation of the peer review recommendations. ISC26 recommended the following future work in advance of the next Pacific bluefin tuna benchmark stock assessment:

- **Continued development and evaluation of new recruitment indices before consideration for inclusion in future assessments.**
- **Ongoing international collaboration to improve ageing methods, growth estimation, and biological parameterization.**
- **Continued development of alternative abundance indices to maintain the robustness of assessment inputs, as stock rebuilding and management measures increasingly influence traditional CPUE series.**

ISC26 recommended inclusion of sensitivity analyses during the next Pacific bluefin health check assessment to evaluate the effects of new recruitment information on terminal-year uncertainty.

ISC26 recommended preparation of a comprehensive recommendation tracking table for the next Pacific bluefin benchmark assessment documenting recommendations that have been addressed, partially addressed, or deferred.

The plenary also discussed priorities and timing for future independent peer reviews of ISC stock assessments. Members agreed that the recently completed PBF peer review provides valuable guidance that extends beyond the bluefin assessment, particularly with respect to overarching issues such as growth assumptions, dependence on abundance indices affected by changing fisheries, and the characterization and communication of uncertainty. While recognizing that the specific recommendations are not directly transferable to other stocks, members agreed that many of the broader principles should be considered during the continued development of the next benchmark stock assessment for North Pacific albacore. Regarding potential peer review of the North Pacific albacore assessment, members agreed that an independent review would be most beneficial following the incorporation of major methodological improvements, including ongoing work on growth, spatial dynamics, and other planned developments.

The Plenary also considered future peer review priorities for billfish and shark assessments. Members noted that substantial methodological work is currently underway, including through WCPFC Project 130, the Joint Bycatch Assessment Workshop for Billfish and Sharks, which is expected to advance stock assessment approaches for these species. Given these ongoing developments, the Plenary agreed that peer reviews of billfish and shark assessments are not warranted at this time but should be reconsidered following the completion of planned methodological improvements.

More broadly, members agreed that peer reviews should be undertaken strategically, with priority given to assessments that have undergone significant methodological changes or where independent scientific input would help resolve important methodological or analytical challenges. Members also noted that future integration of emerging approaches, such as close-kin mark-recapture (CKMR), may warrant independent review once these methods are incorporated into stock assessments.

Members noted that the North Pacific albacore assessment model has matured substantially since the independent review conducted in 2011, while more recent scientific advances have increasingly focused on the development, evaluation, and integration of fishery-dependent and biological data into the assessment. Members also noted that the ALBWG research plan identifies continued development and evaluation of CPUE indices and other supporting data as key priorities for future assessments. In light of these developments, members discussed whether a future independent review focused on the broader assessment framework, including the development, evaluation, and integration of abundance indices and other supporting data, could provide useful scientific guidance prior to the next benchmark assessment.

ISC26 recommended that the ALBWG evaluate the potential value, scope, and timing of an independent review of the broader albacore assessment framework and report its findings and recommendations to ISC27.

ISC26 recommended that future stock assessment peer reviews be undertaken strategically, with priority given to assessments that have undergone significant methodological advances, are addressing complex data or analytical challenges, or are incorporating new assessment approaches, such as close-kin mark-recapture (CKMR), where independent scientific review would provide the greatest benefit.

11 Report on the progress for the North Pacific swordfish MSE

M. Sculley BILLWG Chair presented the proposed work plan requested by NC21. Blue Matter Science was contracted to conduct the MSE under the guidance of the WG. The work plan presented two options.

Discussion

The Plenary discussed progress on the development of the North Pacific swordfish MSE, including project oversight, responsibilities of the Billfish Working Group (BILLWG), technical priorities, and implementation timelines. Members confirmed that the contractor, through external funds under NOAA oversight, will undertake the technical analyses under the guidance of the BILLWG, with all outputs reviewed and endorsed by the BILLWG prior to being presented as ISC products until March 2028. The Plenary emphasized the importance of regular progress updates and close collaboration between the contractor and BILLWG to ensure the operating model reflects the best available scientific information.

Members expressed concern regarding the ambitious workload facing the BILLWG, given the concurrent development of the swordfish MSE, a planned striped marlin assessment in 2027, swordfish stock assessment in 2028, and ongoing biological research. While the contractor is expected to undertake most technical analyses, members recognized that meaningful scientific oversight and review by the BILLWG will still require a substantial commitment of time and expertise. The Plenary discussed whether postponing the planned 2028 swordfish stock assessment to 2029 could better align stock assessment schedule with completion of the MSE and allow incorporation of new biological information. Members noted both the potential benefits of delaying the assessment and the importance of ensuring that the operating model remains consistent with the most current scientific understanding of the stock.

ISC26 recommended that the Northern Committee consider both options 1 and 2 outlined in the North Pacific swordfish MSE workplan and identify a preferred option, and provide the management guidance necessary to support continued MSE development, including decisions on the spatial extent of the MSE and the fisheries to be included. The ISC26 notes that the BILLWG recommended option 1 and the ISC26 Plenary supports this recommendation.

ISC26 recommended that the Northern Committee revise the schedule for the next North Pacific swordfish benchmark stock assessment from 2028 to 2029, recognizing that the additional year would allow incorporation of updated biological parameters from the IBBS project, while also facilitating completion of the swordfish MSE and improving the distribution of BILLWG workload. ISC26 further noted that successful completion of the North Pacific swordfish MSE through to the end of 2028 and beyond may require additional resources.

12 Discussion and adoption of TORs for the ISC review

R. Ahrens, ISC Chair, solicited feedback on the terms of reference (**Annex 11**) for the proposed review of ISC function.

<u>Discussion</u>

The Plenary discussed the draft Terms of Reference (TOR) for the next external review of ISC operations and considered options for conducting and funding the review. Members discussed the potential use of the NOAA Center for Independent Experts (CIE) process, noting its advantages in providing an independent, externally funded review, while recognizing that it would require modifications to the review process, including reviewer selection, refinement of the TOR, and preparation of supporting documentation. Members also discussed maintaining an ISC-led review process similar to previous reviews. Overall, members preferred maintaining an ISC-led review process similar to previous reviews, with member countries identifying and supporting independent reviewers. The Plenary also discussed reviewer qualifications, emphasizing that reviewers should be independent of ISC, have expertise in tuna fisheries, stock assessment processes, and preferably have experience with international scientific organizations and/or RFMOs.

The Plenary agreed that the draft TOR should continue to be refined intersessionally, including clarification of reviewer qualifications, review logistics, reporting arrangements, and the scope of the review. Members also agreed that additional information on reviewer funding, participation in Working Group meetings, and reporting requirements should be developed before the review process is finalized.

ISC26 agreed that members should assess opportunities to provide in-kind support for independent reviewers for the ISC functional review and provide nominations for potential reviewers to the ISC Chair by January 31, 2027.

ISC26 further agreed that members should continue intersessional refinement of the TORs, including reviewer qualifications, review logistics, reporting arrangements, and the scope of the review, with a view to finalizing the TORs prior to selection of the review panel.

13 Discussion of WCPFC template for reporting of stock status and management advice

R. Ahrens, ISC Chair, solicited feedback from members and WG on progress integrating the WCPFC guidelines for presenting stock status and management assessment advice (WCPFC-SC21-2025/SA-IP-22).

<u>**Discussion**</u>

The Plenary discussed implementation of the WCPFC stock status and conservation advice template for ISC stock assessments. Members agreed that ISC Working Groups should provide the information required by the WCPFC template to support reporting to the WCFPC, either as an appendix to the stock assessment report or incorporated into the executive summary, at the discretion of each Working Group.

ISC26 agreed that working groups will provide stock status and conservation information following the guidelines in the WCPFC template either as the executive summary or as an appendix to the stock assessment report for future assessments.

14 Discussion of data sharing protocols

R. Ahrens, ISC Chair, opened a discussion related to two aspects of data sharing: protocols for sharing biological samples and protocols for jointly working on sensitive fisheries data for assessments.

Discussion

The Plenary discussed ISC data sharing protocols in the context of both biological samples and stock assessment inputs. Members noted the successful development of a Memorandum of Understanding (MOU) under the International Billfish Biological Sampling (IBBS) project to guide the sharing of biological samples, establish project review procedures, define data ownership and authorship, and prioritize collaborative research among participating laboratories. The Plenary also discussed the potential implications of the BBNJ Agreement for metadata management and agreed that members should further consider future data-sharing requirements.

Members also discussed opportunities and challenges associated with sharing operational fishery data to support joint analyses of relative abundance indices. While data-sharing agreements currently present limitations, the Plenary noted that mechanisms exist to facilitate collaborative analyses under appropriate conditions. Members emphasized that joint CPUE analyses should be considered on a case-by-case basis, taking into account differences in fisheries and assessment objectives.

ISC26 tasked the ISC Chair and Working Groups with reviewing the metadata requirements associated with the BBNJ Agreement and comparing them to current ISC metadata practices. ISC26 further encouraged members to consider the feasibility and potential benefits of making appropriate metadata available through the BBNJ framework and report back at ISC27.

15 ISC - WCPFC MOU

The ISC Chair opened discussion to seek clarification regarding the presentation of ISC scientific information and advice to the Northern Committee and the Scientific Committee, as well as the Commission (**ISC/26/ANNEX/12**). The chair was seeking input on the perception that there is no opportunity for the SC to provide input on ISC assessments.

Discussion

The Plenary discussed a proposal from the United States to revise the current Memorandum of Understanding (MOU) between ISC and WCPFC to more explicitly recognize a pathway for the WCPFC Scientific Committee to request scientific information and advice directly from ISC, particularly as it relates to non-northern stocks. Members acknowledged the historical context of the MOU and agreed that any revisions could have broader implications for the relationship among ISC, the Scientific Committee, the Northern Committee, and the Commission. The

Plenary concluded that additional domestic review and intersessional discussion may be needed before any amendments are considered.

ISC26 requested that members consider proposed revisions to the current ISC–WCPFC MOU, particularly as it relates to the role of the WCFPC Scientific Committee and the Commission for non-northern stocks, and come prepared to discuss further at ISC27.

16 Discussion on incorporation of changing oceans in assessments.

R. Ahrens, ISC Chair, opened discussion to seek feedback on any new developments related to the integration climate change into assessment models.

Discussion

The Plenary discussed approaches for incorporating climate and environmental considerations into ISC stock assessments. Members noted that while climate change is an increasingly important consideration for fisheries science and management, incorporating environmental drivers into stock assessments presents significant scientific and methodological challenges. Discussion highlighted several potential approaches, including the use of climate robustness tests, incorporation of environmental covariates into CPUE standardization, and the evaluation of environmental influences on stock productivity and distribution. Members also noted recent work by the ALBWG to identify priority research areas and environmental indicators that could support the gradual incorporation of climate considerations into future assessments.

ISC26 encouraged Working Groups to continue investigating approaches for incorporating climate and environmental information into stock assessments, including through CPUE standardization, climate robustness testing, and research to better understand environmental influences on stock productivity and distribution.

17 Review of Statistics and Database Issues

17.1 STATWG Report

J. Suter, STATWG Chair, presented a summary of the 2026 ISC Statistics Working Group workshop, held before ISC26 in Taipei. The STATWG reviewed progress on its 2025–2026 work plan, including completion of the ISC data inventory process, metadata updates, archiving of Pacific bluefin tuna and albacore MSE input files, website software updates, and revisions to website and email systems.

The report highlights national fishery and data updates, including increased Pacific bluefin tuna bycatch in Canada’s albacore troll fishery, increasing coastal catches in Chinese Taipei and Korea, increased Pacific bluefin tuna catch and quota in Japan, Mexico’s work reconstructing historical shark catches, and the U.S. request to add a vertical gear code for deep-set buoy gear. It also notes potential implications of “lasso fishing” or swordfish ring gear for swordfish catchability.

Data submission was generally strong, with most nations submitting data by the June 1, 2026 deadline. However, Mexico submitted only Category I catch data without effort, and China did not submit data directly to the ISC. The group also discussed differences between national statistics submitted to the ISC and the datasets used in stock assessments, especially where species-specific spatial needs do not align cleanly with ISC reporting boundaries.

Key recommendations and next steps include considering a historical summary of ISC database holdings, improving consistency in national reports and presentations, continuing website redesign and MSE page development, updating metadata and data inventories in 2026–2027, and holding a STATWG intersessional virtual check-in in March 2027.

Discussion

ISC26 thanked the STATSWG for their work compiling the statistics and adopted the catch tables noting that there may be refinements in subsequent years.

17.2 Total catch tables

K. Nishikawa, the STATWG Vice Chair and Database Administrator, presented the annual catch tables for ISC members for 2024-2025. The catch tables were prepared for the following ISC species of interest: NPO ALB, PBF, NPO SWO, WCNPO MLS, Pacific BUM, NPO BSH, and NPO SMA. The catch tables were generated from the ISC database and are based on Category I data (retained catch and released catch, when available) submitted by Data Correspondents for the major fisheries in the North Pacific Ocean of the members. Graphs of the historical catch by country were also presented for each species. Statistics for mean, minimum, and maximum catch were also presented for each species for the latest 5 years. The complete catch tables are included at the end of this Plenary Report and serve as the official ISC catch tables (see Section 23).

18 Review of Meeting Schedules

18.1 Time and Place of ISC27

The United States offered to host ISC27 at a location to be determined, tentatively scheduled for June 23-28, 2027 with Working Group meetings on June 21-22.

18.2 Time and Place of Working Group Intercessional Meetings

The Plenary reviewed and adopted the schedule of intersessional meetings.

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<tr><th></th><th colspan="6">2026</th><th colspan="6">2027</th></tr>
<tr><th></th><th>Jul</th><th>Aug</th><th>Sep</th><th>Oct</th><th>Nov</th><th>Dec</th><th>Jan</th><th>Feb</th><th>Mar</th><th>Apr</th><th>May</th><th>Jun</th></tr>
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<tr><td>WCPFC</td><td rowspan="2">JWG
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Nagasaki
Japan</td><td>SC22
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Apia
Samoa</td><td></td><td>CPUE
12-16
Yokohama
Japan</td><td colspan="2">WCPFC 23
Nov 30 – Dec 4
Port Vila
Vanuatu</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>IATTC</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Early
La Jolla
USA</td></tr>
</table>

18.3 Schedule of Stock Assessments

The Plenary reviewed and adopted the schedule of assessments noting the 2028 Swordfish assessment may be moved to 2029.

Species	Region	Last	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Albacore Tuna (*Thunnus alalunga*) ALB	NPO	2026		B			B			B			B
Pacific bluefin tuna (*Thunnus orientalis*) PBF	NPO	2024*			U MSE	MP		B MP	MSE	MP			
Swordfish (*Xiphias gladius*) SWO	NPO	2023			MSE	B(?) MSE	B(?)				B		
Striped marlin (*Kajikia audax*) MLS	WCNPO	2023*			B					B			
Blue marlin (*Makaira nigricans*) MLS	PO	2026		B					B				
Blue shark (*Prionace glauca*) BSH	NPO	2022	I		B					B			
Shortfin mako shark (*Isurus oxyrinchus*) SMA	NPO	2024					B					B	

B – benchmark, U – update, I – indicator, MP – Management procedure, MSE – MSE Run/review, * indicates external review

19 Administrative Matters

19.1 Work Group Election results

The Plenary confirmed the following officers and terms:

Title	Name	1st term election date	First term	Second term election date	Second term	First Extension	Second Extension
ISC Chair	Robert Ahrens	Jun-24	2024-2027				
ISC Vice Chair	Shuya Nakatsuka	Jun-24	2024-2027				
ALBWG Chair	Sarah Hawkshaw	May-21	2021-2024	Apr-24	2024-2027		
ALBWG Vice-Chair	Naoto Matsubara	Jun-26	2026-2029				
BILLWG Chair	Michelle Sculley	Jul-23	2023-2026	Jul-26	2026-2029		
BILLWG Vice-Chair	Yi-Jay Chang	Jul-23[4]	2026-2029				
PBFWG Chair	Shuya Nakatsuka	Mar-19	2019-2022	Jul-22	2022-2025	Jul-25	Jul-26
PBFWG Vice-Chair	Shui Kai Chang	Nov-19	2020-2023	Jul-23	2023-2026	July-26	
SHARKWG Chair	Michael Kinney	Jun-24	2024-2027				
SHARKWG Vice-Chair	Yasuko Semba	Jun-24	2024-2027				
STATWG Chair	Jenny Suter	Jul-23	2023-2026	Jul-26	2026-2029		
STATWG Vice-Chair	Kirara Nishikawa	Jul-23	2023-2026	Jul-26	2026-2029		

[4] 3rd 3-year term

19.2 ISC Organizational Chart

Plenary	
7 R. Ahrens (C)	6 L. Carrillo-Colin
5 S. Nakatsuka (VC)	7 F. Carvalho
1 S. Hawkshaw	7 K. Koch
2 Z. Geng	8 S. Batten
3 H.-Y. Yu	9 G. Pilling
4 H. Kim	11 C. Montero
5 H. Kiyofuji	12 S.K. Soh

Webmaster	Database
5 K. Nishikawa	5 K. Nishikawa

ALBWG	BILLWG	PBFWG	SHARKWG	STATWG
1 S. Hawkshaw (C)	7 M. Sculley (C)	5 S. Nakatsuka (C)	7 M. Kinney (C)	7 J. Suter (C)
2 Z. Geng	2 Z. Geng	1 S. Hawkshaw	1 L. Davidson	1 S. Hawkshaw
3 Y.-J. Chang	3 Y.-J. Chang (VC)	2 Z. Geng	2 Z. Geng	2 Z. Geng
4 H. Park	3 C.L. Sun	3 S.-K. Chang (VC)	3 W-P Tsai	3 W. J. Wang
5 N. Matsubara (VC)	4 H. Park	4 J. H. Park	4 H. Park	3 R.F. Wu
5 Y. Aoki	5 M. Jusup	4 H. Park	5 Y. Semba (VC, DM)	4 H. Park
6 M. Dreyfus	5 M. Kai	5 H. Fukuda (DM)	5 M. Kai	5 K. Nishikawa (VC)
7 S. Teo	6 J. Diaz	6 M. Dreyfus	6 L. Carrillo-Colin	5 S. Nakatsuka
7 P. Kuriyama	6 J. Tovar	6 M. Betancourt	7 N. Ducharme-Barth	5 H. Fukuda (PBF DM)
9 P. Hamer	7 J. Brodziak	7 D. Tommasi	7 J. Hsu	5 K. Sato
10 H. Xu	7 E. Bohaboy	7 H.-H. Lee	7 M. Oshima	5 Y. Semba (SHARK DM)
12 S.K. Soh	9 G. Pilling	9 G. Pilling	9 G. Pilling	5 N. Matsubara
	10 C. Minte-Vera	10 M. Maunder	9 P. Hamer	5 H. Kiyofuji
	12 S.K. Soh	10 R. Bi	10 M. Hutchinson	6 L. Carrillo-Colin
		12 S.K. Soh	10 D. Ovando	7 M. Sculley
			12 S.K. Soh	7 M. Kinney
				7 Y. Gu
				12 S.K. Soh

1 - Canada 2 - China 3 - Chinese-Taipei 4 - Korea 5 - Japan 6 - Mexico 7 - USA 8 - PICES 9 - SPC 10 - IATTC 11 - FAO 12 - WCPFC
C - Chair VC - Vice Chair DM - Database manager. This is not a comprehensive list but the main points of contact the main points of contact

19.3 North Pacific Marine Science Organization (PICES) Annual Meeting Observer

The ISC Chair provisionally agreed to serve as an ISC observer remotely at the PICES AGM at the next PICES Annual Meeting Nanaimo, Canada.

19.4 Intersessional Working Group Tasks

ISC Chair and Office of the Chair

- Vice Chair Report to NC 22. Report ISC activities at WCPFC SC22
- Work with on implementing a third peer review of the ISC function and process.
- Work with the Webmaster to update ISC website with "Open Science" dropdown menu and WG Chair names and email addresses to contact for access to repositories on GitHub.
- Follow up with members to ensure internal discussion regarding language changes to the MOU clarifying ISC SC relationship are had.
- Follow up with WG so that metadata requirements for BBNJ are understood and discussion within WG are had regarding engagement with BBNJ and data collection.
- Review and organize operation manual and create a docx.
- Continue to support the adoption of WCPFC reporting template for stock assessments
- June 10 - distribution of all documents for Plenary meeting electronically.

ISC Members

- Provide summaries of all North Pacific Ocean HMS fisheries (annual catch by species and gear, number of vessels by gear and size category and average size of fish caught by species and fishery for entire NPO) in National Reports and to ISC database
- Submit ISC27 documents by dates set out below
- WG working papers are due to Office of the ISC Chair (OOC) and Webmaster immediately after completion of the WG workshop for posting on the ISC website;
- June 1 – deadline for OOC to receive National Reports
- June 1st - Deadline for member countries to report Category I, II and III data to the ISC Final stock assessment reports.

USA – prepare to host ISC27

- WG meetings June 21-22th 2027
- Plenary meeting June 23-28th, 2027.

Albacore Working Group (ALBWG)

- Respond to NC22 requests should there be any.
- Continue to incorporate the WCPFC stock assessment reporting template into the assessment report.
- Hold a modeling improvement workshop in spring 2027
- Continue research-track work on spatial/spatiotemporal population modeling, growth, sex composition, maturity assumptions, and index development for the next assessment cycle.

- Discussion related to stock assessment framework and report back to ISC 2027
- Conduct workshop in advance of ISC27.

Pacific Bluefin Tuna Working Group (PBFWG)

- Respond to NC22 requests should there be any.
- Hold a fall 2026 virtual data preparatory meeting.
- Continue to incorporate the WCPFC stock assessment reporting template into the assessment report.
- Develop responses to stock-assessment peer review recommendations, including an Excel table of recommendations and initial responses
- Provide full-specification MSE simulation results for the agreed management procedure.
- Conduct an Update/Health Check using the 2024 assessment model updated with the latest data. The Health Check should include updated catch, size composition, Taiwanese longline CPUE, and recruitment index information if available. Examine exceptional circumstances.
- Provide updated information on SSB, recruitment, and fishing intensity for the Health Check to ISC 27, WCPFC NC, and WCPFC SC.
- Conduct workshop in advance of ISC27.

Billfish Working Group (BILLWG)

- Respond to NC22 requests should there be any.
- Hold the data preparatory meeting for the 2027 WCNPO striped marlin assessment on Dec 3-9, 2026 in Yokohama, Japan.
- Hold intersessional virtual meetings to prepare for the striped marlin data preparatory meeting.
- Complete striped marlin maturity analysis by September 2026 in time for the 2027 WCNPO striped marlin assessment.
- Continue IBBS sampling, with emphasis on filling gaps for small and large striped marlin, under-sampled regions, and areas with limited longline fishing.
- Continue striped marlin aging and growth work, including inquiries to external aging labs, possible U.S. funding, Japan sending samples, and continued otolith/fin-spine research.
- Advance WCNPO swordfish MSE technical work: define management area, core uncertainties, performance metrics, management parameters, candidate management procedures, and CPUE indices used in candidate MPs.
- Conduct the WCNPO striped marlin assessment process using updated maturity, growth, genetics, catch, CPUE, and size-composition inputs.
- April 30 - Final Stock Assessment Reports due to OOC;
- May 30 – Final Stock Assessment Reports due to OOC for assessments completed in April
- Depending on NC input, provide preliminary WCNPO swordfish MSE results at NC23 or support intersessional review before NC24.
- Report on IBBS Program at ISC 27
- Present WCNPO MLS benchmark assessment to ISC 27, WCPFC NC, WCPFC SC, WCPFC.

Shark Working Group (SHARKWG)

- Respond to NC22 requests should there be any.
- Hold an interim virtual meeting in October 2026.
- Hold the blue shark data preparatory meeting during the week of January 12, 2027, in Japan.
- Conduct the benchmark assessment for Blue Shark.
- April 30 - Final Stock Assessment Reports due to OOC;
- May 30 – Final Stock Assessment Reports due to OOC for assessments completed in April
- Present Blue Shark benchmark assessment to ISC 27, WCPFC NC, WCPFC SC, WCPFC.

Statistic Working Group (STATWG)

- The DA to distribute the ISC data inventory to ISC Data Correspondents for review by September 30, 2026 and to Species WG Chairs by October 15, 2026
- Metadata for national fisheries updated and published by DA on ISC researcher's website by August 31, 2026.
- Archive ISC assessments by Nov. 1, 2026
- Continue to solicit feedback on website design.
- The DA to publish the ISC data inventory on the ISC website by October 31, 2026;
- Conduct a meeting prior to ISC 27.

20 Observer Comments and Recommendations

20.1 WWF

WWF welcomes the completion of the peer review of the Pacific bluefin tuna stock assessment, as well as the decision to consider a future peer review of the North Pacific albacore stock assessment. The Pacific bluefin tuna peer review has not only identified current challenges, but also helped clarify potential solutions. This is important for improving the accuracy of future stock assessments and strengthening the transparency of ISC assessment processes.

WWF recognizes that the adoption of management strategy evaluation is an effective pathway toward achieving sustainable fisheries. We hope that the ISC's experience in developing MSE approaches for North Pacific albacore and Pacific bluefin tuna can help support and accelerate the development of an MSE for North Pacific swordfish.

For billfish and shark stock assessments, challenges related to data limitations and uncertainty remain significant. In this context, collaboration among ISC members through the implementation of the IBBS project represents meaningful progress. WWF encourages continued and expanded cooperation to improve data quality and reduce uncertainty in future assessments.

WWF remains deeply concerned about the impacts of climate change on fish stocks. Scientists working with RFMOs are increasingly facing the shared challenge of incorporating climate change impacts into stock assessments. The ISC should therefore continue to share information and collaborate with scientists from other RFMOs to jointly explore practical solutions.

20.2 Monterey Bay Aquarium

No statement was provided.

21 Adoption of Report

The Report of the ISC26 Plenary session was adopted by the members.

22 Close of Meeting

The meeting was closed at 10:15 AM June 29, 2026.

23 Catch Tables

Table 23-1. North Pacific albacore (*Thunnus alalunga*) retained and released catches (in metric tonnes) by ISC member fisheries, 1952-2024. “0”; Fishing effort was reported but no catch. “0” - Fishing effort was reported but no catch; “+” - Below 499kg catch; “-“ - Unreported catch or catch information not available. * - Data from the most recent years are provisional.

		CAN		JPN								KOR		MEX			TWN						USA									
Catch disposition	Year	Troll	CAN Total	Set-net	Drift gill-net	Longline	Pole and line	Troll	Others	Purse seine	JPN Total	Longline	KOR Total	Others	Purse seine	MEX Total	Set-net	Gill-net (not specified)	Longline	Others	Purse seine	TWN Total	Drift gill-net	Handline	Longline	Pole and line	Troll	Others	Purse seine	Sport	USA Total	Total
Retain	1936																										442				442	442
	1937																										1,681				1,681	1,681
	1938																										8,594				8,594	8,594
	1939	129	129																								8,586				8,586	8,715
	1940	2	2																								6,603				6,603	6,605
	1941	35	35																								5,412				5,412	5,447
	1942																										10,678				10,678	10,678
	1943	13	13																								17,071				17,071	17,084
	1944	210	210																								23,957				23,957	24,167
	1945	648	648																								17,886				17,886	18,534
	1946	196	196																								10,955				10,955	11,151
	1947	36	36																								12,235				12,235	12,271
	1948	984	984																						45		22,457				22,502	23,486
	1949	1,012	1,012																						33		24,901				24,934	25,946
	1950	961	961																						27		32,746				32,773	33,734
	1951	86	86																						24		15,629				15,653	15,739
	1952	71	71	55	-	26,687	41,787	-	237	154	68,920			-	-	-									46		23,843			1,373	25,262	94,253
	1953	5	5	88	-	27,777	32,921	-	132	38	60,956			-	-	-									23		15,740			171	15,934	76,895
	1954			6	-	20,958	28,069	-	38	23	49,094			-	-	-									13		12,246			147	12,406	61,500
	1955			28	-	16,277	24,236	-	136	8	40,685			-	-	-									9		13,264			577	13,850	54,535
	1956	170	170	23	-	14,341	42,810	-	57	0	57,231			-	-	-									6		18,751			482	19,239	76,640
	1957	80	80	13	-	21,053	49,500	-	151	83	70,800			-	-	-									4		21,165			304	21,473	92,353
	1958	17	17	38	-	18,432	22,175	-	124	8	40,777			-	-	-									7		14,855			48	14,910	55,704
	1959	8	8	48	-	15,802	14,252	-	67	0	30,169			-	-	-									5		20,990			+	20,995	51,172
	1960	74	74	23	-	17,369	25,156	-	76	0	42,624			-	-	-									4		20,100			557	20,661	63,359
	1961	212	212	111	-	17,437	18,639	-	268	7	36,462			39	2	41									5	2,837	12,055	1		1,355	16,253	52,968
	1962	141	141	20	-	15,764	8,729	-	191	53	24,757			0	0	0									7	1,085	19,752	1		1,681	22,526	47,424
	1963	4	4	4	-	13,464	26,420	-	218	59	40,165			0	31	31									7	2,432	25,140			1,161	28,740	68,940
	1964	1	1	50	-	15,458	23,858	-	319	128	39,813			-	0	-									4	3,411	18,388			824	22,627	62,441
	1965	5	5	70	-	13,701	41,491	-	121	11	55,394			-	0	-									3	417	16,542	1		731	17,694	73,093
	1966	3	3	64	-	25,050	22,830	-	585	111	48,640			-	0	-									8	1,600	15,333			588	17,529	66,172
	1967	15	15	43	-	28,869	30,481	-	520	89	60,002			-	-	-	-	-	330	189		519			12	4,113	17,814			707	22,646	83,182
	1968	44	44	58	-	23,961	16,597	-	1,109	267	41,992			-	-	-	-	-	216	283		499			11	4,906	20,434			951	26,302	68,837
	1969	161	161	34	-	18,006	31,912	-	925	521	51,398			-	0	-	-	-	65	423		488			14	2,996	18,827			358	22,195	74,242
	1970	1,028	1,028	19	-	16,222	24,263	-	498	317	41,319			-	0	-	-	-	34	59		93			9	4,416	21,032			822	26,279	68,719
	1971	1,365	1,365	5	-	11,473	52,957	-	354	902	65,691	0	0	-	0	-	-	-	20	52		72			11	2,071	20,526			1,175	23,783	90,911
	1972	390	390	6	1	13,022	60,569	-	638	277	74,513	0	0	0	100	100	-	-	187	-		187			8	3,750	23,600			637	27,995	103,185
	1973	1,746	1,746	44	39	16,760	68,767	-	486	1,353	87,449	4	4	-	0	-	-	-	-	-		-			14	2,236	15,653			84	17,987	107,186
	1974	3,921	3,921	13	224	13,384	73,564	-	891	161	88,237	91	91	0	1	1	-	-	486	-		486			9	4,777	20,178			94	25,058	117,794
	1975	1,400	1,400	13	166	10,303	52,152	-	230	159	63,023	7,050	7,050	0	1	1	-	-	1,240	-		1,240			33	3,243	18,932	10		640	22,858	95,572
	1976	1,331	1,331	15	1,070	15,812	85,336	-	270	1,109	103,612	2,212	2,212	5	36	41	-	-	686	-		686			23	2,700	15,905	4		713	19,345	127,227
	1977	111	111	5	688	15,681	31,934	-	365	669	49,342	500	500	0	3	3	-	-	572	-		572			37	1,497	9,969			537	12,040	62,568
	1978	278	278	21	4,029	13,007	59,877	-	2,073	1,115	80,122	669	669	0	1	1	-	-	6	-		6			54	950	16,613	15		810	18,442	99,518
	1979	53	53	16	2,856	14,186	44,662	-	1,139	125	62,984	0	0	0	1	1	-	-	81	-		81				303	6,781			74	7,158	70,277
	1980	23	23	10	2,986	14,681	46,742	-	1,177	329	65,925	592	592	0	31	31	-	1	249	20		270				382	7,556			168	8,106	74,947
	1981	521	521	8	10,348	17,878	27,426	-	699	252	56,611	0	0	0	8	8	1	-	143	12		156			25	748	12,637			195	13,605	70,901
	1982	212	212	11	12,511	16,714	29,614	-	482	561	59,893	4,874	4,874	0	0	0	-	-	38	9		47			105	425	6,609	21		257	7,417	72,443
	1983	200	200	22	6,852	15,094	21,098	-	99	350	43,515	366	366	0	0	0	-	-	8	1		9			6	607	9,359			87	10,059	54,149
	1984	104	104	24	8,988	15,053	26,013	-	494	3,380	53,952	1,925	1,925	6	107	113	-	1	-	-		1			2	1,030	9,304		3,728	1,427	15,491	71,586
	1985	225	225	68	11,204	14,249	20,714	-	339	1,533	48,107	2,789	2,789	35	14	49	1	-	-	2		3	2				6,422	118	26	1,176	7,744	58,917
	1986	50	50	15	7,813	12,899	16,096	-	640	1,542	39,005	3,833	3,833	0	3	3	-	-	-	-		-	3				4,713	66	47	196	5,025	47,916
	1987	56	56	16	6,698	14,668	19,082	-	173	1,205	41,842	1,624	1,624	0	7	7	2	2,514	-	-		2,516	5		150		2,772	139	1	74	3,141	49,186
	1988	30	30	7	9,074	14,688	6,216	-	170	1,208	31,363	799	799	0	15	15	6	7,389	-	-		7,395	15		307		4,221	76	17	64	4,700	44,302
	1989	104	104	33	7,437	13,031	8,629	-	433	2,521	32,084	561	561	0	2	2	-	8,350	40	-		8,390	4		248		1,896	10	1	160	2,319	43,460
	1990	155	155	5	6,064	15,785	8,532	-	248	1,995	32,629	29	29	0	2	2	-	16,701	4	39		16,744	29		177		2,733	20	71	24	3,054	52,613
	1991	140	140	4	3,401	6,664	7,103	-	395	2,652	20,219	4	4	0	2	2	-	3,398	12	-		3,410	17		312		1,917	20		6	2,272	26,047
	1992	302	302	12	2,721	19,042	13,888	-	1,522	4,104	41,289	1	1	0	10	10	-	7,866	-	-		7,866			334		4,626	40		2	5,002	54,470
	1993	139	139	3	287	29,933	12,797	-	897	2,889	46,806	2	2	0	11	11	-	-	5	-		5			438		6,325	194		25	6,982	53,945
	1994	1,998	1,998	11	263	29,565	26,389	-	823	2,026	59,077	2	2	0	6	6	-	-	83	-		83	38		544		11,068	66		106	11,822	72,988
	1995	1,761	1,761	28	282	29,050	20,981	856	78	1,177	52,452	13	13	0	5	5	-	-	4,280	-		4,280	52		882		8,302	4		102	9,342	67,853
	1996	3,321	3,321	43	116	32,440	20,272	815	127	581	54,394	157	157	0	21	21	-	-	7,596	-	-	7,596	83		1,185		17,150	10	11	88	18,527	84,016
	1997	2,166	2,166	40	359	38,899	32,238	1,585	135	1,068	74,324	404	404	0	53	53	-	-	9,456	-	-	9,456	60		1,653		14,458	12	2	1,018	17,203	103,606
	1998	4,177	4,177	41	206	35,755	22,926	1,190	104	1,554	61,776	225	225	0	8	8	-	-	8,810	-	-	8,810	80		1,120		14,577	15	33	1,208	17,033	92,029
	1999	2,734	2,734	90	289	33,339	50,369	891	62	6,872	91,912	98	98	57	0	57	-	-	8,393	-	-	8,393	149		1,542		10,451	61	48	3,621	15,872	119,066
	2000	4,531	4,531	136	67	29,995	21,550	645	86	2,408	54,887	15	15	33	70	103	-	-	8,842	-	-	8,842	55		940		9,834	24	4	1,798	12,655	81,033
	2001	5,248	5,248	78	117	28,801	29,430	416	35	974	59,851	63	63	18	0	18	-	1	8,684	+	-	8,685	94		1,295		11,543	39	51	1,635	14,657	88,522
	2002	5,379	5,379	109	332	23,585	48,454	787	85	3,303	76,655	111	111	0	28	28	-	-	7,965	-	-	7,965	30		525		11,003	13	4	2,357	13,932	104,070
	2003	6,847	6,847	69	126	20,907	36,114	922	85	627	58,850	146	146	0	29	29	-	-	7,166	-	-	7,166	16		524		14,246	8	44	2,214	17,052	90,090
	2004	7,857	7,857	30	61	17,341	32,255	772	54	7,200	57,713	77	77	0	104	104	-	-	4,988	-	-	4,988	12		361		13,630	3	1	1,506	15,513	86,252
	2005	4,829	4,829	97	154	20,465	16,133	665	234	850	38,598	419	419	0	0	0	-	-	4,472	-	-	4,472	20		296		8,654	1		1,719	10,690	59,008
	2006	5,833	5,833	55	221	21,168	15,400	460	42	364	37,710	134	134	0	109	109	-	-	4,317	-	-	4,317	3		270		12,642	+		385	13,300	61,403
	2007	6,040	6,040	30	226	22,381	37,768	519	44	5,682	66,650	136	136	0	40	40	-	+	2,916	-	-	2,916	4	94	250		11,911	+	77	461	12,797	88,579
	2008	5,464	5,464	101	1,531	19,092	19,060	549	34	825	41,192	400	400	-	10	10	-	-	3,069	-	-	3,069	1	28	354		11,762	+		418	12,563	62,698
	2009	5,693	5,693	33	149	21,995	31,172	410	43	2,076	55,878	95	95	-	17	17	-	-	2,378	-	-	2,378	4	97	203		12,343	+	31	944	13,622	77,683
	2010	6,527	6,527	42	24	21,167	19,561	588	37	330	41,749	107	107	-	25	25	+	-	2,818	-	-	2,818	5	53	421		11,691	0		862	13,032	64,258
	2011	5,385	5,385	50	12	20,956	25,704	443	78	480	47,723	78	78	-	0	-	+	1	3,434	2	-	3,437	5	84	708		10,147	0		421	11,365	67,988
	2012	2,484	2,484	48	26	22,828	33,742	610	129	4,193	61,576	156	156	0	0	0	2	2	2,643	-	-	2,647	8	253	660		14,152	2		1,212	16,287	83,150
	2013	5,088	5,088	36	14	19,839	33,568	302	211	1,988	55,958	173	173		0	0	1	+	4,427	-	-	4,428	5	46	317		12,312	0		839	13,519	79,166
	2014	4,780	4,780	24	11	19,973	29,433	197	197	2,009	51,844	116	116		0	0	1	1	2,617	+	-	2,619	+	49	209		13,401			1,042	14,700	74,060
	2015	4,391	4,391	17	138	21,013	21,294	239	167	1,072	43,940	38	38		0	0	1	2	3,020	4	-	3,027	1	62	227		11,597	2		932	12,820	64,216
	2016	2,842	2,842	28	19	16,549	14,435	148	128	3,679	34,986	56	56		0	0	+	+	3,406	-	-	3,406	1	24	248		10,759	0		675	11,708	52,998
	2017	1,831	1,831	48	40	17,309	20,891	107	119	1,251	39,765	202	202		0	0	-	5	4,333	-	-	4,338	0	35	95		7,432	14		372	7,947	54,084
	2018	2,717	2,717	13	35	13,192	17,875	78	70	3,039	34,302	101	101					-	4,514	+	-	4,514		20	87		7,729			381	8,217	49,851
	2019	2,402	2,402	27	9	12,216	8,508	543	95	1,045	22,443	65	65				-	5	5,454	+	1	5,460		10	104		7,745	4		1,364	9,226	39,596
	2020	2,376	2,376	25	7	12,694	36,634	784	159	5,961	56,264	56	56				1	-	3,809	-	-	3,810		3	147		7,530	8		260	7,947	70,453
	2021	2,419	2,419	11	3	18,327	11,136	428	232	92	30,229	275	275				-	+	5,953	+	-	5,953		5	226		4,664	2		248	5,146	44,022
	2022	3,639	3,639	18	31	11,033	4,090	216	159	726	16,273	173	173				-	+	4,860	+	-	4,860	1	5	202		9,080	3		587	9,877	34,822
	2023	1,151	1,151	34	8	14,201	14,006	1,038	231	3,098	32,616	113	113				-	+	6,651	+	-	6,651		5	506		3,651	9		567	4,738	45,269
	2024	2,888	2,888	34	8	14,201	14,006	1,038	231	3,098	32,616	474	474				-	+	9,231	+	-	9,231		29	244		4,699	5	1	865	5,843	51,052
Retain catch total		144,005	144,005	2,617	110,341	1,390,911	2,085,288	18,241	24,300	######	3,733,614	32,603	32,603	193	913	1,106	16	46,237	165,007	1,095	1	212,356	801	903	18,962	52,932	1,125,514	1,041	4,198	51,668	1,256,018	5,379,702
Release	2013	1	1																													1
	2014	7	7																													7
	2015	14	14																													14
	2016	2	2																													2
	2017	2	2																													2
	2018	18	18									+	+																			18
	2019	13	13																													13
	2020	2	2																													2
	2021	22	22									0	0																			22
	2022	5	5									0	0																			7
	2023	9	9																													9
	2024	6	6																													6
Release total		101	101									+	+																			97
Total		144,106	144,106	2,617	110,341	1,390,911	2,085,288	18,241	24,300	######	3,733,614	32,603	32,603	193	913	1,106	16	46,237	165,007	1,095	1	212,356	801	903	18,962	52,932	1,125,514	1,041	4,198	51,668	1,256,018	5,379,799

Table 23-2. Pacific bluefin tuna (*Thunnus orientialis*) retained and released catches (in metric tonnes) by ISC member fisheries, 1952-2024. “0” - Fishing effort was reported but no catch; “+” - Below 499kg catch; “-“ - Unreported catch or catch information not available. * - Data from the most recent years are provisional.

Catch disposition	Year	JPN Set-net	JPN Longline	JPN Pole and line	JPN Troll[1]	JPN Others	JPN Purse seine	JPN Total	KOR Set-net	KOR Longline	KOR Purse seine	KOR Trawl	KOR Total	MEX Others	MEX Purse seine	MEX Sport	MEX Total
Retain	1952	2,145	2,694	2,198	667	1,700	7,680	17,084						-	-		-
	1953	2,335	3,040	3,052	1,472	160	5,570	15,629						-	-		-
	1954	5,579	3,088	3,044	1,656	266	5,366	18,999						-	-		-
	1955	3,256	2,951	2,841	1,507	1,151	14,016	25,722						-	-		-
	1956	4,170	2,672	4,060	1,763	385	20,979	34,029						-	-		-
	1957	2,822	1,685	1,795	2,392	414	18,147	27,255						-	-		-
	1958	1,187	818	2,337	1,497	215	8,586	14,640						-	-		-
	1959	1,575	3,136	586	736	167	9,996	16,196						32	171		203
	1960	2,032	5,910	600	1,885	369	10,541	21,337						-	-		-
	1961	2,710	6,364	662	3,193	599	9,124	22,652						-	130		130
	1962	2,545	5,769	747	1,683	293	10,657	21,694						-	294		294
	1963	2,797	6,077	1,256	2,542	294	9,786	22,752						-	412		412
	1964	1,475	3,140	1,037	2,784	1,884	8,973	19,293						-	131		131
	1965	2,121	2,569	831	1,963	1,106	11,496	20,086						-	289		289
	1966	1,261	1,370	613	1,614	129	10,082	15,069						-	435		435
	1967	2,603	878	1,210	3,273	302	6,462	14,728						-	371		371
	1968	3,058	500	983	1,568	217	9,268	15,594						-	195		195
	1969	2,187	878	721	2,219	195	3,236	9,436						-	260		260
	1970	1,779	607	723	1,198	224	2,907	7,438						-	92		92
	1971	1,555	697	938	1,492	317	3,721	8,720		0			0	-	555		555
	1972	1,107	512	944	842	197	4,212	7,814		0			0	-	1,646		1,646
	1973	2,351	838	526	2,108	636	2,266	8,725		0			0	-	1,084		1,084
	1974	6,019	1,177	1,192	1,656	754	4,106	14,904		0			0	-	344		344
	1975	2,433	1,061	1,401	1,031	808	4,491	11,225		3			3	-	2,145		2,145
	1976	2,996	320	1,082	830	1,237	2,148	8,613		5			5	-	1,968		1,968
	1977	2,257	338	2,256	2,166	1,052	5,110	13,179		0			0	-	2,186		2,186
	1978	2,546	648	1,154	4,517	2,276	10,427	21,568		3			3	-	545		545
	1979	4,558	729	1,250	2,655	2,429	13,881	25,502		0			0	-	213		213
	1980	2,521	811	1,392	1,531	1,953	11,327	19,535		0			0	-	582		582
	1981	2,129	590	754	1,777	2,653	25,422	33,325		0			0	-	218		218
	1982	1,667	718	1,777	864	1,709	19,234	25,969		0	31		31	-	506		506
	1983	972	217	356	2,028	1,117	14,774	19,464		0	13		13	-	214		214
	1984	2,234	142	587	1,874	868	4,433	10,138		1	4		5	-	166		166
	1985	2,562	105	1,817	1,850	1,175	4,154	11,663		0	1		1	-	676		676
	1986	2,914	102	1,086	1,467	719	7,412	13,700		0	344		344	-	189		189
	1987	2,198	211	1,565	880	445	8,653	13,952		13	89		102	-	119		119
	1988	843	157	907	1,124	498	3,605	7,134		0	32		32	1	447		448
	1989	748	209	754	903	283	6,190	9,087		0	71		71	-	57		57
	1990	716	267	536	1,250	455	2,989	6,213		0	132		132	-	50		50
	1991	1,485	218	286	2,069	650	9,808	14,516		0	265		265	-	9		9
	1992	1,208	513	166	915	1,081	7,162	11,045		0	288		288	-	0		0
	1993	848	812	129	546	365	6,600	9,300		0	40		40	-	0		0
	1994	1,158	1,206	162	4,111	398	8,131	15,166		0	50		50	2	63		65
	1995	1,859	678	270	4,778	586	18,909	27,080		0	821		821	-	11		11
	1996	1,149	901	94	3,640	570	7,644	13,998		0	102		102	-	3,700		3,700
	1997	803	1,300	34	2,740	811	13,152	18,840		0	1,054		1,054	-	367		367
	1998	874	1,255	85	2,876	700	5,391	11,181		0	188		188	-	1		1
	1999	1,097	1,157	35	3,440	709	16,173	22,611		0	256		256	35	2,369		2,404
	2000	1,125	953	102	5,217	689	16,486	24,572		0	2,401	0	2,401	99	3,019		3,118
	2001	1,366	791	180	3,466	782	7,620	14,205		0	1,176	10	1,186	-	863		863
	2002	1,100	841	99	2,607	631	8,903	14,181		0	932	1	933	2	1,708		1,710
	2003	839	1,237	44	2,060	446	5,768	10,394		0	2,601	0	2,601	43	3,211		3,254
	2004	896	1,847	132	2,445	514	8,257	14,091		0	773	0	773	14	8,880		8,894
	2005	2,182	1,925	549	3,633	548	12,817	21,654		0	1,318	9	1,327	-	4,542		4,542
	2006	1,421	1,121	108	1,860	777	8,880	14,167		0	1,012	3	1,015	-	9,806		9,806
	2007	1,503	1,762	236	2,823	657	6,840	13,821		0	1,281	4	1,285	-	4,147		4,147
	2008	2,358	1,390	64	2,377	770	10,221	17,180		0	1,866	10	1,876	15	4,407		4,422
	2009	2,236	1,080	50	2,003	575	8,077	14,021		0	936	4	940	-	3,019		3,019
	2010	1,603	890	83	1,583	495	3,742	8,396		0	1,196	16	1,212	-	7,746		7,746
	2011	1,651	837	63	1,820	283	8,340	12,993		0	670	14	684	1	2,731		2,732
	2012	1,932	673	113	570	343	2,462	6,093		0	1,421	2	1,423	1	6,668		6,669
	2013	1,415	784	8	904	529	2,771	6,411	1	-	604	0	605		3,154		3,154
	2014	1,907	683	5	1,023	499	5,456	9,573	6		1,305	-	1,311		4,862		4,862
	2015	1,242	648	8	413	431	3,645	6,386	1		676		677		3,082		3,082
	2016	1,228	691	54	778	508	5,095	8,354	3		1,024	2	1,030		2,709		2,709
	2017	2,221	913	49	605	665	4,540	8,993	3		734	6	743		3,643		3,643
	2018	645	700	9	371	431	4,049	6,205	7		523	5	535		2,840		2,840
	2019	951	1,002	+	720	372	4,464	7,509	36		542	3	581		2,249		2,249
	2020	1,342	1,416	1	759	531	3,960	8,009	35		567	3	605		3,285		3,285
	2021	1,742	1,512	0	661	513	4,199	8,627	84		422	3	509		3,027		3,027
	2022	2,126	1,599	13	1,051	591	4,702	10,082	221		654	6	881		3,194	22	3,216
	2023	1,889	1,557	24	1,171	602	4,570	9,813	215		448	5	668	8	3,399	11	3,418
	2024	1,537	1,550	6	1,370	649	4,614	9,726	307		440	22	768	27	3,531	4	3,562
Retain catch total		141,901	100,437	54,831	135,861	51,353	594,874	1,079,257	613	25	28,863	106	29,607	280	122,932	37	123,249
Total		141,901	100,437	54,831	135,861	51,353	594,874	1,079,257	613	25	28,863	106	29,607	280	122,932	37	123,249

Catch disposition	Year	TWN Set-net	TWN Gill-net (not specified)	TWN Drift gill-net	TWN Longline	TWN Others	TWN Purse seine	TWN Total	USA Drift gill-net	USA Longline	USA Pole and line	USA Troll	USA Hook and Line	USA Others	USA Purse seine	USA Sport	USA Total[4]	Total
Retain	1952														2,076	2	2,078	19,162
	1953														4,433	48	4,481	20,110
	1954														9,537	11	9,548	28,547
	1955														6,173	93	6,266	31,988
	1956														5,727	388	6,115	40,144
	1957														9,215	73	9,288	36,543
	1958														13,934	10	13,944	28,584
	1959										56				3,506	13	3,575	19,974
	1960										+				4,547	1	4,548	25,885
	1961										16				7,989	23	8,028	30,810
	1962										+				10,769	25	10,794	32,782
	1963										28				11,832	7	11,867	35,031
	1964										39				9,047	7	9,093	28,517
	1965				54			54			11	+		66	6,523	1	6,601	27,030
	1966				-			-			12				15,450	20	15,482	30,986
	1967				53			53			+				5,517	32	5,549	20,701
	1968				33			33			8				5,773	12	5,793	21,615
	1969				23			23			9				6,657	15	6,681	16,400
	1970				-			-			+				3,873	19	3,892	11,422
	1971				1			1			+				7,804	8	7,812	17,088
	1972				14			14			3			42	11,656	15	11,716	21,190
	1973				33			33			5	+		20	9,639	54	9,718	19,560
	1974				47	15		62			+	+		30	5,243	58	5,331	20,641
	1975				61	5		66			83			1	7,353	34	7,471	20,910
	1976				17	2		19			22	+		3	8,652	21	8,698	19,303
	1977				131	2		133			10			3	3,259	19	3,291	18,789
	1978				66	2		68			4			2	4,663	5	4,674	26,858
	1979				58	-		58			5			1	5,889	11	5,906	31,679
	1980				114	5		119			+			24	2,327	7	2,358	22,594
	1981				179	-		179	4		+	10		+	867	9	890	34,612
	1982			2	207	-		209	9		1			+	2,639	11	2,660	29,375
	1983			2	175	-	9	186	31		59			2	629	33	754	20,631
	1984			-	477	8	5	490	6	1	5			18	673	49	752	11,551
	1985			11	210	-	80	301	8					20	3,320	89	3,437	16,078
	1986			13	70	-	16	99	16					41	4,851	12	4,920	19,252
	1987			14	365	-	21	400	2					18	861	34	915	15,488
	1988			37	108	25	197	367	4					46	923	6	979	8,960
	1989			51	205	3	259	518	3					18	1,046	112	1,179	10,912
	1990			299	189	16	149	653	11					81	1,380	65	1,537	8,585
	1991			107	342	12	-	461	4	2				+	410	92	508	15,759
	1992			3	464	5	73	545	9	38				14	1,928	110	2,099	13,977
	1993				471	3	1	475	32	42				29	580	283	966	10,781
	1994				559	-		559	28	30				1	906	86	1,051	16,891
	1995				335	2		337	20	29				+	657	245	951	29,200
	1996	-	-		956	-	-	956	43	25		2		+	4,639	40	4,749	23,505
	1997	-	-		1,814	-	-	1,814	58	26		1		48	2,240	131	2,504	24,579
	1998	-	-		1,910	-	-	1,910	40	54		128		59	1,771	422	2,474	15,754
	1999	-	-		3,089	-	-	3,089	22	54		20		88	184	408	776	29,136
	2000	-	1		2,780	1	-	2,782	30	19		1		11	693	319	1,073	33,946
	2001	-	2		1,839	2	-	1,843	35	6		6		1	292	344	684	18,781
	2002	-	3		1,523	1	-	1,527	7	2		1		2	50	613	675	19,026
	2003	-	10		1,863	11	-	1,884	14	1				3	22	355	395	18,528
	2004	-	1		1,714	2	-	1,717	10	1				+		50	61	25,536
	2005	1	-		1,368	1	-	1,370	5	1				1	201	73	281	29,174
	2006	1	-		1,149	-	-	1,150	1	1				+		94	96	26,234
	2007	2	8		1,401	-	-	1,411	2	+				+	42	12	56	20,720
	2008	1	1		979	-	-	981	1	+				+		63	64	24,523
	2009	1	10		877	-	-	888	3	1		0		2	410	156	572	19,440
	2010	29	7		373	-	-	409	1	0				0		88	89	17,852
	2011	16	7		292	1	-	316	18	0		0		100		225	343	17,068
	2012	2	-		210	2	-	214	4	0		0		38		400	442	14,841
	2013	2	1		331	-	-	334	7	1		0		3		809	820	11,324
	2014	38	4		483	-	-	525	5	+		+	2	-	401	420	828	17,099
	2015	25	1		552	-	-	578	4	+			7	-	86	400	498	11,221
	2016	-	+		454	-	-	454	9	1		0	31	-	316	372	728	13,275
	2017	-	-		415	+	-	415	1	1		+	18	+	466	463	950	14,744
	2018	+	3		381	+	-	384	18	1		+	31	4	12	535	600	10,565
	2019	2	2		486	2	-	492	10	2		1	36	1	226	483	758	11,589
	2020	1	-		1,149	-	-	1,150	28	2		+	87	1	116	742	975	14,024
	2021	+	+		1,478	-	-	1,478	55	1		+	116	3	43	1,294	1,512	15,153
	2022	1	+		1,490	-	-	1,491	20	2		0	149	1	198	1,612	1,982	17,652
	2023	4	1		2,116	-	-	2,121	16	2		+	163	2	3	2,019	2,206	18,226
	2024	4	1		2,259	-	-	2,264	4	3		0	130	1		1,385	1,523	17,843
Retain catch total		130	63	539	40,792	128	810	42,462	659	348	376	170	770	849	243,145	16,594	262,910	1,537,484
Total		130	63	539	40,792	128	810	42,462	659	348	376	170	770	849	243,145	16,594	262,910	1,537,484

Table 23-3. Annual retained and released catches of swordfish (*Xiphias gladius*) in metric tonnes for fisheries monitored by ISC members for assessments of the North Pacific Ocean stock, 1951-2024. “0”; Fishing effort was reported but no catch. “0” - Fishing effort was reported but no catch; “+” - Below 499kg catch; “-“ - Unreported catch or catch information not available. * - Data from the most recent years are provisional.

		JPN						KOR			MEX			TWN							USA										
Catch disposition	Year	Set-net	Drift gill-net	Longline	Others	Not specified	JPN Total	Longline	Purse seine	KOR Total	Others	Sport	MEX Total	Set-net	Gill-net (not specified)	Harpoon	Longline	Others	Purse seine	TWN Total	Drift gill-net	Harpoon	Handline	Longline	Pole and line	Troll	Hook-and-line	Other	Purse-seine	USA Total	Total
Retain	1951	78	10	7,361	4,131	98	11,678																								11,678
	1952	68	-	9,042	2,569	12	11,691																								11,691
	1953	21	-	10,873	1,407	107	12,408										-			-											12,408
	1954	18	-	12,659	813	121	13,611										-			-											13,611
	1955	37	-	13,093	821	160	14,111										-			-											14,111
	1956	31	-	14,606	775	73	15,485										-			-											15,485
	1957	18	-	14,305	858	70	15,251										-			-											15,251
	1958	31	-	18,567	1,069	67	19,734										-			-											19,734
	1959	31	-	17,302	891	44	18,268										427			427											18,695
	1960	67	1	20,109	1,191	30	21,398										520			520											21,918
	1961	15	2	19,766	1,335	30	21,148										318			318											21,466
	1962	15	-	10,685	1,371	44	12,115										494			494											12,609
	1963	17	-	10,420	747	59	11,243										343			343											11,586
	1964	16	4	7,760	1,006	66	8,852										358			358											9,210
	1965	14	-	8,861	1,908	208	10,991										331			331											11,322
	1966	11	-	9,979	1,728	45	11,763										489			489											12,252
	1967	12	-	11,067	891	38	12,008							-	-	5	646	30		681											12,689
	1968	14	-	10,046	1,539	50	11,649							-	8	3	763	1		775											12,424
	1969	11	-	9,712	1,557	56	11,336							-	1	6	843	-		850											12,186
	1970	9	-	7,751	1,748	39	9,547							-	1	5	904	-		910		612		5						617	11,074
	1971	37	1	7,387	473	48	7,946	0		0				-	-	3	992	-		995		99		1						100	9,041
	1972	1	55	7,327	282	22	7,687	0		0				-	-	12	862	-		874		171								171	8,732
	1973	23	720	7,574	121	29	8,467	0		0				-	-	113	860	6		979		399								399	9,845
	1974	16	1,304	6,669	190	29	8,208	0		0				-	-	98	881	38		1,017		406								406	9,631
	1975	18	2,672	7,677	205	60	10,632	0		0				-	-	152	928	1		1,081		557								557	12,270
	1976	14	3,488	8,845	313	182	12,842	0		0				-	-	159	636	35		830		42								42	13,714
	1977	7	2,344	9,301	201	73	11,926	0		0				-	2	139	578	-		719		318		17						335	12,980
	1978	22	2,475	9,069	130	111	11,807	0		0				-	3	10	546	-		559		1,699		9						1,708	14,074
	1979	15	983	9,692	161	49	10,900	0		0				-	5	24	668	4		701		329		7						336	11,937
	1980	15	1,746	6,898	398	30	9,087	135		135				-	4	72	613	1		690	160	566		5						731	10,643
	1981	9	1,848	7,841	129	61	9,888	0		0				-	3	18	658	4		683	473	271		3	2					749	11,320
	1982	7	1,257	6,998	195	59	8,516	166		166				-	3	46	856	-		905	945	156		5	3	6		1		1,116	10,703
	1983	9	1,033	8,752	166	32	9,992	47		47				-	3	164	783	-		950	1,693	58		5	2	3		1	1	1,763	12,752
	1984	13	1,053	8,411	117	98	9,692	27		27				43	5	259	733	-		1,040	2,647	104		15	49				26	2,841	13,600
	1985	10	1,133	10,387	191	69	11,790	12		12				3	29	166	566	61		825	2,990	305	4	2				104		3,405	16,032
	1986	9	1,264	9,815	123	47	11,258	18		18				3	1	201	456	6		667	2,069	291	4	2				109		2,475	14,418
	1987	11	1,051	10,411	87	45	11,605	50		50				-	-	187	1,331	3		1,521	1,529	235	4	24				31		1,823	14,999
	1988	8	1,234	9,317	173	19	10,751	27		27				-	1	80	777	183		1,041	1,376	198	6	24				64		1,668	13,487
	1989	10	1,596	7,492	362	21	9,481	7		7				3	2	61	1,541	35		1,642	1,243	62	7	218				56		1,586	12,716
	1990	4	1,074	6,598	128	13	7,817	46		46		-	-	4	2	118	1,452	88		1,664	1,131	64	5	2,437				43		3,680	13,207
	1991	5	498	5,690	153	20	6,366	37		37		-	-	4	2	205	1,430	56		1,697	944	20	6	4,535				44		5,549	13,649
	1992	6	887	8,505	381	16	9,795	32		32		-	-	12	1	287	1,494	33		1,827	1,356	75	1	5,762				47		7,241	18,895
	1993	4	292	9,777	309	44	10,426	27		27		-	-	13	3	194	1,228	100		1,538	1,412	168	4	5,936				161		7,681	19,672
	1994	4	421	8,723	308	37	9,493	4		4		-	-	12	3	211	1,155	9		1,390	792	157	4	3,807				24		4,784	15,671
	1995	7	561	7,809	423	34	8,834	9		9		-	-	6	2	14	1,185	203		1,410	771	97	6	2,981				29		3,884	14,137
	1996	4	428	7,983	597	45	9,057	15		15		-	-	10	2	19	710	1	-	742	761	81	5	2,848				15		3,710	13,524
	1997	5	365	8,216	346	62	8,994	99		99		-	-	8	1	27	1,397	1	-	1,434	708	84	7	3,393				11		4,203	14,730
	1998	2	471	7,423	476	68	8,440	153		153		-	-	15	9	17	1,198	-	-	1,239	931	48	7	3,681				19		4,686	14,518
	1999	5	724	6,606	416	47	7,798	131		131		-	-	5	5	51	1,455	+	-	1,516	606	81	9	4,329				27		5,052	14,497
	2000	5	808	7,301	497	49	8,660	202		202	602	-	602	5	6	74	3,716	-	-	3,801	649	90		4,834				33		5,606	18,871
	2001	15	732	7,840	230	30	8,847	438		438	516	-	516	8	18	64	4,853	-	-	4,943	375	52		1,969				19		2,415	17,159
	2002	11	1,164	7,195	201	29	8,600	438		438	215	-	215	16	8	1	5,400	1	-	5,426	302	90		1,524				3		1,919	16,598
	2003	4	1,198	6,439	149	28	7,818	380		380	237	-	237	8	3	-	4,771	-	-	4,782	216	107	10	1,958				11		2,302	15,519
	2004	4	1,062	6,904	229	30	8,229	410		410	268	-	268	7	6	1	4,248	2	-	4,264	182	69	7	1,185				44		1,487	14,658
	2005	3	956	6,653	187	337	8,136	403		403	234	-	234	5	3	16	3,964	2	-	3,990	220	77	5	1,622				5		1,929	14,692
	2006	5	796	7,690	244	343	9,078	465		465	328	-	328	7	2	49	4,382	3	-	4,443	443	71	4	1,211				5		1,734	16,048
	2007	2	829	8,125	122	368	9,446	453		453	172	-	172	2	2	20	4,099	2	-	4,125	490	59	5	1,735		1				2,290	16,486
	2008	3	648	6,189	173	349	7,362	794		794	242	-	242	3	6	39	3,745	+	-	3,793	405	48	6	2,014				19		2,492	14,683
	2009	3	682	6,007	239	249	7,180	993		993	394	-	394	83	7	31	3,550	-	-	3,671	253	50	5	1,817		0		0		2,125	14,363
	2010	8	494	5,400	110	230	6,242	662		662	222	-	222	6	4	42	2,844	-	-	2,896	62	37	3	1,676				18		1,796	11,818
	2011	2	193	4,022	10	233	4,460	962		962	-	-	-	8	17	52	3,577	1	+	3,655	119	24	5	1,623				90		1,861	10,938
	2012	8	371	4,034	59	288	4,760	856		856	-	-	-	3	15	30	3,746	+	-	3,794	118	5	6	1,395		1		1		1,526	10,936
	2013	13	290	4,248	163	291	5,005	1,071		1,071	-	-	-	2	8	-	2,846	1	-	2,857	95	6	6	1,270		1		7		1,385	10,318
	2014	7	269	4,381	0	291	4,948	829		829	-	-	-	4	4	-	2,817	+	+	2,825	127	6	7	1,665		1	0	4		1,811	10,413
	2015	3	277	5,099	204	281	5,864	776		776		-	-	4	4	-	3,199	-	-	3,207	101	5	5	1,515		1	0	12		1,639	11,486
	2016	2	303	5,605	169	256	6,335	582		582		-	-	2	3	+	2,054	1	-	2,059	183	26	4	1,092			1	42		1,348	10,324
	2017	3	291	4,837	274	289	5,694	583		583				+	3	-	2,194	+	+	2,197	180	28	6	1,618		+	1	44		1,876	10,350
	2018	5	230	5,015	480	267	5,997	708		708				1	+	-	2,124	+	-	2,125	148	10	3	1,053		1	0	67		1,281	10,111
	2019	6	242	3,910	339	210	4,707	468		468				2	0	0	2,113	0	0	2,115	52	11	3	734		0	1	186		987	8,278
	2020	7	290	5,007	179	305	5,788	312		312				3	+	-	1,868	+	-	1,871	35	6	2	728			1	124		896	8,867
	2021	4	301	3,312	270	251	4,138	267		267				1	-	-	1,067	-	-	1,068	14	7	1	971		+	2	54		1,049	6,522
	2022	4	459	2,802	313	283	3,861	447		447				1	-	-	1,108	3	-	1,112	29	33	1	1,307		+	2	27		1,399	6,819
	2023	4	631	4,152	234	225	5,246	590		590				1	-	-	1,564	+	+	1,565	37	36	1	1,219			1	31		1,325	8,726
	2024	4	631	4,265	234	225	5,359	337		337				1	-	-	1,304	+	+	1,305	24	19	1	1,018		+	1	9		1,072	8,073
tain catch total		969	47,142	#######	41,218	8,624	#######	15,131		15,131	3,430	0	3,430	324	220	3,545	#######	914	0	#######	29,393	8,725	176	78,803	56	16	12	1,642	27	#######	969,514
Release	2010																												0	0	0
	2011																												0	0	0
	2018							+		+																					+
	2019							+		+																					+
	2020							+		+																					+
	2021							0		0																					0
	2022							+		+																					+
	2023							0	0	0																					0
	2024							1		1																					
Release total								1	0	1																			0	0	1
Total		969	47,142	#######	41,218	8,624	#######	15,132	0	15,132	3,430	0	3,430	324	220	3,545	#######	914	0	#######	29,393	8,725	176	78,803	56	16	12	1,642	27	#######	969,515

Table 23-4. Annual retained and released catches of striped marlin (*Kajikia audax*) in metric tonnes for fisheries monitored by ISC members for assessments of the WCNPO stock, 1951-2024. “0” - Fishing effort was reported but no catch; “+” - Below 499kg catch; “-“ - Unreported catch or catch information not available. * - Data from the most recent years are provisional.

Catch disposition	Year	JPN						KOR			MEX		TWN							USA							Total
		Set-net	Drift gill-net	Longline	Others	Not specified	JPN Total	Longline	Purse seine	KOR Total	Sport	MEX Total	Set-net	Gill-net (not specified)	Harpoon	Longline	Others	Purse seine	TWN Total	Handline	Longline	Troll	Others	Purse seine	Sport	USA Total	
Retain	1951	92	-	3,167	1,149	39	4,447																				4,447
	1952	203	-	3,623	1,321	40	5,187																		23	23	5,210
	1953	126	-	2,185	793	36	3,140										0		0						5	5	3,145
	1954	82	-	3,120	938	67	4,207										0		0						16	16	4,223
	1955	106	-	3,110	850	82	4,148										0		0						5	5	4,153
	1956	133	-	3,788	1,822	41	5,784										0		0						34	34	5,818
	1957	71	-	3,308	2,312	76	5,767										0		0						42	42	5,809
	1958	82	3	4,383	2,704	127	7,299									543	387		930						59	59	8,288
	1959	87	2	4,308	2,905	200	7,502									391	354		745						65	65	8,312
	1960	161	4	3,963	1,689	87	5,904									398	350		748						30	30	6,682
	1961	161	2	4,589	1,538	98	6,388									306	342		648						24	24	7,060
	1962	197	8	5,849	1,607	108	7,769									332	211		543						5	5	8,317
	1963	92	17	6,197	1,527	292	8,125									560	199		759						68	68	8,952
	1964	81	2	14,346	2,223	41	16,693									392	175		567						58	58	17,318
	1965	81	1	11,621	2,640	73	14,416									355	157		512						23	23	14,951
	1966	226	2	8,531	1,313	31	10,103									370	180		550						36	36	10,689
	1967	82	3	11,825	1,394	75	13,379						-	0	141	387	63		591						49	49	14,019
	1968	71	0	16,143	914	58	17,186						-	40	134	333	34		541						51	51	17,778
	1969	71	3	9,147	2,516	81	11,818						-	5	159	573	28		765						30	30	12,613
	1970	55	3	13,867	824	153	14,902						-	8	175	495	6		684						18	18	15,604
	1971	61	10	11,891	1,674	307	13,943	0		0			-	16	101	449	18		584						17	17	14,544
	1972	72	243	7,988	827	94	9,224	0		0			-	1	124	389	1		515						21	21	9,760
	1973	80	3,265	7,107	476	146	11,074	0		0			-	4	115	569	20		708						9	9	11,791
	1974	90	3,112	7,076	581	104	10,963	0		0			-	7	53	674	58		792						55	55	11,810
	1975	105	6,534	5,605	492	89	12,825	0		0			-	7	86	796	3		892						27	27	13,744
	1976	37	3,561	5,414	441	107	9,560	0		0			-	9	61	379	70		519						31	31	10,110
	1977	103	4,424	3,290	337	107	8,261	0		0			-	9	207	541	3		760						41	41	9,062
	1978	93	5,593	4,227	210	243	10,366	0		0			-	7	70	618	1		696						37	37	11,099
	1979	66	2,532	5,948	327	133	9,006	0		0			2	18	104	458	0		582						36	36	9,624
	1980	80	3,467	6,990	397	59	10,993	73		73			-	39	92	284	1		416						33	33	11,515
	1981	88	3,866	4,377	385	69	8,785	0		0			-	25	70	508	0		603						60	60	9,448
	1982	52	2,351	5,666	476	128	8,673	102		102			-	26	112	404	0		542						41	41	9,358
	1983	124	1,867	4,052	547	156	6,746	49		49			-	31	144	555	39		769						39	39	7,603
	1984	144	2,333	3,901	398	177	6,953	39		39			-	16	314	965	0		1,295						36	36	8,323
	1985	81	2,363	4,632	499	153	7,728	13		13			1	6	152	513	23		695			18			42	60	8,496
	1986	131	3,584	7,336	343	103	11,497	14		14			-	13	119	179	16		327			19			19	38	11,876
	1987	102	1,888	8,731	244	167	11,132	15		15			1	2	132	414	16		565	1	272	29			28	330	12,042
	1988	63	2,211	7,030	400	205	9,909	16		16			7	12	70	464	80		633		504	54			30	588	11,146
	1989	47	1,664	5,834	345	145	8,035	24		24			-	23	124	192	10		349	+	612	24			52	688	9,096
	1990	65	1,945	3,496	287	193	5,986	1		1	-	-	12	16	207	139	21		395	+	538	27			23	588	6,970
	1991	56	1,329	4,045	320	131	5,881	7		7	-	-	-	81	173	290	32		576	+	663	41			12	716	7,180
	1992	71	1,204	4,212	137	95	5,719	53		53	-	-	-	11	163	220	24		418	1	459	37			25	522	6,712
	1993	27	828	5,200	308	373	6,736	568		568	-	-	3	7	132	226	0		368	1	471	67			11	550	8,222
	1994	73	1,443	4,196	218	92	6,022	556		556	-	-	4	5	176	138	11		334	+	326	35			17	378	7,290
	1995	58	970	5,337	139	86	6,590	307		307	-	-	4	5	67	110	6		192	+	543	52			14	609	7,698
	1996	39	703	3,791	25	88	4,646	429		429	-	-	3	8	30	188	6	-	235	1	418	53			20	492	5,802
	1997	34	813	3,523	61	68	4,499	1,017		1,017	-	-	3	9	33	351	0	-	396	1	352	37			21	411	6,323
	1998	34	1,092	3,761	123	147	5,157	635		635	-	-	6	16	19	304	0	-	345	+	378	26			23	427	6,564
	1999	28	1,126	3,163	66	90	4,473	433		433	-	-	5	8	26	197	0	-	236	1	364	27			12	404	5,546
	2000	41	1,062	2,269	165	91	3,628	536		536	-	-	6	18	29	315	1	-	369		200	15			10	225	4,758
	2001	51	1,077	2,322	150	36	3,636	253		253	-	-	5	16	30	250	0	-	301		351	44			+	395	4,585
	2002	80	1,264	1,565	182	28	3,119	187		187	-	-	8	15	6	477	0	-	506	+	226	30			+	256	4,068
	2003	41	1,064	1,858	135	27	3,125	205		205	-	-	5	27	11	922	+	-	965	+	538	29			+	567	4,862
	2004	23	1,339	1,701	33	34	3,130	75		75	-	-	5	10	7	522	2	-	546	2	376	31			+	409	4,160
	2005	28	1,214	1,231	35	35	2,543	136		136	-	-	9	9	5	783	9	-	815	+	511	20			+	531	4,025
	2006	30	1,190	1,162	33	32	2,447	55		55	-	-	-	30	117	741	+	-	888	+	611	21			+	632	4,022
	2007	21	970	1,171	20	38	2,220	46		46	-	-	-	29	141	301	0	-	471		276	13			+	289	3,026
	2008	26	1,302	1,009	43	28	2,408	29		29	-	-	-	43	168	270	2	-	483		427	14				441	3,361
	2009	17	821	809	34	39	1,720	22		22	-	-	-	46	92	262	0	-	400		258	10				268	2,410
	2010	20	913	1,061	26	36	2,056	18		18	-	-	-	42	131	253	3	-	429		165	19				184	2,687
	2011	30	347	1,306	32	26	1,741	48		48	-	-	1	27	95	343	4	0	470		362	16				378	2,637
	2012	52	597	1,336	33	34	2,052	33		33	-	-	+	34	114	443	1	+	592		282	11				293	2,970
	2013	39	336	1,496	19	34	1,924	65		65	-	-	+	24	197	372	+	+	593		398	8				406	2,988
	2014	35	173	1,155	0	22	1,385	82		82	-	-	+	5	64	140	+	1	210		426	12			1	439	2,116
	2015	37	287	1,441	37	27	1,829	44		44	-	-	1	4	28	228	+	-	261		493	11	0			504	2,638
	2016	25	308	1,056	41	32	1,462	61		61	-	-	-	3	21	214	+	1	239	+	390	12				402	2,164
	2017	28	241	977	23	28	1,297	81		81			+	7	41	389	-	-	437		406	6				413	2,227
	2018	28	278	886	52	36	1,280	70		70			+	5	27	330	-	+	362		465	12				477	2,188
	2019	29	241	1,140	61	39	1,510	48		48			-	8	26	373	-	+	407		545	13		1		559	2,524
	2020	37	155	1,097	32	25	1,346	60		60			+	9	25	353	-	-	387		380	10				390	2,182
	2021	31	95	687	60	17	890	66		66			+	9	23	270	+	-	302		279	8				287	1,545
	2022	27	138	516	71	23	775	66		66			+	30	32	298	3	+	363		321	9		1		331	1,535
	2023	33	77	613	37	17	777	90		90			1	23	32	483	2	+	541	+	222	6				228	1,636
	2024	33	77	909	37	17	1,073	63		63			1	23	32	597	2	-	655	+	626	16				642	2,433
Retain catch total		5,206	81,937	325,661	45,453	6,661	464,918	6,727		6,727	0	0	93	986	5,379	26,878	2,974	2	36,312	8	14,667	926	0	2	1,484	17,087	523,773
Release	2010																							1		1	1
	2011																							0		0	0
	2016								+	+								1	1								1
	2018							+	2	2								0	0								2
	2019																	1	1								1
	2020																	+	+								+
	2021							0		0																	0
	2022							0		0								+	+								+
	2023								0	0								+	+								+
	2024								+	+								1	1								1
Release total								+	2	2								3	3					1		1	6
Total		5,206	81,937	325,661	45,453	6,661	464,918	6,727	2	6,729	0	0	93	986	5,379	26,878	2,974	5	36,315	8	14,667	926	0	3	1,484	17,088	523,779

Table 23-5. Annual retained and released catches (metric tonnes, whole weight) of Pacific blue marlin (*Makaira nigricans*) by ISC members fishery in the North Pacific Ocean, north of the equator 1953-2024. "0" - Fishing effort was reported but no catch; "+" - Below 499kg catch; "-" - Unreported catch or catch information not available. * - Data from the most recent years are provisional.

		JPN		KOR			MEX		TWN							USA						
Catch disposition	Year	Longline	JPN Total	Longline	Purse seine	KOR Total	Sport	MEX Total	Set-net	Gill-net (not specified)	Harpoon	Longline	Others	Purse seine	TWN Total	Handline	Longline	Troll	Others	Purse seine	USA Total	Total
Retain	1953											-			-							0
	1954											-			-							0
	1955											-			-							0
	1956											-			-							0
	1957											-			-							0
	1958											887			887							887
	1959											781			781							781
	1960											948			948							948
	1961											703			703							703
	1962											628			628							628
	1963											691			691							691
	1964											934			934							934
	1965											1,016			1,016							1,016
	1966											957			957							957
	1967								-	-	317	898	167		1,382							1,382
	1968								-	30	649	1,433	120		2,232							2,232
	1969								-	58	465	1,232	103		1,858							1,858
	1970								1	21	604	1,385	70		2,081							2,081
	1971	5,461	5,461	0		0			-	13	473	1,331	118		1,935							7,396
	1972	6,772	6,772	0		0			-	14	490	1,205	50		1,759							8,531
	1973	6,453	6,453	0		0			-	12	275	1,650	265		2,202							8,655
	1974	6,545	6,545	0		0			1	6	355	2,144	146		2,652							9,197
	1975	4,374	4,374	0		0			-	3	421	2,638	207		3,269							7,643
	1976	5,018	5,018	0		0			-	9	511	1,315	162		1,997							7,015
	1977	4,780	4,780	0		0			-	11	391	1,183	110		1,695							6,475
	1978	5,900	5,900	0		0			1	15	364	1,633	7		2,020							7,920
	1979	5,949	5,949	0		0			3	19	362	1,646	164		2,194							8,143
	1980	5,613	5,613	155		155			-	35	444	1,185	170		1,834							7,602
	1981	5,518	5,518	0		0			-	35	313	1,840	69		2,257							7,775
	1982	6,051	6,051	351		351			-	7	306	2,139	120		2,572							8,974
	1983	4,796	4,796	82		82			-	26	741	2,122	127		3,016							7,894
	1984	6,248	6,248	155		155			-	22	960	1,789	111		2,882							9,285
	1985	5,164	5,164	45		45			9	11	747	1,187	43		1,997			145			145	7,351
	1986	5,922	5,922	86		86			4	90	839	1,723	107		2,763			220			220	8,991
	1987	5,370	5,370	89		89			12	9	973	4,627	1		5,622		51	261			312	11,393
	1988	5,054	5,054	133		133			20	8	658	2,822	589		4,097		102	266			368	9,652
	1989	5,117	5,117	50		50			10	14	640	2,691	9		3,364		356	326			682	9,213
	1990	4,116	4,116	44		44	-	-	3	24	427	1,749	143		2,346		378	295			673	7,179
	1991	4,094	4,094	75		75	-	-	4	50	338	2,288	152		2,832		297	346			643	7,644
	1992	3,721	3,721	60		60	-	-	25	40	432	3,786	110		4,393		347	260			607	8,781
	1993	4,600	4,600	36		36	-	-	44	41	400	4,135	82		4,702		339	311			650	9,988
	1994	5,832	5,832	2		2	-	-	12	30	206	3,007	7		3,262		362	298			660	9,756
	1995	5,907	5,907	0		0	-	-	15	36	895	3,896	5		4,847		570	315			885	11,639
	1996	3,260	3,260	10		10	-	-	13	35	270	3,337	10	-	3,665		467	409			876	7,811
	1997	3,697	3,697	145		145	-	-	5	48	194	3,683	-	-	3,930		487	378			865	8,637
	1998	3,438	3,438	335		335	-	-	8	59	91	3,624	1	-	3,783		395	242			637	8,193
	1999	3,751	3,751	164		164	-	-	21	32	135	3,417	-	-	3,605		357	293			650	8,170
	2000	3,606	3,606	96		96	-	-	24	40	186	4,131	2	-	4,383		314	235			549	8,634
	2001	3,594	3,594	166		166	-	-	18	57	229	4,733	-	-	5,037		399	291			690	9,487
	2002	2,976	2,976	152		152	-	-	13	63	32	4,448	6	-	4,562		264	225	1		490	8,180
	2003	2,836	2,836	158		158	-	-	20	107	52	7,685	4	-	7,868		363	210			573	11,435
	2004	2,977	2,977	226		226	-	-	14	93	36	6,672	9	-	6,824		283	188	5		476	10,503
	2005	2,506	2,506	303		303	-	-	8	65	48	7,630	16	-	7,767		337	187			524	11,100
	2006	2,414	2,414	217		217	-	-	12	15	30	5,729	-	-	5,786		409	160			569	8,986
	2007	2,016	2,016	120		120	-	-	3	17	20	5,117	+	-	5,157	1	262	127			390	7,683
	2008	2,096	2,096	219		219	-	-	10	16	15	5,477	1	-	5,519	1	349	198			548	8,382
	2009	1,840	1,840	224		224	-	-	9	12	9	4,638	1	-	4,669	1	360	15			376	7,109
	2010	2,457	2,457	257		257	-	-	5	27	15	4,959	1	-	5,007	2	306	148			456	8,177
	2011	2,343	2,343	684		684	-	-	3	18	17	4,625	9	2	4,674	2	373	199			574	8,275
	2012	2,019	2,019	587		587	-	-	6	13	16	4,097	+	12	4,144	2	298	141			441	7,191
	2013	2,179	2,179	963		963	-	-	2	6	16	4,607	+	9	4,640	3	406	137			546	8,328
	2014	1,903	1,903	801		801	-	-	4	11	124	4,861	5	7	5,012	4	535	159		1	699	8,415
	2015	1,622	1,622	531		531	-	-	3	14	177	4,306	+	3	4,503	3	631	196			830	7,486
	2016	1,581	1,581	1,116	+	1,116	-	-	3	23	158	3,398	3	4	3,589	2	562	163			728	7,014
	2017	1,414	1,414	1,453		1,453			-	7	138	3,977	+	6	4,128	3	687	155		3	849	7,844
	2018	1,271	1,271	1,336		1,336			-	11	108	3,501	-	10	3,630	3	664	166		2	835	7,072
	2019	1,245	1,245	981		981			-	22	99	3,359	+	4	3,484	5	901	176		3	1,085	6,795
	2020	834	834	673		673			2	30	115	1,955	+	-	2,102	3	618	111		3	735	4,344
	2021	801	801	678		678			2	30	107	2,098	1	1	2,239	3	444	128		2	576	4,294
	2022	816	816	520		520			2	80	128	2,246	9	+	2,465	3	517	117		1	638	4,439
	2023	986	986	868		868			2	37	75	2,298	1	2	2,415	3	392	94		2	490	4,759
	2024	1,446	1,446	997		997			2	37	75	3,345	1	3	3,463	4	712	132		2	850	6,756
Retain catch total		197,386	197,386	15,346	0	15,346	0	0	376	1,720	17,689	188,819	3,621	60	212,285	44	14,906	8,291	6	17	23,264	448,280
Release	2010																			1	1	1
	2011																			6	6	6
	2012																					
	2013													5	5							5
	2014																					
	2015				+	+								3	3							3
	2016				1	1								4	4							5
	2017													6	6							6
	2018			1	1	2								6	6							8
	2019			+		+								5	5							5
	2020			0		0								5	5							5
	2021			+		+								2	2							2
	2022			+	2	2								3	3							5
	2023			2	4	6								6	6							12
	2024			1	2	3								3	3							6
Release total				3	8	11								48	48					7	7	69
Total		197,386	197,386	15,349	8	15,357	0	0	376	1,720	17,689	188,819	3,621	108	212,333	44	14,906	8,291	6	24	23,271	448,349

Table 23-6. Retained and released catches (metric tonnes, whole weight) of blue sharks (*Prionace glauca*) by ISC members fishery in the North Pacific Ocean, north of the equator, 1985-2024. “0” - Fishing effort was reported but no catch; “+” - Below 499kg catch; “-“ - Unreported catch or catch information not available. * - Data from the most recent years are provisional.

Catch disposition	Year	JPN						KOR			MEX		TWN		USA							Total
		Set-net	Drift gill-net	Longline	Others	Not specified	JPN Total	Longline	Purse seine	KOR Total	Others	MEX Total	Longline	TWN Total	GND	LLD	LTR	LX	MIS	RG	USA Total	
Retain	1985														-						1	1
	1986														1						2	2
	1987														1						2	2
	1988														-						3	3
	1989																				6	6
	1990														-						20	20
	1991														-						1	1
	1992														1						2	2
	1993														-						0	0
	1994	15	582	35,437	18	4	36,055								-						12	36,067
	1995	12	487	34,246	10	4	34,759								-						5	34,764
	1996	11	478	28,054	18	4	28,564								-						0	28,564
	1997	14	603	29,582	7	6	30,212								-						0	30,212
	1998	12	616	29,863	5	4	30,499								-						1	30,500
	1999	12	834	32,816	6	2	33,671								-						0	33,671
	2000	12	736	30,497	10	1	31,257								-						0	31,257
	2001	12	737	32,380	9	2	33,140				-	-									0	33,140
	2002	11	768	28,465	13	1	29,258				-	-									0	29,258
	2003	11	1,350	25,631	12	2	27,006				-	-			-						0	27,006
	2004	12	1,202	23,910	7	3	25,135				-	-									0	25,135
	2005	+	1,321	24,307	13	2	25,643				2,721	2,721									0	28,364
	2006	5	1,204	21,363	2	2	22,576				2,765	2,765									0	25,341
	2007	5	1,323	18,655	19	2	20,004				3,324	3,324			9	8					17	23,345
	2008	+	944	15,374	14	1	16,333				4,355	4,355				7					7	20,695
	2009	+	1,208	15,889	4	1	17,102				4,423	4,423	11,541	11,541	1	9					11	33,077
	2010	4	962	16,504	9	1	17,481				4,469	4,469	7,670	7,670	-	7					7	29,627
	2011	12	771	8,566	1	3	9,353				3,719	3,719	13,117	13,117		13					13	26,202
	2012	2	1,085	10,463	3	3	11,555				4,108	4,108	10,606	10,606		16					16	26,285
	2013	6	1,103	11,860	4	2	12,976	75		75	4,494	4,494	6,321	6,321		1	0				1	23,867
	2014	4	1,060	12,361	0	2	13,426	100		100	5,502	5,502	8,151	8,151		0	-			-	0	27,179
	2015	21	697	10,500	+	2	11,220	53		53			8,551	8,551						-	0	19,824
	2016	26	1,832	9,507	1	2	11,367						8,563	8,563		0				0	0	19,930
	2017	4	1,366	9,795	+	1	11,166	8		8			11,121	11,121						+	1	22,296
	2018	40	1,236	9,111	0	1	10,388	4		4			11,761	11,761					3	+	3	22,156
	2019	35	1,149	8,448	0	1	9,633	4		4			18,165	18,165		+			14	+	15	27,816
	2020	59	1,119	7,072	1	2	8,253	0		0			15,566	15,566		0			3	0	3	23,822
	2021	25	1,484	7,774	1	1	9,285	2		2			8,835	8,835					2	0	2	18,124
	2022	27	1,063	6,901	0	1	7,992	0		0			12,871	12,871				0	3	0	3	20,866
	2023	31	1,058	8,484	1	1	9,576						22,306	22,306					2	0	3	31,884
	2024	31	1,058	8,484	1	1	9,576						26,462	26,462					1	1	2	36,039
Retain catch total		438	30,381	562,216	187	65	593,287	246		246	39880	39880	175,049	175,049	13	61	0	0	81	2	157	808,619
Release	2015							0		0												0
	2016							8		8												8
	2017							11		11												11
	2018							58		58												58
	2019							12		12												12
	2020							22		22												22
	2021							20		20												20
	2022							33		33												33
	2023							36	0	36												36
	2024							56	+	56												56
Release catch total								202	0	202												202
Total		409	29,319	555,322	187	64	585,302	447	0	447	39,880	39,880	175,049	175,049	13	61	0	0	81	2	157	808,816

Catch disposition	Year	JPN Drift gill-net	JPN Longline	JPN Others	JPN Total	KOR Longline	KOR Purse seine	KOR Total	MEX Others	MEX Total	TWN Longline	TWN Purse seine	TWN Total	USA Drift gill-net	USA Harpoon	USA Handline	USA Longline	USA Troll	USA Hook and line	USA Others	USA Purse-seine	USA Sport	USA Total	Total
Retain	1985								43	43				129	1					19			149	192
	1986								84	84				250	1					59			310	394
	1987								197	197				208	3					188			399	596
	1988								248	248				106	3					214			323	571
	1989								135	135				117	1					137			255	390
	1990								288	288				229	3					141			373	661
	1991								228	228				125	1					91			217	445
	1992								376	376				118	3					19			140	516
	1993								442	442				87	1					32			120	562
	1994	123	748	18	889				336	336				80	1					46			127	1,352
	1995	103	985	13	1,102				333	333				79	1					14			94	1,529
	1996	101	1,152	14	1,267				413	413				85	1					9			95	1,775
	1997	127	877	15	1,020				401	401				118	3					11			132	1,553
	1998	130	667	12	809				386	386				85	1					12			98	1,293
	1999	176	1,051	13	1,241				439	439				52	0					9			61	1,741
	2000	156	1,020	14	1,189				539	539				64	+					12			12	1,804
	2001	156	1,132	14	1,301				491	491				30	1					10			41	1,833
	2002	122	803	5	930				488	488				69	+					12			81	1,499
	2003	229	849	6	1,083				471	471				57	+					9			66	1,620
	2004	134	920	1	1,054				865	865				38	1					13			52	1,971
	2005	155	938	43	1,135				609	609				25	1					8			34	1,778
	2006	178	996	6	1,180				641	641				38	+					7			45	1,866
	2007	244	1,041	15	1,299				689	689				37	+					6			43	2,031
	2008	212	968	14	1,194	-		-	609	609				27	1					5			33	1,836
	2009	294	1,201	1	1,496	-		-	653	653	78		78	21	1			0		7			29	2,256
	2010	272	917	20	1,208	-		-	760	760	54		54	10	0					10			20	2,042
	2011	163	648	11	823	-		-	758	758	208		208	8	0					8			16	1,805
	2012	229	716	2	948	-		-	715	715	74		74	9	0			0		11			20	1,757
	2013	345	700	9	1,054	8		8	711	711	107		107	16	0					12			28	1,908
	2014	263	784	3	1,051	8		8	-	-	119		119	7	0		53	+	3	6		9	78	1,256
	2015	334	553	11	898						322		322	7			58		1	4			71	1,291
	2016	446	1,020	16	1,481	+		+			220		220	12	0	1	70	+	1	4		+	89	1,790
	2017	271	702	10	983	+		+			187		187	13	+		71	+	1	5			89	1,260
	2018	223	862	28	1,114	+		+			265		265	11			60	+	1	5			78	1,456
	2019	214	883	3	1,100	0		0			273		273	7			47	0	1	20		0	74	1,448
	2020	194	549	16	759	0		0			247		247	3	1		16		1	3			23	1,029
	2021	133	473	23	629	0		0			196		196	5	0		5		1	2			13	838
	2022	161	618	41	820	0		0			161		161	2			2		1	2			7	988
	2023	142	718	17	877						205		205	6			2		1	6			14	1,096
	2024	142	718	17	877						193		193	5			2		2	4			12	1,082
Retain catch total		6,031	25,491	413	31,934	16		16	13,348	13,348	2,909		2,909	2,395	30	1	386	1	13	1,191		9	4,025	52,173
Release	2011																				0		0	0
	2012											-	-											-
	2016					1		1																1
	2018					1		1																1
	2019					1		1																1
	2020					1		1																1
	2021					+		+																+
	2022					+		+																+
	2024					+	+	+																
Release catch tota						3		3				-	-								0		0	3
Total		6,050	25,391	437	31,877	20		20	13,348	13,348	2,918	0	2,918	2,390	30	1	384	1	11	1,187	0	9	4,013	52,176

Table 23-7. Retained and released catches (metric tonnes, whole weight) of shortfin mako sharks (*Isurus oxyrhinchus*) by ISC members fishery in the North Pacific Ocean, north of the equator, 1985-2024. “0” - Fishing effort was reported but no catch; “+” - Below 499kg catch; “-“ - Unreported catch or catch information not available. * - Data from the most recent years are provisional.