Development of Harvest Strategies in the WCPFC: History, Current Status, and Future Work

Abstract

This paper provides an overview of the development, current status, and future direction of harvest strategies within the Western and Central Pacific Fisheries Commission (WCPFC), tracing the evolution from reactive, stock-assessment–driven management to proactive, pre-agreed, and simulation-tested management procedures. Building on mandates under CMM 2014-06 and the updated CMM 2022-03, the Commission has advanced species-specific and mixed-fishery harvest strategy frameworks, supported by the Scientific Committee, the Northern Committee, the SPC, and the ISC.

The paper reviews progress across all major WCPO tuna stocks—including operational harvest strategy for skipjack and ready for operational for Pacific bluefin tuna and North Pacific albacore—and summarizes accelerated work for bigeye, yellowfin, and South Pacific albacore, including the nearly finalized South Pacific albacore MP and emerging cross-RFMO cooperation through the new IATTC–WCPFC Joint Working Group. Key components of the WCPFC Harvest Strategy Framework—management objectives, reference points, monitoring strategies, performance indicators, harvest control rules, and MSE—are described along with institutional structures shaping their development. Remaining priorities include refining mixed-fishery operating models, addressing data and monitoring challenges, integrating climate-related uncertainty, expanding capacity building, and preparing for updates to CMM 2022-03 as the Commission transitions from design to full implementation of robust, climate-resilient, science-based management procedures.

Development of Harvest Strategies in the WCPFC: History, Current Status, and Future Work

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Executive Summary

The Western and Central Pacific Fisheries Commission (WCPFC) has made substantial progress in modernising its fisheries management through the structured development and progressive implementation of harvest strategies across its key tuna and tuna-like stocks. Building on the foundational mandate established under CMM 2014-06 and strengthened through CMM 2022-03[3], the Commission has transitioned from predominantly reactive, stock-assessment-driven management toward a proactive framework based on pre-agreed objectives, reference points, monitoring strategies, and simulation-tested management procedures (MPs). This evolution has been supported by coordinated scientific advice from the Scientific Committee (SC), the Northern Committee (NC), the Pacific Community (SPC), and the International Scientific Committee (ISC), as well as iterative review and governance processes within the Commission.

Harvest strategies are now operational or near-operational for several stocks. Skipjack tuna has the most mature and fully operational harvest strategy, supported by an adopted MP and an established monitoring and review framework. Pacific bluefin tuna and North Pacific albacore are managed under highly specified harvest strategies with agreed rebuilding or fishing-intensity reference points, probabilistic harvest control rules, strengthened monitoring, and active Management Strategy Evaluation (MSE) programs. Significant progress has also been achieved for South Pacific albacore, marked by the Commission's adoption of a Management Procedure and the establishment of a new WCPFC–IATTC Joint Working Group in 2025, with work on allocation and implementation arrangements ongoing. Bigeye and yellowfin tuna remain under active development within a mixed-fishery framework, with candidate target reference points, preliminary MPs, and expanded MSE analyses under consideration.

During 2024–2025, harvest strategy work intensified, particularly for bigeye, yellowfin, and South Pacific albacore, reflecting the Commission's objective to expand MP adoption while improving coherence across mixed fisheries in the WCPO. These efforts have highlighted key technical and policy challenges, including the need to refine mixed-fishery operating models, to address uncertainties in fisheries operations outside direct MP control, to strengthen data and monitoring systems, and to reconcile competing objectives across species. At the same time, emerging work has begun to incorporate climate-related and environmental uncertainty into

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[3] CMM 2022-03 (*Conservation and Management Measure on Establishing a Harvest Strategy for key fisheries and stocks in the Western and Central Pacific Ocean*)

MSE frameworks, recognising the importance of robustness under non-stationary productivity and changing stock distributions.

Overall, the work described in this paper demonstrates that WCPFC has entered a critical transition phase—from exploratory design toward operational implementation of harvest strategies. While notable achievements have been made, continued progress will depend on completing remaining MPs, strengthening monitoring and compliance arrangements, enhancing inter-RFMO coordination, and prioritising scientific work to ensure institutional sustainability. Together, these efforts position the Commission to deliver stable, transparent, and climate-resilient fisheries management outcomes consistent with the Convention and evolving international best practice.

1. Background for the Need to Develop a WCPFC Harvest Strategy Framework

WCPFC manages the world's largest tuna fisheries in an exceptionally complex ecological and multi-jurisdictional environment. The provisional total tuna catch for 2024 in the Convention Area was estimated at 3,024,149 mt, a record for the time series dating back to 1970, representing 85% of the total Pacific Ocean tuna catch and 54% of the global tuna catch, where over 80% of the catch occurs in the waters of coastal states (Figures 1 and 2). Historically, however, annual negotiations for tuna fisheries management, guided by periodic stock assessments, have created delays in responding to stock status changes and contributed to regulatory uncertainty, underscoring the limitations of reactive management, in which management measures are decided or adjusted after stock assessments reveal changes. Increasing variability in stock conditions, evolving fishing pressures, and climate-related distributional shifts highlighted the limitations of traditional management approaches.

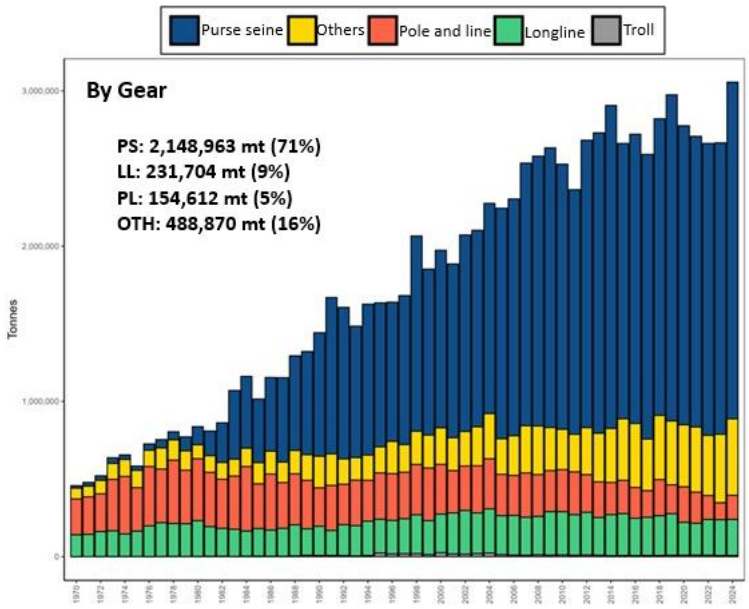

Figure 1. Catch (mt) of albacore, bigeye, skipjack, and yellowfin (combined) in the WCPFC–CA.

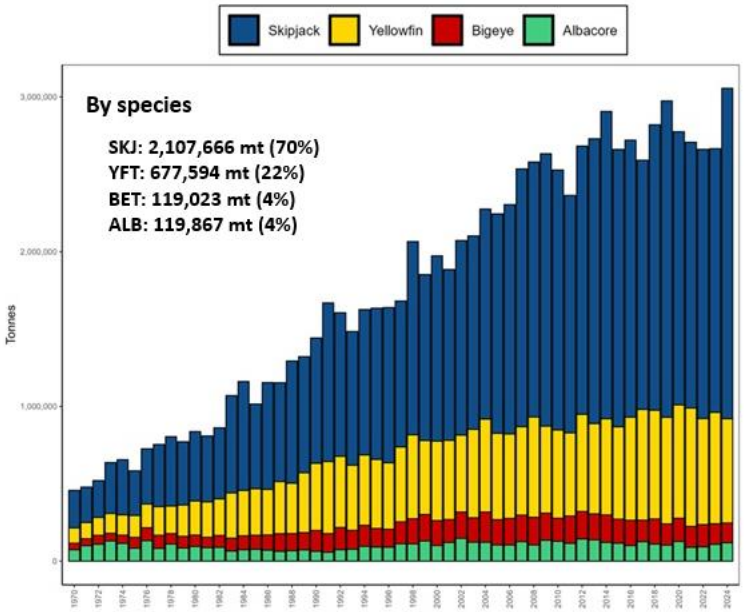

Figure 2. Catch (mt) of albacore, bigeye, skipjack, and yellowfin tuna (combined) in the WCPFC-CA, by longline, pole-and-line, purse seine, and other gear types.

Initial CMMs were developed for the key target tuna stocks to implement management measures based on stock-abundance estimates derived from developing stock assessments. The CMMs outlined requirements for data reporting, observer coverage, and fishing practices and were progressively adopted and revised for bigeye, yellowfin, skipjack, albacore, and Pacific bluefin

tuna, thereby improving responsiveness relative to ad hoc measures but still requiring frequent renegotiation and offering limited capacity to address emerging uncertainty.

Climate change adds complexity to this management context. Projected and observed changes in ocean temperature, stratification, oxygen levels, and productivity are expected to affect tuna distribution, migration patterns, growth, and recruitment in the WCPO. These shifts may alter the spatial overlap between tuna resources and fishing fleets, change relative stock productivity across sub-regions, and affect the reliability of historical reference points derived under past environmental conditions. As a result, management strategies that rely heavily on past conditions and infrequent stock assessments may become less robust, potentially increasing the risk of local or sub-regional depletion and complicating the sharing of benefits among WCPFC members.

Several RFMOs initiated substantial progress in developing and implementing harvest strategies, raising expectations that WCPFC will similarly modernize its fisheries management approach. The Commission's commitment to this transition was formalized in CMM 2014-06 and further reinforced by CMM 2022-03 (*CMM on Establishing a Harvest Strategy for key fisheries and stocks in the WCPO*), which together established clear mandates and timelines for developing harvest strategies across key WCPO tuna fisheries. By explicitly incorporating climate-informed operating models, uncertainty analyses, and pre-defined decision rules, harvest strategy frameworks provide transparent, predictable, and science-based pathways for management decisions that are better equipped to accommodate climate-driven variability and non-stationary stock dynamics. In doing so, they enhance long-term sustainability, reduce the need for repeated ad hoc negotiations, and promote greater regulatory stability and equitable benefit sharing for both coastal States and distant-water fishing fleets under changing ocean conditions.

2. Structure of Developing the WCPFC Harvest Strategy Framework

Institutional governance of harvest strategy development within WCPFC

The structure of the WCPFC harvest strategy framework reflects the Commission's institutional architecture and the allocation of scientific and management responsibilities among its subsidiary bodies. At the Commission level, WCPFC retains overall responsibility for managing all tunas and billfishes within the Convention Area. In contrast, the Northern Committee, as a subsidiary body of the Commission, is mandated to provide recommendations to the Commission on the formulation and implementation of CMMs for three northern stocks—North Pacific albacore, Pacific bluefin tuna, and North Pacific swordfish—occurring north of 20°N, in accordance with Article 11 of the WCPF Convention and Annex 1 of the WCPFC Rules of Procedure. The Scientific Committee provides scientific advice to the Commission and its subsidiary bodies, including stock assessments, evaluations of reference points, and reviews of proposed harvest control rules, while the Technical and Compliance Committee contributes to the broader management and compliance framework supporting implementation. Under this institutional arrangement, the Northern Committee leads the development of harvest strategies for northern stocks, the Scientific Committee synthesizes scientific inputs across all fisheries, and

the Commission ultimately adopts conservation and management measures (CMMs). This governance structure helps explain the uneven pace of harvest strategy development across species and regions, with northern stocks progressing through ISC-led processes, whereas tropical stocks are guided primarily by SPC analyses.

Institutionalized scientific support and analytical complexity in WCPFC harvest strategy development

Supporting this governance system is a complementary scientific architecture that underpins the development of harvest strategies within WCPFC. Scientific services are provided primarily by the Pacific Community (SPC) and the International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean (ISC), each of which is responsible for defined species groups and regions. SPC undertakes stock assessments and supports harvest strategy development for the tropical tunas—skipjack, bigeye, and yellowfin—as well as South Pacific albacore and billfishes and sharks in the South Pacfic Ocean, including Southwest Pacific swordfish, drawing on long-standing expertise in tropical fisheries, extensive observer and catch–effort datasets, and integrated, region-wide fisheries data systems. ISC plays a corresponding role for the three northern stocks, reflecting its mandate to coordinate and synthesize scientific information across multiple jurisdictions and among the members' scientific institutions. This division of scientific responsibility reflects historical mandates, differences in data availability and monitoring coverage, and region-specific biological and fishery characteristics. As a result, it has shaped both the sequencing and the relative pace of harvest strategy development across stocks. At the same time, emerging analytical requirements are increasing the complexity of harvest strategy development. These include integrated modelling frameworks for mixed-species fisheries, spatially structured operating models that account for regional differences in stock dynamics and fishing pressure, and the treatment of stocks managed across RFMO boundaries. Addressing these challenges requires close coordination and alignment not only between the scientific service providers, SPC and ISC, but also between WCPFC and IATTC, to ensure consistency, efficiency, and robustness as the harvest strategy framework continues to develop.

Core elements of the WCPFC harvest strategy framework

Within this institutional and scientific foundation, the WCPFC harvest strategy framework is built around six core components, as established in CMM 2022-03. Management objectives define the biological, economic, and social outcomes that fisheries aim to achieve. Reference points—target reference points (TRPs) and limit reference points (LRPs)—serve as benchmarks for evaluating stock performance relative to these objectives. Acceptable levels of risk specify the probability the Commission is willing to tolerate for breaching LRPs or deviating from TRPs, in line with the Convention's requirement that the risk of exceeding LRPs remains very low. Monitoring strategies identify the data streams required to track progress toward agreed management objectives, including progress of stock status relative to target and limit reference points, through observer coverage, size and catch sampling, tagging programmes, and effort-based indices. Harvest control rules translate indicators of stock status into pre-agreed management actions to maintain stocks at desired levels. Finally, Management Strategy Evaluation (MSE) provides a

simulation-based framework for testing the performance of proposed management procedures under uncertainty, enabling the Commission to identify robust and precautionary harvest strategies before implementation. Together, these six elements form the backbone of the WCPFC's approach to modern, evidence-based management.

Complex fishery dynamics shaping harvest strategy implementation

The design and implementation of the WCPFC harvest strategy framework take place within a fishery system characterized by pronounced biological, spatial, and operational complexity. WCPO fisheries are characterized by strong mixed-species interactions, particularly in purse seine fisheries that target skipjack tuna but also catch juvenile bigeye and yellowfin, as well as in longline fisheries that concurrently exploit multiple tuna and billfish species. Recent analyses, including the SC21 Project 128 connectivity study (SC21-SA-WP-13), demonstrate that tuna stocks exhibit substantial spatial connectivity across EEZs and high-seas areas through movement, mixing, and environmentally driven redistribution, challenging assumptions of spatially static stock dynamics. Fishing effort is similarly heterogeneous and mobile, shaped by fleet behavior, FAD-associated fishing, and regional differences in productivity and accessibility. These biological and spatial linkages complicate aligning management units with the underlying stock structure and amplify the effects of data limitations and uneven monitoring coverage. Transboundary governance arrangements—most notably the joint WCPFC–IATTC management of Pacific bluefin tuna—add an additional layer of institutional complexity. Together, these cross-cutting factors help explain both the historical sequencing and uneven pace of harvest strategy development across stocks, as well as the substantial analytical integration and institutional coordination still required as WCPFC advances toward fully specified and operational harvest strategies.

3. Current Status of Harvest Strategy Development by Species

3.1 Skipjack Tuna

Foundations and early development

Skipjack tuna represents the most advanced and operational harvest strategy within WCPFC, reflecting nearly a decade of incremental development under the harvest strategy framework first established by CMM 2014-06. Early milestones included the adoption of a target reference point (TRP) for skipjack in 2015 (CMM 2015-06), followed by progressive refinement of performance indicators[4] and extensive Management Strategy Evaluation (MSE) work undertaken throughout the late 2010s. These efforts laid the technical and institutional groundwork for transitioning from *ad hoc* management measures to a fully specified harvest strategy.

[4] Performance indicators include biomass relative to reference points, average expected catch, maintain acceptable CPUE (vulnerable biomass), catch and effort stability, and proximity of simulated $SB/SB_{F=0}$ to the average $SB/SB_{F=0}$ observed in 2018–21.

Adoption of the interim management procedure

This preparatory work culminated in the Commission's adoption of an interim Management Procedure (MP) in 2022 and updated in December 2025 (CMM 2025-03), marking the first fully specified harvest strategy adopted by WCPFC. The MP explicitly defined management objectives, reference points, scope of application, and core operational elements, including the harvest control rule (HCR), estimation method, data requirements, and monitoring strategy, provisions for exceptional and special circumstances, and the respective roles of the Commission, the Scientific Committee, and the scientific services provider (SPC). The MP was underpinned by MSE testing, ensuring its performance was evaluated across a range of plausible uncertainty scenarios before implementation.

Operational implementation and data robustness

Preparatory "dry-run" testing was conducted at SC18 to verify the operational readiness of the skipjack Management Procedure (MP), followed by confirmation at SC19 in 2023 that the first operational run was successfully completed. The three fishery categories accounting for the majority of skipjack catches are controlled under the skipjack MP: these are the purse seine fishery, the pole and line fishery, and the domestic fisheries operating in the waters of Indonesia and the Philippines. The skipjack MP manages the level of fishing for skipjack through a combination of catch and effort controls on these three fisheries. The output of the harvest control rule is a scalar that increases or decreases fishery-specific catch or effort relative to agreed baseline levels (purse seine 2012 effort, pole and line 2001-04 effort, and domestic Indonesia/Philippines catches in 2016-18).

Potential risks to the implementation of an effective MP for skipjack were identified early in the development process. These included the strong dependency of estimates of skipjack stock status on tag-release and recapture data and on CPUE estimates derived from the Japanese pole and line fishery (JPPL). Effort in the JPPL fishery has progressively declined in recent years, such that it no longer produces reliable indices of abundance over the full range of the stock. SC21 noted that simulation testing indicated the skipjack MP remains robust to short-term degradation of JPPL data in equatorial regions, while recognising that sustained or long-term degradation of these data streams would increase risks to MP performance and therefore warrant continued monitoring and data quality review.

Operational implementation and management oversight

Operational implementation of the skipjack MP commenced in 2024, supported by full monitoring and reporting arrangements, and its early performance was reviewed through SC21, TCC21, and WCPFC22 in December 2025 (Attachment 21, WCPFC22 Outcomes). Across SC19–SC21, the Scientific Committee consistently advised that while the overall data inputs supporting the MP were broadly robust, persistent declines in the coverage and representativeness of tropical pole-and-line CPUE constituted a structural risk to the long-term reliability of the

estimation method. SC21 therefore supported the continued application of the interim MP for the next implementation cycle, while clearly indicating that resolving pole-and-line CPUE issues and developing alternative abundance indices would be required in advance of future MP re-evaluations under the formal MSE review cycle. The adopted HCR incorporates additional precautionary features, including a lower minimum depletion step of 0.40 and a reduced maximum catch scalar of 1.2, to strengthen performance under low-biomass scenarios and maintain consistency with Commission guidance on acceptable risk levels.

Forward planning for skipjack MP implementation

Building on this advice, the Commission agreed to a one-time extension of the MP application period from three to four years, such that the next MP run will occur in 2027 rather than 2026, with corresponding adjustments to subsequent management cycles. This extension was undertaken to better align the implementation of the skipjack MP with the scheduled review of the tropical tuna measure and the planned implementation of MPs for other tuna stocks. To give effect to this decision, the Commission adopted CMM 2025-03[5], which supersedes CMM 2022-01, and endorsed consolidated updates to the skipjack monitoring strategy (Attachment 21, WCPFC22 Outcomes), thereby formalizing procedures for performance review, data sufficiency assessment, exceptional circumstances, and evaluation of MSE assumptions. Recent scientific advice, including the 2025 stock assessment and TCC21 compliance reviews, indicates that depletion remains close to the recalibrated TRP[6] and that realized fishing activity in 2024 remained below MP-permitted levels. Looking ahead, priority areas include strengthening pole-and-line data streams, advancing evaluation of alternative tuning indices, improving alignment between MP outputs and implementation measures, and expanding operating model grids to test additional robustness scenarios, including climate-driven changes in productivity and spatial distribution. Together, these developments confirm skipjack tuna as the WCPFC stock with the most mature harvest strategy architecture, while underscoring the need for continued data improvement, institutional alignment, and analytical integration to sustain its long-term robustness.

3.2 South Pacific Albacore

Early scoping and analytical foundations

The development of a harvest strategy for South Pacific albacore progressed through a structured, multi-year process guided by the *South Pacific Albacore Roadmap Workplan* (Attachment 7, WCPFC22 Outcomes) and supported by extensive analytical work conducted by the Pacific

[5] CMM on a management procedure for WCPO skipjack tuna

[6] Under the current skipjack MP, the Target Reference Point is defined as the simple average (50/50 weighting) of the estimated mean spawning potential depletion over 2018–2021 ($SB_{2018–2021}/SB_{F=0}$) and the long-term median equilibrium depletion expected under agreed baseline fishing conditions (purse-seine effort at 2012 levels, pole-and-line effort at the 2001–04 average, and Region 5 domestic catches at the 2016–18 average), with $SB_{F=0}$ calculated using a rolling 10-year window (t1 = y–10 to t2 = y–1).

Community (SPC), the scientific services provider. Early efforts focused on clarifying management objectives, biological reference points, and acceptable levels of risk, underpinned by a comprehensive Management Strategy Evaluation (MSE) programme. This programme was built on expert consultation workshops and external MSE reviews[7], and systematically evaluated candidate harvest control rules (HCRs), performance indicators, and trade-offs among stock sustainability, CPUE outcomes, and economic performance under uncertainty. Particular attention was given to key sources of uncertainty—including recruitment, productivity, spatial structure, and fleet behaviour—ensuring that subsequent Commission deliberations were grounded in simulation-tested evidence rather than ad hoc negotiation.

Reference point development, recalibration, and recovery pathways

A central element of the analytical phase was the development and subsequent recalibration of reference points for South Pacific albacore to establish a clear, operational link between biological stock status and fishery performance objectives. The Commission initially agreed on an interim target reference point (iTRP) of 0.56 SB/SBF=0, reflecting a policy objective of achieving, on average, an 8% increase in CPUE for the southern longline fishery relative to 2013 levels. Subsequent Scientific Committee reviews, however, demonstrated that equivalent stock depletion levels could yield different CPUE outcomes across operating models, indicating that a single fixed TRP value did not consistently deliver the intended economic signal. In response, SPC undertook additional analyses to recalibrate the iTRP so that, when evaluated across the full MSE operating model grid, it would achieve the agreed CPUE improvement on average, thereby ensuring a consistent interpretation of the TRP across diverse biological and fishery conditions.

In parallel, SPC conducted trajectory analyses to examine alternative pathways for rebuilding the stock toward the recalibrated TRP under different levels of catch reduction and recovery timeframes. These analyses quantified trade-offs among stock recovery speed, short-term economic impacts, and long-term sustainability, and provided explicit information on the probability of achieving the TRP within agreed time horizons. Together, the recalibrated TRP and trajectory analyses formed a critical bridge between high-level management objectives and practical management procedure (MP) design, informing discussions on acceptable recovery timelines, the scale of catch adjustments, and the balance between biological precaution and socio-economic considerations.

Preparatory workshops and convergence on MP design

A major milestone was achieved through sustained intersessional engagement in 2025, and a structured programme of technical and policy-focused discussions, most notably through two virtual South Pacific Albacore Management Workshops (SPAMWS01 and SPAMWS02) convened under the South Pacific Albacore Roadmap Intersessional Working Group process. Established as a dedicated technical forum to advance the Commission's tasking from WCPFC21, these

[7] Refer to SC12-MI-WP-05, SC15-MI-IP-03, and SC16-MI-IP-11

workshops enabled focused evaluation and refinement of candidate management procedures, consideration of implementation arrangements, and coordination with related mixed-fishery and allocation discussions, including compatibility with the bigeye tuna management procedure. Through iterative review of SPC analyses, sensitivity testing, and performance trade-off assessments, the workshops facilitated convergence among CCMs on core MP design principles, interpretation of reference points, and management stability considerations. In particular, the process supported agreement on an interim target reference point (iTRP) defined as four percent (4%) below the estimated average spawning potential depletion over the 2017–2019 period, alongside a limit reference point (LRP) of 20% SB/SBF=0, while confirming that all shortlisted candidate MPs were capable of maintaining the stock above the LRP with a high probability.

The workshops clarified expectations regarding MP responsiveness, economic performance, and interannual stability by examining how candidate harvest control rules adjust catches or effort under a three-year management cycle with a two-year data lag, and by comparing the scale and frequency of management adjustments. They also addressed key implementation issues, including the spatial scope of the MP (south of the Equator versus south of 10°S), the treatment of external catches such as troll fisheries or specific EEZ slivers, and the associated monitoring, data, and performance indicator requirements. Throughout these discussions, participants emphasized the need to minimize administrative burden and ensure consistency with the special requirements of small island developing States (SIDS), helping translate technical MSE results into policy-relevant options in preparation for the adoption of the South Pacific Albacore management procedure and its implementing measure at WCPFC22.

Adoption of the Management Procedure and scope of application

Building on this analytical and consultative groundwork, the Commission adopted a Management Procedure for South Pacific albacore at WCPFC22 (CMM 2025-01), marking the first fully specified harvest strategy for this stock under the WCPFC framework. The adopted MP applies to longline and troll fisheries operating south of 10°S and is designed to control the majority of South Pacific albacore removals while avoiding conflicts with tropical tuna management. To address mixed-fishery interactions, data limitations, and operational constraints, the MP treats catches north of 10°S, in the Eastern Pacific Ocean, and in small portions of the EEZs of Tokelau and Tuvalu as external and fixed at recent historical levels. This spatial delineation reflects careful consideration of stock structure, fleet operations, and obligations under Article 30 (*Recognition of the special requirements of developing States*) of the Convention.

Harvest control rule and implementation arrangements

The adopted harvest control rule is catch-based and generates a single, overall annual Total Allowable Catch (TAC) for fisheries managed under the MP, primarily the southern longline fishery south of 10°S. The HCR operates on a three-year management cycle with a two-year data lag and incorporates explicit constraints on inter-period changes to limit the magnitude of TAC increases and decreases between management periods, thereby enhancing predictability and reducing interannual variability for fleets and coastal States. Evaluations presented during the

preparatory workshops demonstrated that these constraints improve economic stability while maintaining a high probability of keeping the stock above the LRP, including under sensitivity scenarios with higher assumed catches outside the MP's direct control.

While the MP CMM does not itself prescribe allocation, transferability, or reconciliation mechanisms, the Commission recognised that effective implementation of a TAC-based MP requires complementary arrangements addressing how the TAC is apportioned between EEZs and the high seas, how proportional shares are defined and adjusted, and how unused allocations may be transferred and reconciled. Particular attention was given to mitigating administrative complexity and avoiding disproportionate burden on SIDS, consistent with Article 30. Accordingly, WCPFC22 agreed to progress a dedicated implementing measure through the South Pacific Albacore Roadmap intersessional working group in 2026 and adopted Terms of Reference for a South Pacific albacore allocation workshop (Attachment 18, WCPFC22 Outcomes) to address distributional and equity considerations, particularly for coastal States and SIDS that are highly dependent on the fishery.

Inter-RFMO coordination, recent outcomes, and future work

Inter-RFMO coordination has been a defining feature of the development of South Pacific albacore harvest strategy. Recognising that the stock is also harvested in the Eastern Pacific Ocean, the Commission at WCPFC22 formally adopted Terms of Reference to establish a Joint Working Group between WCPFC and IATTC (Attachment 15, WCPFC22 Outcomes). The Joint Working Group is intended to promote compatible conservation and management measures across the stock's full geographic range, facilitate coordination of scientific analyses and data exchange, and reduce the risk that inconsistent measures across Convention Areas could undermine the effectiveness of the adopted harvest strategy.

Taken together, the adoption of the South Pacific albacore Management Procedure, the initiation of work on its implementing arrangements[8], and the establishment of the Joint Working Group position that South Pacific albacore is among the most advanced applications of harvest strategy management within the WCPFC framework. Recent Commission outcomes have underscored the interim nature of the adopted MP, the importance of continued monitoring and MSE-based review, and the need for flexibility and learning as implementation proceeds.

Future work on South Pacific albacore will focus on completing and operationalising the remaining elements of the harvest strategy framework, including developing and adopting allocation and implementation measures, and effectively commencing the WCPFC–IATTC Joint Working Group to support consistent management across the full stock range. Continued monitoring, periodic MSE-based review, and adaptive refinement of the management procedure

[8] Refer to WCPFC22-2025-DP02b (*Draft Conservation and Management Measure for Implementing the South Pacific Albacore Management Procedure*)

will be essential to ensure its robustness under evolving biological, fishery, and economic conditions, while maintaining consistency with the special requirements of small island developing States and the interim nature of the adopted MP.

3.3 Bigeye Tuna

Candidate target reference points

Development of a harvest strategy for bigeye tuna has progressed under the sequenced approach endorsed by the Commission, whereby agreement on a target reference point (TRP) for bigeye tuna precedes evaluation of the implications for yellowfin tuna in the mixed-fishery context. Consistent with this approach, the Commission at WCPFC21 identified three candidate TRPs for bigeye tuna—approximately 32%, 34%, and 36% SB/SBF=0—corresponding to the estimated stock depletion levels observed during the 2012–2015 period[9]. This policy direction was reaffirmed at WCPFC22 as the basis for continued Management Strategy Evaluation (MSE) testing and refinement of candidate management procedures (MPs).

Preliminary MSE evaluation of candidate MPs

In response to the Commission's guidance, preliminary MSE work was reviewed by the Scientific Committee at SC21, including evaluation of three candidate MPs for bigeye tuna—MP-HCR1, MP-HCR2, and MP-HCR3[10]. These MPs shared common data inputs, estimation methods, and meta-rule structures, differing only in their harvest control rule (HCR) shapes, which were tuned to achieve the mid, higher, and lower candidate TRPs based on the 2012–2015 depletion level. All three MPs incorporated ±10% inter-period change constraints and produced HCR outputs ranging from approximately 0.20 to 1.20, 1.35, and 1.07, relative to baseline tropical longline catches. The preliminary MSE results showed that all candidate MPs could achieve their respective TRPs while maintaining probabilities greater than 80% of remaining above the limit reference point, consistent with Commission-agreed risk tolerances. Differences among MPs were expressed primarily in the magnitude and interannual variability of catch adjustments applied to the tropical longline fishery, while overall stock conservation performance and the probability of remaining above the limit reference point were broadly similar across candidates. As the candidate TRPs do not pose a sustainability risk and all MPs met the Commission-agreed risk tolerance, scientific risk does not need to be a consideration in distinguishing among MPs under the specified TRPs.

[9] 433. The Commission agreed to provide the following guidance on candidate BET tuna target reference points that will be further evaluated through their incorporation into candidate management procedures for BET tuna. Candidate BET TRPs are specified as follows:

a) 2012-2015 average spawning biomass depletion (currently estimated at 34%$SB_{F=0}$)
b) 0.94 x 2012-2015 average spawning biomass depletion (currently estimated at 32%$SB_{F=0}$)
c) 1.06 x 2012-2015 average spawning biomass depletion (currently estimated at 36%$SB_{F=0}$)

[10] SC21-MI-WP-07 *Evaluation of candidate management procedures for bigeye tuna*

Initial MP scope and subsequent expansion of design options

Initial MP development focused on regulating catch in the tropical longline (TLL) fishery operating between 20°N and 10°S, which accounts for approximately 27% of total bigeye catch, while assuming that other fisheries—tropical purse seine, pole-and-line, southern longline, and archipelagic fisheries—were managed through other MPs or remained outside direct MP control. Both SC21 and WCPFC22 recognised that this partial-coverage approach introduced critical assumptions and potential distributional effects, particularly given the substantial contribution of purse seine and archipelagic fisheries to overall bigeye mortality. Accordingly, WCPFC22 provided explicit guidance to expand MP development to include control options for both tropical longline and tropical purse seine fisheries, and to evaluate alternative HCR designs that incorporate different combinations of catch or effort controls, FAD-closure assumptions, and inter-period change constraints, all calibrated to achieve the same TRP. The Commission further requested that a consistent set of performance indicators, including the probability of remaining above MSY, be applied across future evaluations to support transparent and comparable decision-making.

Key trade-offs, uncertainties, and next steps toward MP adoption

Updated MSE results, reviewed through WCPFC22, indicate that while candidate MPs can still meet the proposed TRPs with acceptable risk, significant trade-offs persist. In particular, under some TRP scenarios, the MSE projects an increase of approximately 10–50% in tropical longline catches, even as vulnerable biomass (a proxy for CPUE) declines in longline fishing areas, reflecting a concentration of adjustment burden on the longline fishery and raising concerns about economic performance and the equitable distribution of conservation costs across fisheries. Significant uncertainty also remains around future catch trajectories in archipelagic fisheries—especially in Indonesia, the Philippines, and Vietnam—where recent increases in catches from "other gears" and variability in reporting complicate projections. To address these uncertainties, WCPFC22 tasked SPC with expanding sensitivity analyses to cover a wide range of plausible catch and effort scenarios outside direct MP control, including scenarios reflecting recent national management measures. In line with the Commission's objective of adopting a bigeye MP by 2026, WCPFC22 further agreed to convene a series of dedicated *Bigeye Tuna Management Workshops* in 2026, under the leadership of the Scientific Committee Chair, to refine candidate MP designs, resolve outstanding policy choices—such as the target versus threshold interpretation of TRPs, treatment of FAD assumptions, and translation of MP outputs into management measures—and complete the remaining MSE work required for adoption.

3.4 Yellowfin Tuna

Yellowfin tuna management under the mixed-fishery harvest strategy framework

Yellowfin tuna is progressing through harvest strategy development under the WCPFC mixed-fishery framework, whereby management outcomes for yellowfin are determined by the management procedures (MPs) developed for skipjack, bigeye, and South Pacific albacore, rather

than by a species-specific MP. Approximately 70% of yellowfin catch occurs in fisheries that are directly managed or expected to be managed under these three MPs, while the remaining ~30% originates from domestic fisheries in Indonesia, the Philippines, and Vietnam, much of which occurs within archipelagic waters and remains outside the direct scope of WCPFC management procedures. Recent changes in fishing behavior following Indonesia's implementation of domestic yellowfin management measures, combined with persistent uncertainty and variability in catch and effort reporting from archipelagic fisheries, have highlighted the need for explicit sensitivity testing and the development of alternative catch scenarios for these fisheries within the yellowfin MSE framework.

Yellowfin management objectives under the sequenced approach

Under CMM 2025-02, yellowfin is currently managed to maintain the 2012–2015 average depletion level (SB/SBF=0), pending agreement on a formal target reference point (TRP), which the Commission has indicated in the *Harvest Strategy Workplan* should be established by 2026 (Attachment 24, WCPFC22 Outcomes). Analyses reviewed at WCPFC21 and subsequent meetings demonstrated that the management objectives for bigeye and yellowfin in the Tropical Tuna CMM (CMM 2025-02) cannot be simultaneously achieved under the mixed-fishery system. As a result, the Commission endorsed a sequenced approach in which the bigeye TRP is established first, followed by an evaluation of whether the resulting outcomes for yellowfin remain consistent with its management objectives. Early analyses indicate that bigeye TRPs within the Commission-agreed candidate range (approximately 32–36% SB/SBF=0) could result in long-term yellowfin biomass levels that are lower than those envisaged under the yellowfin objective in CMM 2025-02, suggesting that the Commission may need to take further decisions to reconcile these objectives or to specify acceptable ranges of yellowfin outcomes within the mixed-fishery management framework.

Advancing yellowfin MSE and managing cross-MP interactions

Technical development of the yellowfin MSE remains at an early but advancing stage. SC21 and WCPFC22 reviewed the initial modelling framework, candidate performance indicators, and data structures, and emphasized the importance of ensuring consistency with performance metrics used for bigeye and other tropical tunas, including MSY-related indicators[11]. Given that yellowfin outcomes are largely determined by fishing levels set through other MPs, the MSE must explicitly evaluate interactions among the skipjack, bigeye, and South Pacific albacore MPs, particularly in relation to purse seine FAD dynamics, changes in tropical longline catches, and alternative trajectories for archipelagic fisheries outside MP control. The Commission has supported the development of a broad range of sensitivity scenarios for unmanaged fisheries and emphasized that adverse outcomes for yellowfin could trigger exceptional circumstances provisions across multiple MPs. As the Commission moves toward adopting a bigeye MP in 2026, continued

[11] SC21-MI-WP-08 *Considerations for yellowfin tuna within the mixed fishery harvest strategy framework*
WCPFC22-2025-26 *WCPFC mixed fishery approach: Progress and key decision points*

strategic guidance will be required to ensure that yellowfin outcomes are adequately evaluated and managed within the evolving mixed-fishery harvest strategy framework.

3.5 North Pacific Albacore

Adopted harvest strategy framework and reference points

North Pacific albacore (NPALB) is one of the most mature stocks in the WCPFC's harvest strategy programme, supported by the adopted Commission-level harvest strategy (HS 2023-01) and a comprehensive exceptional circumstances protocol[12] developed by the ISC. The NPALB HS was established based on the 2021 ISC's MSE, which identified a preferred management procedure capable of meeting biomass, risk, and stability objectives across a wide range of operating-model uncertainties (refer to NC17-IP-06 *Report of the NPALB MSE*). Under the adopted HS, management is grounded in fishing-intensity-based reference points—TRP = F45% (F that results in the stock producing 45% of SPR), TRP = 30%$SSB_{current, F=0}$ (30% of the dynamic unfished SSB), and LRP = 14% $SSB_{current, F=0}$—with a requirement that the probability of breaching the LRP remain below 20% and that fishing intensity be kept at or below the TRP on average over a 10-year horizon. The HCR applies uniformly to all NPALB fisheries north of the equator, with specified behavioural rules to reduce fishing intensity when biomass falls below the threshold and to initiate rebuilding measures when below the LRP.

Exceptional circumstances protocol and early-warning mechanisms

A key element of NPALB's current maturity is the existence of a detailed, operational procedure for exceptional circumstances. The protocol establishes a structured, transparent set of quantitative indicators covering stock and fleet dynamics, biological and assessment assumptions, and implementation performance, designed to detect conditions that fall outside the range of scenarios tested in the MSE and may warrant suspension, modification, or re-evaluation of the harvest strategy. Exceptional circumstances may be triggered, for example, when benchmark stock assessment estimates of spawning stock biomass or fishing mortality relative to reference points fall outside the uncertainty bounds represented in the MSE operating models, when substantial deviations occur in key biological parameters or fleet behavior assumptions, or when assessments are judged unreliable. Implementation-related triggers include cases where realized catch or effort exceeds the levels implied by the harvest control rule by more than 20%[13]. These indicators are reviewed on a recurring three-year assessment cycle, providing an early-warning mechanism that helps ensure the harvest control rule remains scientifically defensible, robust to unanticipated change, and fit for purpose over time.

Monitoring, assessment cycle, and management implementation

In operational terms, the monitoring framework requires a full ISC benchmark stock assessment

[12] Attachment C, NC21 Summary Report
[13] WCPFC's Harvest Strategy 2023-01

every three years, at which time stock status relative to the target reference point (TRP), threshold reference point (ThRP), and limit reference point (LRP) is formally evaluated, and the exceptional circumstances criteria are applied. Based on this assessment, the Northern Committee considers whether the existing CMM 2019-03 for NPALB remains consistent with the harvest control rule (HCR) or requires adjustments to maintain fishing intensity at or below the HCR-specified level. The harvest strategy also incorporates explicit stability provisions, constraining changes in catch or effort between successive three-year management periods to ±20%, unless stock status indicators trigger more substantial rebuilding responses. In addition, compatibility with the IATTC's *Harvest Strategy for North Pacific Albacore*[14] is explicitly required, reflecting the trans-Pacific distribution of the stock and the reliance on a shared scientific and analytical foundation across RFMOs.

Overall maturity of the NPALB harvest strategy and future work

Overall, North Pacific albacore is one of the WCPFC stocks with a fully specified and operational harvest strategy in place, including agreed reference points, an adopted HCR, a defined monitoring and assessment schedule, and a detailed process for exceptional circumstances. As a result, NPALB is positioned among the most advanced stages of harvest strategy governance within the Commission. Remaining work focuses on scheduled harvest strategy reviews in 2030 and 2033, updating and reconditioning operating models as new biological, environmental, and fishery information becomes available, and assessing whether refinements to the management procedure or the incorporation of additional performance indicators—such as improved longline CPUE standardization or environmental indices—are warranted to ensure the harvest strategy remains robust and fit for purpose under evolving stock and fishery conditions.

3.6 Pacific Bluefin Tuna

Pre-harvest strategy period and stock collapse

Prior to adopting a formal harvest strategy, Pacific bluefin tuna (PBF) experienced one of the most severe stock declines among highly migratory tuna species, becoming emblematic of global overfishing concerns. By the early 2010s, spawning stock biomass (SSB) had declined to historically low levels—estimated at approximately 2–3% of unfished biomass—driven by sustained high fishing mortality across both the WCPO and EPO, strong targeting of juveniles, and the absence of binding, long-term rebuilding objectives. Management during this period relied largely on short-term and incremental catch and effort controls, which proved insufficient to halt or reverse the decline. These circumstances prompted Members of the WCPFC and IATTC, supported by advice from the ISC, to pursue a more structured, science-based rebuilding framework, marking the transition toward a formal harvest strategy approach.

Adoption of a two-stage rebuilding harvest strategy

[14] Resolution C-23-02 (*Amendment to Harvest Strategy for North Pacific Albacore*)

Pacific bluefin tuna now has one of the most fully specified harvest strategy frameworks among WCPFC stocks, centred on a formally adopted two-stage rebuilding plan and supported by an ongoing Management Strategy Evaluation (MSE) process. Under Harvest Strategy 2023-02, the stock is managed toward an initial rebuilding target defined as the median spawning stock biomass (SSB) estimated for the 1952–2014 period, to be achieved by 2024 with at least a 60% probability. This is followed by a second rebuilding target of 20% SSBF=0, to be reached by 2034 or within 10 years of attaining the initial target, whichever occurs earlier, also with at least a 60% probability.

Explicit recruitment-scenario rules govern the implementation of these rebuilding objectives. During the initial rebuilding phase, projections assume either low historical recruitment (1980–1989) or recent recruitment (resampled from the last 10 years), whichever is lower. During the second rebuilding phase, projections assume an average recruitment rate. The ISC was tasked with periodically reviewing the appropriateness of these assumptions and providing recommendations to the Northern Committee as new scientific information becomes available. Recent ISC stock assessment (SC20-SA-WP-08) indicates that spawning stock biomass has increased markedly over the past decade, with the initial rebuilding target exceeded earlier than anticipated and stock status assessed as consistent with having reached the second rebuilding target of 20% SSBF=0 by around 2021. This rebuilding performance reflects stronger-than-assumed recruitment, sustained reductions in juvenile fishing mortality, and the cumulative effectiveness of coordinated rebuilding measures implemented by WCPFC and IATTC. The latest measures are WCPFC's CMM 2024-01 and IATTC's RESOLUTION C-24-02.

Harvest control rules and coordinated implementation across RFMOs

The current harvest control rule (HCR) framework specifies probabilistic adjustment rules based on ISC stock projections. When the probability of achieving a rebuilding target falls below 60%, catch limits must be reduced or reallocated between small (<30 kg) and large (≥30 kg) size classes. Conversely, where probabilities exceed 75%, limited catch increases may be permitted, provided that minimum probability thresholds (≥70%) continue to be met. During the post-rebuilding transitional period, management measures must maintain spawning stock biomass at or above 20% SSB_0 with at least a 60% probability.

These HCRs are applied jointly across WCPFC (HS 2023-02) and IATTC (RESOLUTION C-23-01) fisheries, reflecting the fully shared, trans-Pacific nature of the stock and the need for consistent and coordinated management across RFMOs. This coordination has been central to ensuring that rebuilding gains achieved in one region are not undermined by fishing activity in the other.

Development of a long-term harvest strategy through MSE

In parallel with implementing the rebuilding harvest strategy, the ISC has advanced the development of a comprehensive management strategy evaluation (MSE) to support the transition to a fully specified long-term harvest strategy. The MSE evaluates candidate long-term

target and limit reference points, alternative HCR designs, and robustness to key uncertainties, including recruitment regimes, size-specific fishery selectivity, and the spatial distribution of fishing impacts between the WCPO and EPO.

Results from recent ISC Pacific bluefin tuna MSE analyses[15] demonstrate clear trade-offs among candidate harvest control rules (HCRs), with marked differences in performance across objectives, particularly in terms of interannual catch variability, rebuilding probability, and risk under low-recruitment scenarios. The analyses show that some HCR designs achieve higher yield stability at the cost of increased conservation risk, while others provide stronger rebuilding performance but result in greater short-term catch fluctuations, highlighting the need to balance biological precaution, economic stability, and equitable impacts across fisheries. ISC technical workshops held during 2023–2024[16] further emphasized the importance of improving the representation of small-fish selectivity, refining size-based fishery dynamics, and developing performance indicators that more effectively capture proportional impacts between WCPO and EPO fisheries. Collectively, these findings reinforce the need for continued cross-RFMO coordination and iterative MSE refinement as the Commission progresses toward finalizing a long-term harvest strategy for Pacific bluefin tuna.

Monitoring, control, and surveillance framework supporting the harvest strategy

Effective implementation of the PBF harvest strategy is supported by strengthened monitoring, control, and surveillance (MCS) arrangements. In this context, WCPFC adopted CMM 2024-02[17], which establishes a dedicated framework for monitoring, controlling, and surveillance of Pacific bluefin tuna fisheries and farming activities in the WCPO. This measure builds on the harvest strategy by enhancing reporting requirements, strengthening controls on domestic transfers and farming operations, and improving transparency across the supply chain.

CMM 2024-02 introduces requirements for vessel and farm registration, catch and landing documentation, and periodic review of national MCS implementation. It also provides for systematic consideration of MCS performance by the Technical and Compliance Committee and the Northern Committee, thereby linking compliance monitoring directly to the effectiveness of harvest strategy implementation. The measure further supports future development of a Pacific bluefin tuna catch documentation scheme, in coordination with IATTC, to reinforce traceability and ensure that management outcomes achieved through the harvest strategy are sustained in practice.

Ongoing review, responsiveness, and transition to long-term management

Monitoring remains intensive throughout both the rebuilding and transitional phases, with annual reviews of recruitment and fishery indicators and benchmark stock assessments

[15] SC21-MI-WP-09 *Report of the Pacific Bluefin Tuna Management Strategy Evaluation*
[16] PBF WG Workshops in March, November 2023; February, December 2024; and April 2025.
[17] IATTC adopted its RESOLUTION C-24-03 on MCS.

conducted every three years. The harvest strategy provides for management adjustments if recruitment declines sharply or if revised assessment assumptions materially affect depletion estimates, ensuring responsiveness to new scientific information.

Overall, Pacific bluefin tuna has reached a mature stage of harvest strategy development—characterized by agreed rebuilding reference points, risk-based harvest control rules, coordinated implementation across RFMOs, strengthened MCS arrangements, and an active MSE programme. This integrated framework positions the stock to transition toward a fully specified long-term management procedure once rebuilding is consolidated and long-term target and limit reference points are formally adopted.

3.7 Southwest Pacific Swordfish

Work toward a harvest strategy for Southwest Pacific swordfish formally commenced following the Commission's agreement at WCPFC21 to begin developing a Management Strategy Evaluation (MSE) framework for this stock, reflecting growing interest in extending harvest strategy–based management beyond tuna species. In response, Australia and the European Union, consistent with the SC20 Billfish Research Plan (SC20-SA-IP-09), developed a multi-year project proposal and an indicative workplan, which was reviewed and endorsed by SC21 and subsequently adopted by the Commission at WCPFC22 (Attachment 23, WCPFC22 Outcomes). The agreed workplan sets out a structured and sequential pathway for harvest strategy development from 2026 to 2030, aligned with the elements of CMM 2022-03 (*CMM on establishing a harvest strategy*), and identifies key milestones for both scientific and management decision-making. These include consideration of management objectives, candidate reference points, acceptable risk levels, performance indicators, monitoring requirements, and the evaluation of candidate management procedures through MSE, with the workplan intended to remain a living document that can be updated as scientific understanding and Commission priorities evolve.

The scientific foundation for this work was strengthened by the completion of the 2025 Southwest Pacific swordfish stock assessment (SC21-SA-WP-05), which transitioned the assessment framework from MULTIFAN-CL to Stock Synthesis and introduced a new two-sex benchmark model incorporating updated data through 2023. The assessment concluded that the stock is not overfished and is not experiencing overfishing, with median SB/SBMSY well above 1.0 and fishing mortality well below FMSY across the uncertainty grid. It also highlighted key uncertainties related to growth, population scale, and spatial structure that are directly relevant to MSE design. The Commission-adopted workplan explicitly builds on this assessment by scheduling the development of operating models, identification of baseline catches and candidate management controls for all fisheries catching Southwest Pacific swordfish, and evaluation of candidate harvest control rules applicable to both targeted longline fisheries and bycatch in tuna fisheries. Together, these developments mark the transition from preliminary scoping to an organized, Commission-endorsed process to deliver a fully specified management

procedure for Southwest Pacific swordfish, consistent with WCPFC's broader commitment to harvest strategy–based management across its key fisheries.

3.8 Overall progress of the WCPFC's Harvest Strategy Development

The matrix below shows the status of harvest strategy development for six WCPO tuna stocks and fisheries.

	Skipjack	**South Pacific Albacore**	**Bigeye**	**Yellowfin**	**Pacific Bluefin[18]**	**North Pacific Albacore[19]**
Management Objectives	TRP adopted	TRP adopted	Candidate TRPs identified	Noted	Candidate Objectives Adopted	Adopted
Management Procedure	MP adopted	MP adopted	Developing	Not available	Develped	Adopted
Performance Indicators	Identified				Candidate Indicators Adopted	Identified
Monitoring Strategy	Adopted	Adopted	Developing	Not available	Developing	Adopted[3]
Mixed fishery	Developing				Not relevant	Not relevant

4. Expected Future Activities to Develop the WCPFC Harvest Strategy Framework

[18] WCPFC20 adopted Harvest Strategy 2023-02 on Pacific Bluefin tuna (PBF) and currently developing a long-term harvest strategy for PBF

[19] WCPFC20 adopted Harvest Strategy 2023-01 for North Pacific Albacore, which includes management objectives, monitoring strategy, and the harvest control rule.

[3]Part of Harvest Strategy 2023-01 for North Pacific Albacore and NC21 agreed to use the exceptional circumstances criteria developed by ISC (Attachment E of NC21 summary report)

Transition from Design to Operational Implementation

As an increasing number of stocks move from development to formal adoption of harvest strategies, a primary future activity for the Commission will be the transition from design-focused work to a fully operational framework. This includes finalizing and adopting the remaining MPs, most notably for bigeye tuna, and completing associated implementation arrangements in which MP outputs are expressed as total allowable catches (TACs), effort limits, or scalars. A key focus will be ensuring that MP outputs are translated clearly, consistently, and transparently into implementing arrangements (CMMs), minimizing ambiguity in the operationalization of scientific advice. In line with recent Commission discussions, greater emphasis is expected on aligning MP outputs with existing management measures to reduce implementation complexity and avoid parallel or duplicative regulatory frameworks.

Refinement of Mixed-Fishery Operating Models

Continued refinement of mixed-fishery operating models remains a central scientific priority. Future work will focus on improving the representation of interactions among skipjack, bigeye, yellowfin, and South Pacific albacore fisheries, particularly across purse seine and longline fleets. This includes improved management of FAD-associated fishing, redistribution of effort across regions and gears, and fisheries operating outside direct MP control, such as in archipelagic waters. The Scientific Committee has emphasized that improving these models is essential to ensure that harvest strategies deliver coherent outcomes across stocks and avoid unintended shifts in conservation burden among fleets, gears, or Members.

Completion of Reference Points and Risk Settings

For stocks where harvest strategies remain under development, future activities will include finalizing target and limit reference points (TRPs and LRPs) and agreeing on acceptable risk levels consistent with CMM 2022-03. This remains particularly important for yellowfin tuna, where management objectives must be reconciled with outcomes driven by mixed-fishery MPs, and for bigeye tuna, where policy choices among candidate TRPs and rebuilding pathways remain unresolved. Clear articulation of acceptable risk levels, including probability-based performance requirements, will be critical for selecting among candidate harvest control rules (HCRs) and for ensuring that management procedures explicitly reflect agreed management trade-offs.

Expansion and Harmonisation of Monitoring Strategies

Strengthening and harmonizing monitoring strategies will remain a core component of harvest strategy implementation. Priorities include improving observer coverage, advancing electronic monitoring, and enhancing data quality for CPUE indices, size composition, and tagging programs. The Commission is expected to continue efforts to harmonize monitoring requirements across stocks and fisheries, building on recent work on scientific data reporting, observer data standards, and electronic monitoring minimum requirements. More precise criteria for data sufficiency,

exceptional circumstances, and review triggers will be important to support reliable MP operation and timely management responses.

Integration of Climate and Environmental Uncertainty

In line with SC guidance, future harvest strategy work will increasingly incorporate climate-related and environmental uncertainty into operating models and Management Strategy Evaluation (MSE) testing. This includes evaluating non-stationary productivity, environmentally driven changes in stock distribution, and potential impacts on fleet behavior. Expanding operating model grids to include plausible climate scenarios will help ensure that adopted MPs remain robust under changing ocean conditions and are consistent with emerging international expectations for climate-resilient fisheries management.

Strengthening Inter-RFMO Coordination

Given that several WCPO stocks span RFMO boundaries, continued and expanded coordination with the IATTC will remain a key future activity. This includes operationalizing the Joint Working Group for South Pacific albacore, ensuring continued compatibility of harvest strategies and rebuilding measures for Pacific bluefin tuna, and sharing data, assumptions, and MSE results where stocks or fisheries overlap. Effective inter-RFMO coordination is essential to avoid undermining conservation outcomes through inconsistent management approaches and to support coherent implementation of shared harvest strategies.

Capacity Building, Prioritisation, and Institutional Sustainability

Finally, future work will continue to emphasise capacity building and institutional sustainability. This includes supporting Members—particularly SIDS—in understanding and implementing harvest strategies, managing increased technical complexity, and engaging effectively in MSE and MP review processes. In parallel, the Commission has recognized the rapidly expanding workload of the Scientific Committee and the Science Service Provider. As a result, ongoing discussions on prioritizing scientific work are expected to continue to ensure that harvest strategy development and review remain achievable within available scientific and financial resources while maintaining the quality and credibility of scientific advice.