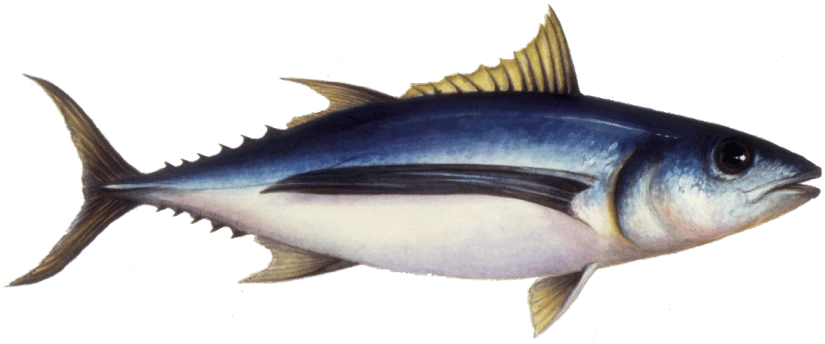
Environmental sustainability of wild-caught tuna and large pelagic species from the North, South, Western, and Central Pacific Ocean caught using handlines, longlines, purse seines, and trolling lines



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Species:	Albacore (*Thunnus alalunga*), Bigeye tuna (*Thunnus obesus*), Black marlin (*Istiompax indica*), Blue marlin (*Makaira nigricans*), Blue shark (*Prionace glauca*), Dolphinfish (*Coryphaena hippurus*), Opah (*Lampris guttatus*), Pacific bluefin tuna (*Thunnus orientalis*), Shortfin mako shark (*Isurus oxyrinchus*), Skipjack tuna (*Katsuwonus pelamis*), Southern bluefin tuna (*Thunnus maccoyii*), Striped marlin (*Kajikia audax*), Swordfish (*Xiphias gladius*), Yellowfin tuna (*Thunnus albacares*)
Location:	Western and Central Pacific, North Pacific, South Pacific
Gear:	Floating object purse seine (FAD), Unassociated purse seine (non-FAD), Drifting longlines, Hand-operated pole-and-lines, Trolling lines, Handlines and hand-operated pole-and-lines
Type:	Wild Caught
Author:	Seafood Watch
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Assessed using Seafood Watch Fisheries Standard v4

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About the Monterey Bay Aquarium Seafood Watch program

The mission of the Monterey Bay Aquarium is to inspire conservation of the ocean and enable a future where the ocean flourishes and people thrive in a just and equitable world. To do this, the Aquarium is focused on creating extraordinary experiences that inspire awe and wonder, championing science-based solutions, and connecting people across the planet to protect and restore the ocean. We know that healthy ocean ecosystems are critical to enabling life on Earth to exist, and that our very survival depends on them. As such, our conservation objectives are to mobilize climate action, improve the sustainability of global fisheries and aquaculture, reduce sources of plastic pollution, and restore and protect ocean wildlife and ecosystems.

The aquarium is focused on improving the sustainability of fisheries and aquaculture given the role seafood plays in providing essential nutrition for 3 billion people globally, and in supporting hundreds of millions of livelihoods. Approximately 180 million metric tons of wild and farmed seafood is harvested each year (excluding seaweeds). Unfortunately, not all current harvest practices are sustainable and poorly managed fisheries and aquaculture pose the greatest immediate threat to the health of the ocean and the economic survival and food security of billions of people.

The Seafood Watch program was started 25 years ago as a small exhibit in the Monterey Bay Aquarium highlighting better fishing practices and grew into one of the leading sources of information on seafood sustainability, harnessing the power of consumer choice to mobilize change. The program's comprehensive open-source information and public outreach raises awareness about global sustainability issues, identifies areas for improvement, recognizes and rewards best practices and empowers individuals and businesses to make informed decisions when purchasing seafood.

We define sustainable seafood as seafood from sources, whether fished or farmed, that can maintain or increase production without jeopardizing the structure and function of affected ecosystems, minimize harmful environmental impacts, assure good and fair working conditions, and support livelihoods and economic benefits throughout the entire supply chain. As one aspect of this vision, Seafood Watch has developed trusted, rigorous standards for assessing the environmental impacts of fishing and aquaculture practices worldwide. Built on a solid foundation of science and collaboration, our standards reflect our guiding principles for defining environmental sustainability in seafood.

Seafood Watch ratings

The Seafood Watch Standard for Fisheries is used to produce assessments for wild-capture fisheries resulting in a Seafood Watch rating of green, yellow, or red. Seafood Watch uses the assessment criteria to determine a final numerical score as well as numerical subscores and colors for each criterion. These scores are translated to a final Seafood Watch color rating according to the methodology described in the table below. The table also describes how Seafood Watch defines each of these categories. The narrative descriptions of each Seafood Watch rating, and the guiding principles listed below, compose the framework on which the criteria are based.

Green	Final Score >3.2, and either Criterion 1 or Criterion 3 (or both) is green, and no red criteria, and no critical scores	Wild-caught and farm-raised seafood rated green are environmentally sustainable, well managed and caught or farmed in ways that cause little or no harm to habitats or other wildlife. These operations align with all of our guiding principles.
Yellow	Final score >2.2, and no more than one red criterion, and no critical scores, and does not meet the criteria for green (above)	Wild-caught and farm-raised seafood rated yellow cannot be considered fully environmentally sustainable at this time. They align with most of our guiding principles, but there is either one conservation concern needing substantial improvement, or there is significant uncertainty associated with the impacts of the fishery or aquaculture operations.
Red	Final Score ≤2.2, or two or more red criteria, or one or more critical scores.	Wild-caught and farm-raised seafood rated red are caught or farmed in ways that have a high risk of causing significant harm to the environment. They do not align with our guiding principles and are considered environmentally unsustainable due to either a critical conservation concern, or multiple areas where improvement is needed.

Disclaimer: All Seafood Watch fishery assessments are reviewed for accuracy by external experts in ecology, fisheries science, and aquaculture. Scientific review does not constitute an endorsement of the Seafood Watch program or its ratings on the part of the reviewing scientists. Seafood Watch is solely responsible for the conclusions reached in this assessment.

Recommended Citation: Seafood Watch (2026) Environmental sustainability of wild-caught tuna and large pelagic species from the North, South, Western, and Central Pacific Ocean caught using handlines, longlines, purse seines, and trolling lines Monterey Bay Aquarium

Guiding principles

Monterey Bay Aquarium defines sustainable seafood as seafood from sources, whether fished or farmed, that can maintain or increase production without jeopardizing the structure and function of affected ecosystems, minimize harmful environmental impacts, assure good and fair working conditions, and support livelihoods and economic benefits throughout the entire supply chain.

As one aspect of this vision, Seafood Watch has developed trusted, rigorous standards for assessing the environmental impacts of fishing and aquaculture practices worldwide. Environmentally sustainable wild capture fisheries:

1. **Follow the principles of ecosystem-based fisheries management**

   The fishery is managed to ensure the integrity of the entire ecosystem, rather than solely focusing on maintenance of single species stock productivity. To the extent allowed by the current state of the science, ecological interactions affected by the fishery are understood and protected, and the structure and function of the ecosystem is maintained.

2. **Ensure all affected stocks[1] are healthy and abundant**

   Abundance, size, sex, age and genetic structure of the main species affected by the fishery (not limited to target species) is maintained at levels that do not impair recruitment or long-term productivity of the stocks or fulfillment of their role in the ecosystem and food web.

   Abundance of the main species affected by the fishery should be at, above, or fluctuating around levels that allow for the long-term production of maximum sustainable yield. Higher abundances are necessary in the case of forage species, in order to allow the species to fulfill its ecological role.

3. **Fish all affected stocks at sustainable levels**

   Fishing mortality for the main species affected by the fishery should be appropriate given current abundance and inherent resilience to fishing while accounting for scientific uncertainty, management uncertainty, and non-fishery impacts such as habitat degradation.

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[1]"Affected" stocks include all stocks affected by the fishery, no matter whether target or bycatch, or whether they are ultimately retained or discarded.

The cumulative fishing mortality experienced by affected species must be at or below the level that produces maximum sustainable yield for single-species fisheries on typical species that are at target levels.

Fishing mortality may need to be lower than the level that produces maximum sustainable yield in certain cases such as forage species, multispecies fisheries, highly vulnerable species, or fisheries with high uncertainty.

For species that are depleted below target levels, fishing mortality must be at or below a level that allows the species to recover to its target abundance.

4. **Minimize bycatch**

Seafood Watch defines bycatch as all fisheries-related mortality or injury other than the retained catch. Examples include discards, endangered or threatened species catch, pre-catch mortality and ghost fishing. All discards, including those released alive, are considered bycatch unless there is valid scientific evidence of high post-release survival and there is no documented evidence of negative impacts at the population level.

The fishery optimizes the utilization of marine and freshwater resources by minimizing post-harvest loss and by efficiently using marine and freshwater resources as bait.

5. **Have no more than a negligible impact on any threatened, endangered or protected species**

The fishery avoids catch of any threatened, endangered or protected (ETP) species. If any ETP species are inadvertently caught, the fishery ensures and can demonstrate that it has no more than a negligible impact on these populations.

6. **Are managed to sustain the long-term productivity of all affected species**

Management should be appropriate for the inherent resilience of affected marine and freshwater life and should incorporate data sufficient to assess the affected species and manage fishing mortality to ensure little risk of depletion. Measures should be implemented and enforced to ensure that fishery mortality does not threaten the long term productivity or ecological role of any species in the future.

The management strategy has a high chance of preventing declines in stock productivity by taking into account the level of uncertainty, other impacts on the stock, and the potential for increased pressure in the future.

The management strategy effectively prevents negative population impacts on bycatch species, particularly species of concern.

7. **Avoid negative impacts on the structure, function or associated biota of aquatic habitats where fishing occurs**

The fishery does not adversely affect the physical structure of the seafloor or associated biological communities.

If high-impact gears (e.g. trawls, dredges) are used, vulnerable seafloor habitats (e.g. corals, seamounts) are not fished, and potential damage to the seafloor is mitigated through substantial spatial protection, gear modifications and/or other highly effective methods.

8. **Maintain the trophic role of all aquatic life**

All stocks are maintained at levels that allow them to fulfill their ecological role and to maintain a functioning ecosystem and food web, as informed by the best available science.

9. **Do not result in harmful ecological changes such as reduction of dependent predator populations, trophic cascades, or phase shifts**

Fishing activities must not result in harmful changes such as depletion of dependent predators, trophic cascades, or phase shifts.

This may require fishing certain species (e.g., forage species) well below maximum sustainable yield and maintaining populations of these species well above the biomass that produces maximum sustainable yield.

10. **Ensure that any enhancement activities and fishing activities on enhanced stocks do not negatively affect the diversity, abundance, productivity, or genetic integrity of wild stocks**

Any enhancement activities are conducted at levels that do not negatively affect wild stocks by reducing diversity, abundance or genetic integrity.

Management of fisheries targeting enhanced stocks ensures that there are no negative impacts on the wild stocks, in line with the guiding principles described above, as a result of the fisheries.

Enhancement activities do not negatively affect the ecosystem through density dependent competition or any other means, as informed by the best available science.

Final ratings

Ratings Details	C 1 Target Species	C 2 Other Species	C 3 Management	C 4 Habitat	Rating
Albacore North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines	5.000	1.000	1.000	3.162	Red (1.994)
Albacore South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines	4.284	1.000	1.000	3.162	Red (1.918)
Albacore North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines	5.000	2.236	3.000	3.873	Green (3.376)
Albacore South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines	4.284	2.236	3.000	3.873	Green (3.248)
Albacore South Pacific Stock - Southwest Pacific Ocean - Hand-operated pole-and-lines - Pacific, Southwest	4.284	2.236	3.000	3.873	Green (3.248)
Albacore North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines	5.000	2.236	3.000	3.873	Green (3.376)
Albacore South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines	4.284	2.236	3.000	3.873	Green (3.248)
Albacore North Pacific Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central	5.000	1.000	3.000	3.873	Yellow (2.761)
Bigeye tuna Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest	5.000	1.000	1.000	3.162	Red (1.994)
Bigeye tuna Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines	5.000	1.000	1.000	3.162	Red (1.994)

Ratings Details	C 1 Target Species	C 2 Other Species	C 3 Management	C 4 Habitat	Rating
Bigeye tuna Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest	5.000	1.000	1.000	3.873	Red (2.098)
Bigeye tuna Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines	5.000	2.236	3.000	3.873	Green (3.376)
Bigeye tuna Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central	5.000	1.000	3.000	3.873	Yellow (2.761)
Black marlin Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest	1.732	1.000	1.000	3.162	Red (1.530)
Black marlin Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest	1.732	1.000	1.000	3.162	Red (1.530)
Blue marlin Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest	4.284	1.000	1.000	3.162	Red (1.918)
Blue marlin Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest	4.284	1.000	1.000	3.162	Red (1.918)
Blue shark North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest	4.284	1.000	1.000	3.162	Red (1.918)
Blue shark South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest	4.284	1.000	1.000	3.162	Red (1.918)

Ratings Details	C 1 Target Species	C 2 Other Species	C 3 Management	C 4 Habitat	Rating
Dolphinfish Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest	2.644	1.000	1.000	3.162	Red (1.700)
Dolphinfish Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest	2.644	1.000	1.000	3.162	Red (1.700)
Opah Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest	2.644	1.000	1.000	3.162	Red (1.700)
Opah Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest	2.644	1.000	1.000	3.162	Red (1.700)
Pacific bluefin tuna Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines	2.644	1.000	1.000	3.162	Red (1.700)
Pacific bluefin tuna Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines	2.644	2.236	3.000	3.873	Yellow (2.879)
Pacific bluefin tuna Northwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines	2.644	2.236	3.000	3.873	Yellow (2.879)
Pacific bluefin tuna Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central	2.644	1.000	3.000	3.873	Yellow (2.354)
Shortfin mako shark North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest	5.000	1.000	1.000	3.162	Red (1.994)
Shortfin mako shark South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest	1.732	1.000	1.000	3.162	Red (1.530)

Ratings Details	C 1 Target Species	C 2 Other Species	C 3 Management	C 4 Habitat	Rating
Skipjack tuna Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest	5.000	1.000	1.000	3.873	Red (2.098)
Skipjack tuna Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines	5.000	2.236	3.000	3.873	Green (3.376)
Skipjack tuna Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines	5.000	2.236	3.000	3.873	Green (3.376)
Skipjack tuna Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean - Hand-operated pole-and-lines - Pacific, Southwest	5.000	2.236	3.000	3.873	Green (3.376)
Skipjack tuna Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines	5.000	2.236	3.000	3.873	Green (3.376)
Skipjack tuna Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines	5.000	2.236	3.000	3.873	Green (3.376)
Skipjack tuna Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central	5.000	1.000	3.000	3.873	Yellow (2.761)
Southern bluefin tuna Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)	4.284	1.000	1.000	3.162	Red (1.918)
Striped marlin Western and Central North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest	1.000	1.000	1.000	3.162	Red (1.333)

Ratings Details	C 1 Target Species	C 2 Other Species	C 3 Management	C 4 Habitat	Rating
Striped marlin Southwestern Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest	3.413	1.000	1.000	3.162	Red (1.812)
Swordfish North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines	5.000	1.000	1.000	3.162	Red (1.994)
Swordfish South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines	4.284	1.000	1.000	3.162	Red (1.918)
Swordfish North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines	5.000	2.236	3.000	3.873	Green (3.376)
Swordfish South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines	4.284	2.236	3.000	3.873	Green (3.248)
Yellowfin tuna Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines	5.000	1.000	1.000	3.162	Red (1.994)
Yellowfin tuna Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines	5.000	1.000	1.000	3.162	Red (1.994)
Yellowfin tuna Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest	5.000	1.000	1.000	3.873	Red (2.098)
Yellowfin tuna Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines	5.000	2.236	3.000	3.873	Green (3.376)
Yellowfin tuna Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines	5.000	2.236	3.000	3.873	Green (3.376)

Ratings Details	C 1 Target Species	C 2 Other Species	C 3 Management	C 4 Habitat	Rating
Yellowfin tuna Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean - Hand-operated pole-and-lines - Pacific, Southwest	5.000	2.236	3.000	3.873	Green (3.376)
Yellowfin tuna Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines	5.000	2.236	3.000	3.873	Green (3.376)
Yellowfin tuna Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines	5.000	2.236	3.000	3.873	Green (3.376)
Yellowfin tuna Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central	5.000	1.000	3.000	3.873	Yellow (2.761)

Abbreviations

Table 1:

Abbreviation	Description
WCPO	Western and Central Pacific Ocean
WCPFC	Western and Central Pacific Fisheries Commission
FAD	fish aggregating device
ISC	International Scientific Committee for Tuna and Tuna-Like Species in the North Pacific Ocean
FOB	floating object
RFMO	Regional Fisheries Management Organization
CCM	Members, Participating Territories, and Cooperating Non-Members
MSC	Marine Stewardship Council
FIP	Fishery Improvement Project
EEZ	Exclusive Economic Zone
IATTC	Inter-American Tropical Tuna Commission
CCSBT	Commission for the Conservation of Southern Bluefin Tuna
SBT	Southern bluefin tuna
WPO	Western Pacific Ocean
TRP	target reference point
LRP	limit reference point
MSY	maximum sustainable yield
PSA	productivity-susceptibility analysis
SSB	spawning stock biomass

IUCN	International Union for the Conservation of Nature
PBF	Pacific bluefin tuna
TRO	total reproductive output
ETP	endangered, threatened, or protected
SPC	The Pacific Community
FAO	Food and Agriculture Organization
UBM	unknown bycatch matrices
CMM	conservation and management measure
MP	management procedure
MSE	management strategy evaluation
TAC	total allowable catch
EM	electronic monitoring
VMS	vessel monitoring system
EBFM	ecosystem-based fisheries management

Summary

This report covers longline, purse seine (unassociated and FAD-set), handline, pole-and-line, and troll fisheries for tuna and large pelagic species in the Western Pacific, including the Western and Central Pacific Ocean (WCPO), Northwest, and Southwest Pacific. Ratings are produced for bigeye tuna (*Thunnus obesus*), yellowfin tuna (*Thunnus albacares*), swordfish (*Xiphias gladius*), albacore tuna (*Thunnus alalunga*), Pacific bluefin tuna (*Thunnus orientalis*), southern bluefin tuna (*Thunnus maccoyii*), skipjack tuna (*Katsuwonus pelamis*), blue shark (*Prionace glauca*), shortfin mako shark (*Isurus oxyrinchus*), blue marlin (*Makaira nigricans*), black marlin (*Istiompax indica*), striped marlin (*Kajikia audax*), opah (*Lampris guttatus*), and dolphinfish (*Coryphaena hippurus*). Southern bluefin ratings in this assessment are only produced for longlines, because purse seine catches of this species exclusively go to net pen operations and are outside the scope of this assessment.

North and South Pacific albacore, WCPO bigeye, Pacific blue marlin, North and South Pacific blue shark, North Pacific shortfin mako shark, WCPO skipjack, North and Southwest Pacific swordfish, and WCPO yellowfin tuna stocks are all generally healthy. Southern bluefin tuna is rebuilding within specified timeframes, and Pacific bluefin tuna recently reached its second rebuilding target. Both Southwest and Northwest striped marlin are likely overfished, though only the Southwest stock is likely undergoing overfishing. Black marlin, dolphinfish, opah, and South Pacific shortfin mako have unassessed stocks.

Based on Western and Central Pacific Fisheries Commission (WCPFC) data, drifting longlines have the highest bycatch rates and highest number of bycatch species, including sea turtles, seabirds, and marine mammals. Unassociated and fish aggregating device (FAD)-set purse seines also capture a number of species of concern (in lower quantities than longlines), including sea turtles, false killer whale, and hammerhead shark. Handline, pole-and-line, and troll fisheries are generally considered clean (low bycatch) fisheries; however, no observer programs for handlines, pole-and-lines, or trolls exist through WCPFC to confirm this, and bycatch in these fisheries may include finfish and sharks, based on external vulnerability studies.

The WCPFC manages bigeye, skipjack, and yellowfin tuna in the WCPO and albacore tuna in the South Pacific, while the WCPFC and Inter-American Tropical Tuna Commission (IATTC) manage swordfish, albacore, and Pacific bluefin tuna throughout the North Pacific Ocean in their respective convention areas. Marlin species with a single Pacific-wide stock (blue marlin) or a single stock in the North (striped marlin) are also comanaged by the IATTC and WCPFC. The Commission for the Conservation of Southern Bluefin Tuna (CCSBT) manages southern bluefin tuna throughout its range. The International Scientific Committee for Tuna and Tuna-Like Species in the North Pacific Ocean (ISC) provides stock assessments and management advice for North Pacific stocks (e.g., North Pacific albacore). Some reference points and harvest strategies exist for target tuna species, but nontarget species (other large pelagics such as neritic tunas) generally lack harvest control rules, and bycatch species typically lack catch limits. Observer programs exist for longlines and purse seines, but longline coverage is not enough to understand the full impact of these fisheries on bycatch species. Enforcement and compliance mechanisms are in place, but not all management measures have a consistent, 100% enforcement rate across all WCPFC members. Although management decisions and meetings are often transparent, not all science and management decision-making meetings are fully accessible to all stakeholders.

All longline and FAD-set purse seine ratings in this assessment are red, while trolling and handline ratings are all green aside from those for Pacific bluefin tuna, which are yellow. All unassociated purse seine ratings are also yellow.

Introduction

Scope of the analysis and ensuing rating

This report covers longline, purse seine (unassociated and fish aggregating device (FAD)-set), troll, handline, and pole-and-line fisheries for tuna and related large pelagics (large finfish, billfish, and sharks) in the Western and Central Pacific Ocean (WCPO). Ratings are produced for bigeye tuna (*Thunnus obesus*), yellowfin tuna (*Thunnus albacares*), swordfish (*Xiphias gladius*; NW and SW stocks), albacore tuna (*Thunnus alalunga*; N and S stocks), Pacific bluefin tuna (*Thunnus orientalis*), southern bluefin tuna (*Thunnus maccoyii*), skipjack tuna (*Katsuwonus pelamis*), blue shark (*Prionace glauca*; N and S stocks) , shortfin mako shark (*Isurus oxyrinchus*; N and S stocks), blue marlin (*Makaira nigricans*), black marlin (*Istiompax indica*), striped marlin (*Kajikia audax*; NW and SW stocks), opah (*Lampris guttatus*), and dolphinfish (*Coryphaena hippurus*).

Fisheries

Purse Seines

Purse seine ratings are produced for unassociated sets and FAD sets, the latter of which may include traditional FADs, logs, whales, and whale sharks, or any other object (thus, FADs in the WCPO are more akin to floating object [FOB] fisheries). Purse seines primarily operate in the WCPO and primarily target tropical tunas (yellowfin, bigeye, and skipjack), with unassociated purse seines in this area also targeting Pacific bluefin tuna. Ratings in these fisheries are provided for bigeye, Pacific bluefin (unassociated only), skipjack, and yellowfin. Members of the Western and Central Pacific Fisheries Commission (WCPFC, the regional fisheries management organization [RFMO] in this area) that operate purse seine fisheries include:

Unassociated sets: Ecuador, Indonesia, Japan, Kiribati, Marshall Islands, Papua New Guinea, Philippines, Taiwan, United States, Micronesia, South Korea, Cook Islands, China, Spain, Nauru, New Zealand, Solomon Islands, El Salvador, Tuvalu, Vanuatu, and Vietnam.

FAD sets: Likely the same countries as the preceding—WCPFC data do not differentiate between set types when disseminating catch data by purse seine set type (see the Commission's public domain aggregated catch data, which only includes a general "purse seine" gear type category for seine operations).

Longlines

Longlines operate on a broader geographic scale than purse seines, with ratings here separated between North and South. Longlines generally target tropical and nontropical tunas (e.g., albacore), billfish (e.g., swordfish), and other large pelagic finfish. Ratings in these fisheries are provided for albacore, bigeye, black marlin, blue marlin, blue shark, dolphinfish, opah, Pacific bluefin (NW only), shortfin mako shark, striped marlin, swordfish, and yellowfin. WCPFC members operating longline fisheries include:

NW: China, Japan, Taiwan, United States, Vanuatu, Vietnam, Marshall Islands, Palau, China, Micronesia, Kiribati, South Korea, and United States.

SW: Australia, China, Fiji, French Polynesia, New Zealand, Spain, Taiwan, Vanuatu, South Korea, Cook Islands, Indonesia, New Caledonia, Papua New Guinea, Solomon Islands, Tokelau, Tonga, Tuvalu, Wallis and Futuna, Samoa, Micronesia, Kiribati, United States, and Spain.

Others

Troll, pole-and-line, and handline fisheries generally target skipjack, yellowfin, and albacore, with some Japanese vessels also targeting Pacific bluefin tuna. Ratings in these fisheries are provided for Pacific bluefin (NW fisheries only), skipjack, yellowfin, albacore (SW only for trolls), and swordfish (handlines and pole-and-lines only). WCPFC members operating each of these gears include:

Trolls: Japan, United States (NW); Cook Islands, Fiji, New Zealand, Tokelau, Tuvalu, Vanuatu (SW), Wallis and Futuna, Tonga, and Nauru.

Handlines and pole-and-lines: Japan, Philippines, United States (NW), Indonesia (SW), Solomon Islands, and French Polynesia.

Pole-and-lines (SW): French Polynesia, Solomon Islands.

Note that the United States and Canada albacore troll fisheries, which operate primarily in the Northeast Pacific (NEPO) but also extend to the Northwest Pacific (NWPO), are assessed in a separate Seafood Watch assessment (EPO Tunas and Large Pelagics).

Species overview

Globally, longlines are the most common method used to capture swordfish, albacore, and bigeye tuna, and purse seines are the primary gear used to capture Pacific bluefin and yellowfin tuna. The Western and Central Pacific Fisheries Commission (WCPFC) manages swordfish, albacore, bigeye, skipjack, and yellowfin tuna in the Western and Central Pacific Ocean. The Inter-American Tropical Tuna Commission (IATTC) also manages swordfish, Pacific bluefin, and albacore tuna in the North and South (swordfish) Pacific Ocean. The Commission for the Conservation of Southern Bluefin Tuna (CCSBT) manages that species throughout its range.

Tuna

Albacore tuna is widely distributed in temperate and tropical waters in all oceans. There are six managed populations of albacore tuna: North Pacific Ocean, South Pacific Ocean, North Atlantic Ocean, South Atlantic Ocean, Indian Ocean, and Mediterranean Sea.

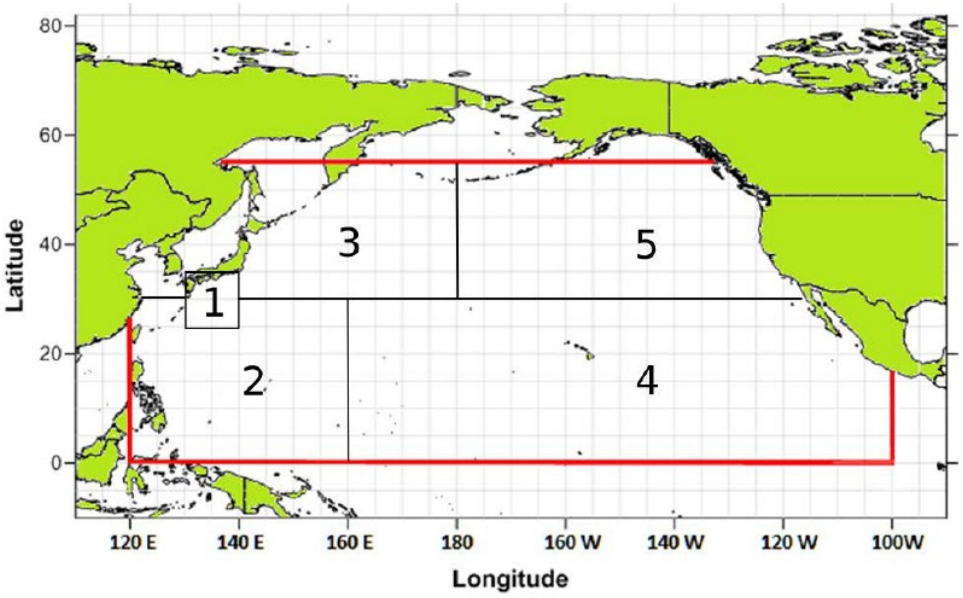


Figure 1: Spatial domain of the albacore stock in the North Pacific Ocean (ISC 2017).

Bigeye, skipjack, and yellowfin tuna are found in tropical and subtropical waters of the Pacific Ocean {McKechnie et al. 2017; Tremblay-Boyer et al. 2017; McKechnie et al. 2016}. There are four populations of bigeye and yellowfin tuna: the Western and Central Pacific Ocean, Eastern Pacific Ocean, Atlantic Ocean, and Indian Ocean. There are five populations of skipjack tuna: Western and Central Pacific Ocean, Eastern Pacific Ocean, Eastern Atlantic Ocean, Western Atlantic, and Indian Ocean. Yellowfin tuna reaches a maximum size of around 180 cm. Sexual maturity is reached between 78 and 158 cm, at around 2 to 3 years of age, and the species can live up to 9 years (Froese and Pauly 2024). Bigeye tuna reaches sexual maturity between 100 to 125 cm and at around 3 years of age. It can reach a maximum size of 180 cm and live up to 11 years (ibid). Skipjack tuna reaches sexual maturity at around 40 cm. It can live up to 12 years and attain a maximum size of 110 cm (ibid).

Pacific bluefin tuna is a single stock found throughout the North Pacific Ocean. Juvenile bluefin tuna can make trans-Pacific migrations. Bluefin tuna can live more than 20 years and reaches sexual maturity at around 3 years of age or 100 cm in length (ISC 2018). Spawning occurs between May and June and from late June to August in the northwestern Pacific Ocean (ISC 2018).

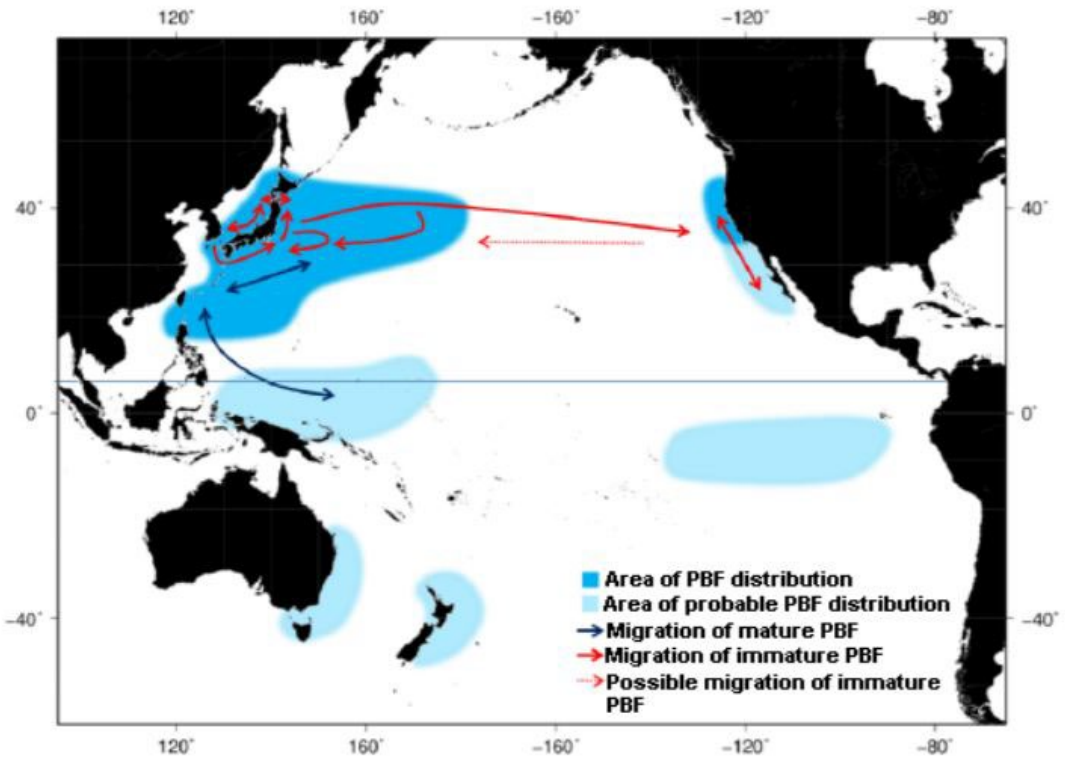


Figure 2: Distribution of Pacific bluefin tuna. Darker areas indicate core habitat (ISC 2018).

Southern bluefin tuna is only found in the Southern Hemisphere, primarily in the Indian, Atlantic, and Western Pacific Oceans, and is uncommonly found in the Eastern Pacific Ocean. This species migrates from the southern coast of Australia and the central Indian Ocean as a juvenile and remains in offshore waters as an adult. There is only one known spawning location: southeast of Java, Indonesia in the Indian Ocean (CCSBT 2017).

Swordfish

Swordfish is a widely distributed billfish species, found globally from lat. 50° N. to 50° S. and at all longitudes in the Pacific Ocean (Takeuchi et al. 2017). It was previously assessed as two populations in the North Pacific (Western and Central Pacific and the Eastern Pacific), but the most recent North Pacific assessment was performed for a single North Pacific stock. There are two populations in the South Pacific (Western and Eastern), two populations in the Atlantic (South and North), and a single population in both the Indian Ocean and Mediterranean Sea.

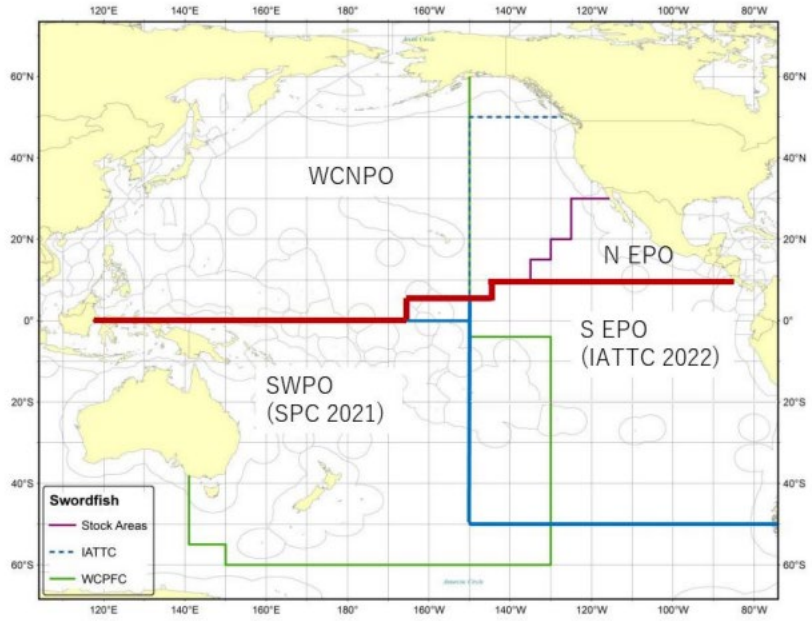


Figure 3: Stock boundaries for the 2023 North Pacific swordfish assessment. WCNPO and N EPO are treated as one stock in 2023. Source: (ISC 2023a).

Marlins

Black marlin lives in tropical and subtropical waters of the Indian and Pacific Oceans. It is found in surface waters and often close to land. Black marlin is highly migratory and an apex predator, feeding on fish, squid, and octopods, among others (Froese and Pauly 2024).

Blue marlin is a circumglobal species found in tropical and semitropical waters. It is highly migratory and also an apex predator that feeds on small tuna and squids, among other prey. There is believed to be a single population of blue marlin in the Pacific Ocean (WCPFC 2019c; ISC 2016).

Striped marlin is the most abundant and widely distributed Istiophorid billfish species. It is epipelagic, found across the 85° latitude in the Pacific Ocean, with the largest abundance in the Eastern and North Central Pacific Ocean. Striped marlin also feeds on fish, squid, and other prey (Davies et al. 2012; ISC 2019).

Sharks

Blue sharks are highly migratory, found throughout the world's oceans in epipelagic and mesopelagic waters. They are considered the most widely distributed shark species and most abundant, with abundance increasing with latitude. They are an apex predator, consuming a variety of fish and squid species (ISCSWG 2017; Takeuchi et al. 2016).

Shortfin mako shark also is highly migratory, inhabiting coastal and oceanic epipelagic waters worldwide. It is found from 20° S. to 40° N. in the Pacific Ocean. This species feeds on fish and cephalopods, among other prey (Froese and Pauly 2024).

Pelagic Finfish

Opah is found worldwide in bathypelagic tropical and temperate waters, most commonly between 100 m and 500 m in depth. Opah also is a top predator, feeding on fish and squid among other prey (Froese and Pauly 2024). Opah is most frequently caught in longline sets targeting albacore (Molony 2008).

Dolphinfish (*Coryphaena hippurus*; one of two species) has a global distribution and is a mid-trophic level predators, feeding primarily on other fishes and occasionally on crustaceans and squid (Froese and Pauly 2024). It is found worldwide in tropical and subtropical waters warmer than 20 °C (Palko et al. 1982). It is extremely fast-growing and reaches sexual maturity in the first year of life.

Production statistics

Tuna

Tuna catches in the Western Pacific Ocean are significantly higher than in other ocean basins, with WPO catches making up about 70% of the total global tuna catch (WCPFC 2024l).

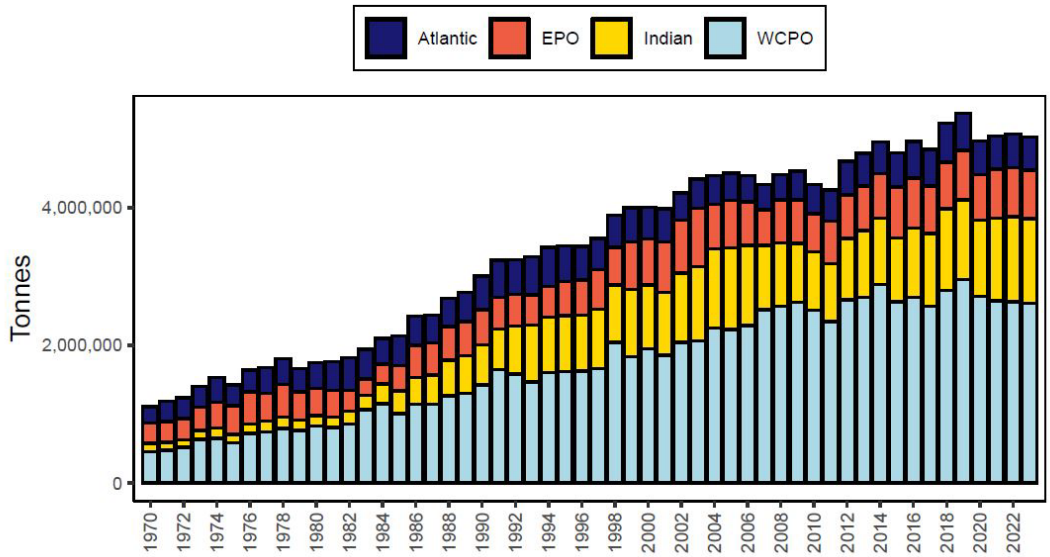


Figure 4: Total catches (MT) of tunas by ocean basin, 1970 to 2023. Source: (WCPFC 2024l).

Skipjack tuna is caught in the largest quantity in the WPO (63% of all tuna catch in 2023), followed by yellowfin (28%), bigeye (5%), and albacore (4%) (WCPFC 2024l). Purse seines are responsible for the majority of catches (70% of tuna catch in 2023). The total catch since 1970 increased fairly steadily into the 2010s but declined in the 2020s.

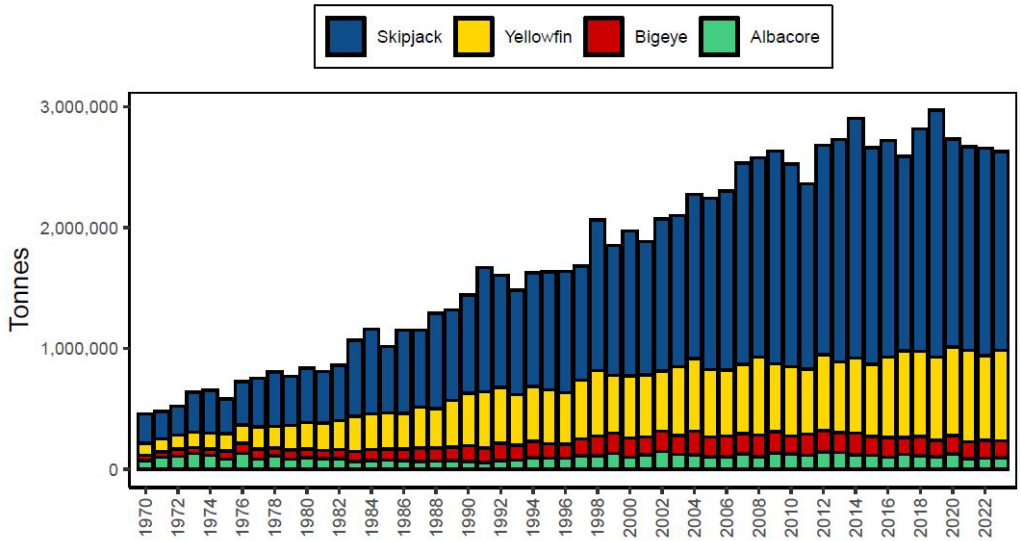


Figure 5: Total catches (MT) of primary target tunas (all gear types included) in the WCPFC statistical area, 1970 to 2023. Source: (WCPFC 2024l).

Across WCPFC members (CCMs), Indonesia is responsible for the largest share of tuna catches (≈19.5% of albacore, bigeye, yellowfin, and skipjack in 2023), followed by Korea and Japan (WCPFC 2024l). In 2023, the United States was responsible for under 2% of total tuna catches in the Western Pacific (ibid).

Purse seines catch the majority of Pacific bluefin tuna, followed by trolling line, longline, and set nets in recent years. Information on historical Pacific bluefin catches (total) is limited, although data since 1804 and the early 1900s are available from Japan and the United States, respectively. Catches were high from 1929 to 1940, peaking at 59,000 MT in 1935. Since 1952 (when catch reporting improved), the majority of Pacific bluefin tuna had been caught by Japan. Historically, the United States was the second-most important fishing nation for Pacific bluefin tuna. But since the late 1990s, Mexico has replaced the United States as the second-largest fishing nation for this species.

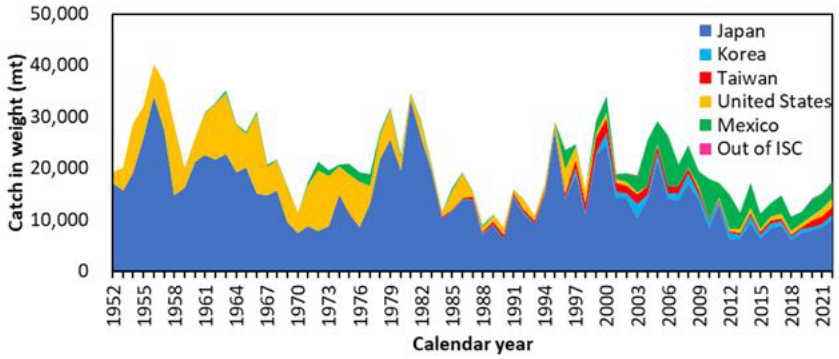


Figure 6: Annual catch (MT) of Pacific bluefin tuna by country, 1952 to 2022. Source: (ISC 2024).

Only a small proportion of southern bluefin tuna (16%) is caught in the Pacific Ocean. Total catches of southern bluefin tuna peaked in the 1960s at around 82,000 MT, with just under 80,000 MT coming from the longline fishery. Catches have declined significantly since then, with only around 10,000 MT caught in 2012, and around half of that was by the longline fleet. Catches in the Pacific Ocean have ranged from 800 to 19,000 MT since 1968, with an average catch of 5,500 MT annually {CCBST 2016}. In 2022, Australian commercial fisheries captured the highest number of southern bluefin tuna, followed by Japan (CCSBT 2023).

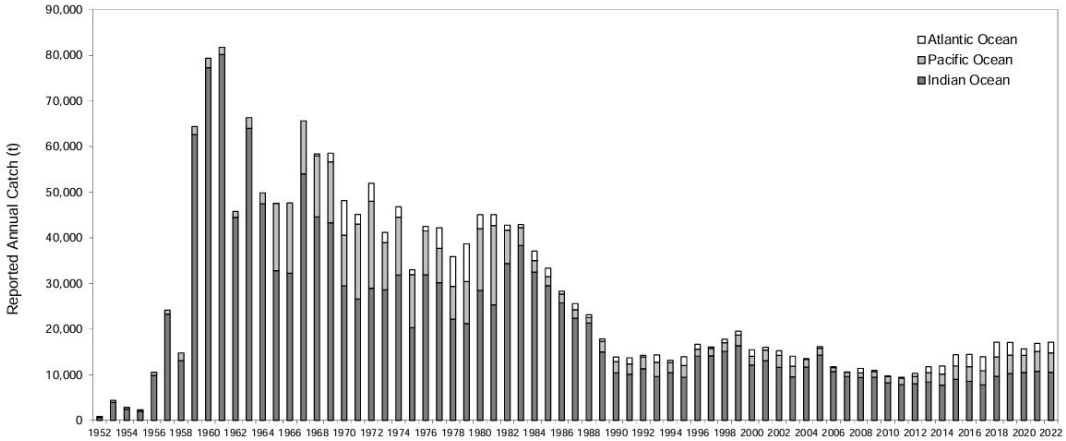


Figure 7: Total catch (MT) of southern bluefin by ocean basin, 1952 to 2022. Note that catch data from ~1986 to 2006 is thought to have been underreported. Source: (CCSBT 2023).

Billfish

Billfish catches, though smaller than tuna catches, are nonetheless another important component of WCPFC fisheries production. Swordfish and blue marlin make up the majority of billfish catches, followed by striped marlin and black marlin (WCPFC 2024l).

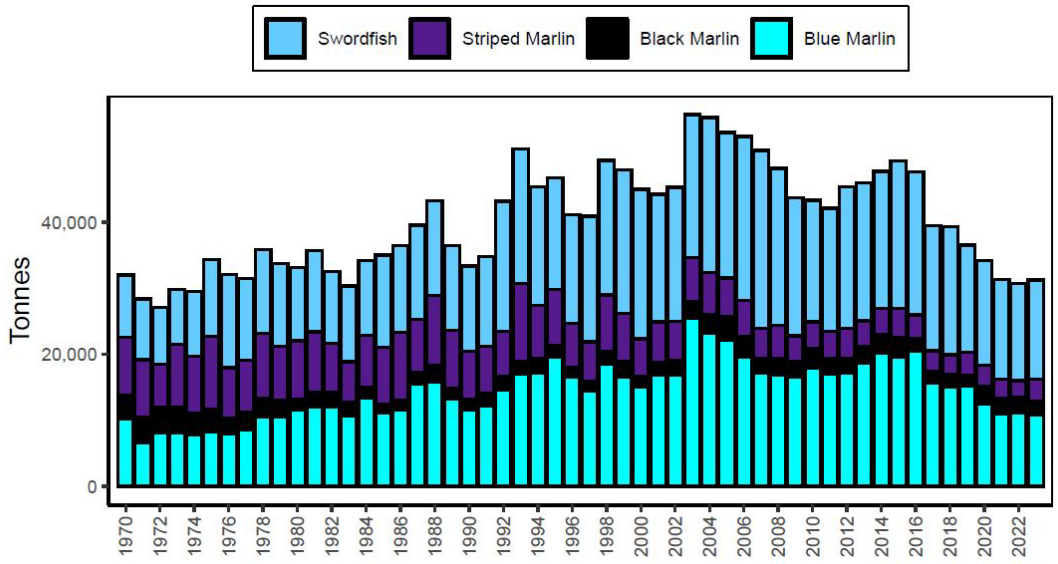


Figure 8: Total commercial catch (MT) of billfish (all gear types combined) in the WCPFC statistical area, 1970 to 2023. Source: (WCPFC 2024l).

Sharks

The WCPFC collects catch data on some shark species, including blue and mako sharks. There is underreporting of shark catches, so the values reported may not be accurate. In the North Pacific, catches of blue sharks peaked between 1976 and 1989 (113,000 MT in 1981). Catches have since declined. The majority of blue shark in both the North and South Pacific are caught by longlines (ISCSWG 2017).

Information on shortfin mako shark catches is more limited in the region. Like blue shark, shortfin mako is primarily caught in longlines but is reported as bycatch more often than blue shark.

Other Pelagics

Like sharks, the majority of wahoo, opah, and mahi are caught in longlines. Catch numbers for these species are much lower than for primary target species but have averaged between ≈1,100 and ≈2,700 MT in recent years (Peatman and Nicol 2023) (Peatman et al. 2024).

Importance to the US/North American market

Outside of Hawaii (covered in a separate Seafood Watch assessment), most U.S. catches of Pacific tuna occur in the Eastern Pacific. In general, the U.S. imports most of its tuna products. While some imports specify tuna species and/or ocean stock, many tuna imports are not specified beyond product form (in oil, etc). From 2019 to 2023, the majority of U.S. tuna imports were from Thailand, followed by Vietnam and Indonesia (NOAA Fisheries 2025). When species were noted in import data, albacore made up the largest share, followed by dolphinfish (mahi), yellowfin, and swordfish (ibid). Imported sharks and shark products tend to be dominated by EPO countries (e.g., Canada, Mexico, Nicaragua) (ibid). Import data for other species included in this assessment are not available through NOAA Fisheries' foreign trade database.

Common and market names

Table 2:

Swordfish	broadbilled swordfish, broadbill, espada, emperado, mekajiki (Hawaii)
Albacore tuna	germon, longfinned tuna, T. germo, tombo ahi (Hawaii)
Skipjack tuna	ocean bonito, lesser tuna, Aku (Hawaii)
Pacific Bluefin tuna	giant bluefin, northern bluefin, tunny, oriental tuna
Southern bluefin	southern tunn, tunny

Bigeye tuna Yellowfin tuna	Ahi (Hawaii)
Blue, black, striped marlin	Marlin
Opah	Moonfish
Blue shark	Shark
Shortfin mako	Mako
Mahi	dolphinfish, dorado

Primary product forms

Swordfish, albacore, bigeye, skipjack, and yellowfin tuna are sold in fresh and frozen forms, and the tuna may be canned. Albacore tuna is sold primarily in canned form but also in fresh and frozen form. Pacific bluefin and southern bluefin tuna are primarily sold in fresh and frozen forms. Sharks are mostly traded in fresh or frozen fillets.

Eco-certification information

Many fisheries in the Northwest, Western Central, and Southwest Pacific are certified as sustainable against the Marine Stewardship Council standards for sustainable seafood. The following list of MSC certifications is provided to acknowledge the potential overlap between MSC and Seafood Watch. MSC certification does not affect the Seafood Watch score per se and does not necessarily mean a fishery is recognized as environmentally sustainable or as a specific color under the Seafood Watch rating system. For a list of MSC-certified seafood products that Seafood Watch does recognize, see the Seafood Watch website.

- skipjack, yellowfin, and bigeye caught in the Western Central Pacific by purse seines operated as part of AGAC's four oceans Integral Purse Seine Tropical Tuna Fishery;
- swordfish, albacore, bigeye, and yellowfin caught in longlines in the Southwest Pacific operated as part of Australia's Eastern Tuna and Billfish Fishery;
- yellowfin, bigeye, and albacore caught in the Northwest, Western Central, and Southwest Pacific in pelagic longlines operated as part of the DFC/HEC WCPO longline fishery;
- albacore, bigeye, and yellowfin caught in the Western Central and Southwest Pacific by longlines operated as part of the Dongwon Pacific longline fishery;
- skipjack, yellowfin, and bigeye tuna caught in the Western Central Pacific with purse seines operated as part of the Dongwon Pacific purse seine fishery;
- albacore, bigeye, and yellowfin caught in the Western Central Pacific by longlines operated as part of the Fiji longline fishery;
- albacore, bigeye, and yellowfin caught in the Northwest, Western Central, and Southwest Pacific by longlines operated as part of the Fortuna Pacific longline fishery;

- yellowfin, swordfish, and albacore caught in the Western Central Pacific by longlines operated as part of the French Polynesia longline fishery;
- yellowfin, bigeye, and albacore caught in the Western Central Pacific by longlines operated as part of the Fukuichi WCPO longline fishery;
- skipjack and yellowfin caught in the Western Central Pacific by handlines and pole-and-lines operated as part of the Indonesian pole-and-line and handline archipelagic fishery;
- albacore and skipjack caught in the Northwest and Western Central Pacific by handlines and pole-and-lines operated as part of the Japanese pole-and-line fishery;
- skipjack and albacore caught in the Western Central Pacific by handlines and pole-and-lines operated as part of the Katsuo Ippon-zuri Gyogyo pole-and-line fishery;
- skipjack and albacore caught in the Western Central Pacific by handlines and pole-and-lines operated as part of the Kochi and Miyazaki Offshore pole-and-line fishery;
- yellowfin and skipjack caught in the Western Central Pacific by purse seines operated as part of the Kyowa-Meiho Japan purse seine fishery;
- skipjack, yellowfin, and bigeye caught in the Western Central Pacific by purse seines operated as part of the Nauru purse seine fishery;
- albacore caught the Southwest Pacific by trolling lines as part of New Zealand's albacore troll fishery;
- albacore, bigeye, and yellowfin caught in the Northwest Pacific by longlines operated as part of the Owasebussan Co. Ltd. North Pacific Longline Fishery;
- yellowfin caught in the Western Central Pacific by handlines and pole-and-lines operated as part of the Philippine small-scale yellowfin handline fishery;
- albacore, bigeye, swordfish, and yellowfin in the Northwest, Western Central, and Southwest Pacific by deep-set longlines as part of the Pingtairong Pacific tuna deep set longline fishery;
- yellowfin, bigeye, and skipjack caught in the Western Central Pacific by purse seines operated as part of the PNA Western and Central Pacific Tuna Purse Seine Fishery;
- yellowfin, skipjack, and bigeye caught in the Western Central Pacific by purse seines operated as part of the PNG Fishing Industry Association's purse seine tuna fishery;
- bigeye, yellowfin, and albacore caught in the Western Central Pacific by longlines operated as part of the Sajo WCPO and EPO tuna longline fishery;
- yellowfin and skipjack caught in the Western Central Pacific by purse seines as part of the SI WCPO tuna purse seine fishery;
- yellowfin, bigeye, and albacore caught in the Western Central Pacific by longlines operated as part of the Silla WCPO longline tuna fishery;
- skipjack, yellowfin, and bigeye caught in the Western Central Pacific by unassociated and FAD-set purse seines operated as part of the Silla WCPO purse seine tuna fishery;
- yellowfin and skipjack caught in the Western Central Pacific by handlines/pole-and-lines and purse seines operated as part of the Solomon Islands purse seine and pole-and-line fishery;
- bigeye and yellowfin caught in the Western Central Pacific by pelagic longlines operated as part of the SZLC, CSFC & FMLC FSM EEZ Longline fishery;

- yellowfin, bigeye, and albacore caught in the Southwest Pacific by longlines operated as part of the SZLC, CSFC & FMLC Cook Islands EEZ longline fishery;
- yellowfin, bigeye, and albacore caught in the Western Central Pacific by pelagic longlines operated as part of the SZLC, CSFC, FMLC & MIFV RMI EEZ longline fishery;
- skipjack and yellowfin caught in the Western Central Pacific by purse seines operated as part of the TAFCO FSM tuna purse seine fishery;
- albacore, yellowfin, bigeye, and skipjack caught in the Northwest, Western Central, and Southwest Pacific by longlines operated as part of the Tri Marine Pacific Ocean longline fishery;
- skipjack, yellowfin, and bigeye caught in the Western Central Pacific by purse seines operated as part of the Tri Marine Western and Central Pacific tuna fishery;
- yellowfin and skipjack caught in the Northwest and Western Central Pacific by purse seines operated as part of the TTKV WCPO tuna purse seine fishery;
- skipjack, yellowfin, and bigeye caught in the Western Central and Southwest Pacific by purse seines operated as part of the U.S. Pacific Tuna Group Purse Seine FSC and FAD Set Fishery; and
- yellowfin, bigeye, and skipjack caught in the Western Central Pacific by purse seines operated as part of the WPSTA Western and Central Pacific Purse Seine Fishery.

In addition, several fisheries in this area are engaged in Fishery Improvement Projects (FIPs). Engagement in an FIP does not affect the Seafood Watch score per se because we base our assessments on the current situation. The following fisheries are engaged in FIPs: Indonesia's Southeast Sulawesi yellowfin and skipjack tuna purse seine fishery in the Western Central Pacific; Taiwan Tuna Association's Pacific Ocean albacore tuna longline fishery in the Western Central Pacific; Cheng Hung Seafood Frozen Produce Co., Ltd.'s Pacific Ocean tuna longline fishery in the Northwest, Southwest, and Western Central Pacific; FCF Co., Ltd.'s Pacific Ocean tuna longline fishery in the Western Central and Southwest Pacific; Fue Shin's Pacific Ocean tuna longline fishery in the Northwest, Western Central, and Southwest Pacific; StarKist's Pacific Ocean tuna longline fishery in the Northwest, Western Central, and Southwest Pacific; TTLA's Pacific Ocean tuna longline in the EEZs of the Solomon Islands and on the high seas of the Pacific; and Vietnam's yellowfin tuna handline fishery in the Western Central Pacific.

Assessments

This section assesses the sustainability of the fishery(s) relative to the Seafood Watch Standard for Fisheries, available at www.seafoodwatch.org. The specific standard used is referenced on the title page of all Seafood Watch assessments.

Criterion 1: Impacts on the species under assessment

This criterion evaluates the impact of fishing mortality on the species, given its current abundance. When abundance is unknown, abundance is scored based on the species' inherent vulnerability, which is calculated using a Productivity-Susceptibility Analysis. The final Criterion 1 score is determined by taking the geometric mean of the abundance and fishing mortality scores. The Criterion 1 rating is determined as follows:

- Score >3.2 = **Green** or Low concern
- Score >2.2 and ≤3.2 = **Yellow** or Moderate concern
- Score ≤2.2 = **Red** or High concern

Rating is Critical if Factor 1.3 (Fishing mortality) is Critical.

Guiding principles

- *Ensure all affected stocks are healthy and abundant.*
- *Fish all affected stocks at sustainable level*

Criterion 1 summary

Albacore			
Region / Method	**Abundance**	**Fishing Mortality**	**Score**
North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines	3.670 Low Concern	5.000 Low Concern	**Green (4.284)**
North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines	3.670 Low Concern	5.000 Low Concern	**Green (4.284)**
South Pacific Stock - Southwest Pacific Ocean - Hand-operated pole-and-lines - Pacific, Southwest	3.670 Low Concern	5.000 Low Concern	**Green (4.284)**
North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines	3.670 Low Concern	5.000 Low Concern	**Green (4.284)**
North Pacific Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**

Bigeye tuna			
Region / Method	**Abundance**	**Fishing Mortality**	**Score**
Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**

Bigeye tuna			
Region / Method	**Abundance**	**Fishing Mortality**	**Score**
Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**

Black marlin			
Region / Method	**Abundance**	**Fishing Mortality**	**Score**
Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest	1.000 High Concern	3.000 Moderate Concern	**Red (1.732)**
Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest	1.000 High Concern	3.000 Moderate Concern	**Red (1.732)**

Blue marlin			
Region / Method	**Abundance**	**Fishing Mortality**	**Score**
Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest	3.670 Low Concern	5.000 Low Concern	**Green (4.284)**
Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest	3.670 Low Concern	5.000 Low Concern	**Green (4.284)**

Blue shark			
Region / Method	**Abundance**	**Fishing Mortality**	**Score**
North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest	3.670 Low Concern	5.000 Low Concern	**Green (4.284)**

Blue shark			
Region / Method	**Abundance**	**Fishing Mortality**	**Score**
South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest	3.670 Low Concern	5.000 Low Concern	**Green (4.284)**

Dolphinfish			
Region / Method	**Abundance**	**Fishing Mortality**	**Score**
Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest	2.330 Moderate Concern	3.000 Moderate Concern	**Yellow (2.644)**
Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest	2.330 Moderate Concern	3.000 Moderate Concern	**Yellow (2.644)**

Opah			
Region / Method	**Abundance**	**Fishing Mortality**	**Score**
Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest	2.330 Moderate Concern	3.000 Moderate Concern	**Yellow (2.644)**
Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest	2.330 Moderate Concern	3.000 Moderate Concern	**Yellow (2.644)**

Pacific bluefin tuna			
Region / Method	**Abundance**	**Fishing Mortality**	**Score**
Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines	2.330 Moderate Concern	3.000 Moderate Concern	**Yellow (2.644)**
Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines	2.330 Moderate Concern	3.000 Moderate Concern	**Yellow (2.644)**
Northwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines	2.330 Moderate Concern	3.000 Moderate Concern	**Yellow (2.644)**
Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central	2.330 Moderate Concern	3.000 Moderate Concern	**Yellow (2.644)**

Shortfin mako shark			
Region / Method	**Abundance**	**Fishing Mortality**	**Score**
North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest	1.000 High Concern	3.000 Moderate Concern	**Red (1.732)**

Skipjack tuna			
Region / Method	**Abundance**	**Fishing Mortality**	**Score**
Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean - Hand-operated pole-and-lines - Pacific, Southwest	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**

Southern bluefin tuna			
Region / Method	**Abundance**	**Fishing Mortality**	**Score**
Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)	3.670 Low Concern	5.000 Low Concern	**Green (4.284)**

Striped marlin			
Region / Method	**Abundance**	**Fishing Mortality**	**Score**
Western and Central North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest	1.000 High Concern	1.000 High Concern	**Red (1.000)**
Southwestern Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest	2.330 Moderate Concern	5.000 Low Concern	**Green (3.413)**

Swordfish			
Region / Method	**Abundance**	**Fishing Mortality**	**Score**
North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines	3.670 Low Concern	5.000 Low Concern	**Green (4.284)**
North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines	3.670 Low Concern	5.000 Low Concern	**Green (4.284)**

Yellowfin tuna			
Region / Method	**Abundance**	**Fishing Mortality**	**Score**
Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**

Yellowfin tuna			
Region / Method	**Abundance**	**Fishing Mortality**	**Score**
Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean - Hand-operated pole-and-lines - Pacific, Southwest	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**
Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central	5.000 Very Low Concern	5.000 Low Concern	**Green (5.000)**

Criterion 1 assessment

Scoring guidelines

Factor 1.1 - Abundance

Goal: Stock abundance and size structure of native species is maintained at a level that does not impair recruitment or productivity.

- *5 (Very low concern) — Strong evidence exists that the population is above an appropriate target abundance level (given the species' ecological role), or near virgin biomass.*
- *3.67 (Low concern) — Population may be below target abundance level, but is at least 75% of the target level, OR data-limited assessments suggest population is healthy and species is not highly vulnerable.*
- *2.33 (Moderate concern) — Population is not overfished but may be below 75% of the target abundance level, OR abundance is unknown and the species is not highly vulnerable.*
- *1 (High concern) — Population is considered overfished/depleted, a species of concern, threatened or endangered, OR abundance is unknown and species is highly vulnerable.*

Factor 1.2 - Fishing mortality

Goal: Fishing mortality is appropriate for current state of the stock.

- *5 (Low concern) — Probable (>50%) that fishing mortality from all sources is at or below a sustainable level, given the species ecological role, OR fishery does not target species and fishing mortality is low enough to not adversely affect its population.*
- *3 (Moderate concern) — Fishing mortality is fluctuating around sustainable levels, OR fishing mortality relative to a sustainable level is uncertain.*
- *1 (High concern) — Probable that fishing mortality from all source is above a sustainable level.*

Albacore *(Thunnus alalunga)*

1.1 Abundance

North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines

North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines

North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines

North Pacific Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central

Very low concern

Albacore is assessed as a single stock in the North Pacific. The most recent stock assessment was conducted in 2023 using biomass data through 2021 and a length-based, sex-structured modeling approach (WCPFC 2024b). The limit reference point (LRP) for this stock has been set at 14%$SSB_{current,\ F=0}$, or 20% of current biomass when there is no fishing mortality. No abundance-based target reference point (TRP) has been set for North Pacific albacore, but a threshold reference point of 30%$SSB_{current,\ F=0}$ is used instead (ibid). The SSB has been relatively stable since 2000, and SSB in 2021 was estimated to be above both the limit and threshold reference points ($SSB_{2021}/SSB_{current,\ F=0}$ = 0.54; thus, SSB_{2021} was approximately 1.8 times the threshold reference point) (ibid). WCPFC denotes the stock as not overfished, though the Scientific Committee does note some uncertainty in the 2018–21 biomass estimates. Based on a stock assessment using data < 5 years old with a finding that SSB is above management reference points, abundance is considered a “very low concern” (per lines 1.a-b in table 1.1.1 the Seafood Watch Standard).

South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines

South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines

South Pacific Stock - Southwest Pacific Ocean - Hand-operated pole-and-lines - Pacific, Southwest

South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines

Low concern

Albacore is assessed as a single stock in the South Pacific. The most recent stock assessment was conducted in 2024 using biomass data through 2022. The limit reference point (LRP) for this stock is a spawning depletion

ratio of 0.2, and the recent (2019–22) spawning depletion ratio was found to be above the limit reference point ($SB_{2019–22}/SB_{F=0}$ = 0.48), with a zero percent probability that the stock was below the LRP (Teears et al. 2024). There is no officially adopted target reference point (TRP) for the entire stock, but an interim TRP has been adopted. Recent biomass was just below this interim TRP (median $SB_{2019–22}/SB_{F=0}$: iTRP = 0.952) (ibid). Based on a stock assessment using data < 5 years old indicating that the stock is above the adopted LRP but between 75% and 100% of the iTRP, abundance is considered a "low concern" (per line 1.a in table 1.1.1 of the Seafood Watch Standard).

Supplementary information

The stock was also estimated to be above the maximum sustainable yield (MSY) level ($SB_{2019–22}/SB_{MSY}$ = 3.02) (Teears et al. 2024). But the official management interim target reference point is used for scoring purposes, because it is more precautionary and has been determined by managers to be appropriate for the stock.

1.2 Fishing mortality

North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines

North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines

North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines

North Pacific Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central

Low concern

WCPFC and IATTC use a target reference point of $F_{45\%SPR}$ for fishing mortality. The 2023 stock assessment of North Pacific albacore found that the 2018–20 (current) fishing mortality was below this target ($F_{\%SPR,\ 2018–20}$ = $F_{59\%SPR}$) (WCPFC 2024b). The range of possible fishing mortality values stayed below the target reference point (95% CI = $F_{72\%SPR}$ – $F_{46\%SPR}$) (ibid). Based on a stock assessment using data < 10 years old with a finding that fishing mortality is below fishing mortality reference points, fishing mortality is considered a "low concern" (per line 1 in table 1.2.1 of the Seafood Watch Standard).

South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines

South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines

South Pacific Stock - Southwest Pacific Ocean - Hand-operated pole-and-lines - Pacific, Southwest

South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines

Low concern

The latest stock assessment of South Pacific albacore found that recent fishing mortality was below the MSY level (median F_{recent}/F_{MSY} = 0.18), with a zero percent probability that fishing mortality was above MSY (Teears et al. 2024). Based on a stock assessment using data < 10 years old with a finding that fishing mortality is below a sustainable level, fishing mortality is considered a "low concern" (per line 1 in table 1.2.1 of the Seafood Watch Standard).

Bigeye tuna *(Thunnus obesus)*

1.1 Abundance

Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest

Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines

Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest

Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines

Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central

Very low concern

Bigeye tuna in the WCPO was most recently assessed in 2023 using biomass data up to 2021. According to the updated model, the median recent (2018–21) spawning biomass depletion ratio was above the limit reference point (a depletion ratio of 0.2), and the median recent and latest (2021) spawning biomasses were above the MSY level ($SB_{recent}/SB_{F=0}$ = 0.35 [80% CI = 0.31–0.40]; SB_{recent}/SB_{MSY} = 1.83 [80% CI = 1.32–2.38]; SB_{latest}/SB_{MSY} = 1.45 [80% CI = 0.86–1.97]) (WCPFC 2024b). There is no target reference point formally in place, but WCPFC has agreed to an interim target of maintaining the spawning biomass depletion ratio at or above the 2012–15 average

level (0.34) (ibid). The Commission has also noted that the spawning potential has been declining for several decades. Based on a stock assessment using data < 5 years old indicating that the stock is above the limit reference point, MSY level, and an interim target level, WCPO bigeye tuna abundance is considered a "very low concern" (per lines 1.a and b in table 1.1.1 of the Seafood Watch Standard).

1.2 Fishing mortality

Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest

Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines

Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest

Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines

Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central

Low concern

The 2023 WCPO bigeye stock assessment results indicate that recent (2017–20) median fishing mortality is below the MSY level (F_{recent}/F_{MSY} = 0.59 [80% CI = 0.46–0.74]), and none of the 54 models used in the assessment estimated that recent fishing mortality was above MSY (WCPFC 2024b). All models in the assessment indicated that the stock is not overfished or experiencing overfishing. Based on an assessment using data < 10 years old indicating that fishing mortality is below a sustainable level, fishing mortality is considered a "low concern" (per line 1 in table 1.2.1 of the Seafood Watch Standard).

Black marlin *(Istiompax indica)*

1.1 Abundance

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest

High concern

No assessment for black marlin has been conducted in the Pacific Ocean. The International Union for the Conservation of Nature (IUCN) has classified this species as "Data Deficient" with an unknown population trend (Collette et al 2022d). Black marlin has a high vulnerability to fishing (PSA = 3.21; see details in the Justification). Based on the PSA score, abundance is considered a "high concern" (per line 3.e in table 1.1.1 of the Seafood Watch Standard).

Supplementary information

PSA for black marlin in the Pacific (see the Seafood Watch Fisheries Standard Version 4 for methodology details).

Table 3:

Productivity Attribute	**High (score = 1)**	**Medium (score = 2)**	**Low (score = 3)**	**Score**	**Value; {Reference(s)}**
Average age at maturity (yrs)	< 5	5–15	> 15	1	2 years (females); 4–5 years (males) (Sun et al. 2015b)
Von Bertalanffy (Brody) Growth Coefficient (K)	> 0.25	0.15–0.25	< 0.15	1	0.47 (Froese and Pauly 2020)

Fecundity (eggs/yr)	> 20,000	100–20,000	< 100	1	11,000,000 (Sun et al. 2015b)
Average maximum size (cm)	< 100	100–300	> 300	3	400 cm (Sun et al. 2015a)
Average size at maturity (cm)	< 40	40–200	> 200	3	209 cm (Sun et al. 2015b)
Reproductive strategy	Broadcast spawner	Demersal egg layer or brooder	Live bearer	1	Broadcast spawner
Productivity score (mean of attribute scores)				**1.57**	

Table 4:

Susceptibility Attribute (default scores in bold)	**Low S (score = 1)**	**Medium S (score = 2)**	**High S (score = 3)**	**Score**	**Value/notes; (reference)**
Areal overlap (all fisheries)	> 90% of species concentration is unfished	70–90% of species concentration is unfished	**> 30% of the species concentration is fished**	3	Default (bolded) scores selected
Vertical overlap (all fisheries)	> 67% of species' depth range is unfished	33–66% of species' depth range is unfished	**< 33% of species' depth range is unfished**	3	
Seasonal Availability (all fisheries)	Fisheries overlap with species < 3 months/year	Fisheries overlap with species 3–6 months/year	**Fisheries overlap with species > 6 months/year**	3	

Selectivity of fishery (specific to fishery under assessment)	Species is not targeted AND is not likely to be captured by gear	**Species is targeted, or is incidentally encountered AND is not likely to escape the gear**	Species is targeted or is incidentally encountered AND combination of fishery attributes and species' biology increases its susceptibility to the gear	2	
Post-capture mortality (specific to fishery under assessment)	> 66% individuals survive post-capture	33–66% individuals survive post-capture	**Retained species, or > 66% do not survive post capture**	3	
Susceptibility score (mean of attribute scores)				**2.8**	

Table 5:

Productivity-Susceptibility Score ($V = v(P^2 + S^2)$)	**3.21**
Vulnerability Rating: < 2.64 = Low vulnerability, >= 2.64 and <= 3.18 = Medium vulnerability, > 3.18 = High vulnerability	High

1.2 Fishing mortality

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest

Moderate concern

There are no reference points or stock assessments for black marlin in the Pacific. Because fishing mortality relative to a sustainable level is unknown, fishing mortality is considered a "moderate concern" (per line 2.3 in table 1.2.1 of the Seafood Watch Standard).

Blue marlin *(Makaira nigricans)*

1.1 Abundance

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest

Low concern

Blue marlin is assessed as a single stock in the Pacific. The latest stock assessment was completed in 2021 using data through 2019, and found a SSB/SSBMSY ratio of 1.17 (ISC 2021). Based on a stock assessment using data < 10 years old with a finding that SSB > SSBMSY, abundance is considered a "low concern" (per line 1.b in table 1.1.1 of the Seafood Watch Standard).

1.2 Fishing mortality

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest

Low concern

Results from the base case assessment model indicate that the Pacific blue marlin stock is currently not experiencing overfishing. The current fishing mortality on the stock (average F, ages 1–10) was above FMSY levels from 2003 to 2006 but has been well below FMSY since 2017. Current fishing mortality rates (average ages 1–10, 2017–19) are 40% below FMSY. Although data are limited due to low observer coverage, the best available information suggests that blue marlin fishing mortality is below a sustainable level; therefore, fishing mortality is considered a "low concern" (per line 1 in table 1.2.1 of the Seafood Watch Standard).

Blue shark *(Prionace glauca)*

1.1 Abundance

North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest

Low concern

Blue shark is assessed as a single stock in the North Pacific. The most recent assessment was conducted in 2022 using data through 2020, and found female spawning biomass to be above the MSY level ($SSB_{current}/SSB_{MSY}$ = 1.17) (ISC 2022). Based on a stock assessment using data < 10 years old with a finding that SSB > SSB_{MSY}, abundance is considered a "low concern" (per line 1.b in table 1.2.1 of the Seafood Watch Standard).

South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest

Low concern

The latest stock assessment for the South Pacific blue shark was conducted in 2022, using biomass data up to 2020. While no official reference points have been adopted by WCPFC, conventional reference points (MSY and depletion-based reference points) were used in the stock assessment. Median recent (2017–20) and latest (2020) stock biomass were found to be above MSY (SB_{recent}/SB_{MSY} = 1.64 and SB_{latest}/SB_{MSY} = 1.84) (WCPFC 2023a). A spawning biomass depletion equal to 0.2 is used as a standard LRP by WCPFC, and the recent spawning biomass depletion of blue shark is above this ($SB_{2017–2020}/SB_{F=0}$ = 0.71) (ibid). Based on a stock assessment using data < 10 years old indicating that biomass is above a target and limit reference point, abundance is considered a "low concern" (per line 1.b in table 1.1.1 of the Seafood Watch Standard).

1.2 Fishing mortality

North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest

Low concern

The 2022 stock assessment of North Pacific blue shark found that fishing mortality is below the MSY level ($F_{2017–19}/F_{MSY}$ = 0.445) (ISC 2022). Based on a stock assessment using data < 10 years old with a finding that fishing mortality is less than fishing mortality at MSY, fishing mortality is considered a "low concern" (per line 1 in table 1.2.1 of the Seafood Watch Standard).

Supplementary information

Blue shark is widely distributed throughout the North Pacific and dominates shark catches in that region. The primary source of known blue shark fishing mortality is oceanic longline fisheries targeting swordfish and tuna, including mostly shallow-set longline fisheries in temperate waters and deep-set longline fisheries in more tropical areas. Sharks are targeted less often than tunas and swordfish, although new Asian shark markets have been developing for over a decade and targeted fisheries for blue shark do exist (Clarke et al. 2014; ISC 2017b).

South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest

Low concern

Blue shark is widely distributed throughout the Western and Central Pacific Ocean, including the South Pacific region. A stock assessment for blue shark in the southern Pacific was conducted in 2022. The stock assessment found that the ecent average fishing mortality was below the MSY level ($F_{2017–20}/F_{MSY}$ = 0.65) (WCPFC 2023a). Further, the assessment noted a 1% probability that recent average fishing mortality was above the MSY level. Based on a stock assessment using data < 10 years old indicating that there is a < 50% chance that the stock is overfished, fishing mortality is considered a "low concern" (per line 1 in table 1.2.1 of the Seafood Watch Standard).

Dolphinfish *(Coryphaena hippurus)*

1.1 Abundance

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest

Moderate concern

Data are limited for dolphinfish (also known as mahi mahi and dorado) in the EPO and WCPO. The International Union for the Conservation of Nature (IUCN) has assessed dolphinfish as a species of "Least Concern," but this assessment is > 10 years old (Collette et al. 2011a). Therefore, a productivity-susceptibility analysis (PSA) was performed, resulting in a score of 3.10 (medium vulnerability). Based on the PSA results indicating that dolphinfish has a medium vulnerability, abundance is considered a "moderate concern" (per 3.2.e in table 1.1.1 of the Seafood Watch Standard).

Supplementary information

PSA for dolphinfish in the Pacific (see the Seafood Watch Fisheries Standard Version 4 for methodology details).

Table 6:

Productivity Attribute	**High (score = 1)**	**Medium (score = 2)**	**Low (score = 3)**	**Score**	**Value; {Reference(s)}**
Average age at maturity (yrs)	< 5	5–15	> 15	1	< 1 year (Froese and Pauly 2020; Collette et al. 2011a)
Average maximum age (yrs) (do not use if max size is available)	< 10	10–25	> 25	N/A	11 years (Sun et al. 2015a)
Von Bertalanffy (Brody) Growth Coefficient (K)	> 0.25	0.15–0.25	< 0.15	1	0.4 (Froese and Pauly 2020)
Fecundity (eggs/yr)	> 20,000	100–20,000	< 100	1	85,000 (Froese and Pauly 2020)
Average maximum size (cm)	< 100	100–300	> 300	2	210 cm (Froese and Pauly 2020)
Average size at maturity (cm)	< 40	40–200	> 200	2	55.8 cm (Froese and Pauly 2020)

Reproductive strategy	Broadcast spawner	Demersal egg layer or brooder	Live bearer	1	Broadcast spawner (Froese and Pauly 2020)
Productivity score (mean of attribute scores)				**1.33**	

Table 7:

Susceptibility Attribute (default scores in bold)	**Low S (score = 1)**	**Medium S (score = 2)**	**High S (score = 3)**	**Score**	**Value/notes; {Reference(s)}**
Areal overlap (all fisheries)	> 90% of species concentration is unfished	70–90% of species concentration is unfished	**> 30% of the species concentration is fished**	3	Unknown; Default (bolded) scores selected
Vertical overlap (all fisheries)	> 67% of species' depth range is unfished	33–66% of species' depth range is unfished	**> 33% of species' depth range is unfished**	3	
Seasonal availability (all fisheries)	Fisheries overlap with species < 3 months/year	Fisheries overlap with species 3–6 months/year	**Fisheries overlap with species > 6 months/year**	3	

Selectivity of fishery (specific to fishery under assessment)	Species is not targeted AND is not likely to be captured by gear	**Species is targeted, or is incidentally encountered AND is not likely to escape the gear**	Species is targeted or is incidentally encountered AND combination of fishery attributes and species' biology increases its susceptibility to the gear	2	
Post-capture mortality (specific to fishery under assessment)	> 66% individuals survive post-capture	33–66% individuals survive post-capture	**Retained species, or > 66% do not survive post-capture**	3	
Susceptibility score (mean of attribute scores)				**2.8**	

Table 8:

Productivity-Susceptibility Score ($V = v(P^2 + S^2)$)	**3.10**
Vulnerability Rating: < 2.64 = Low vulnerability; >= 2.64 and <= 3.18 = Medium vulnerability; > 3.18 = High vulnerability	Medium

1.2 Fishing mortality

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest

Moderate concern

Because there is no stock assessment for dolphinfish in the WCPO, fishing mortality is unknown, resulting in a "moderate concern" score (per line 2.3 in table 1.2.1 of the Seafood Watch Standard).

Opah *(Lampris guttatus)*

1.1 Abundance

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest

Moderate concern

There are no stock assessments for opah in the Pacific. The species is categorized as "Least Concern" by the IUCN via a 2013 assessment (Smith-Vaniz et al. 2015), but that assessment is based on data that is > 10 years old, so it cannot be used for scoring. Therefore, a PSA was performed using limited data. The PSA resulted in a score of 3.18; thus, the stock is not highly vulnerable and abundance is considered a "moderate concern" (per line 2.e in table 1.1.1 of the Seafood Watch Standard).

Supplementary information

PSA for opah

Table 9:

Productivity Attribute	**High (score = 1)**	**Medium (score = 2)**	**Low (score = 3)**	**Score**	**Value; {Reference(s)}**
Average age at maturity (yrs)	< 5	5–15	> 15	1	~4.3 years (Francis et al. 2004)
Von Bertalanffy (Brody) Growth Coefficient (K)	> 0.25	0.15–0.25	< 0.15	2	0.218 (Francis et al. 2004)

Fecundity (eggs/yr)	> 20,000	100–20,000	< 100	1	7,200,000–9,700,000 (Froese and Pauly 2019)
Average maximum size (cm)	< 100	100– 300	> 300	2	200 cm (Froese and Pauly 2019); 119 cm (Griffiths et al 2019a)
Average size at maturity (cm)	< 40	40–200	> 200	2	> 104 cm (CDFW 2001)
Reproductive strategy	Broadcast spawner	Demersal egg layer or brooder	Live bearer	1	Broadcast spawner (Froese and Pauly 2019)
Productivity score (mean of attribute scores)				**1.5**	

Table 10:

Susceptibility Attribute (default scores in bold)	**Low S (score = 1)**	**Medium S (score = 2)**	**High S (score = 3)**	**Score**	**Value/notes; (reference)**
Areal overlap (all fisheries)	> 90% of species concentration is unfished	70–90% of species concentration is unfished	**> 30% of the species concentration is fished**	3	Default (bolded) scores selected
Vertical overlap (all fisheries)	> 67% of species' depth range is unfished	33–66% of species' depth range is unfished	**< 33% of species' depth range is unfished**	3	

Seasonal Availability (all fisheries)	Fisheries overlap with species < 3 months/year	Fisheries overlap with species 3–6 months/year	**Fisheries overlap with species > 6 months/year**	3	
Selectivity of fishery (specific to fishery under assessment)	Species is not targeted AND is not likely to be captured by gear	**Species is targeted, or is incidentally encountered AND is not likely to escape the gear**	Species is targeted or is incidentally encountered AND combination of fishery attributes and species' biology increases its susceptibility to the gear	2	
Post-capture mortality (specific to fishery under assessment)	> 66% individuals survive post-capture	33–66% individuals survive post-capture	**Retained species, or > 66% do not survive post capture**	3	
Susceptibility score (mean of attribute scores)				**2.8**	

Table 11:

Productivity-Susceptibility Score ($V = v(P^2 + S^2)$)	**3.18**
Vulnerability Rating: < 2.64 = Low vulnerability, >= 2.64 and <= 3.18 = Medium vulnerability, > 3.18 = High vulnerability	Medium

1.2 Fishing mortality

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest

Moderate concern

There are no reference points or stock assessments for opah in the Pacific. Total fishing mortality in the Western Pacific is unknown, so it is considered a “moderate concern” (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Pacific bluefin tuna *(Thunnus orientalis)*

1.1 Abundance

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines

Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines

Northwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central

Moderate concern

The most recent stock assessment for Pacific bluefin tuna was conducted in 2024, using data through 2022. The assessors presented biomass results relative to unfished biomass ($SSB_{current}/SSB_{unfished}$ = 0.232, or 23.2% of unfished biomass) (IATTC 2024). Biomass continues to grow following declines from 1996 to 2010, and it has reached the second rebuilding target laid out by the WCPFC and IATTC (ibid). There are no formally adopted reference points for Pacific bluefin tuna; however, applying a reference point of 20% of unfished biomass ($SSB_{20\%}$, the second rebuilding target and the biomass-based limit reference point for other tuna species in the WCPO), the bluefin population would no longer be considered overfished, and management does not consider the population to be overfished. Because the stock is not considered overfished, but its status relative to a TRP is unknown, abundance is considered a “moderate concern" (per line 3 in table 1.1.1 of the Seafood Watch Standard).

1.2 Fishing mortality

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines

Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines

Northwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central

Moderate concern

The 2024 assessment did not estimate F_{MSY}; instead, it indicated that recent fishing mortality (2020–22) corresponds to $F_{23.6\%\ SPR}$, which, according to the stock assessment, is below "some commonly used F-based reference points." Specifically, the 2020–22 fishing mortality rates were lower than the F corresponding to 20% SPR and F_{max} (ISC 2024). Although the current level is higher than the fishing mortality level in the previous assessment (2018–20 level = $F_{30.7\%\ SPR}$), fishing mortality from 2020 to 2018 has still allowed the stock to reach its first and second rebuilding targets ahead of schedule. But it is not clear if the reference points cited in the assessment are appropriate for the stock or scientifically recommended for the stock. Though fishing mortality is below some reference points, their appropriateness is uncertain, so fishing mortality is considered a "moderate concern" (per line 4 in table 1.2.1 of the Seafood Watch Standard).

Shortfin mako shark *(Isurus oxyrinchus)*

1.1 Abundance

North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest

Very low concern

Shortfin mako shark has no adopted reference points, but stock assessments use MSY to determine stock status. The 2024 stock assessment for North Pacific shortfin mako shark used MSY-based reference points calculated for depletion rather than spawning abundance or biomass. Depletion from 2019 to 2022 was found to be above the MSY level ($D_{2019–22}/D_{MSY}$ = 1.17), suggesting that the stock is not overfished (66% probability) (WCPFC 2025a). Because a stock assessment using data < 5 years old suggests that abundance is above a sustainable level, abundance is considered a "very low concern" (per lines 1.a and b in table 1.1.1 of the Seafood Watch Standard).

South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest

High concern

No official population assessment of shortfin mako shark in the South Pacific region of the WCPO has been conducted. A preliminary stock assessment was conducted in 2022, but results were deemed uncertain and unfit for providing management advice, making the official status unknown (WCPFC 2023b). The center of abundance for this species appears to be northwest of New Zealand (Lawson 2001). The IUCN Red List has assessed this species globally as "Endangered" (Rigby et al. 2019). According to the IUCN, the population in the South Pacific appears to be increasing. But based on the IUCN global listing and the lack of a reliable stock assessment to override the listing, abundance is considered a "high concern."

1.2 Fishing mortality

North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest

Low concern

The most recent stock assessment for shortfin mako shark in the North Pacific suggests that fishing mortality has been less than that at MSY since the mid-1990s and remains below in the latest years of the assessment, though results are presented in terms of exploitation ($U_{2018–21}/U_{MSY}$ = 0.34) (WCPFC 2025a). The assessment notes a 65% probability that the stock is not overfished and is not undergoing overfishing. Based on a stock assessment using data < 10 years old with a finding that fishing mortality is below a sustainable level, fishing mortality is considered a "low concern" (per line 1 in table 1.2.1 of the Seafood Watch Standard).

South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest

Moderate concern

No full stock assessment of shortfin mako shark has been conducted in the South Pacific region. Fishing mortality is unknown, resulting in a "moderate concern" score.

Skipjack tuna *(Katsuwonus pelamis)*

1.1 Abundance

Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest

Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines

Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines

Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean - Hand-operated pole-and-lines - Pacific, Southwest

Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines

Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines

Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central

Very low concern

Skipjack tuna in the WCPO was last assessed in 2022. An interim target reference point of $0.5SB_{F=0}$ and a limit reference point of $0.2SB_{F=0}$ were used for the assessment. According to the assessment, the stock has become more depleted over time, mostly from fishing impacts in the equatorial regions. The spawning potential has not changed substantially over time. None of the models used in the assessment showed the stock to be below the limit reference point, and the median spawning depletion from 2018 to 2021 ($SB_{recent}/SB_{F=0}$) is estimated to be 0.51, which is just above the target reference point (Jordan et al. 2022). Further, the recent spawning biomass was found to be well above the MSY level (SB_{recent}/SB_{MSY} = 2.98) (ibid).The population of skipjack tuna in the WCPO is not considered overfished. Based on a stock assessment using data < 5 years old indicating that the stock biomass is just above the target reference point, abundance is considered a “very low concern” (per line 1.a and b in table 1.1.1 of the Seafood Watch Standard).

1.2 Fishing mortality

Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest

Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines

Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines

Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean - Hand-operated pole-and-lines - Pacific, Southwest

Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines

Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines

Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central

Low concern

According to the 2022 stock assessment, average fishing mortality rates have increased throughout the modeled time period for juvenile and adult skipjack tuna. But recent (2018–21) fishing mortality rates (F_{recent}) are below the maximum sustainable yield levels (F_{recent}/F_{MSY} = 0.32) (Jordan et al. 2022). Therefore, overfishing of skipjack tuna is not occurring, and WCPO skipjack tuna fishing mortality is considered a “low concern" (per line 1 in table 1.2.1 of the Seafood Watch Standard).

Southern bluefin tuna *(Thunnus maccoyii)*

1.1 Abundance

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Low concern

Southern bluefin tuna abundance is assessed using total reproductive output (TRO) rather than the more traditional stock biomass (SSB) used for other tunas. CCSBT's 2023 stock assessment indicates that the TRO in 2023 was below the target reference/rebuilding point for the stock, which is 30% of the unfished TRO (TRO_{2023}/TRO_0 = 0.23 [CI = 0.21–0.29]) (CCSBT 2023). It was further found that the TRO in 2023 was above 75% but below 100% of the MSY level (TRO_{2023}/TRO_{MSY} = 0.85) (ibid). The previous 2022 interim update noted that TRO relative to TRO_0 increased by 0.02 from 2020 to 2021, and the 2023 full assessment shows an increase of 0.01, indicating that the stock is still slowly rebuilding (CCSBT 2022a; CCSBT 2023). A previous rebuilding target of 20% of TRO_0 was met in 2020, and the new rebuilding target of 30% of TRO_0 has been set with a rebuilding deadline of 2035 (CCSBT 2022a). CCSBT has further noted that the stock has been rebuilding at a rate of 5% per year since 2009 (CCSBT 2022b). Although there is no defined limit reference point, the TRO is just above 75% of the target reference point and is above 75% of the MSY level, so abundance is considered a "low concern" (per line 1.a in table 1.2.1 of the Seafood Watch Standard).

1.2 Fishing mortality

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Low concern

Fishing mortality rates have decreased for southern bluefin tuna and continue to be below the target reference point for fishing mortality (F_{2023}/F_{MSY} = 0.46) {CCSBT2023}. In addition, reported catches are below the MSY, and current exploitation rates are considered moderate {CCSBT 20231}. Because a stock assessment using data < 10 years old indicates that fishing mortality rates are below the target reference point and the MSY level, abundance is considered a "low concern" (per line 1.b in table 1.1.1 of the Seafood Watch Standard).

Supplementary information

Note that purse seine catches supply aquaculture operations that are outside the scope of this assessment.

Striped marlin *(Kajikia audax)*

1.1 Abundance

Southwestern Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest

Moderate concern

Southwest Pacific striped marlin was last assessed in 2024, but the results of this assessment were not accepted during review at the WCPFC's 2024 science committee meeting (WCPFC 2024m). Therefore, stock status and management advice for this stock still rely on the 2019 assessment. The 2019 assessment found the stock to be overfished with a 68.66% probabiility, because the median recent spawning biomass was below the MSY level (SB_{recent}/SB_{MSY} = 0.737), where "recent" refers to biomass from 2014 to 2017 (Ducharme-Barth et al. 2019). Although there is not an adopted limit reference point for the stock, it is above the often-used proxy of 50% of the target reference point, or, in this case, 50% of MSY. Based on a stock assessment using data < 10 years old that indicates that spawning biomass is below 75% of a target reference point but above 50% of this point, abundance is considered a "moderate concern" (per line 1 in table 1.1.1 of the Seafood Watch Standard).

Supplementary information

The authors of the 2024 assessment found that the ecent spawning biomass was still below the MSY level (SB_{recent}/SB_{MSY} = 0.60) (Castillo-Jordan et al. 2024). But there were issues in the assessment with size composition data and CPUE indices, producing unresolved uncertainty. Therefore, the assessment was not adopted for management advice and will be revised in 2025.

Western and Central North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest

High concern

Striped marlin in the WCNPO was last assessed in 2023, using data up to 2020. Reference points for the assessment were calculated based on B_0, and a potential target reference point of $20\%SSB_{F=0}$ was used (currently, no official reference points are established for this stock). The assessment found that the average biomass from 2018 to 2020 was 63% below this target reference point ($SSB_{2018–20}/0.2SSB_{F=0}$ = 0.37) (WCPFC 2024c). Based on model results, there is a > 99% probability that the stock is overfished. Because the stock is well below the target reference point (with no limit reference point used) and is designated as overfished, abundance is considered a "high concern" (per line 1 in table 1.1.1 of the Seafood Watch Standard).

1.2 Fishing mortality

Southwestern Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest

Low concern

The 2019 SW Pacific striped marlin stock assessment found that the median recent fishing mortality was below the MSY level (F_{recent}/F_{MSY} = 0.911) (Ducharme-Barth et al. 2019). Although the estimate is close to the MSY level,

there was only a 44.3% chance that recent fishing mortality was above the MSY level. Based on a stock assessment < 10 years old indicating a < 50% chance that the stock is undergoing overfishing, fishing mortality is considered a “low concern” (per line 1 in table 1.2.1 of the Seafood Watch Standard).

Western and Central North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest

High concern

The 2023 stock assessment also used $20\%SSB_{F=0}$ in calculating a target F reference point. Fishing mortality for striped marlin aged 3 to 12, averaged from 2018 to 2020, was found to be above the target reference point proposed in the assessment ($F_{2018–20}/F_{20\%SSB(F=0)}$ = 1.28 and $F_{2020}/F_{20\%SSB(F=0)}$ = 1.09) (WCPFC 2024c). The stock was found to be subject to overfishing with a > 66% probability. Because fishing mortality is thought to be above a sustainable level, with over 50% certainty, fishing mortality is considered a “high concern” (per line 1 in table 1.2.1 of the Seafood Watch Standard).

Swordfish *(Xiphias gladius)*

1.1 Abundance

North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines

North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines

Very low concern

North Pacific swordfish was last assessed in 2023, using data up to 2021. There are no adopted reference points for this stock, but MSY-based reference points were used for the 2023 assessment. The assessment found that SSB in 2021 was well above SSB_{MSY} (SSB_{2021}/SSB_{MSY} = 2.18) (ISC 2023a). The assessment further concluded that there was a > 99% probability that the stock was not overfished in 2021. Because the stock is well above a sustainable target reference point, based on an assessment using data < 5 years old, abundance is considered a “very low concern” (per line 1 in table 1.1.1 of the Seafood Watch Standard).

Supplementary information

Previous stock assessments for North Pacific swordfish were divided into two stock delineations: Western Central and North Pacific stock, and Eastern Pacific stock; however, the 2023 stock assessment was performed for a single North Pacific stock delineation that covers both stock areas (ISC 2023a).

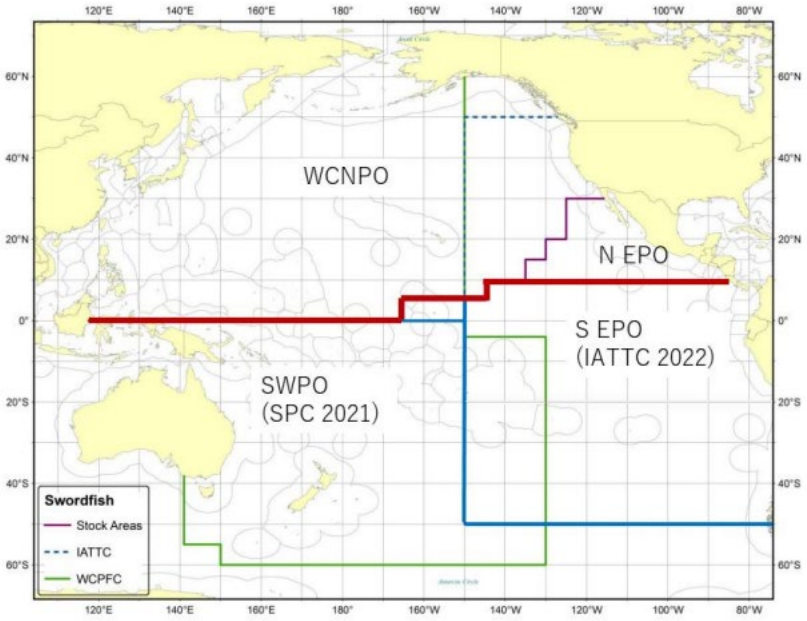


Figure 9: Stock boundaries for the 2023 North Pacific swordfish assessment. WCNPO and N EPO are treated as one stock in 2023. Source: (WCPFC 2024d).

South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines

South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines

Low concern

The most recent assessment for swordfish in the southwestern Pacific Ocean was conducted in 2021. There are no reference points adopted for this population. The median estimate of the latest (2019) spawning stock biomass is above the limit reference point and the MSY level ($SB_{latest}/SB_{F=0}$ = 0.39 and SB_{latest}/SB_{MSY} = 2.95) (Ducharme-Barth 2021).These results suggest a 13% risk (based on model and estimation uncertainty) that the stock is overfished based on the spawning potential-based reference point, and a 10% risk that the stock is overfished based on the MSY-based reference point. Based on a stock assessment using data that are between 5 and 10 years old indicating that the stock is above the MSY level, abundance is considered a “low concern” (per line 1.b in table 1.1.1 of the Seafood Watch Standard).

1.2 Fishing mortality

North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines

North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines

Low concern

The 2023 North Pacific swordfish stock assessment found that fishing mortality generally decreased from 1978 to 2021 and was below the MSY level in the final year of the assessment (F_{2021}/F_{MSY} = 0.49) (ISC 2023a). There was a > 99% probability that the stock was not subject to overfishing in 2021. Based on a stock assessment using data < 10 years old indicating that fishing mortality is below a sustainable level, fishing mortality is considered a "low concern" (per line 1 in table 1.2.1 of the Seafood Watch Standard).

South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines

South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines

Low concern

According to the updated 2021 stock assessment of swordfish in the South Pacific, fishing mortality rates are sustainable, and the recent (2015–18) fishing mortality was below the MSY level (F_{recent}/F_{MSY} = 0.47) (Ducharme-Barth 2021). Although the associated confidence interval includes ratios above 1, there is only an estimated 20% risk that this stock is undergoing overfishing (F/F_{MSY} > 1), so fishing mortality is considered a "low concern" (per line 1 in table 1.2.1 of the Seafood Watch Standard).

Yellowfin tuna *(Thunnus albacares)*

1.1 Abundance

Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines

Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines

Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest

Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines

Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines

Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean - Hand-operated pole-and-lines - Pacific, Southwest

Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines

Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines

Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central

Very low concern

An updated assessment of yellowfin tuna was conducted in 2023 using input data up to 2021 and incorporating additional uncertainty compared to previous assessments. Yellowfin tuna has an adopted limit reference point of $0.2SB_{F=0}$, similar to other species managed by the WCPFC, but there is no adopted target reference point. Previously, the Commission set an objective of maintaining the spawning biomass depletion ratio at or above the average 2012–15 level (0.44) (WCPFC 2024e). The 2023 assessment indicates that the median recent (2018–21) spawning depletion ratio was above both the LRP and the 2012–15 level ($SB_{recent}/SB_{F=0} = 0.47$) (ibid). Though MSY is not used to manage Western Pacific yellowfin tuna biomass, the recent spawning biomass was also above the MSY level ($SB_{recent}/SB_{MSY} = 2.28$) (ibid). Because a stock assessment using data < 5 years old indicates that spawning biomass is above MSY, the interim target level, and the limit reference point, abundance is scored a "very low concern" (per lines 1.a and b in table 1.1.1 of the Seafood Watch Standard).

1.2 Fishing mortality

Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines

Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines

Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest

Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines

Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines

Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean - Hand-operated pole-and-lines - Pacific, Southwest

Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines

Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines

Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central

Low concern

The recent (2017–20) median fishing mortality rate for yellowfin tuna was below the MSY level (F_{recent}/F_{MSY} = 0.50) (WCPFC 2024e). None of the models used in the assessment indicated that recent fishing mortality rates are above the maximum sustainable yield levels (ibid). Therefore, overfishing is not occurring. Because F is below sustainable levels according to a stock assessment using data < 10 years old, fishing mortality is considered a "low concern" (per line 1 in table 1.2.1 of the Seafood Watch Standard).

Criterion 2: Impacts on other species

All main retained and bycatch species in the fishery are evaluated under Criterion 2. Seafood Watch defines bycatch as all fisheries-related mortality or injury to species other than the retained catch. Examples include discards, endangered or threatened species catch, and ghost fishing. Species are evaluated using the same guidelines as in Criterion 1. When information on other species caught in the fishery is unavailable, the fishery's potential impacts on other species is scored according to the Unknown Bycatch Matrices, which are based on a synthesis of peer-reviewed literature and expert opinion on the bycatch impacts of each gear type. The fishery is also scored for the amount of non-retained catch (discards) and bait use relative to the retained catch. To determine the final Criterion 2 score, the score for the lowest scoring retained/bycatch species is multiplied by the discard/bait score. The Criterion 2 rating is determined as follows:

- Score >3.2 = **Green** or Low concern
- Score >2.2 and ≤3.2 = **Yellow** or Moderate concern
- Score ≤2.2 = **Red** or High concern

Rating is Critical if Factor 2.3 (Fishing mortality) is Critical

Guiding principles

- *Ensure all affected stocks are healthy and abundant.*
- *Fish all affected stocks at sustainable level.*
- *Minimize bycatch.*

Criterion 2 summary

Criterion 2 score(s) overview

This table(s) provides an overview of the Criterion 2 subscore, discards+bait modifier, and final Criterion 2 score for each fishery. A separate table is provided for each species/stock that we want an overall rating for.

Albacore			
Region / Method	**Sub Score**	**Discard Rate/Landings**	**Score**
North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines	1.000	1.000: < 100%	**Red (1.000)**
South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines	1.000	1.000: < 100%	**Red (1.000)**
North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines	2.236	1.000: < 100%	**Yellow (2.236)**
South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines	2.236	1.000: < 100%	**Yellow (2.236)**
South Pacific Stock - Southwest Pacific Ocean - Hand-operated pole-and-lines - Pacific, Southwest	2.236	1.000: < 100%	**Yellow (2.236)**
North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines	2.236	1.000: < 100%	**Yellow (2.236)**
South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines	2.236	1.000: < 100%	**Yellow (2.236)**
North Pacific Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central	1.000	1.000: < 100%	**Red (1.000)**

Bigeye tuna			
Region / Method	**Sub Score**	**Discard Rate/Landings**	**Score**
Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest	1.000	1.000: < 100%	**Red (1.000)**

Bigeye tuna			
Region / Method	**Sub Score**	**Discard Rate/Landings**	**Score**
Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines	1.000	1.000: < 100%	**Red (1.000)**
Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest	1.000	1.000: < 100%	**Red (1.000)**
Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines	2.236	1.000: < 100%	**Yellow (2.236)**
Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central	1.000	1.000: < 100%	**Red (1.000)**

Black marlin			
Region / Method	**Sub Score**	**Discard Rate/Landings**	**Score**
Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest	1.000	1.000: < 100%	**Red (1.000)**
Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest	1.000	1.000: < 100%	**Red (1.000)**

Blue marlin			
Region / Method	**Sub Score**	**Discard Rate/Landings**	**Score**
Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest	1.000	1.000: < 100%	**Red (1.000)**
Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest	1.000	1.000: < 100%	**Red (1.000)**

Blue shark			
Region / Method	**Sub Score**	**Discard Rate/Landings**	**Score**
North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest	1.000	1.000: < 100%	**Red (1.000)**
South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest	1.000	1.000: < 100%	**Red (1.000)**

Dolphinfish			
Region / Method	**Sub Score**	**Discard Rate/Landings**	**Score**
Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest	1.000	1.000: < 100%	**Red (1.000)**
Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest	1.000	1.000: < 100%	**Red (1.000)**

Opah			
Region / Method	**Sub Score**	**Discard Rate/Landings**	**Score**
Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest	1.000	1.000: < 100%	**Red (1.000)**
Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest	1.000	1.000: < 100%	**Red (1.000)**

Pacific bluefin tuna			
Region / Method	**Sub Score**	**Discard Rate/Landings**	**Score**
Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines	1.000	1.000: < 100%	**Red (1.000)**
Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines	2.236	1.000: < 100%	**Yellow (2.236)**
Northwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines	2.236	1.000: < 100%	**Yellow (2.236)**

Pacific bluefin tuna			
Region / Method	**Sub Score**	**Discard Rate/Landings**	**Score**
Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central	1.000	1.000: < 100%	**Red (1.000)**

Shortfin mako shark			
Region / Method	**Sub Score**	**Discard Rate/Landings**	**Score**
North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest	1.000	1.000: < 100%	**Red (1.000)**
South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest	1.000	1.000: < 100%	**Red (1.000)**

Skipjack tuna			
Region / Method	**Sub Score**	**Discard Rate/Landings**	**Score**
Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest	1.000	1.000: < 100%	**Red (1.000)**
Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines	2.236	1.000: < 100%	**Yellow (2.236)**
Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines	2.236	1.000: < 100%	**Yellow (2.236)**
Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean - Hand-operated pole-and-lines - Pacific, Southwest	2.236	1.000: < 100%	**Yellow (2.236)**
Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines	2.236	1.000: < 100%	**Yellow (2.236)**
Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines	2.236	1.000: < 100%	**Yellow (2.236)**

Skipjack tuna			
Region / Method	**Sub Score**	**Discard Rate/Landings**	**Score**
Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central	1.000	1.000: < 100%	**Red (1.000)**

Southern bluefin tuna			
Region / Method	**Sub Score**	**Discard Rate/Landings**	**Score**
Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)	1.000	1.000: < 100%	**Red (1.000)**

Striped marlin			
Region / Method	**Sub Score**	**Discard Rate/Landings**	**Score**
Western and Central North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest	1.000	1.000: < 100%	**Red (1.000)**
Southwestern Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest	1.000	1.000: < 100%	**Red (1.000)**

Swordfish			
Region / Method	**Sub Score**	**Discard Rate/Landings**	**Score**
North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines	1.000	1.000: < 100%	**Red (1.000)**
South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines	1.000	1.000: < 100%	**Red (1.000)**
North Pacific Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines	2.236	1.000: < 100%	**Yellow (2.236)**
South Pacific Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines	2.236	1.000: < 100%	**Yellow (2.236)**

Yellowfin tuna			
Region / Method	**Sub Score**	**Discard Rate/Landings**	**Score**
Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines	1.000	1.000: < 100%	**Red (1.000)**
Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines	1.000	1.000: < 100%	**Red (1.000)**
Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest	1.000	1.000: < 100%	**Red (1.000)**
Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines	2.236	1.000: < 100%	**Yellow (2.236)**
Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines	2.236	1.000: < 100%	**Yellow (2.236)**
Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean - Hand-operated pole-and-lines - Pacific, Southwest	2.236	1.000: < 100%	**Yellow (2.236)**
Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines	2.236	1.000: < 100%	**Yellow (2.236)**
Western and Central Pacific Ocean (WCPO) Stock - Southwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines	2.236	1.000: < 100%	**Yellow (2.236)**
Western and Central Pacific Ocean (WCPO) Stock - Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central	1.000	1.000: < 100%	**Red (1.000)**

Criterion 2 main assessed species/stocks table(s)

This table(s) provides a list of all species/stocks included in this assessment for each 'fishery' (as defined by a region/method combination). The text following this table(s) provides an explanation of the reasons the listed species were selected for inclusion in the assessment.

Northwest Pacific, Western Central Pacific - Drifting longlines			
Sub Score: 1.000	**Discard Rate: 1.000**		**Score: 1.000**
Species	**Abundance**	**Fishing Mortality**	**Score**
Manta rays and devil rays	1.000: High Concern	1.000: High Concern	**Red (1.000)**
Thresher shark (Unspecified)	1.000: High Concern	1.000: High Concern	**Red (1.000)**
Seabirds	1.000: High Concern	1.000: High Concern	**Red (1.000)**
Marine mammals	1.000: High Concern	1.000: High Concern	**Red (1.000)**
Whitetip shark	1.000: High Concern	1.000: High Concern	**Red (1.000)**
Mako shark (unspecified)	1.000: High Concern	1.000: High Concern	**Red (1.000)**
Hammerhead sharks	1.000: High Concern	1.000: High Concern	**Red (1.000)**
Striped marlin	1.000: High Concern	1.000: High Concern	**Red (1.000)**
Pomfrets	2.330: Moderate Concern	1.000: High Concern	**Red (1.526)**
Green turtle	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Bigeye thresher shark	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Sailfish	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Escolar	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Black marlin	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Olive Ridley turtle	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Loggerhead turtle	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Leatherback turtle	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Hawksbill turtle	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Opah	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Pacific bluefin tuna	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Pelagic stingray	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Wahoo	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Dolphinfish	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Long snouted lancetfish	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Blue marlin	3.670: Low Concern	5.000: Low Concern	**Green (4.284)**
Silky shark	3.670: Low Concern	5.000: Low Concern	**Green (4.284)**
Blue shark	3.670: Low Concern	5.000: Low Concern	**Green (4.284)**
Albacore	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**

Northwest Pacific, Western Central Pacific - Drifting longlines			
Sub Score: 1.000	**Discard Rate: 1.000**		**Score: 1.000**
Species	**Abundance**	**Fishing Mortality**	**Score**
Shortfin mako shark	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**
Bigeye tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**
Swordfish	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**
Yellowfin tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**

Northwest Pacific, Western Central Pacific - Handlines and hand-operated pole-and-lines			
Sub Score: 2.236	**Discard Rate: 1.000**		**Score: 2.236**
Species	**Abundance**	**Fishing Mortality**	**Score**
Sharks	1.000: High Concern	5.000: Low Concern	**Yellow (2.236)**
Finfish	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Pacific bluefin tuna	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Albacore	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**
Skipjack tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**
Swordfish	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**
Yellowfin tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**

Northwest Pacific, Western Central Pacific - Trolling lines			
Sub Score: 2.236	**Discard Rate: 1.000**		**Score: 2.236**
Species	**Abundance**	**Fishing Mortality**	**Score**
Sharks	1.000: High Concern	5.000: Low Concern	**Yellow (2.236)**
Finfish	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Pacific bluefin tuna	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Albacore	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**
Skipjack tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**
Yellowfin tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**

Southwest Pacific - Hand-operated pole-and-lines			
Sub Score: 2.236	**Discard Rate: 1.000**		**Score: 2.236**
Species	**Abundance**	**Fishing Mortality**	**Score**
Sharks	1.000: High Concern	5.000: Low Concern	**Yellow (2.236)**
Finfish	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Albacore	3.670: Low Concern	5.000: Low Concern	**Green (4.284)**
Skipjack tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**
Yellowfin tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**

Southwest Pacific, Western Central Pacific - Drifting longlines			
Sub Score: 1.000	**Discard Rate: 1.000**		**Score: 1.000**
Species	**Abundance**	**Fishing Mortality**	**Score**
Marine mammals	1.000: High Concern	1.000: High Concern	**Red (1.000)**
Seabirds	1.000: High Concern	1.000: High Concern	**Red (1.000)**
Thresher shark (Unspecified)	1.000: High Concern	1.000: High Concern	**Red (1.000)**
Whitetip shark	1.000: High Concern	1.000: High Concern	**Red (1.000)**
Manta rays and devil rays	1.000: High Concern	1.000: High Concern	**Red (1.000)**
Hammerhead sharks	1.000: High Concern	1.000: High Concern	**Red (1.000)**
Mako shark (unspecified)	1.000: High Concern	1.000: High Concern	**Red (1.000)**
Pomfrets	2.330: Moderate Concern	1.000: High Concern	**Red (1.526)**
Sailfish	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Porbeagle	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Olive Ridley turtle	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Shortfin mako shark	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Loggerhead turtle	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Hawksbill turtle	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Green turtle	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Escolar	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Black marlin	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Bigeye thresher shark	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**

Southwest Pacific, Western Central Pacific - Drifting longlines			
Sub Score: 1.000	**Discard Rate: 1.000**		**Score: 1.000**
Species	**Abundance**	**Fishing Mortality**	**Score**
Leatherback turtle	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Long snouted lancetfish	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Dolphinfish	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Opah	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Pelagic stingray	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Wahoo	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Striped marlin	2.330: Moderate Concern	5.000: Low Concern	**Green (3.413)**
Swordfish	3.670: Low Concern	5.000: Low Concern	**Green (4.284)**
Albacore	3.670: Low Concern	5.000: Low Concern	**Green (4.284)**
Silky shark	3.670: Low Concern	5.000: Low Concern	**Green (4.284)**
Blue shark	3.670: Low Concern	5.000: Low Concern	**Green (4.284)**
Blue marlin	3.670: Low Concern	5.000: Low Concern	**Green (4.284)**
Southern bluefin tuna	3.670: Low Concern	5.000: Low Concern	**Green (4.284)**
Bigeye tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**
Yellowfin tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**

Southwest Pacific, Western Central Pacific - Handlines and hand-operated pole-and-lines			
Sub Score: 2.236	**Discard Rate: 1.000**		**Score: 2.236**
Species	**Abundance**	**Fishing Mortality**	**Score**
Sharks	1.000: High Concern	5.000: Low Concern	**Yellow (2.236)**
Finfish	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Albacore	3.670: Low Concern	5.000: Low Concern	**Green (4.284)**
Swordfish	3.670: Low Concern	5.000: Low Concern	**Green (4.284)**
Bigeye tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**
Skipjack tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**
Yellowfin tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**

Southwest Pacific, Western Central Pacific - Trolling lines			
Sub Score: 2.236	**Discard Rate: 1.000**		**Score: 2.236**
Species	**Abundance**	**Fishing Mortality**	**Score**
Sharks	1.000: High Concern	5.000: Low Concern	**Yellow (2.236)**
Finfish	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Albacore	3.670: Low Concern	5.000: Low Concern	**Green (4.284)**
Skipjack tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**
Yellowfin tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**

West Pacific - Floating object purse seine (FAD)			
Sub Score: 1.000	**Discard Rate: 1.000**		**Score: 1.000**
Species	**Abundance**	**Fishing Mortality**	**Score**
Manta rays and devil rays	1.000: High Concern	1.000: High Concern	**Red (1.000)**
Baleen whales	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Dolphin (unspecified)	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
False killer whale	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Ocean triggerfish	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Whale shark	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Olive Ridley turtle	1.000: High Concern	5.000: Low Concern	**Yellow (2.236)**
Loggerhead turtle	1.000: High Concern	5.000: Low Concern	**Yellow (2.236)**
Hawksbill turtle	1.000: High Concern	5.000: Low Concern	**Yellow (2.236)**
Hammerhead sharks	1.000: High Concern	5.000: Low Concern	**Yellow (2.236)**
Green turtle	1.000: High Concern	5.000: Low Concern	**Yellow (2.236)**
Leatherback turtle	1.000: High Concern	5.000: Low Concern	**Yellow (2.236)**
Mackerel scad	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Silky shark	3.670: Low Concern	5.000: Low Concern	**Green (4.284)**
Bigeye tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**
Skipjack tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**
Yellowfin tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**

West Pacific - Unassociated purse seine (non-FAD)			
Sub Score: 1.000	**Discard Rate: 1.000**		**Score: 1.000**
Species	**Abundance**	**Fishing Mortality**	**Score**
Manta rays and devil rays	1.000: High Concern	1.000: High Concern	**Red (1.000)**
False killer whale	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Whale shark	1.000: High Concern	3.000: Moderate Concern	**Red (1.732)**
Baleen whales	1.000: High Concern	5.000: Low Concern	**Yellow (2.236)**
Dolphin (unspecified)	1.000: High Concern	5.000: Low Concern	**Yellow (2.236)**
Green turtle	1.000: High Concern	5.000: Low Concern	**Yellow (2.236)**
Hammerhead sharks	1.000: High Concern	5.000: Low Concern	**Yellow (2.236)**
Hawksbill turtle	1.000: High Concern	5.000: Low Concern	**Yellow (2.236)**
Leatherback turtle	1.000: High Concern	5.000: Low Concern	**Yellow (2.236)**
Loggerhead turtle	1.000: High Concern	5.000: Low Concern	**Yellow (2.236)**
Olive Ridley turtle	1.000: High Concern	5.000: Low Concern	**Yellow (2.236)**
Pacific bluefin tuna	2.330: Moderate Concern	3.000: Moderate Concern	**Yellow (2.644)**
Albacore	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**
Bigeye tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**
Skipjack tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**
Yellowfin tuna	5.000: Very Low Concern	5.000: Low Concern	**Green (5.000)**

Per version 4 of the Standard for Fisheries {Seafood Watch 2020}, the Criterion 2 score for the stock being rated is the lowest score of all the other main species caught with it (including both target and nontarget, retained and discarded species), multiplied by the discard + bait use rate. A species is a main species if it meets any of the following conditions ("catch" here includes landings plus discards, and is defined in terms of weight rather than number of fish/animals):

1. A common component of the catch (as guidance, > 5% of the catch in most cases), or
2. Overfished, endangered, threatened, undergoing overfishing, or otherwise a species of concern (hereafter termed "ETP species"), where catch occurs regularly and may significantly contribute to the conservation concern (i.e., more than a negligible and/or sporadic level of catch). As guidance, mortality of the species caused by this fishery is > 5% of a sustainable level, or
3. The fishery under assessment is one of the main sources of fishing mortality for the species, including bait species if known (as guidance, approximately 20% or more of total fishing mortality), and
4. In fisheries that use bait, the bait species should be treated as a bycatch species if it meets the preceding main species criteria. If the species used as bait are unknown but together account for > 5% of the catch and

no other main species have been identified, then add "unknown finfish" with abundance and fishing mortality both scored as a "moderate concern."

Condition 3 is also met in cases where total fishing mortality is unknown, so the fishery's contribution to total mortality is unknown. For this Seafood Watch assessment, condition 2 is considered met if mortality is not negligible or sporadic and a sustainable level of catch is unknown. Condition 2 is also met where estimated mortality exceeds 5% of any of the following thresholds:

- a level based on an appropriate reference point (such as MSY),
- a potential biological removal (PBR) level for mammals or other sensitive species for which PBR has been calculated (e.g., some seabird species).

Data Sources

Several data sources from WCPFC were used to identify main species to include in this review. WCPFC provides a publicly available data catalogue that includes catches of tunas, some billfish and shark species, and whale sharks {WCPFC 2024i}. WCPFC also provides separate bycatch data reports for longline and purse seine fisheries {Peatman and Nicol 2023} {Peatman et al. 2024}. The latest available data (up to 2021–22) from these sources were used in this assessment. Catch composition data are divided into an overall catch dataset and NW and SW datasets that are separated by whether fishing activities took place above or below the midpoint in the WCPFC convention area. These geographically separated datasets include fewer species than the full WCPFC catch dataset. Bycatch data are presented for some species in weight (metric tons; MT) and for others in number of individuals. Further, to determine the fate (retained/discarded) of bycatch species, older purse seine and longline bycatch data reports were used, because species' fates were included in these up to 2016–17 (for purse seines/longlines, respectively) {Peatman et al. 2017b} {Peatman et al. 2018}. Some supplemental information on bycatch trends in WCPFC fisheries was obtained via the Pacific Community's (SPC) latest status report {Hare et al. 2025}. CCSBT catch data for southern bluefin tuna were also used, because CCSBT and WCPFC have some area of overlap in the SW Pacific {CCSBT 2025}. Finally, the FAO FishStat database was used to develop a clearer picture of total mortality in the Pacific for some teleost species; e.g., neritic tunas.

While bycatch data, as noted, is available for purse seine and longline fisheries, it is not available for handline or troll fisheries, so the unidentified bycatch matrices (UBMs) were used to identify potential bycatch taxa in these fisheries. For a full account of the main species in each fishery, see the Appendices.

In addition, the Seafood Watch Unknown Bycatch Matrices (UBM) (Appendix 2 of the Seafood Watch Standard) can be used when a) catch composition is incomplete for a fishery, b) there are no catch composition data available for a fishery, or c) when catch composition data point to species groups; e.g., "sharks nei." The UBM is a tool that identifies which taxonomic groups are susceptible to fishing activities across the world's oceans, compiled from the best available scientific literature, and provides scores for species groups' vulnerability to different gear types. While catch data, including bycatch, are available for the drifting longline and purse seine (all set types) fisheries, no bycatch data are available for the troll (LTL) or handline (LHP) fisheries across the Northwest, Western Central, and Southwest Pacific. Some anecdotal data from logbooks suggest that bycatch is very low in the New Zealand albacore troll fishery, but this evidence is not strong enough to extend to all troll fisheries in the WCPO {Akroyd and

McLoughlin 2022}. Therefore, the UBM was used to identify potential bycatch species in these fisheries, leading to the inclusion of finfish and sharks. Further, the bycatch composition data for purse seines and drifting longlines included several species groups (taxonomic groupings not specified at the individual species level) that the UBM was used to score in factor 2.2: baleen whales and dolphins in unassociated purse seines (PSU) and FAD-set purse seines (PSF) in the Western Central Pacific, hammerhead sharks (unspecified) in drifting longlines (LLD) in the Northwest Pacific and Southwest Pacific, marine mammals in LLD in the Northwest Pacific and Southwest Pacific, seabirds in LLD in the Northwest Pacific and Southwest Pacific, and thresher sharks (unspecified) in LLD in the Northwest Pacific and Southwest Pacific.

Main Species in Each Fishery

NW Drifting Longlines

- > 5% of the catch: yellowfin tuna, albacore tuna, bigeye tuna, swordfish
- ETP species:
    - Where mortality is not negligible and a sustainable level of catch is unknown or total fishing mortality in the fishery is unknown: silky shark, elasmobranchs nei, bigeye thresher shark, thresher sharks, mobulid rays, olive ridley turtle, sea turtles, loggerhead turtle, marine mammals, green turtle, leatherback turtle, hawksbill turtle, hammerhead sharks, mako sharks, seabirds
    - Where mortality exceeds 5% of a sustainable level: oceanic whitetip shark, striped marlin
- Where the fishery accounts for at least 20% of mortality or total mortality is unknown: escolar, wahoo, opah, longsnouted lancetfish, mahi, pomfrets, blue shark, blue marlin, shortfin mako shark, Indo-Pacific sailfish, black marlin, pelagic stingray
- Main species limiting the Criterion 2 score (lowest-scoring species): hammerhead sharks, mako sharks, mobulid rays, marine mammals, seabirds, thresher sharks, oceanic whitetip shark.

NW Trolls

- > 5% of the catch: yellowfin tuna, skipjack tuna, Pacific bluefin tuna
- ETP species: none
- Where the fishery accounts for at least 20% of mortality or total mortality is unknown: none
- UBM-based additions: finfish, sharks
- Main species limiting the Criterion 2 score: sharks.

Unassociated Purse Seines

- > 5% of the catch: skipjack tuna, yellowfin tuna
- ETP species:
    - Where mortality is not negligible and a sustainable level of catch is unknown or total fishing mortality in the fishery is unknown: mobulid rays, olive ridley turtle, loggerhead turtle, green turtle, leatherback turtle, hawksbill turtle, whale shark, hammerhead sharks, false killer whale, dolphins, baleen whales*
    - Where mortality exceeds 5% of a sustainable level: none

- Where the fishery accounts for at least 20% of mortality or total mortality is unknown: bigeye tuna, Pacific bluefin tuna
- Main species limiting the Criterion 2 score: mobulid rays.

NW Handlines and Hand-Operated Pole-and-Lines

- > 5% of the catch: skipjack tuna, yellowfin tuna, albacore
- ETP species: none
- Where the fishery accounts for at least 20% of mortality or total mortality is unknown: none
- UBM-based additions: finfish, sharks
- Main species limiting the Criterion 2 score: sharks
- Additional Criterion 1 species that are **not** main species but are included to produce a rating: Pacific bluefin tuna, swordfish.

SW Drifting Longlines

- > 5% of the catch: yellowfin tuna, albacore tuna, bigeye tuna
- ETP species
    - Where mortality is not negligible and a sustainable level of catch is unknown: silky shark, elasmobranchs nei, bigeye thresher shark, thresher sharks, mobulid rays, olive ridley turtle, sea turtles, loggerhead turtle, marine mammals, green turtle, leatherback turtle, hawksbill turtle, porbeagle, hammerhead sharks, mako sharks, seabirds
    - Where estimated take exceeds 5% of a sustainable level: oceanic whitetip shark, striped marlin
- Where the fishery accounts for at least 20% of mortality or total mortality is unknown: blue shark, swordfish, blue marlin, black marlin, Indo-Pacific sailfish, escolar, wahoo, opah, mahi, pomfrets, pelagic stingray, southern bluefin tuna (as indicated by CCSBT data; see Appendices)
- Main species limiting the Criterion 2 score: hammerhead sharks, mako sharks, mobulid rays, marine mammals, seabirds, thresher sharks, oceanic whitetip shark.

SW Hand-Operated Pole-and-Lines

- > 5% of the catch: skipjack tuna, yellowfin tuna
- ETP species: none
- Where the fishery accounts for at least 20% of mortality or total mortality is unknown: none
- UBM-based additions: finfish, sharks
- Main species limiting the Criterion 2 score: sharks
- Additional Criterion 1 species that are **not** main species but are included to produce a rating: albacore.

SW Handlines and Hand-Operated Pole-and-Lines

- > 5% of the catch: skipjack tuna, yellowfin tuna
- ETP species: none
- Where the fishery accounts for at least 20% of mortality or total mortality is unknown: none
- UBM-based additions: finfish, sharks

- Main species limiting the Criterion 2 score: sharks
- Additional Criterion 1 species that are **not** main species but are included to produce a rating: albacore tuna, swordfish, bigeye tuna.

FAD-set Purse Seines

- > 5% of the catch: skipjack tuna, yellowfin tuna
- ETP species:
    - Where mortality is not negligible and a sustainable level of catch is unknown or total fishing mortality in the fishery is unknown: silky shark, mobulid rays, olive ridley turtle, loggerhead turtle, green turtle, leatherback turtle, hawksbill turtle, whale shark, hammerhead sharks, false killer whale, dolphins, baleen whales*
    - Where mortality exceeds 5% of a sustainable level: none
- Where the fishery accounts for at least 20% of mortality or total mortality is unknown: bigeye tuna, mackerel scad, ocean triggerfish
- Main species limiting the Criterion 2 score: mobulid rays.

* While bycatch data from WCPFC (see Appendices for full data tables) indicate that baleen whale bycatch is only a concern in unassociated purse seines, this may be due to the nature of data delivery for marine mammals captured in WCPFC purse seines. WCPFC has noted the possibility of underreporting of whale and whale shark-based purse seine sets (and therefore whale shark and cetacean interactions) in logbooks (compared to reports from observers), and as a solution, it reports whale and whale shark interactions under unassociated (free school) sets rather than FAD sets {Peatman et al. 2024}. But Seafood Watch considers whale and whale shark sets to be FAD sets. Thus, while bycatch data indicate that baleen whale catch occurs primarily in unassociated purse seine sets, some of these instances are likely from whale sets, but it is unknown how many can be attributed to whale vs. unassociated sets. Therefore, baleen whales are included as main species in both unassociated purse seines and FAD-set purse seines as a precautionary measure.

Pacific bluefin catch data in purse seines are not separated by catch type, but FAD-set purse seines are not used to target or capture Pacific bluefin tuna. Thus, it is only included as a main species in the unassociated purse seine fishery.

Criterion 2 assessment

Scoring guidelines

Factor 2.1 - Abundance

(same as Factor 1.1 above)

Factor 2.2 - Fishing mortality

(same as Factor 1.2 above)

Factor 2.3 - Modifying factor: discards and bait use

Goal: Fishery optimizes the utilization of marine and freshwater resources by minimizing post-harvest loss. For fisheries that use bait, bait is used efficiently.

Scoring guidelines: The discard rate is the sum of all dead discards (i.e. non-retained catch) plus bait use divided by the total retained catch.

Ratio of bait + discards/landings	Factor 2.3 score
<100%	1
>=100	0.75

Baleen whales *(Mysticeti)*

2.1 Abundance

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central - Western and Central Pacific Fisheries Commission (WCPFC)

High concern

Baleen whales found in the WCPO include species such as blue whale, gray whale, and humpback whale. Blue whale is listed by the IUCN as “Endangered,” and the Oceania subpopulation of humpback whale is listed as “Endangered” as well (Childerhouse et al. 2008; Cooke 2018). Because specific species and stocks included in the data category of “baleen whales” are unknown, but at least one applicable stock is considered endangered, abundance is considered a “high concern” (per line 1 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing mortality

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Moderate concern

From 2018 to 2022, an average of 354 baleen whales were caught annually in unassociated purse seines in the WCPO (Peatman et al. 2024). Because WCPFC reports whale-set (which Seafood Watch considers a type of FAD set) marine mammal interactions under unassociated purse seines, it is not clear how many of these whale catches can be attributed to unassociated vs. FAD-set purse seines, so they are included in both fisheries. But the specific species and thus levels of sustainable catch rates are unknown. Therefore, the Seafood Watch UBM was used for scoring. The UBM points to a score of 3 for FAD-set purse seines operating in the Western Central Pacific, so fishing mortality is considered a “moderate concern" (per table 2.2.2 of the Seafood Watch Standard).

Supplementary information

While this fishery may operate slightly north and south of the WCPO FAO area, the majority of purse seine fishing occurs in the WCPO, so UBM scoring is based only on this area (Figure 21).

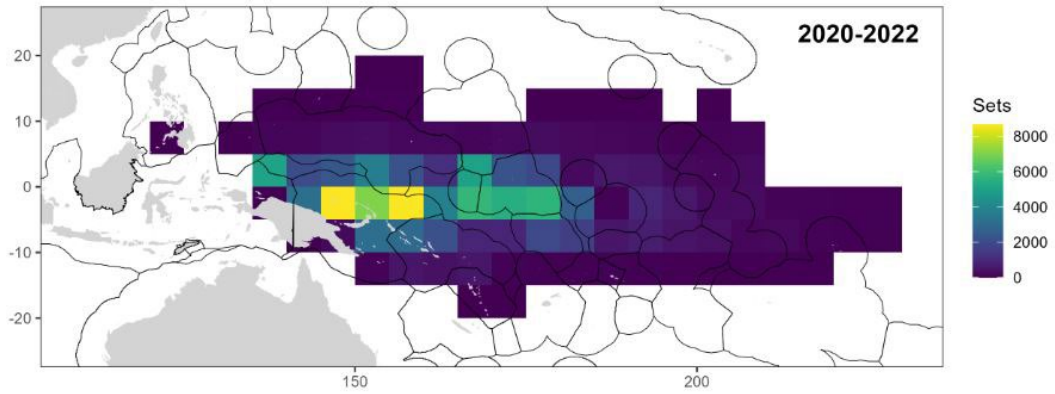


Figure 10: Spatial distribution of WCPFC purse seine fishery sets from 2020 to 2022. Source: (Peatman et al. 2024).

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central - Western and Central Pacific Fisheries Commission (WCPFC)

Low concern

From 2018 to 2022, an average of 354 baleen whales were caught annually in unassociated purse seines in the WCPO (Peatman et al. 2024). But the specific species and thus levels of sustainable catch rates are unknown. Therefore, the Seafood Watch UBM was used for scoring. The UBM points to a score of 4 for unassociated purse seines operating in the Western Central Pacific, so fishing mortality is considered a “low concern” (per table 2.2.2 of the Seafood Watch Standard).

Supplementary information

Though this fishery may operate slightly north and south of the WCPO FAO area, the majority of purse seine fishing occurs in the WCPO, so UBM scoring is based only on this area (Figure 21).

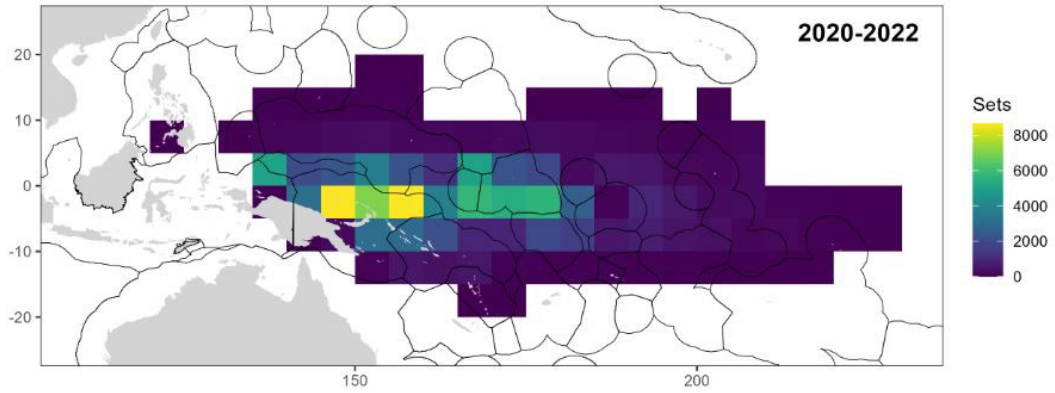


Figure 10: Spatial distribution of WCPFC purse seine fishery sets from 2020 to 2022. Source: (Peatman et al. 2024).

Bigeye thresher shark *(Alopias superciliosus)*

2.1 Abundance

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

High concern

A Pacific-wide stock assessment for bigeye thresher shark has not been performed, though a vulnerability assessment was completed for the species in 2017 (Clarke 2017b). This assessment did not estimate biomass for the Pacific stock. The IUCN lists bigeye thresher as "Vulnerable" on a global scale (Rigby et al. 2019d). Based on the IUCN status, abundance is considered a "high concern" (per line 1 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing mortality

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Moderate concern

While the 2017 vulnerability assessment for Pacific bigeye thresher shark suggested that fishing mortality may have been above a sustainable level in some years before 2014, fishing mortality after 2014 has not been quantified, making current fishing mortality relative to appropriate reference points unknown (Clarke 2017b). Because it is unknown, fishing mortality is considered a "moderate concern" (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Dolphin (unspecified) *(Delphinidae)*

2.1 Abundance

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central - Western and Central Pacific Fisheries Commission (WCPFC)

High concern

Although some specific species of dolphins are identified in bycatch data for WCPO purse seines, a general "dolphins nei" category is also included in the data (Peatman et al. 2024). Species of dolphins identified in observer data include bottlenose, common, dusky, and others, but it is unclear which species make up the dolphins nei category (Williams et al. 2021). Dolphins, like other marine mammals, are considered by Seafood Watch to be an inherently vulnerable taxonomic group, so abundance is considered a "high concern" (per line 1 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing mortality

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Moderate concern

Because this category is not detailed to the species level in WCPFC data, a sustainable level of mortality is unknown. Further, it is unknown if purse seines are substantial contributors to dolphin mortality because comparable data are not available for other fisheries, such as longlines. Therefore, the UBM was used to score fishing mortality, which points to score of 3 for FADs operating in the Western Central Pacific. Thus, fishing mortality is considered a "moderate concern."

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central - Western and Central Pacific Fisheries Commission (WCPFC)

Low concern

Because this category is not detailed to the species level in WCPFC data, a sustainable level of mortality is unknown. Further, it is unknown if purse seines are substantial contributors to dolphin mortality because comparable data are not available for other fisheries, such as longlines. Therefore, the UBM was used to score fishing mortality, which points to score of 4 for unassociated purse seines operating in the Western Central Pacific. Thus, fishing mortality is considered a "low concern" (per table 2.2.2 of the Seafood Watch Standard).

Escolar *(Lepidocybium flavobrunneum)*

2.1 Abundance

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

High concern

Escolar has not been formally assessed in the Pacific Ocean. Therefore, a PSA was performed, resulting in a score of 3.34, or high vulnerability. Based on the PSA results, abundance is considered a "high concern" (per line 3.e in table 1.1.1 of the Seafood Watch Standard).

Supplementary information

Productivity-Susceptibility Analysis for escolar:

Table 12:

Productivity Attribute	**High (score = 1)**	**Medium (score = 2)**	**Low (score = 3)**	**Score**	**Value; {Reference(s)}**
Average age at maturity (yrs)	< 5	5–15	> 15	2	8 years (Hung-Hung et al. 2014)

Von Bertalanffy (Brody) Growth Coefficient (K)	> 0.25	0.15–0.25	< 0.15	3	0.080 {Griffiths et al 2019}
Fecundity (eggs/yr)	> 20,000	100–20,000	< 100	1	~46 million eggs (Hung-Hung et al. 2014)
Average maximum size (cm)	< 100	100–300	> 300	2	200 cm (Froese and Pauly 2019)
Average size at maturity (cm)	< 40	40–200	> 200	2	129.5 cm (Hung-Hung et al. 2014)
Reproductive strategy	Broadcast spawner	Demersal egg layer or brooder	Live bearer	1	Broadcast spawner (Hung-Hung et al. 2014)
Productivity score (mean of attribute scores)				**1.83**	

Table 13:

Susceptibility Attribute (default scores in bold)	**Low S (score = 1)**	**Medium S (score = 2)**	**High S (score = 3)**	**Score**	**Value/notes; (reference)**
Areal overlap (all fisheries)	> 90% of species concentration is unfished	70–90% of species concentration is unfished	**> 30% of the species concentration is fished**	3	Unknown; Default (bolded) scores selected
Vertical overlap (all fisheries)	> 67% of species' depth range is unfished	33–66% of species' depth range is unfished	**< 33% of species' depth range is unfished**	3	

Seasonal Availability (all fisheries)	Fisheries overlap with species < 3 months/year	Fisheries overlap with species 3–6 months/year	**Fisheries overlap with species > 6 months/year**	3	
Selectivity of fishery (specific to fishery under assessment)	Species is not targeted AND is not likely to be captured by gear	**Species is targeted, or is incidentally encountered AND is not likely to escape the gear**	Species is targeted or is incidentally encountered AND combination of fishery attributes and species' biology increases its susceptibility to the gear	2	
Post-capture mortality (specific to fishery under assessment)	> 66% individuals survive post-capture	33–66% individuals survive post-capture	**Retained species, or > 66% do not survive post capture**	3	
Susceptibility score (mean of attribute scores)				**2.8**	

Table 14:

Productivity-Susceptibility Score ($V = v(P^2 + S^2)$)	**3.34**
Vulnerability Rating: < 2.64 = Low vulnerability, >= 2.64 and <= 3.18 = Medium vulnerability, > 3.18 = High vulnerability	High

2.2 Fishing mortality

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Moderate concern

Fishing mortality for escolar in the Pacific Ocean is unknown. Therefore, fishing mortality is considered a "moderate concern" (per line 3 in table 1.2.1 of the Seafood Watch Standard).

False killer whale *(Pseudorca crassidens)*

2.1 Abundance

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central - Western and Central Pacific Fisheries Commission (WCPFC)

High concern

False killer whale has not been formally assessed in the Western Pacific. The IUCN lists the species as "Near Threatened" per a 2018 assessment (Baird 2018). Based on an IUCN assessment < 10 years old, abundance is considered a "high concern" (per line 1 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing mortality

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central - Western and Central Pacific Fisheries Commission (WCPFC)

Moderate concern

From 2018 to 2022, an annual average of 282 (unassociated sets) and 288 (FAD sets) false killer whales were caught in WCPO purse seines (Peatman et al. 2024). False killer whale is also known to be caught in longlines, but fully extrapolated estimates for this catch are unavailable, so catch in longlines cannot be compared to catch in purse seines. Total fishing mortality is unknown, so fishing mortality is considered a "moderate concern" (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Finfish *(Osteichthyes)*

2.1 Abundance

Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean - Hand-operated pole-and-lines - Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Moderate concern

Handline fisheries that target tuna and swordfish also capture several small tuna species, such as bullet and kawakawa. Because finfish are not considered a highly vulnerable taxonomic group, abundance is considered a "moderate concern" (per line 3 on page 20 of the Seafood Watch Standard).

Northwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Moderate concern

Though bycatch data are lacking for troll fisheries, finfish are at risk of capture in this gear type in the Western Pacific Ocean. Because finfish are not considered a highly vulnerable taxonomic group, abundance is considered a "moderate concern" (per line 3 on page 20 of the Seafood Watch Standard).

2.2 Fishing mortality

Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean - Hand-operated pole-and-lines - Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Moderate concern

According to the Seafood Watch Unknown Bycatch Matrix, finfish score a 3 in handline and troll fisheries. Therefore, fishing mortality is considered a "moderate concern" (per table 2.2.2 of the Seafood Watch Standard).

Green turtle *(Chelonia mydas)*

2.1 Abundance

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central - Western and Central Pacific Fisheries Commission (WCPFC)

High concern

The International Union for the Conservation of Nature (IUCN) has classified green sea turtle worldwide as "Endangered" with a decreasing population trend, but there is no stock assessment available that is specific to the WCPO (Seminoff 2004). Seafood Watch considers sea turtles to be a vulnerable taxon. In the absence of a stock assessment, abundance is considered a "high concern" by default for vulnerable taxa (per line 2.a on page 20 of the Seafood Watch Standard).

2.2 Fishing mortality

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Low concern

The incidental capture of sea turtles during purse seine sets is quite low in the WCPO, particularly compared to WCPFC longline fisheries. From 2016 to 2020, an average of 19 green sea turtles were captured per year in WCPFC FAD-set purse seines, compared to an average of ≈1,372 green turtles captured in WCPFC longlines from 2017 to 2021 (Peatman and Nicol 2021; Peatman and Nicol 2023). Because of the low interaction rates between FAD sets and green sea turtle, which suggests that FAD purse seines may not be a substantial contributor to green sea turtle fishing mortality in tuna fisheries in the WCPO, fishing mortality is considered a "low concern" (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central - Western and Central Pacific Fisheries Commission (WCPFC)

Low concern

The incidental capture of sea turtles during purse seine sets is quite low in the WCPO, particularly compared to WCPFC longline fisheries. From 2016 to 2020, an average of 41 green sea turtles were captured per year in WCPFC free school purse seines, compared to an average of ≈1,372 green turtles captured in WCPFC longlines

from 2017 to 2021 (Peatman and Nicol 2021) (Peatman and Nicol 2023). Because of the low interaction rates between unassociated purse seine sets and green sea turtle, which suggests that these fisheries may not be a substantial contributor to green sea turtle fishing mortality in tuna fisheries in the WCPO, fishing mortality is considered a “low concern” (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Moderate concern

The incidental capture of green sea turtle is considered a major threat to their populations worldwide (Seminoff 2004). Although green sea turtle is one of the more commonly caught turtle species in the South Pacific region (Williams et al. 2009), the impact from bycatch to the population is low in the south Central Pacific and the Western and Central Pacific Ocean, and those populations are considered at low risk (Wallace et al. 2011) {Wallace et al. 2013b} (Wallace et al. 2010). From 2017 to 2021, an estimated 6,863 total green turtles were caught in longline fisheries, but it is unknown how this compares to sustainable levels of catch (Peatman and Nicol 2023). Therefore, fishing mortality is considered a “moderate concern” (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Hammerhead sharks *(Sphyrna spp.)*

2.1 Abundance

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central - Western and Central Pacific Fisheries Commission (WCPFC)

High concern

Smooth, scalloped, and great hammerhead sharks are all listed by the IUCN as having statuses worse than "Least Concern" (e.g., see (Rigby et al. 2019b)). Based on the IUCN statuses and the inherent vulnerability of shark species, abundance is considered a "high concern" (per line 1 in table 1.1.1 and line 2.a on page 20 of the Seafood Watch Standard).

2.2 Fishing mortality

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central - Western and Central Pacific Fisheries Commission (WCPFC)

Low concern

Hammerhead shark catches are reported in bycatch data for purse seines and in WCPFC's regular catch dataset for longlines. Based on the latest data from both datasets, hammerhead shark catch in both FAD-set and unassociated purse seines is significantly lower than annual catch in longline fisheries (Peatman et al. 2024; WCPFC 2024i). As a result, both purse seine fisheries are not considered to be substantial contributors to hammerhead shark catches, and fishing mortality is considered a "low concern" (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

High concern

According to the Seafood Watch Unknown Bycatch Matrix, sharks caught with pelagic longlines in the Northwest, Western Central, and Southwest Pacific all score 1. Therefore, fishing mortality is considered a "high concern" (per table 2.2.2 of the Seafood Watch Standard).

Hawksbill turtle *(Eretmochelys imbricata)*

2.1 Abundance

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central - Western and Central Pacific Fisheries Commission (WCPFC)

High concern

The IUCN has classified hawksbill turtle as “Critically Endangered” with a decreasing population trend (Mortimer and Donnelly 2008). Hawksbill turtle has been listed on CITES since 1977 and is currently listed on CITES Appendix 1, meaning that it is threatened with extinction, and international trade is prohibited. There are no stock assessments for hawksbill in the WCPO, but Seafood Watch considers sea turtles to be a taxon with high inherent vulnerability. In the absence of a stock assessment, abundance is considered a “high concern” by default for vulnerable taxa (per line 2.a on page 20 of the Seafood Watch Standard).

2.2 Fishing mortality

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Low concern

The incidental capture of sea turtles during purse seine sets is quite low in the WCPO, especially compared to WCPFC longlines. From 2016 to 2020, an average of 9 hawksbill turtles per year were captured in WCPFC FAD-set purse seines, compared to an average of ≈422 hawksbills captured in WCPFC longlines from 2017 to 2021 (Peatman and Nicol 2021) (Peatman and Nicol 2023). Because of the low interaction rates between FAD sets and hawksbill sea turtle, which suggests that FAD purse seines may not be a substantial contributor to hawksbill sea turtle fishing mortality in tuna fisheries in the WCPO, fishing mortality is considered a “low concern” (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central - Western and Central Pacific Fisheries Commission (WCPFC)

Low concern

The incidental capture of sea turtles during purse seine sets is quite low in the WCPO, especially compared to WCPFC longlines. From 2016 to 2020, an average of 20 hawksbill turtles per year were captured in WCPFC free school purse seines, compared to an average of ≈422 hawksbills captured in WCPFC longlines from 2017 to 2021 (Peatman and Nicol 2021) (Peatman and Nicol 2023). Because of the low interaction rates between unassociated sets and hawksbill sea turtle, which suggests that these fisheries may not be a substantial contributor to hawksbill sea turtle fishing mortality in tuna fisheries in the WCPO, fishing mortality is considered a "low concern."

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Moderate concern

Interactions between hawksbill turtles and pelagic longline gear in the WCPO are not infrequent, though they are less frequent than interactions with all other sea turtle species. From 2017 to 2021, a total of 2,109 hawksbill turtles were captured in WCPFC longline fisheries (Peatman and Nicol 2023). But the impact of these captures on the population is unknown because no stock assessment exists in the Western Pacific Ocean. Because fishing mortality is unknown, it is considered a "moderate concern" (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Leatherback turtle *(Dermochelys coriacea)*

2.1 Abundance

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central - Western and Central Pacific Fisheries Commission (WCPFC)

High concern

The IUCN classified leatherback turtle globally as “Vulnerable” with a decreasing population trend in 2000 (Wallace et al. 2013). The west Pacific subpopulation is considered “Critically Endangered” with a decreasing population trend (Tiwari et al. 2013). Leatherback turtle has been listed in the Convention on International Trade in Endangered Species (CITES) since 1975 and is currently listed in CITES Appendix 1, meaning that it is threatened with extinction, and international trade is prohibited. There is no recent stock assessment for leatherback turtle in the WCPO, but Seafood Watch considers sea turtles to have high inherent vulnerability. In the absence of a stock assessment, abundance is considered a “high concern” by default for vulnerable taxa (per line 2.a on page 20 of the Seafood Watch Standard).

2.2 Fishing mortality

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Low concern

The incidental capture of sea turtles during purse seine sets is quite low in the WCPO, particularly compared to WCPFC longline fisheries. From 2016 to 2020, an average of 4 leatherback turtles were captured per year in WCPFC FAD-set purse seines, compared to an average of ≈519 leatherback turtles captured in WCPFC longlines from 2017 to 2021 (Peatman and Nicol 2021) (Peatman and Nicol 2023). Because of the low interaction rates between FAD purse seine sets and leatherback turtle, which suggests that these fisheries may not be a substantial contributor to leatherback turtle fishing mortality in tuna fisheries in the WCPO, fishing mortality is considered a “low concern” (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central - Western and Central Pacific Fisheries Commission (WCPFC)

Low concern

The incidental capture of sea turtles during purse seine sets is quite low in the WCPO, particularly compared to WCPFC longline fisheries. From 2016 to 2020, an average of 5 leatherback sea turtles were captured per year in WCPFC free school purse seines, compared to an average of ≈519 leatherback turtles captured in WCPFC longlines from 2017 to 2021 (Peatman and Nicol 2021) (Peatman and Nicol 2023). Because of the low interaction rates between unassociated purse seine sets and leatherback turtle, which suggests that these fisheries may not be a substantial contributor to leatherback turtle fishing mortality in tuna fisheries in the WCPO, fishing mortality is considered a "low concern" (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Moderate concern

Fishing mortality is thought to be a major threat to leatherback turtle, especially for juveniles and adults that can be incidentally captured in fisheries along their migration routes (Wallace et al. 2013) (Zug and Parham 1996) (Roe et al. 2014). From 2017 to 2021, a total of 2,596 leatherback turtles were captured in WCPFC longline fisheries (Peatman and Nicol 2023). But in the absence of a stock assessment, the population impact of these captures is unknown. Because fishing mortality is unknown, it is considered a "moderate concern" (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Loggerhead turtle *(Caretta caretta)*

2.1 Abundance

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central - Western and Central Pacific Fisheries Commission (WCPFC)

High concern

The IUCN classified loggerhead turtle in the North Pacific Regional Management Unit (RMU) as "Least Concern" with an increasing population trend, but this listing is 10 years old (Casale & Matsuzawa 2015), and it classified loggerhead turtle in the South Pacific RMU as "Critically Endangered" with a decreasing population trend (Limpus & Casale 2015). Loggerhead turtle is listed on Appendix 1 of CITES. No more recent assessments exist for either subpopulation, but Seafood Watch considers sea turtles to have high inherent vulnerability. In the absence of a stock assessment, abundance is considered a "high concern" by default for vulnerable taxa (per line 2.a on page 20 of the Seafood Watch Standard).

2.2 Fishing mortality

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Low concern

The incidental capture of sea turtles during purse seine sets is quite low in the WCPO, particularly compared to WCPFC longline fisheries. From 2016 to 2020, an average of 18 loggerhead turtles were captured per year in WCPFC FAD-set purse seines, compared to an average of 3,554 loggerhead turtles captured in WCPFC longlines from 2017 to 2021 (Peatman and Nicol 2021) (Peatman and Nicol 2023). Because of the low interaction rates between FAD purse seine sets and loggerhead turtle, which suggests that these fisheries may not be a substantial contributor to loggerhead turtle fishing mortality in tuna fisheries in the WCPO, fishing mortality is considered a "low concern."

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central - Western and Central Pacific Fisheries Commission (WCPFC)

Low concern

The incidental capture of sea turtles during purse seine sets is quite low in the WCPO, particularly compared to WCPFC longline fisheries. From 2016 to 2020, an average of 31 loggerhead turtles were captured per year in WCPFC free school purse seines, compared to an average of 3,554 loggerhead turtles captured annually in WCPFC longlines from 2017 to 2021 (Peatman and Nicol 2021) (Peatman and Nicol 2023). Because of the low interaction rates between unassociated purse seine sets and loggerhead turtle, which suggests that these fisheries may not be a substantial contributor to loggerhead turtle fishing mortality in tuna fisheries in the WCPO, fishing mortality is considered a "low concern" (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Moderate concern

The incidental capture of loggerhead turtles has historically been considered a primary threat to their populations (Casale and Tucker 2017). From 2017 to 2021, an average of 3,554 loggerhead turtles were captured annually in WCPFC longline fisheries (Peatman and Nicol 2023). But it is unknown how these captures affect the population, because there is no stock assessment for the Western Pacific. Therefore, fishing mortality unknown and is considered a "moderate concern" (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Long snouted lancetfish *(Alepisaurus ferox)*

2.1 Abundance

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Moderate concern

The status of long snouted lancetfish in the Pacific Ocean is unknown. The IUCN lists this species as "Least Concern," but this listing is > 10 years old (Paxton 2010). Without an up-to-date stock assessment or IUCN listing, a PSA was used to score this factor. Information on this species is lacking, but the PSA resulted in a score of 3.18,

or medium vulnerability. Based on the PSA results, abundance is considered a "moderate concern" (per line 2.e in table 1.1.1 of the Seafood Watch Standard).

Supplementary information

Productivity-Susceptibility Analysis for long snouted lancetfish:

Table 15:

Productivity Attribute*	**High (score = 1)**	**Medium (score = 2)**	**Low (score = 3)**	**Score**	**Value; {Reference(s)}**
Average maximum size (cm)	< 100	100–300	> 300	2	215 cm (Froese and Pauly 2019)
Reproductive strategy	Broadcast spawner	Demersal egg layer or brooder	Live bearer	1	Broadcast spawner (Froese and Pauly 2020)
Productivity score (mean of attribute scores)				**1.33**	
* Note that fecundity, growth coefficient, average age at maturity, and average size at maturity are unknown, so they were not included as Productivity attributes.					

Table 16:

Susceptibility Attribute (default scores in bold)	**Low S (score = 1)**	**Medium S (score = 2)**	**High S (score = 3)**	**Score**	**Value/notes; (reference)**
Areal overlap (all fisheries)	> 90% of species concentration is unfished	70–90% of species concentration is unfished	**> 30% of the species concentration is fished**	3	Default (bolded) scores selected
Vertical overlap (all fisheries)	> 67% of species' depth range is unfished	33–66% of species' depth range is unfished	**> 33% of species' depth range is unfished**	3	

Seasonal Availability (all fisheries)	Fisheries overlap with species < 3 months/year	Fisheries overlap with species 3–6 months/year	**Fisheries overlap with species > 6 months/year**	3	
Selectivity of fishery (specific to fishery under assessment)	Species is not targeted AND is not likely to be captured by gear	**Species is targeted, or is incidentally encountered AND is not likely to escape the gear**	Species is targeted or is incidentally encountered AND combination of fishery attributes and species' biology increases its susceptibility to the gear	2	
Post-capture mortality (specific to fishery under assessment)	> 66% individuals survive post-capture	33–66% individuals survive post-capture	Retained species, or > 66% do not survive post capture	3	Not retained; max survival rate ˜40% (Gilman et al. 2018)
Susceptibility score (mean of attribute scores)				**2.8**	

Table 17:

Productivity-Susceptibility Score ($V = v(P^2 + S^2)$)	**3.18**
Vulnerability Rating: < 2.64 = Low vulnerability, >= 2.64 and <= 3.18 = Medium vulnerability, > 3.18 = High vulnerability	Medium

2.2 Fishing mortality

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Moderate concern

Though long snouted lancetfish is a common bycatch species in WCPFC longline fisheries, the IUCN suggests that catches from commercial fisheries are likely not a threat to this species (Paxton 2010). But because fishing mortality is unknown, it is considered a "moderate concern" (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Mackerel scad *(Decapterus macarellus)*

2.1 Abundance

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Moderate concern

Mackerel scad has not been assessed in the Pacific Ocean. Though it is considered "Least Concern" on a global scale, its IUCN listing is from 2012, so it is outdated for Seafood Watch scoring purposes (Smith-Vaniz et al. 2015). A PSA was performed that resulted in a score of 2.97. Based on the PSA results, abundance is considered a "moderate concern" (per line 2.e in table 1.1.1 of the Seafood Watch Standard).

Supplementary information

Productivity-Susceptibility Analysis for mackerel scad:

Table 18:

Productivity Attribute	**High (score = 1)**	**Medium (score = 2)**	**Low (score = 3)**	**Score**	**Value; {Reference(s)}**
Average age at maturity (yrs)	< 5	5–15	> 15	1	0.8 (Froese and Pauly 2024)

Fecundity (eggs/yr)	> 20,000	100–20,000	< 100	1	≈43,000–46,000 eggs (Sululu et al. 2022)
Von Bertalanffy (Brody) Growth Coefficient (K)	> 0.25	0.15–0.25	< 0.15	1	46 cm (Froese and Pauly 2024)
Average maximum size (cm)	< 100	100–300	> 300	1	46 cm (Froese and Pauly 2024)
Average size at maturity (cm)	< 40	40–200	> 200	1	25 cm (Smith-Vaniz et al. 2015)
Reproductive strategy	Broadcast spawner	Demersal egg layer or brooder	Live bearer	1	Broadcast spawner (Sululu et al. 2022)
Productivity score (mean of attribute scores)				**1**	

Table 19:

Susceptibility Attribute (default scores in bold)	**Low S (score = 1)**	**Medium S (score = 2)**	**High S (score = 3)**	**Score**	**Value/notes; {Reference(s)}**
Areal overlap (all fisheries)	> 90% of species concentration is unfished	70–90% of species concentration is unfished	**> 30% of the species concentration is fished**	3	Default (bolded) scores selected
Vertical overlap (all fisheries)	> 67% of species' depth range is unfished	33–66% of species' depth range is unfished	**> 33% of species' depth range is unfished**	3	

Seasonal availability (all fisheries)	Fisheries overlap with species < 3 months/year	Fisheries overlap with species 3–6 months/year	**Fisheries overlap with species > 6 months/year**	3	
Selectivity of fishery (specific to fishery under assessment)	Species is not targeted AND is not likely to be captured by gear	**Species is targeted, or is incidentally encountered AND is not likely to escape the gear**	Species is targeted or is incidentally encountered AND combination of fishery attributes and species' biology increases its susceptibility to the gear	2	
Post-capture mortality (specific to fishery under assessment)	> 66% of individuals survive post-capture	33–66% of individuals survive post-capture	**Retained species, or > 66% do not survive post-capture**	3	
Susceptibility score (mean of attribute scores)				**2.8**	

Table 20:

Productivity-Susceptibility Score ($V = v(P^2 + S^2)$)	**2.97**
Vulnerability Rating: < 2.64 = Low vulnerability; >= 2.64 and <= 3.18 = Medium vulnerability; > 3.18 = High vulnerability	Medium

2.2 Fishing mortality

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Moderate concern

Fishing mortality for mackerel scad is unknown, so it is considered a “moderate concern” (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Mako shark (unspecified) *(Isurus spp.)*

2.1 Abundance

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

High concern

Both longfin and shortfin mako sharks are considered “Endangered” by the IUCN (e.g., see (Rigby et al. 2019)), and Seafood Watch considers sharks to have a high inherent vulnerability. Based on their IUCN listings, abundance for mako sharks as a group is considered a “high concern” (per line 1 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing mortality

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

High concern

According to the Seafood Watch Unknown Bycatch Matrix, sharks caught with pelagic longlines in the Northwest, Western Central, and Southwest Pacific all score 1. Therefore, fishing mortality is considered a “high concern” (per table 2.2.2 of the Seafood Watch Standard).

Manta rays and devil rays *(Mobula spp.)*

2.1 Abundance

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central - Western and Central Pacific Fisheries Commission (WCPFC)

High concern

There are 11 species of manta/devil rays. The giant devil ray is considered “Endangered” by the IUCN (Notarbartolo di Sciara 2015), and the spinetail devil ray (*Mobula munkiana*), longhorned pygmy devil ray, and bentfin devil ray are considered “Near Threatened” (White et al. 2006; Bizzaro et al. 2006) (Pierce and Bennet 2003) (Walls et al. 2016). The giant manta ray, reef manta ray, and sicklefin devil ray are considered “Vulnerable” by the IUCN (Marshall et al. 2018a) (Marshall et al. 2018b) (Pardo et al. 2016). Species-specific information on manta/devil ray bycatch in the Western and Central Pacific purse seine and longline fisheries is lacking, because these species are all recorded as “mobulid rays” in WCPFC bycatch data. Based on the IUCN statuses of various rays in this taxonomic group, abundance is considered a “high concern” (per line 1 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing mortality

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central - Western and Central Pacific Fisheries Commission (WCPFC)

High concern

Manta/devil rays are among the most common ray species incidentally captured in purse seine fisheries (Hall and Roman 2013) (Croll et al. 2015). From 2018 to 2022, annual averages of 3,090 and 1,255 mobulid rays were captured in WCPFC free school and FAD-set tuna fisheries, respectively (Peatman et al. 2024). While purse seine fisheries contribute less than 20% of total mobulid mortality in WCPFC fisheries, a sustainable level of mortality for this species group is unknown. Therefore, the Seafood Watch Unknown Bycatch Matrix was used for scoring, which points to a score of 1 for FAD purse seines and 2 for unassociated purse seines in the Western Central Pacific. Both scores translate to fishing mortality as a "high concern" (per in table 2.2.2 of the Seafood Watch Standard).

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

High concern

From 2017 to 2021, a total of 77,020 mobulid rays were captured in WCPFC longline fisheries, which contributed substantially more than purse seine fisheries to mobulid ray bycatch. But the population impacts of this catch on this taxonomic group are unknown, so the Seafood Watch Unknown Bycatch Matrix was used for scoring. The UBM points to a score of 1 for pelagic longlines used in the Northwest, Southwest, and Western Central Pacific, which translates to fishing mortality as a "high concern" (per table 2.2.2 of the Seafood Watch Standard).

Marine mammals *(Mammalia)*

2.1 Abundance

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

High concern

Several species of marine mammals interact with WCPFC longline fisheries. From 2015 to 2020, the five species most frequently interacted with, based on observer data, were false killer whale, toothed whales nei (species not identified), bottlenose dolphin, rough-toothed dolphin, and short-finned pilot whale (Williams et al. 2021). Other

bycatch data also note a general “marine mammal” category captured in longline fisheries (Peatman and Nicol 2023). Seafood Watch considers marine mammals to have high inherent vulnerability, and the species with the highest interaction rate in WCPFC longline fisheries is considered “Near Threatened” by the IUCN (Baird 2018). Because a mixture of known and unknown marine mammal species are caught in longline fisheries, and marine mammals have high inherent vulnerability, abundance is considered a “high concern” (per line 2.a on page 20 of the Seafood Watch Standard).

Supplementary information

For a full list of marine mammals interacting in longline fisheries from 2017 to 2021, see Appendix A.

2.2 Fishing mortality

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

High concern

From 2017 to 2021, 9,180 marine mammals (not more specifically identified) were noted in bycatch data from WCPFC longline vessels (Peatman and Nicol 2023). Further, observers noted interaction rates ranging from 0.078 (false killer whale) to 0.00093 (humpback whale) (Williams et al. 2021). But because all individual marine mammal species are unknown, and stock assessments for marine mammals in the Western Pacific are lacking, the Seafood Watch Unknown Bycatch Matrix is used to determine the score. The UBM points to scores of 2 and 1 for drifting longline fisheries in the Northwest and Southwest Pacific, respectively. Both scores translate to fishing mortality as a “high concern” (per table 2.2.2 of the Seafood Watch Standard).

Ocean triggerfish *(Canthidermis sufflamen)*

2.1 Abundance

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

High concern

Ocean triggerfish has not been assessed in the Pacific Ocean, and its IUCN "Least Concern" listing is > 10 years old (Leis et al. 2015). A PSA was performed, resulting in a score of 3.25. Based on the PSA score, abundance is considered a "high concern" (per line 3.e in table 1.1.1 of the Seafood Watch Standard).

Supplementary information

Productivity-Susceptibility Analysis for ocean triggerfish:

Table 21:

Productivity Attribute*	**High (score = 1)**	**Medium (score = 2)**	**Low (score = 3)**	**Score**	**Value; {Reference(s)}**
Average maximum size (cm)	< 100	100–300	> 300	1	65 cm (Froese and Pauly 2024)
Average size at maturity (cm)	< 40	40–200	> 200	2	< 65 cm (inferred from above)
Reproductive strategy	Broadcast spawner	Demersal egg layer or brooder	Live bearer	2	Demersal egg layer
Productivity score (mean of attribute scores)				**1.67**	
* Note that ocean triggerfish is not a well-studied species, and fecundity, average age at maturity, and growth coefficient are unknown.					

Table 22:

Susceptibility Attribute (default scores in bold)	**Low S (score = 1)**	**Medium S core = 2)**	**High S (score = 3)**	**Score**	**Value/notes; {Reference(s)}**
Areal overlap (all fisheries)	> 90% of species concentration is unfished	70–90% of species concentration is unfished	**> 30% of the species concentration is fished**	3	Default (bolded) scores selected

Vertical overlap (all fisheries)	> 67% of species' depth range is unfished	33–66% of species' depth range is unfished	**> 33% of species' depth range is unfished**	3	
Seasonal availability (all fisheries)	Fisheries overlap with species < 3 months/year	Fisheries overlap with species 3–6 months/year	**Fisheries overlap with species > 6 months/year**	3	
Selectivity of fishery (specific to fishery under assessment)	Species is not targeted AND is not likely to be captured by gear	**Species is targeted, or is incidentally encountered AND is not likely to escape the gear**	Species is targeted or is incidentally encountered AND combination of fishery attributes and species' biology increases its susceptibility to the gear	2	
Post-capture mortality (specific to fishery under assessment)	> 66% individuals survive post-capture	33–66% individuals survive post-capture	**Retained species, or > 66% do not survive post-capture**	3	
Susceptibility score (mean of attribute scores)				**2.8**	

Table 23:

Productivity-Susceptibility Score ($V = \sqrt{(P^2 + S^2)}$)	**3.25**
Vulnerability Rating: < 2.64 = Low vulnerability, ≥ 2.64 and ≤ 3.18 = Medium vulnerability, > 3.18 = High vulnerability	High

2.2 Fishing mortality

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Moderate concern

Fishing mortality is unknown for ocean triggerfish in the Pacific, so it is considered a "moderate concern" (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Olive Ridley turtle *(Lepidochelys olivacea)*

2.1 Abundance

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central - Western and Central Pacific Fisheries Commission (WCPFC)

High concern

The IUCN considers olive ridley sea turtle to be "Vulnerable" globally with a decreasing population trend {Abreu-Grobis and Plotkin 2008}. There is no stock assessment for olive ridley turtle specifically in the WCPO, but Seafood Watch considers sea turtles to be a taxon with high inherent vulnerability. In the absence of a stock assessment, abundance is considered a "high concern" by default for vulnerable taxa (per line 2.a on page 20 of the Seafood Watch Standard).

2.2 Fishing mortality

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Low concern

The incidental capture of sea turtles during purse seine sets is quite low in the WCPO, especially compared to bycatch in longline fisheries. Between 2016 and 2020, an average of 25 olive ridley turtles per year were captured in FAD-set purse seines, compared to an average of 4,788 annually from 2017 to 2021 in WCPFC longlines (Peatman and Nicol 2021) (Peatman and Nicol 2023). Because of the low interaction rates between FAD sets and olive ridley turtle, which suggests that FAD purse seines may not be a substantial contributor to olive ridley sea turtle fishing mortality in tuna fisheries in the WCPO, fishing mortality is scored a "low concern."

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central - Western and Central Pacific Fisheries Commission (WCPFC)

Low concern

The incidental capture of sea turtles during purse seine sets is quite low in the WPCO, especially compared to bycatch in longline fisheries. Between 2016 and 2020, an average of 35 olive ridley turtles per year were captured in unassociated purse seines, compared to an average of 4,788 annually from 2017 to 2021 in WCPFC longlines (Peatman and Nicol 2021) (Peatman and Nicol 2023). Because of the low interaction rates between unassociated purse seines and olive ridley turtle, which suggests that these fisheries may not be a substantial contributor to olive ridley sea turtle fishing mortality in WCPO tuna fisheries, fishing mortality is considered a "low concern" (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Moderate concern

The incidental capture of olive ridley turtle occurs worldwide, although other fisheries such as trawls and gillnets appear to have a larger negative impact compared to longlines {Wallace et al. 2013b} (Abreu-Grobois and Plotkin 2008). Bycatch is a high threat to the West Pacific RMU, although the population currently is at low risk of population declines (Wallace et al. 2011). From 2017 to 2021, 23,940 olive ridley sea turtles were caught in

WCPFC longlines, while bycatch in purse seines was much smaller. Without a stock assessment, total fishing mortality is unknown, so fishing mortality is considered a “moderate concern” (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Pelagic stingray *(Pteroplatytrygon violacea)*

2.1 Abundance

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Moderate concern

Pelagic stingray has not been assessed in the Western Pacific. On a global scale, the IUCN lists the species as “Least Concern” (Kyne et al. 2019). Based on an IUCN listing that is < 10 years old, abundance is considered a “moderate concern” (per line 3 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing mortality

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Moderate concern

Pelagic stingray interacts with longline and purse seine fisheries in the WCPFC, but interactions with longlines are much more common (Hare et al. 2025). From 2017 to 2021, a total of 1,472,000 pelagic stingrays were caught in WCPFC longline fisheries, and pelagic stingray is the third-most common shark/ray bycatch species in these fisheries (Peatman and Nicol 2023) (Hare et al. 2025). But because there is no stock assessment, it is unknown how this catch relates to a sustainable level of catch for this species. Because fishing mortality is unknown, it is considered a “moderate concern” (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Pomfrets *(Bramidae)*

2.1 Abundance

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Moderate concern

Pomfrets are noted bycatch in WCPFC longline data, but species of pomfrets are not specified. Because pomfrets are teleosts, Seafood Watch does not consider them to have inherently high vulnerability, so abundance is considered a “moderate concern” (per line 3 on page 20 of the Seafood Watch Standard).

2.2 Fishing mortality

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

High concern

From 2017 to 2021, ≈1,138.5 MT of pomfrets were captured in WCPFC longline fisheries (Peatman and Nicol 2023). But this catch is not broken into individual species, so the Seafood Watch Unknown Bycatch Matrix was used for scoring. The UBM points to a score of 2 for finfish in pelagic longlines, which translates to fishing mortality as a “high concern” (per table 2.2.2 of the Seafood Watch Standard).

Porbeagle *(Lamna nasus)*

2.1 Abundance

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

High concern

Multiple assessments of porbeagle shark in the Southern Hemisphere are inconclusive about the species' abundance, but they do indicate that the Southern Hemisphere stock is not as depleted as the North Atlantic stock (Clarke 2017). According to the IUCN, abundance of the Southern Hemisphere stock of porbeagle shark has declined by less than 20% over three generations, and much higher declines in the North Atlantic Ocean have occurred during the same period. The global population is listed as "Vulnerable" on the IUCN Red List (Rigby et al. 2019c). A 2016 status review under the U.S. Endangered Species Act (ESA) determined that the Southern Hemisphere stock of porbeagle shark was stable or increasing, but there is uncertainty around that estimate (Curtis et al. 2016). A 2017 stock risk and status assessment indicates that porbeagle shark in the Southern Hemisphere are not experiencing overfishing, but the assessment did not estimate biomass and uses fishing mortality data that are not < 10 years old (Clarke 2017). Porbeagle shark has also been listed under Appendix II of CITES since 2014 (Rigby et al. 2019c). The stock status of porbeagle shark is unknown, but based on the IUCN and CITES designations for the species, abundance is considered a "high concern" (per line 1 in table 1.1.1 of the Seafood Watch Standard).

Supplementary information

The most recent assessment for porbeagle shark in the Southern Hemisphere did find that relative CPUE was generally stable in the Western Pacific Ocean from the mid-1990s until 2015, suggesting potential population stability during the same period (Clarke 2017). But this stability is representative of less than one full generation for the species (IUCN estimates three generations for the Southern Hemisphere stock at 114.9 years) (Rigby et al. 2019c).

2.2 Fishing mortality

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Moderate concern

The most recent stock status assessment for porbeagle in the Southern Hemisphere was performed in 2017. This study did not make conclusions about biomass but did find that fishing mortality in all years (1992–2014) was below reference points used for the assessment (Clarke 2017). But this study is not < 10 years old, so it cannot provide up-to-date conclusions about fishing mortality. Because more recent fishing mortality conclusions/data are not available, fishing mortality is considered a "moderate concern" (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Sailfish *(Istiophorus platypterus)*

2.1 Abundance

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

High concern

Sailfish has genetically distinct populations in the East and West Pacific, but its stock status is unknown in either region. The IUCN lists sailfish as "Vulnerable" with a decreasing global population trend (Collette et al. 2022). Without a regional stock assessment, the IUCN listing that is < 10 years old is used to describe abundance, which is considered a "high concern" (per line 1 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing mortality

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Moderate concern

Because there is no stock assessment for the Western Pacific population of sailfish, reference points are lacking and fishing mortality is unknown. Therefore, fishing mortality is considered a "moderate concern" (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Seabirds *(Aves)*

2.1 Abundance

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

High concern

A number of seabird species are captured in WCPFC northern (north of 25° N.) longline fisheries. From 2008 to 2018, three species composed over 95% of captured seabirds in these fisheries: Laysan albatross, black-footed albatross, and unspecified albatrosses (Peatman et al. 2019). Other seabirds were not identified to a species or genus level by observers (ibid). Both the Laysan albatross and black-footed albatross have "Near Threatened" IUCN statuses, but no regional stock assessments are available (BirdLife International 2017b; BirdLife International 2018b). Based on these IUCN statuses and the inherent high vulnerability of all seabirds, abundance is considered a "high concern" (per line 1 in table 1.1.1 and line 2.a on page 20 of the Seafood Watch Standard).

Supplementary information

Table 24 exhibits seabird interactions with North Pacific longlines as modeled for WCPFC Project 68. Data source: (Peatman et al. 2019).

Table 24:

Species	Number modeled based on observer data
Laysan albatross	1,188
Black-footed albatross	1,087
Albatrosses	269
Birds unspecified	84
Others	26

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

High concern

In WCPFC longlines in the South Pacific (south of 25° S.), 80% of observed seabird captures from 2008 to 2018 comprised mollymawks or unidentified albatrosses (Peatman et al. 2019). Only 59 of a total 257 observed seabirds were identified to a species level (ibid). Seabirds as a species group are considered to have a high inherent vulnerability, so abundance is considered a "high concern" (per line 2.a on page 20 of the Seafood Watch Standard).

Supplementary information

Table 25 exhibits seabird interactions with WCPFC South Pacific longlines from 2008 to 2018, as modeled for WCPFC Project 68. Data source: (Peatman et al. 2019).

Table 25:

Species (or other identifier)	Number modeled based on observer data
Petrels and shearwaters	103
Albatrosses	22
Cape petrel	15
Black-footed albatross	18
Boobies and gannets	15
Laridae	10
Birds unspecified	46
Others	28

2.2 Fishing mortality

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

High concern

WCPFC longlines were responsible for an estimated 14,700 to 20,600 seabird captures and 13,000 to 19,000 seabird deaths each year from 2015 to 2019 (Peatman et al. 2019). Of these captures, 65% were from northern longline fisheries and 23% were from southern longline fisheries (ibid). But population impacts on identified and unidentified seabird species captured in northern WCPFC longlines are unknown, so the Seafood Watch Unidentified Bycatch Matrix is used for scoring (based on the data including captures of seabirds not identified to the species level). The UBM points to a score of 1 in the Northwest Pacific, so fishing mortality is considered a “high concern” (per table 2.2.2 of the Seafood Watch Standard).

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

High concern

WCPFC longlines were responsible for an estimated 14,700 to 20,600 seabird captures and 13,000 to 19,000 seabird deaths each year from 2015 to 2019 (Peatman et al. 2019). Of these captures, 65% were from northern longline fisheries and 23% were from southern longline fisheries (ibid). More recent research in the Southern Hemisphere specifically suggests that 17 seabird species, including white-chinned petrel and Southern Buller's

albatross, may have bycatch numbers above sustainable levels, though this is based only on New Zealand data (Edwards et al. 2023). White-chinned petrel and Buller's albatross were the species with the second- and third-highest estimated captures in the overlap model used to determine overall seabird mortality and bycatch in the WCPFC convention area (Peatman et al. 2019). Because research suggests that multiple Southern Hemisphere seabirds that are captured in WCPFC longlines as bycatch may be above sustainable levels, fishing mortality is considered a “high concern” (per line 1 in table 1.2.1 of the Seafood Watch Standard).

Sharks *(Selachimorpha)*

2.1 Abundance

Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean - Hand-operated pole-and-lines - Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

High concern

Many shark species in the Pacific Ocean are endangered, vulnerable, or otherwise threatened. Seafood Watch considers sharks as a species group to have an inherent high vulnerability, so abundance is considered a “high concern” (per line 2.a on page 20 of the Seafood Watch Standard).

2.2 Fishing mortality

Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean - Hand-operated pole-and-lines - Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Low concern

According to the Seafood Watch Unknown Bycatch Matrix for sharks, this species group receives a score of 3.5 for susceptibility to capture in trolls and handlines in the Western Central Pacific, Northwest Pacific, and Southwest Pacific. Therefore, fishing mortality is considered a “low concern” (per table 2.2.2 of the Seafood Watch Standard).

Silky shark *(Carcharhinus falciformis)*

2.1 Abundance

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Low concern

In the WCPO, a stock assessment for silky shark was last performed in 2024, using data up to 2020. This assessment found that silky shark spawning stock biomass has generally increased since 2010, though biomass and depletion were noted as poorly estimated (Neubauer et al. 2024). Because of this uncertainty, the assessment concluded that there was a 40–60% chance that the stock is overfished relative to MSY (though no official reference points are in place). But indicators in the assessment suggest that spawning biomass is above a suggested LRP for WCPO shark stocks (see (Zhou et al. 2020; Neubauer et al. 2024)). Indicators further suggested

that spawning biomass in 2022 is quite close to virgin levels (Neubauer et al. 2024). Although there is uncertainty in the biomass results, no conflicting indicators are provided in the 2024 assessment. Based on a data-limited assessment that suggests the stock is healthy, abundance is considered a "low concern" (per line 2 in table 1.1.1 of the Seafood Watch Standard).

Supplementary information

Positive trend indicators for WCPO silky shark abundance include CPUE, plotted SB/SB_0, Monte Carlo-modeled SSB, and Majuro plots (see Figures 16, 39, 43, and 44 in (Neubauer et al. 2024)). An LRP of $0.25B_0$ has been recommended for WCPO elasmobranchs, and 2020 depletion (SB/SB_0) was estimated at 0.45 (Zhou et al. 2020; Neubauer et al. 2024). Although a TRP has not been similarly recommended, figures in the full 2024 stock assessment suggest that SB/SB_0 in 2022 was approaching 1. Though elasmobranchs are considered inherently vulnerable taxa by Seafood Watch, the positive indicators and trends suggested in the latest stock assessment allow for an improved abundance descriptor.

2.2 Fishing mortality

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Low concern

Overall exploitation for silky shark in the Western Pacific was last estimated (U_{recent} = 2019–20) to be below reference points (U_{recent}/U_{crash} = 0.13; probability that $U_{recent}/U_{lim} > 1 = 0$), with a < 10% chance of overfishing occurring (Neubauer et al. 2024). Based on an assessment using data < 10 years old indicating that there is a > 50% chance that overfishing is not occurring, fishing mortality is considered a "low concern" (per line 1 in table 1.2.1 of the Seafood Watch Standard).

Supplementary information

Further, supporting figures in the full 2024 assessment indicate that F/F_{MSY} in 2022 was below 1 (see Figures 43, 37 in (Neubauer et al. 2024)). In the WCPO, elasmobranch bycatch is orders of magnitude greater in longlines than in purse seines, with silky shark being the second-most common shark caught in WCPFC longline fisheries (after blue shark) (Hare et al. 2025).

Thresher shark (Unspecified) *(Alopias spp.)*

2.1 Abundance

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

High concern

There are three species of thresher sharks that may be captured in WCPFC longline fisheries, all of which are species of concern according to the IUCN (e.g., see (Rigby et al. 2019d)). Based on the IUCN listings for thresher shark species, abundance is considered a “high concern” (per line 1 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing mortality

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

High concern

From 2017 to 2021, a total of 205,500 bigeye thresher sharks and 109,310 unidentified thresher sharks were caught in WCPFC longline fisheries (Peatman and Nicol 2023). The stock status of bigeye thresher shark in the Pacific is unknown, as well as the status of other potentially captured thresher shark species, so the Unknown Bycatch Matrix is used for scoring. The UBM points to a score of 1 for longlines in the Northwest, Western Central, and Southwest Pacific; thus, fishing mortality is considered a “high concern” (per table 2.2.2 of the Seafood Watch Standard).

Wahoo *(Acanthocybium solandri)*

2.1 Abundance

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Moderate concern

There is no stock assessment for wahoo in the Western Pacific Ocean. The IUCN considers the species to be “Least Concern” with a stable population trend on a global scale (Collette et al. 2023d). Based on this IUCN listing that is < 10 years old, abundance is considered a “moderate concern” (per line 3 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing mortality

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Moderate concern

Because there is not a formal stock assessment of wahoo in the Western Pacific Ocean, fishing mortality in longline fisheries, compared to reference points, is unknown. Therefore, fishing mortality is considered a “moderate concern" (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Whale shark *(Rhincodon typus)*

2.1 Abundance

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central - Western and Central Pacific Fisheries Commission (WCPFC)

High concern

The stock status of whale shark in the WCPO is unknown; however, it is thought that this species is vulnerable to fishing-related mortality, similar to other shark species, and observer records indicate that whale shark has been affected by tuna purse seine fisheries in the WCPO (Rice and Harley 2012). Ecological risk assessments (ERA)

have identified whale shark as having a moderate to high susceptibility to purse seine capture (Kirby 2006; Kirby and Hobday 2007). The IUCN Red List of Threatened Species considers whale shark to be “Endangered” (Pierce and Norman 2016). Based on the IUCN status of whale shark, abundance is considered a “high concern” (per line 1 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing mortality

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central - Western and Central Pacific Fisheries Commission (WCPFC)

Moderate concern

There is information available from observer programs pertaining to the number and mortality rates of whale shark in the tropical purse seine fishery. Intentional setting on whale shark has been prohibited in WCPFC purse seine fisheries since 2014 (Hare et al. 2025). But from 2018 to 2022, an average of over 400 whale sharks were captured annually in purse seines in the WCPFC convention area (Peatman et al. 2024; WCPFC 2024i). Previous research suggests that approximately 5–10% of these whale sharks die as a result of incidental capture (Clarke 2015). In addition to mortalities from the purse seine fishery, there are non-tuna-related fishery interactions and targeted fishing in some locations (Rice and Harley 2012) (OFP 2012b). But a sustainable level of fishing-related mortality for whale shark in the WCPO is unknown. Because mortality rates are unknown, fishing mortality is considered a “moderate concern” (per line 3 in table 1.2.1 of the Seafood Watch Standard).

Supplementary information

A risk assessment for whale shark in the Indo-Pacific was undertaken by WCPO in 2018. While the assessment found that there was a “low probability” that the population is at risk from Pacific purse seine fisheries, the authors note some uncertainty in early years of data, based on lower observer coverage before 2010 (WCPFC 2019c). The risk relative to three estimated F reference points was indeed low (an average 8% risk of exceeding reference points), but this assessment only considered Pacific purse seines, so total fishing mortality on the stock is unknown.

Note that data on whale shark captures in both FAD and unassociated purse seine sets are considered together here, because whale shark-set interactions (which are a kind of FAD set) are provided by WCPFC under the unassociated purse seine set type.

Whitetip shark *(Carcharhinus longimanus)*

2.1 Abundance

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

High concern

The IUCN considers oceanic whitetip shark to be "Vulnerable" globally (Baum et al. 2015). The most recent stock assessment of oceanic whitetip shark in the WCPO was conducted in 2019 (Tremblay-Boyer et al. 2019). It is the first stock assessment since the implementation of CMM2011-04, which became active in 2013, enacting a no-retention measure for this species for WCPFC members, cooperating nonmembers, and participating territories. The results are reported in relation to maximum sustainable yield (MSY) reference points, but reference points to manage this stock have not yet been identified by the scientific committee or Commission. According to the assessment, the median spawning biomass (mature fish) of 648 model runs is estimated to be far below the level needed to produce the maximum sustainable yield (SB_{RECENT}/SB_{MSY} = 0.09), indicating that the stock is overfished (Tremblay-Boyer et al. 2019). Because of the severely overfished stock status, abundance is considered a "high concern" (per line 1 in table 1.1.1 of the Seafood Watch Standard).

2.2 Fishing mortality

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

High concern

Fishing mortality relative to F_{MSY} has declined dramatically since the 2012 stock assessment and the implementation of CMM2011-04, which became active in 2013, enacting a no-retention measure for this species for WCPFC members, cooperating nonmembers, and participating territories. The most recent stock assessment estimates that fishing mortality still exceeds the levels needed to produce the maximum sustainable yield, with the median F_{RECENT}/F_{MSY} = 3.92 (Tremblay-Boyer et al. 2019). Therefore, overfishing is occurring (Tremblay-Boyer et al. 2019). As a result, fishing mortality is considered a "high concern" (per line 1 in table 1.2.1 of the Seafood Watch Standard).

2.3 Discard rate/landings

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

< 100%

Purse seine fisheries have an average discard rate of just under 5% (Kelleher 2005). In the WCPO, between 1995 and 2011, the estimated discard rate of tunas in purse seine fisheries was just over 3% (OFP 2012a), and between 1994 and 2009, targeted tunas represented 98% of the total catch on log-associated sets (OFP 2010). In the years since, discard rates for target tunas have remained low, with rates for tropical tunas all below 1% in 2023 (Oceanic Fisheries Programme 2024). Further, WCPFC has a retention requirement in place for all bigeye, skipjack, and yellowfin tunas caught in purse seine fisheries (WCPFC 2024f). Discard rates are higher for nontarget species but do not exceed 100% (Peatman et al. 2017b).

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central - Western and Central Pacific Fisheries Commission (WCPFC)

< 100%

Purse seine fisheries have an average discard rate of just under 5% (Kelleher 2005). Between 1995 and 2011, the estimated discard rate of tunas in purse seine fisheries was just over 3% in the WCPO (OFP 2012a). In the years since, discard rates for target tunas have remained low, with rates for tropical tunas all below 1% in 2023 (Oceanic Fisheries Programme 2024). Further, WCPFC has a retention requirement in place for all bigeye, skipjack, and yellowfin tunas caught in purse seine fisheries (WCPFC 2024f). Discard rates are higher for nontarget species but do not exceed 100% (Peatman et al. 2017b).

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

< 100%

The average overall discard rate in tuna longline fisheries worldwide is 22%. In the Western and Central Pacific Ocean (WCPO), distant water longline vessels may have a discard rate as high as 40% (Kelleher 2005). Information from observer records collected in the North Pacific indicate that 36% of the total catch is discarded. Specifically, in the area north of 10° N., discard rates for tuna ranged from 0% to 35%, for billfish from 3% to 44%, for sharks and rays from 0% to 100%, 0% to 100% for other bony fish, and 100% for marine mammals, sea birds, and turtles (OFP 2010). Discard rates for target species are much lower, sitting below 5% for

yellowfin, bigeye, and albacore tunas (Oceanic Fisheries Programme 2024). Bait is used in this fishery, but information on the percentage of bait to total landings is unavailable. It is unlikely that combined discards and bait use are greater than 100% of the total landings.

Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean - Hand-operated pole-and-lines - Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

< 100%

The average discard rate in tuna pole-and-line and trolling line fisheries is 0.1%, although it is slightly higher in the WCPO, at 0.4% (Kelleher 2005). Trolling line and pole-and-line fisheries depend heavily on the use of baitfish, which most often comes from other fisheries {Gillett 2012}. But the amount of tuna caught is much greater than the amount of baitfish used. The tuna to bait ratio is typically around 30:1, although this can vary by fishery due to differences in the baitfish used and in fishing technique (Gillett 2010). Therefore, we have left the score as < 100%.

Northwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

< 100%

The average discard rate in tuna pole-and-line fisheries is 0.1%, although it is slightly higher in the WCPO, at 0.4% (Kelleher 2005). Troll/pole and handline fisheries can depend heavily on the use of baitfish (some fisheries may use tuna and/or squid), which most often comes from other fisheries (Gillett 2012b). But the amount of tuna landed is much greater than the amount of baitfish used. The tuna to bait ratio is typically around 30:1, although this can vary by fishery due to differences in the baitfish used and in fishing technique (Gillett 2010).

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

< 100%

The average overall discard rate in tuna longline fisheries worldwide is 22%, but in the WCPO, distant water longline vessels may have a discard rate as high as 40% (Kelleher 2005). According to observer data from the Fiji pelagic longline fishery in the South Pacific, discard rates vary by species but are around 6% of the total catch for all species combined {Akroyd et al. 2012}. For example, tuna, mahi mahi, and opah have low discard rates of < 5%, but sharks have quite high discard rates of > 95% (Akroyd et al. 2012). But it should be noted that Fiji bans the retention of sharks, so discard rates may be skewed. Observer data from the South Pacific albacore fishery indicate that discard rates ranged for tuna from 3% to 100%, for billfish from 4% to 45%, for sharks and rays from 0% to 100%, for other bony fish from 0% to 100%, for seabirds from 0% to 100%, and for turtles from 71% to 100%, and discard rates were 100% for marine mammals (OFP 2010). Discard rates for target species are much lower, sitting below 5% for yellowfin, bigeye, and albacore tunas (Oceanic Fisheries Programme 2024). The overall discard rate, according to observer records, is around 18% (OFP 2010). Bait is used in this fishery, but information on the percentage of bait to total landings is unavailable. It is unlikely that combined discards and bait use are greater than 100% of the total landings.

Criterion 3: Management effectiveness

Five factors are evaluated in Criterion 3: Management strategy and implementation, Bycatch strategy, Scientific research/monitoring, Enforcement of regulations, and Inclusion of stakeholders. Each is scored as either 'highly effective', 'moderately effective', 'ineffective,' or 'critical'. The final Criterion 3 score is determined as follows:

- *5 (Very low concern) — Meets the standards of 'highly effective' for all five factors considered.*
- *4 (Low concern) — Meets the standards of 'highly effective' for 'Management strategy and implementation' and at least 'moderately effective' for all other factors.*
- *3 (Moderate concern) — Meets the standards for at least 'moderately effective' for all five factors.*
- *2 (High concern) — At a minimum, meets standards for 'moderately effective' for 'Management strategy and implementation' and 'Bycatch strategy', but at least one other factor is rated 'ineffective.'*
- *1 (Very high concern) — 'Management strategy and implementation' and/or 'Bycatch strategy' are 'ineffective.'*
- *0 (Critical) — 'Management strategy and implementation' is 'critical'.*

The Criterion 3 rating is determined as follows:

- Score >3.2 = **Green** or Low concern
- Score >2.2 and ≤3.2 = **Yellow** or Moderate concern
- Score ≤2.2 = **Red** or High concern

Rating is Critical if 'Management strategy and implementation' is Critical.

Guiding principle

- The fishery is managed to sustain the long-term productivity of all impacted species.

Criterion 3 summary

Fishery	Management Strategy And Implementation	Bycatch Strategy	Scientific Data Collection and Analysis	Enforcement of and Compliance with Management Regulations	Stakeholder Inclusion	Score
Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)	Ineffective	Ineffective	Ineffective	Moderately Effective	Moderately Effective	**Red (1.000)**
Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)	Moderately Effective	Highly effective	Moderately Effective	Moderately Effective	Moderately Effective	**Yellow (3.000)**
Northwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)	Moderately Effective	Highly effective	Moderately Effective	Moderately Effective	Moderately Effective	**Yellow (3.000)**
Southwest Pacific Ocean - Hand-operated pole-and-lines - Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)	Moderately Effective	Highly effective	Moderately Effective	Moderately Effective	Moderately Effective	**Yellow (3.000)**
Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)	Ineffective	Ineffective	Ineffective	Moderately Effective	Moderately Effective	**Red (1.000)**

Fishery	Management Strategy And Implementation	Bycatch Strategy	Scientific Data Collection and Analysis	Enforcement of and Compliance with Management Regulations	Stakeholder Inclusion	Score
Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)	Moderately Effective	Highly effective	Moderately Effective	Moderately Effective	Moderately Effective	**Yellow (3.000)**
Southwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)	Moderately Effective	Highly effective	Moderately Effective	Moderately Effective	Moderately Effective	**Yellow (3.000)**
Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)	Moderately Effective	Ineffective	Highly effective	Moderately Effective	Moderately Effective	**Red (1.000)**
Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central - Western and Central Pacific Fisheries Commission (WCPFC)	Moderately Effective	Moderately Effective	Highly effective	Moderately Effective	Moderately Effective	**Yellow (3.000)**

The United Nations Straddling and Highly Migratory Fish Stocks Agreement (1995) indicated that the management of straddling and highly migratory fish stocks should be carried out through regional fisheries management organizations (RFMOs). RFMOs are the only legally mandated fishery management body on the high seas and within EEZ waters. There are currently 18 RFMOs (www.fao.org) and they cover nearly all of the world's waters. Member countries must abide by the management measures set forth by individual RFMOs in order to fish in their waters {Cullis-Suzuki and Pauly 2010}. Some RFMOs manage all marine living resources within their authority (i.e., General Fisheries Commission for the Mediterranean [GFCM]), while others manage a group of species such as tunas (i.e., Inter-American Tropical Tuna Commission [IATTC]).

WCPFC members are as follows: Australia, Canada, China, Cook Islands, European Union, Federated States of Micronesia, Fiji, France, Indonesia, Japan, Kiribati, Republic of Korea, Republic of Marshall Islands, Nauru, New Zealand, Niue, Palau, Papua New Guinea, Philippines, Samoa, Solomon Islands, Chinese Taipei, Tonga, Tuvalu, United States, and Vanuatu.

IATTC members are as follows: Belize, Canada, China, Colombia, Costa Rica, Ecuador, El Salvador, European Union, France, Guatemala, Japan, Kiribati, Republic of Korea, Mexico, Nicaragua, Panama, Peru, Chinese Taipei, United States, Vanuatu, and Venezuela.

CCSBT members include the following countries: Australia, European Union, Indonesia, Japan, Republic of Korea, New Zealand, South Africa, and the Fishing Entity of Taiwan.

Criterion 3 assessment

Scoring guidelines

Factor 3.1 - Management strategy and implementation

Considerations: What type of management measures are in place? Are there appropriate management goals, and is there evidence that management goals are being met? Do manages follow scientific advice? To achieve a highly effective rating, there must be appropriately defined management goals, precautionary policies that are based on scientific advice, and evidence that the measures in place have been successful at maintaining/rebuilding species.

Factor 3.2 - Bycatch strategy

Considerations: What type of management strategy/measures are in place to reduce the impacts of the fishery on bycatch species and when applicable, to minimize ghost fishing? How successful are these management measures? To achieve a 'highly effective' rating, the fishery must have no or low bycatch, or if there are bycatch or ghost fishing concerns, there must be effective measures in place to minimize impacts.

Factor 3.3 - Scientific research and monitoring

Considerations: How much and what types of data are collected to evaluate the fishery's impact on the species? Is there adequate monitoring of bycatch? To achieve a 'highly effective' rating, regular, robust population assessments must be conducted for target or retained species, and an adequate bycatch data collection program must be in place to ensure bycatch management goals are met.

Factor 3.4 - Enforcement of management regulations

Considerations: Do fishermen comply with regulations, and how is this monitored? To achieve a 'highly effective' rating, there must be regular enforcement of regulations and verification of compliance.

Factor 3.5 - Stakeholder inclusion

Considerations: Are stakeholders involved/included in the decision-making process? Stakeholders are individuals/groups/organizations that have an interest in the fishery or that may be affected by the management of the

fishery (e.g., fishermen, conservation groups, etc.). A 'highly effective' rating is given if the management process is transparent, if high participation by all stakeholders is encouraged, and if there a mechanism to effectively address user conflicts.

3.1 Management strategy and implementation

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Moderately effective

Tropical tunas (bigeye, skipjack, and yellowfin) are the main retained species in this fishery. WCPFC has agreed to develop harvest strategies for tropical tunas, and the most progress has been made thus far for skipjack. While the WCPO skipjack stock has a TRP and management procedure adopted, bigeye and yellowfin do not have adopted components of their harvest strategies in place, though the Commission has noted management objectives and identified performance indicators for these stocks (WCPFC 2024g). Bigeye and yellowfin have interim management objectives, and an LRP is in place for all three tropical tunas (WCPFC 2024f). Additional regulations are in place to limit fishing pressure on tunas stemming from purse seines and longlines. While some aspects of highly effective management are in place for tunas, additional precaution and further development of the harvest strategy are needed, so management strategy and implementation is considered "moderately effective" (per lines 1 and 2.a in table 3.1.1 of the Seafood Watch Standard).

Supplementary information

Reference Points

Skipjack, yellowfin, and bigeye tuna have an LRP in place of 20% of the recent average spawning biomass in the absence of fishing (WCPFC 2024f). The maximum acceptable level of risk for breaching this LRP is 20%, as defined in the skipjack interim MP (ibid). TRPs for bigeye and yellowfin will be agreed upon when harvest strategies are developed. Skipjack is managed such that spawning biomass is maintained at a level consistent with the interim management procedure outlined in CMM 2022-01; this TRP is calculated based on estimates of stock depletion (WCPFC 2024f). Interim biomass objectives for bigeye and yellowfin are currently set at maintaining spawning biomass depletion rates at 2012–15 average levels (ibid).

Controlling Fishing Mortality

The Nauru Agreement and subsequent action by its members created a vessel scheme for WCPFC purse seine fisheries (WCPFC 2024f). Other limits on fishing pressure are focused on purse seine fishery closures and FAD regulations and limits (ibid). If WCPFC members catch more than their set limits, their overage is deducted from the following year's catch limit. Catch limits are often calculated using MPs, but are not automatically implemented after their calculation and must be agreed upon by the Commission. Further, WCPFC has implemented several management measures specific to the purse seine fisheries. There is a 1.5-month prohibition on the use of FADs each summer, as well as an additional 1-month prohibition in place for 2024–26 (WCPFC 2024f). There is also a retention requirement for bigeye, skipjack, and yellowfin that is meant to discourage juvenile captures. A limit on the number of FADs per vessel is in place, though scientific justification for this limit is lacking. FAD limits will be reviewed in 2026 (ibid).

The latest tropical tuna measure, CMM 2023-01, focuses on maintaining certain population levels for skipjack, yellowfin, and bigeye tunas, primarily via controls on purse seine and longline catches (WCPFC 2024f). The measure also lays out a collective limit for each CCM's other fisheries that take at least 2,000 MT of tropical tunas. A recent evaluation of this CMM's progress suggests that skipjack biomass objectives are likely to continue to be met in the future, but there are certain scenarios under which bigeye objectives are not met, and yellowfin objectives are not met under any modeled scenarios (Pilling et al. 2024). Therefore, more stringent management measures may be needed to avoid biomass decreases for both bigeye and yellowfin stocks.

Flexible and Precautionary Management

WCPFC has a harvest strategy workplan for key tuna species that is currently focused on the purse seine/pole-and-line skipjack fishery and the southern longline/troll albacore fishery (WCPFC 2024g). The most progress has been made for skipjack within this workplan, but there are plans to eventually create a mixed fishery harvest strategy framework that will include bigeye. Currently, management progress for bigeye and yellowfin includes noting management objectives for each stock and identifying performance indicators for longline fisheries targeting each stock, but no management procedures or monitoring strategies have been proposed or adopted. There is no plan for a yellowfin MP, but the stock will be managed indirectly via other stocks' MPs in a multispecies framework. An interim skipjack MP was passed in 2022, and the MP will be run in 2026 to assess performance. There is also a monitoring strategy in place for the skipjack MP (SPC-OFP 2024).

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central - Western and Central Pacific Fisheries Commission (WCPFC)

Moderately effective

Tropical tunas (bigeye, skipjack, and yellowfin) and Pacific bluefin tuna are the main retained species in this fishery. The WCPFC has agreed to develop harvest strategies for tropical tunas, and the most progress has been made thus far for skipjack. While the WCPO skipjack stock has a TRP and management procedure adopted, bigeye and yellowfin do not have adopted components of their harvest strategies in place, though the Commission has noted management objectives and identified performance indicators for these stocks (WCPFC 2024g). Bigeye and yellowfin have interim management objectives, and an LRP is in place for all three tropical tunas (WCPFC 2024f). The WCPFC has a harvest strategy for the Pacific bluefin stock that was adopted in 2017 and has been amended twice. This harvest strategy lays out management objectives, discusses how to set limit reference points, and sets initial and secondary rebuilding targets for the stock (WCPFC 2023e). Both rebuilding targets have associated deadlines and projection specifications, and harvest control rules are in place to adjust fishing pressure based on rebuilding progress (ibid). While the stock has made significant rebuilding progress and is no longer overfished, WCPFC has not adopted official limit or target reference points or a long-term harvest strategy (only target rebuilding points). Additional regulations are in place to limit fishing pressure on tunas stemming from purse seines and longlines. While some aspects of highly effective management are in place for tunas, additional precaution and further development of the harvest strategy are needed, so management strategy and

implementation is considered “moderately effective” (per lines 1 and 2.a in table 3.1.1 of the Seafood Watch Standard).

Supplementary information

Reference Points

Skipjack, yellowfin, and bigeye tuna have an LRP in place of 20% of the recent average spawning biomass in the absence of fishing (WCPFC 2024f). The maximum acceptable level of risk for breaching this LRP is 20%, as defined in the skipjack interim MP (ibid). TRPs for bigeye and yellowfin will be agreed upon when harvest strategies are developed. Skipjack is managed such that spawning biomass is maintained at a level consistent with the interim management procedure outlined in CMM 2022-01; this TRP is calculated based on estimates of stock depletion (WCPFC 2024f). Interim biomass objectives for bigeye and yellowfin are currently set at maintaining spawning biomass depletion rates at 2012–15 average levels (ibid).

The current harvest strategy for Pacific bluefin tuna includes initial and secondary rebuilding target points (to be reached by 2024 and 2034, respectively) (WCPFC 2023e). The harvest strategy discusses how to set limit reference points for the stock, but it does not include officially adopted limit or target reference points; instead, it tasks the WCPFC Northern Committee with developing reference points through the management strategy and evaluation (MSE) process. The initial rebuilding target is set at the median SSB from 1952 to 2014, and the second rebuilding target is set at 20%$SSB_{F=0}$ (often used as a limit reference point for other species). Both targets must be met with at least a 60% probability, according to projections. Both rebuilding points have been met, but a long-term harvest strategy following the success of the rebuilding plan has not been developed. In 2024, WCPFC passed resolutions focused on achieving sustainable catch levels for Pacific bluefin with the expectation that new management advice, following the achievement of the second rebuilding point in 2024, will be given in 2026 (WCPFC 2024f).

Controlling Fishing Mortality

The Nauru Agreement and subsequent action by its members created a vessel scheme for WCPFC purse seine fisheries (WCPFC 2024f). Other limits on fishing pressure are focused on purse seine fishery closures as well as FAD regulations and limits (ibid). Catch limits are often calculated using MPs, but are not automatically implemented after their calculation and must be agreed upon by the Commission. Members are instructed via CMM 2005-03 to create measures to minimize the catch of nontarget fish species and attempt to avoid the catch of these species, which are often more important in smaller, artisanal fisheries than in large commercial fisheries (WCPFC 2024f). Further, WCPFC has implemented several management measures specific to the purse seine fisheries, but these focus on FAD-set purse seines rather than unassociated sets.

WCPFC has a harvest strategy workplan for key tuna species that is currently focused on the purse seine/pole-and-line skipjack fishery and the southern longline/troll albacore fishery (WCPFC 2024g). The most progress has been made for skipjack within this workplan, but there are plans to eventually create a mixed fishery harvest strategy framework. Currently, management progress for bigeye and yellowfin includes noting management objectives for each stock and identifying performance indicators for longline fisheries targeting each stock, but no management procedures or monitoring strategies have been proposed or adopted.

The latest tropical tuna measure, CMM 2023-01, focuses on maintaining certain population levels for skipjack, yellowfin, and bigeye tunas via controls on purse seine and longline catches (WCPFC 2024f). A recent evaluation of this CMM's progress suggests that skipjack biomass objectives are likely to continue to be met in the future, but there are certain scenarios under which bigeye objectives are not met, and yellowfin objectives are not met under any modeled scenarios (Pilling et al. 2024). Therefore, more stringent management measures may be needed to avoid biomass decreases for both bigeye and yellowfin stocks.

Catch limits for Pacific bluefin are laid out for Japan, Korea, and Chinese Taipei for both small (< 30 kg) bluefin tuna and large (> 30 kg) fish. Other CCMs have general catch limits that are determined based on 2002–04 catch levels (WCPFC 2024f). Catch limits that are exceeded are reduced the following fishing year. Harvest control rules are outlined with respect to both the interim and second rebuilding period for the stock. If projections indicate that the probability of achieving the rebuilding goals is under 60%, management measures will be altered to increase this probability. These modifications may include updates such as reductions in catch limits or changes/transfers in limits for different size classes of bluefin tuna (WCPFC 2023e). Though the stock is now no longer overfished, further control measures have not been developed.

Adaptive Management

An interim skipjack MP was passed in 2022, and the MP will be run in 2026 to assess performance. There is also a monitoring strategy in place for the skipjack MP (SPC-OFP 2024). There is no plan for a yellowfin MP, but the stock will be managed indirectly via other stocks' MPs in a multispecies framework.

An MSE process is used to monitor the Pacific bluefin stock and the effectiveness of future management measures. The current MSE was developed from 2019 to 2024 by ISC, during which time there were three stock assessments conducted (2018, 2020, 2022). The MSE will further be used by the Northern Committee to develop reference points and additional management objectives (WCPFC 2023e). Data are reviewed annually, and potential adjustments to fishing effort are laid out through harvest control rules. WCPFC and ISC are also working with IATTC to evaluate the performance of current rebuilding strategies.

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Ineffective

A number of tunas (bigeye, albacore, yellowfin), billfish (black, striped, and blue marlin), and other associated pelagic species (dolphinfish, sailfish, pomfrets) are the main retained species in this fishery. While tuna species have some reference points in place, finfish and billfish generally are not managed using adopted reference points. Rebuilding plans are in place for North Pacific striped marlin, while North Pacific albacore, Pacific bluefin tuna, and swordfish have a harvest strategy in place. Bigeye tuna and yellowfin tuna have interim management objectives in place. Other landed species in this fishery lack harvest control rules. Though some elements of highly effective management are in place for primary tuna species (defined reference points, harvest control

rules), > 30% of retained species lack reference points and harvest control rules, so management strategy and implementation is considered “ineffective” (per lines 3 and 5 in table 3.1.1 of the Seafood Watch Standard).

Supplementary information

North Pacific albacore, bigeye, yellowfin, black marlin, blue marlin, North Pacific striped marlin, opah, swordfish, dolphinfish, pomfrets, sailfish, and wahoo may be captured and retained in this fishery. Of these, the majority lack management measures and reference points.

Reference Points

Before the harvest strategy, North Pacific albacore had an adopted biomass LRP of $20\%SSB_{current,\ F=0}$ (WCPFC 2024f). The more recent harvest strategy shifts this LRP (now $14\%SSB_{current,\ F=0}$) and also lays out biomass threshold ($30\%SSB_{current,\ F=0}$) and fishing mortality target ($F45_{\%}$) reference points (WCPFC 2023d). But the North Pacific albacore harvest strategy has not been fully implemented.

Yellowfin, skipjack, and bigeye tuna have an LRP in place of 20% of the recent average spawning biomass in the absence of fishing (WCPFC 2024f). The maximum acceptable level of risk for breaching this LRP is defined as 20% in the skipjack interim MP (WCPFC 2024f). A TRP for bigeye will be agreed upon when its harvest strategy is developed. An interim biomass objective for bigeye is currently set at maintaining spawning biomass depletion rates at 2012–15 average levels (WCPFC 2024f).

North Pacific striped marlin has had a rebuilding plan in place since 2019, with a target rebuilding point of $20\%SSB_{F=0}$, to be reached by 2034 with 60% certainty (WCPFC 2020b). The harvest strategy for northern swordfish sets an LRP at F_{MSY}, but no biomass reference points have been adopted for the stock (WCPFC 2019b). No reference points are in place for other species landed in this fishery.

Controlling Fishing Pressure

The Nauru Agreement and subsequent action by its members created a vessel scheme for WCPFC longline fisheries and allows for the option of setting longline effort/catch limits for tropical tunas (WCPFC 2024f). Other limits on fishing pressure include some catch level limits for longlines capturing bigeye tuna (ibid). If WCPFC members catch more than their set limits, their overage is deducted from the following year’s catch limit. Catch limits are often calculated using MPs, but are not automatically implemented after their calculation and must be agreed upon by the Commission.

The latest tropical tuna measure, CMM 2023-01, focuses on maintaining certain population levels for skipjack, yellowfin, and bigeye tunas via controls on purse seine and longline catches (WCPFC 2024f). A recent evaluation of this CMM’s progress suggests that skipjack biomass objectives are likely to continue to be met in the future, but there are certain scenarios under which bigeye objectives are not met, and yellowfin objectives are not met under any modeled scenarios (Pilling et al. 2024). Thus, more stringent management measures may be needed to avoid biomass decreases for both bigeye and yellowfin stocks.

The latest projections for North Pacific striped marlin indicate that the stock will reach its rebuilding deadline by 2040 (past the 2034 deadline) if catches are kept under 2,400 MT, and the Commission has passed CMM 2024-06 to dictate catch limits for 2025–27 to help achieve rebuilding (WCPFC 2024f). But the decision to close fisheries that reach their limits is left up to individual CCMs.

CMM 2023-03 dictates that fisheries landing North Pacific swordfish in quantities exceeding 200 MT should not increase their fishing effort past 2008–10 average levels, a regulation which is based on the latest ISC stock advice (WCPFC 2024f).

Members are instructed via CMM 2005-03 to create measures to minimize the catch of nontarget fish species and attempt to avoid the catch of these species, which are often more important in smaller, artisanal fisheries than in large commercial fisheries (WCPFC 2024f). Because the catch of these species is not prohibited, they may be caught and landed on WCPFC vessels, though landings are likely to be higher in less industrialized fleets.

Adaptive Management

The 2023 harvest strategy for North Pacific albacore defines acceptable levels of risk relative to the adopted reference points for the stock. The spawning biomass must be maintained above the biomass LRP with at least 80% probability (acceptable level of risk of breaching the LRP = 20%), and fishing mortality must be maintained at or below the TRP with at least 50% probability (ibid). Both of these requirements are on a 10-year time scale, alongside a requirement to maintain the biomass depletion rate at 2006–15 average levels. Stock assessments for North Pacific albacore are performed by ISC every 3 years, and the 2023 harvest strategy notes that the stock status will be reevaluated based on these assessments. The harvest control rules laid out in the harvest strategy dictate necessary changes in fishing mortality rates based on stock status, and adjustments to the harvest strategy can be recommended based on stock assessment results. Reviews of the harvest strategy performance are also laid out for completion by 2030 and 2033. The 2023 harvest strategy additionally states that a rebuilding plan should be created between WCPFC and IATTC if there is a > 50% probability that spawning stock biomass is at or below the biomass LRP (ibid). But the strategy has yet to be fully implemented.

Currently, management progress for bigeye includes noting management objectives for the stock and identifying performance indicators for longline fisheries targeting the stock, but no management procedures or monitoring strategies have been proposed or adopted. There are plans to eventually create a mixed fishery harvest strategy framework that will include bigeye management. There is no plan for a yellowfin MP, but the stock will be managed indirectly via other stocks' MPs in a multispecies framework.

Stock advice for North Pacific swordfish is produced by ISC every 4 years, and if fishing mortality is found to exceed its LRP, the Commission will create recommendations to reduce the fishing mortality rate (WCPFC 2024f).

Moderately effective

The main retained species in this fishery are albacore (North Pacific stock), skipjack, and yellowfin tunas. A harvest strategy with reference points and harvest control rules has been developed for North Pacific albacore, but the strategy has yet to be fully implemented. WCPFC has agreed to develop harvest strategies for tropical tunas, and the most progress has been made thus far for skipjack. While the WCPO skipjack stock has a TRP and management procedure adopted, yellowfin does not have adopted components of its harvest strategy in place, though the Commission has noted management objectives and identified performance indicators for this stock (WCPFC 2024g). Yellowfin has an interim management objective in place, and an LRP is in place for all three tropical tunas (WCPFC 2024f). Additional regulations are in place to limit fishing pressure stemming from purse seines and longlines. Although some aspects of highly effective management are in place (e.g., LRP for yellowfin), additional precaution (e.g., adopting TRPs) and further development of the harvest strategies are needed, so management strategy and implementation is considered "moderately effective" (per lines 1 and 2.a in table 3.1.1 of the Seafood Watch Standard).

Supplementary information

Reference Points

Skipjack and yellowfin tuna have an LRP in place of 20% of the recent average spawning biomass in the absence of fishing (WCPFC 2024f). The maximum acceptable level of risk for breaching this LRP is 20%, as defined in the skipjack interim MP (WCPFC 2024f). The TRP yellowfin will be agreed upon when harvest strategies are developed. An interim biomass objective for yellowfin is currently set at maintaining spawning biomass depletion rates at 2012–15 average levels (ibid).

Before the harvest strategy, North Pacific albacore had an adopted biomass LRP of $20\%SSB_{current,\ F=0}$ (WCPFC 2024f). The more recent harvest strategy shifts this LRP (now $14\%SSB_{current,\ F=0}$) and also lays out biomass threshold ($30\%SSB_{current,\ F=0}$) and fishing mortality target ($F45_{\%}$) reference points (WCPFC 2023d). But the North Pacific albacore harvest strategy has not been fully implemented.

Controlling Fishing Mortality

The Nauru Agreement creates a vessel scheme for WCPFC longline and purse seine fisheries and allows for the option of setting longline effort/catch limits, but this does not affect other gear types like handlines (WCPFC 2024f). Other limits on fishing pressure are focused on purse seine fishery closures and FAD regulations and limits (ibid).

The latest tropical tuna measure, CMM 2023-01, focuses on maintaining certain population levels for skipjack, yellowfin, and bigeye tunas, primarily via controls on purse seine and longline catches (WCPFC 2024f). The measure also lays out a collective limit for each CCM's other fisheries that take at least 2,000 MT of tropical tunas. A recent evaluation of this CMM's progress suggests that skipjack biomass objectives are likely to continue to be met in the future, but there are certain scenarios under which bigeye objectives are not met, and yellowfin objectives are not met under any modeled scenarios (Pilling et al. 2024). More stringent management measures may therefore be needed to avoid biomass decreases for yellowfin.

WCPFC has a harvest strategy workplan for key tuna species that is currently focused on the purse seine/pole-and-line skipjack fishery and the southern longline/troll albacore fishery (WCPFC 2024g). The most progress has been made for skipjack within this workplan, but there are plans to eventually create a mixed fishery harvest strategy framework that will include bigeye.

Adaptive Management

WCPFC has plans to eventually create a mixed fishery harvest strategy framework that will include yellowfin harvest. Currently, management progress for yellowfin includes noting management objectives for the stock and identifying performance indicators for longline fisheries targeting the stock, but no management procedures or monitoring strategies have been proposed or adopted.

An interim skipjack MP was passed in 2022, and the MP will be run in 2026 to assess performance. There is also a monitoring strategy in place for the skipjack MP (SPC-OFP 2024).

Currently, management progress for yellowfin includes noting management objectives for each stock and identifying performance indicators for longline fisheries targeting each stock, but no management procedures or monitoring strategies have been proposed or adopted. There is no plan for a yellowfin MP, but the stock will be managed indirectly via other stocks' MPs in a multispecies framework.

The 2023 harvest strategy for North Pacific albacore defines acceptable levels of risk relative to the adopted reference points for the stock. The spawning biomass must be maintained above the biomass LRP with at least 80% probability (acceptable level of risk of breaching the LRP = 20%), and fishing mortality must be maintained at or below the TRP with at least 50% probability (WCPFC 2024g). Both of these requirements are on a 10-year time scale, alongside a requirement to maintain the biomass depletion rate at 2006–15 average levels. Stock assessments for North Pacific albacore are performed by ISC every 3 years, and the 2023 harvest strategy notes that stock status will be reevaluated based on these assessments. The harvest control rules laid out in the harvest strategy dictate necessary changes in fishing mortality rates based on stock status, and adjustments to the harvest strategy can be recommended based on stock assessment results. Reviews of the harvest strategy performance are also laid out for completion by 2030 and 2033. The 2023 harvest strategy additionally states that a rebuilding plan should be created between WCPFC and IATTC if there is a > 50% probability that spawning stock biomass is at or below the biomass LRP (ibid). But the strategy has yet to be fully implemented.

Moderately effective

Pacific bluefin, skipjack, and yellowfin tuna are landed and retained in this fishery. WCPFC has agreed to develop harvest strategies for tropical tunas, and the most progress has been made thus far for skipjack. While the WCPO skipjack stock has a TRP and management procedure adopted, yellowfin does not have adopted components of its harvest strategy in place, though the Commission has noted management objectives and identified performance indicators for this stock (WCPFC 2024g). Yellowfin has an interim management objective, and an LRP is in place for all three tropical tunas (WCPFC 2024f). Pacific bluefin has a rebuilding plan in place but lacks long-term reference points/a long-term harvest strategy. Additional regulations are in place to limit fishing pressure stemming from purse seines and longlines. Though some aspects of highly effective management are in place (e.g., LRPs), additional precaution (e.g., adopting TRPs) and further development of the harvest strategy are needed, so management strategy and implementation is considered “moderately effective” (per lines 1 and 2.a in table 3.1.1 of the Seafood Watch Standard).

Supplementary information

Reference Points

Skipjack, yellowfin, and bigeye tuna have an LRP in place of 20% of the recent average spawning biomass in the absence of fishing (WCPFC 2024f). The maximum acceptable level of risk for breaching this LRP is 20%, as defined in the skipjack interim MP (WCPFC 2024f). The TRP for yellowfin will be agreed upon when a harvest strategy is developed. Skipjack is managed such that spawning biomass is maintained at a level consistent with the interim management procedure outlined in CMM 2022-01; this TRP is calculated based on estimates of stock depletion (WCPFC 2024f). An interim biomass objective for yellowfin is currently set at maintaining spawning biomass depletion rates at 2012–15 average levels (ibid).

The current harvest strategy for Pacific bluefin tuna includes initial and secondary rebuilding target points (to be reached by 2024 and 2034, respectively) (WCPFC 2023e). The harvest strategy discusses how to set limit reference points for the stock, but it does not include officially adopted limit or target reference points; instead, it tasks the WCPFC Northern Committee with developing reference points through the management strategy and evaluation (MSE) process. The initial rebuilding target is set at the median SSB from 1952 to 2014, and the second rebuilding target is set at 20%$SSB_{F=0}$ (often used as a limit reference point for other species). Both targets must be met with at least a 60% probability, according to projections. Both rebuilding points have been met, but a long-term harvest strategy following the success of the rebuilding plan has not been developed. In 2024, WCPFC passed resolutions focused on achieving sustainable catch levels for Pacific bluefin with the expectation that new management advice, following the achievement of the second rebuilding point in 2024, will be given in 2026 (WCPFC 2024f).

Controlling Fishing Mortality

The Nauru Agreement creates a vessel scheme for WCPFC longline and purse seine fisheries and allows for the option of setting longline effort/catch limits, but limits for other fisheries are not established (WCPFC 2024f). Other limits on fishing pressure are focused on purse seine fishery closures and FAD regulations and limits (ibid).

The latest tropical tuna measure, CMM 2023-01, focuses on maintaining certain population levels for skipjack, yellowfin, and bigeye tunas, primarily via controls on purse seine and longline catches (WCPFC 2024f). The measure also lays out a collective limit for each CCM's other fisheries that take at least 2,000 MT of tropical tunas. A recent evaluation of this CMM's progress suggests that skipjack biomass objectives are likely to continue to be met in the future, but there are certain scenarios under which bigeye objectives are not met, and yellowfin objectives are not met under any modeled scenarios (Pilling et al. 2024). More stringent management measures may therefore be needed to avoid biomass decreases for yellowfin.

Catch limits for Pacific bluefin tuna are laid out for Japan, Korea, and Chinese Taipei for both small (< 30 kg) bluefin tuna and large (> 30 kg) fish. Other CCMs have general catch limits that are determined based on 2002–04 catch levels (WCPFC 2024f). Catch limits that are exceeded are reduced the following fishing year. Harvest control rules are outlined with respect to both the interim and second rebuilding period for the stock. If projections indicate that the probability of achieving the rebuilding goals is under 60%, management measures will be altered to increase this probability. These modifications may include updates such as reductions in catch limits or changes/transfers in limits for different size classes of bluefin tuna (WCPFC 2023e). Though the stock is now no longer overfished, further control measures have not been developed.

Adaptive Management

WCPFC has a harvest strategy workplan for key tuna species that is currently focused on the purse seine/pole-and-line skipjack fishery and the southern longline/troll albacore fishery (WCPFC 2024g). The most progress has been made for skipjack within this workplan, but there are plans to eventually create a mixed fishery harvest strategy framework that will also focus on bigeye. An interim skipjack MP was passed in 2022, and the MP will be run in 2026 to assess performance. There is also a monitoring strategy in place for the skipjack MP (SPC-OFP 2024). Currently, management progress for yellowfin includes noting management objectives for the stock and identifying performance indicators for longline fisheries targeting the stock, but no management procedures or monitoring strategies have been proposed or adopted.

An MSE process is used to monitor the Pacific bluefin tuna stock and the effectiveness of future management measures. The current MSE was developed from 2019 to 2024 by ISC, during which time there were three stock assessments conducted (2018, 2020, 2022). The MSE will further be used by the Northern Committee to develop reference points and additional management objectives (WCPFC 2023e). Data are reviewed annually, and potential adjustments to fishing effort are laid out through harvest control rules. WCPFC and ISC are also working with IATTC to evaluate the performance of current rebuilding strategies.

Ineffective

A number of tunas (bigeye, yellowfin, skipjack, albacore, Southern bluefin), billfish (black, blue, and Southwest Pacific striped marlin, plus swordfish), and other associated pelagic species (dolphinfish, wahoo, opah, and pomfrets) are the main retained species in this fishery. Tuna species have some reference points in place, but sharks, billfish, and associated pelagics generally are not managed using adopted reference points. A harvest strategy is being developed for southern albacore but is not yet finalized. Management for Southern bluefin (SBT) has resulted in slow but steady population growth, though the population remains below the target reference point. Other landed species in this fishery lack harvest control rules. Though some elements of highly effective management are in place for targeted tunas (reference points, management procedures), > 30% of retained species lack reference points and harvest control rules, so management strategy and implementation is considered “ineffective” (per lines 3 and 5 in table 3.1.1 of the Seafood Watch Standard).

Supplementary information

South Pacific albacore, bigeye, yellowfin, skipjack, Southern bluefin tuna (SBT), black marlin, blue marlin, striped marlin, opah, swordfish, dolphinfish, pomfrets, wahoo, and sailfish may be captured and retained in this fishery. Of these, the majority lack management measures and reference points.

Reference Points

An interim TRP of 50%$SSB_{F=0}$ and a management objective of increasing CPUE in southern longlines by 8% from 2013 levels have been set for South Pacific albacore captured by WCPFC vessels (SPC-OFP 2024b; WCPFC 2024g). The LRP for this stock is 20%$SSB_{F=0}$.

Yellowfin, bigeye, and skipjack tuna have an LRP in place of 20% of the recent average spawning biomass in the absence of fishing (WCPFC 2024f). The maximum acceptable level of risk for breaching this LRP is 20%, as defined in the skipjack interim MP (ibid). A TRP for bigeye will be agreed upon when its harvest strategy is developed. An interim biomass objective for bigeye is currently set at maintaining spawning biomass depletion rates at 2012–15 average levels (WCPFC 2024f).

SBT has a TRP in place for rebuilding but no adopted LRP (CCSBT 2023b). No reference points have been adopted for Southwest Pacific swordfish, striped marlin, or other billfish or large pelagics.

Controlling Fishing Pressure

The Nauru Agreement and subsequent action by its members created a vessel scheme for WCPFC longline fisheries and allows for the option of setting longline effort/catch limits for tropical tunas (WCPFC 2024f). Other limits on fishing pressure include some catch level limits for longlines capturing bigeye tuna (ibid). If WCPFC members catch more than their set limits, their overage is deducted from the following year’s catch limit. Catch limits are often calculated using MPs, but are not automatically implemented after their calculation and must be agreed upon by the Commission.

The latest tropical tuna measure, CMM 2023-01, focuses on maintaining certain population levels for skipjack, yellowfin, and bigeye tunas, primarily via controls on purse seine and longline catches (WCPFC 2024f). The measure also lays out a collective limit for each CCM's other fisheries that take at least 2,000 MT of tropical tunas. A recent evaluation of this CMM's progress suggests that skipjack biomass objectives are likely to continue to be met in the future, but there are certain scenarios under which bigeye objectives are not met, and yellowfin objectives are not met under any modeled scenarios (Pilling et al. 2024). Therefore, more stringent management measures may be needed to avoid biomass decreases for both bigeye and yellowfin stocks.

The CPUE increase objective for South Pacific albacore helps guide managers in setting the TRP, which will be revised if the CPUE increase goal becomes unattainable (ibid). The TRP is reviewed every 3 years and is meant to be reached in a maximum 20-year timeline. The development of model-based management procedures will help lead to the development of a harvest strategy that will further dictate management goals and decisions for this stock.

CMM 2006-04 limits the number of fishing vessels that can catch South Pacific striped marlin to the maximum number of vessels used from 2000 to 2004, and CMM 2009-03 does the same for Southwest Pacific swordfish fisheries, using the maximum number of vessels from 2000 to 2005 (ibid). The latest Management Procedure (MP) for SBT sets 3-year TACs to limit fishing pressure in order to achieve the newest rebuilding target (30% of TRO) by 2035, with a 50% likelihood of success (CCSBT 2023b).

Southwest swordfish fishing mortality is controlled by CMM 2009-03, which limits the number of fishing vessels in the southern portion of the Convention Area to the maximum number of vessels between 2000 and 2005 and the number of swordfish that can be caught to the maximum number caught from 2000 to 2006 (WCPFC 2024f). If these limits are breached, the overage is deducted from the following year's limits. This CMM also prevents fishing effort on this stock from expanding northward.

Members are instructed via CMM 2005-03 to create measures to minimize the catch of nontarget fish species and attempt to avoid the catch of these species, which are often more important in smaller, artisanal fisheries than in large commercial fisheries (WCPFC 2024f). Because the catch of these species is not prohibited, they may be caught and landed on WCPFC vessels, though landings are likely to be higher in less industrialized fleets.

Adaptive Management

One active CMM applies to vessels fishing for South Pacific albacore: CMM 2015-02, which limits fishing mortality via setting a limit on fishing vessels (WCPFC 2024f). WCPFC CCMs cannot increase their numbers of fishing vessels targeting albacore in the southern waters of the Convention Area beyond 2005 or recent historical (2000–04) levels.

There are plans to eventually create a mixed fishery harvest strategy framework that will include bigeye management. Currently, management progress for bigeye includes noting management objectives for the stock and identifying performance indicators for longline fisheries targeting the stock, but no management procedures or monitoring strategies have been proposed or adopted. There is no plan for a yellowfin MP, but the stock will be managed indirectly via other stocks' MPs in a multispecies framework.

An interim skipjack MP was passed in 2022, and the MP will be run in 2026 to assess performance. There is also a monitoring strategy in place for the skipjack MP (SPC-OFP 2024).

The SBT MP uses adult abundance inputs of CPUE and mark-recapture. Declines in either abundance input for SBT result in a lower TAC being set. TACs are in place for 3-year periods, and are allocated across Members and Cooperating Non-Members (CCSBT 2023b). Under the previous MP, CCSBT's interim rebuilding goal for SBT was achieved, and the latest MP has been in place since 2021 (CCSBT 2023).

Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean - Hand-operated pole-and-lines - Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Moderately effective

Skipjack and yellowfin tunas are the only main retained species in this fishery. WCPFC has agreed to develop harvest strategies for tropical tunas, and the most progress has been made thus far for skipjack. While the WCPO skipjack stock has a TRP and management procedure adopted, yellowfin does not have adopted components of its harvest strategy in place, though the Commission has noted management objectives and identified performance indicators for this stock (WCPFC 2024g). Yellowfin has an interim management objective, and an LRP is in place for all three tropical tunas (WCPFC 2024f). Though some aspects of highly effective management are in place (e.g., LRPs), additional precaution (e.g., adopting TRPs) and further development of the harvest strategy are needed, so management strategy and implementation is considered "moderately effective" (per lines 1 and 2.a in table 3.1.1 of the Seafood Watch Standard).

Supplementary information

Reference Points

Skipjack and yellowfin tuna have an LRP in place of 20% of the recent average spawning biomass in the absence of fishing (WCPFC 2024f). The maximum acceptable level of risk for breaching this LRP is 20%, as defined in the skipjack interim MP (ibid). The TRP for yellowfin will be agreed upon when a harvest strategy is developed. Skipjack is managed such that spawning biomass is maintained at a level consistent with the interim management procedure outlined in CMM 2022-01; this TRP is calculated based on estimates of stock depletion (WCPFC 2024f). An interim biomass objective for yellowfin is currently set at maintaining spawning biomass depletion rates at 2012–15 average levels (ibid).

Controlling Fishing Mortality

The Nauru Agreement creates a vessel scheme for WCPFC longline and purse seine fisheries and allows for the option of setting longline effort/catch limits, though this does not affect other gear types such as handlines (WCPFC 2024f). Other limits on fishing pressure are focused on purse seine fishery closures and FAD regulations and limits (ibid).

The latest tropical tuna measure, CMM 2023-01, focuses on maintaining certain population levels for skipjack, yellowfin, and bigeye tunas, primarily via controls on purse seine and longline catches (WCPFC 2024f). The measure also lays out a collective limit for each CCM's other fisheries that take at least 2,000 MT of tropical tunas. A recent evaluation of this CMM's progress suggests that skipjack biomass objectives are likely to continue to be met in the future, but there are certain scenarios under which bigeye objectives are not met, and yellowfin objectives are not met under any modeled scenarios (Pilling et al. 2024). Thus, more stringent management measures may be needed to avoid biomass decreases for yellowfin.

Adaptive Management

WCPFC has a harvest strategy workplan for key tuna species that is currently focused on the purse seine/pole-and-line skipjack fishery and the southern longline/troll albacore fishery (WCPFC 2024g). The most progress has been made for skipjack within this workplan, but there are plans to eventually create a mixed fishery harvest strategy framework that will include bigeye. Currently, management progress for yellowfin includes noting management objectives for the stock and identifying performance indicators for longline fisheries targeting the stock, but no management procedures or monitoring strategies have been proposed or adopted. There is no plan for a yellowfin MP, but the stock will be managed indirectly via other stocks' MPs in a multispecies framework. An interim skipjack MP was passed in 2022, and the MP will be run in 2026 to assess performance. There is also a monitoring strategy in place for the skipjack MP (SPC-OFP 2024).

Southwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Moderately effective

South Pacific albacore, yellowfin, and skipjack tunas are the main retained species in this fishery. A harvest strategy for the southern albacore stock is in development but has not yet been completed. Managers are currently focused on developing management procedures for the stock using CPUE data from southern longlines (WCPFC 2024g). WCPFC has set an interim TRP and management objectives related to this reference point. A management strategy evaluation (MSE) framework has been produced and reviewed as part of the harvest strategy development process. WCPFC has agreed to develop harvest strategies for tropical tunas, and the most progress has been made thus far for skipjack. While the WCPO skipjack stock has a TRP and management procedure adopted, yellowfin does not have adopted components of its harvest strategy in place, though the Commission has noted management objectives and identified performance indicators for this stock (WCPFC 2024g). Yellowfin has an interim management objective, and an LRP is in place for all three tropical tunas

(WCPFC 2024f). Though some key management elements are in place (e.g., LRPs), increased precaution could be taken in managing these stocks, so management strategy and implementation is considered "moderately effective" (per lines 1 and 2.a in table 3.1.1 of the Seafood Watch Standard).

Supplementary information

Reference Points

An interim TRP of 50%$SSB_{F=0}$ and a management objective of increasing CPUE in southern longlines by 8% from 2013 levels have been set for South Pacific albacore captured by WCPFC vessels (SPC-OFP 2024b; WCPFC 2024g). The stock has an LRP of 20%$SSB_{F=0}$.

Skipjack and yellowfin tuna have an LRP in place of 20% of the recent average spawning biomass in the absence of fishing (WCPFC 2024f). The maximum acceptable level of risk for breaching this LRP is 20%, as defined in the skipjack interim MP (ibid). The TRP for yellowfin will be agreed upon when a harvest strategy is developed. Skipjack is managed such that spawning biomass is maintained at a level consistent with the interim management procedure outlined in CMM 2022-01; this TRP is calculated based on estimates of stock depletion (WCPFC 2024f). An interim biomass objective for yellowfin is currently set at maintaining spawning biomass depletion rates at 2012–15 average levels (ibid).

Controlling Fishing Mortality

The Nauru Agreement creates a vessel scheme for WCPFC longline and purse seine fisheries and allows for the option of setting longline effort/catch limits, but this does not affect other gear types like trolls (WCPFC 2024f). Other limits on fishing pressure are focused on purse seine fishery closures and FAD regulations and limits (ibid).

The latest tropical tuna measure, CMM 2023-01, focuses on maintaining certain population levels for skipjack, yellowfin, and bigeye tunas, primarily via controls on purse seine and longline catches (WCPFC 2024f). The measure also lays out a collective limit for each CCM's other fisheries that take at least 2,000 MT of tropical tunas. A recent evaluation of this CMM's progress suggests that skipjack biomass objectives are likely to continue to be met in the future, but there are certain scenarios under which bigeye objectives are not met, and yellowfin objectives are not met under any modeled scenarios (Pilling et al. 2024). Therefore, more stringent management measures may be needed to avoid biomass decreases for yellowfin.

One active CMM applies to vessels fishing for South Pacific albacore: CMM 2015-02, which limits fishing mortality via setting a limit on fishing vessels (WCPFC 2024f). WCPFC CCMs cannot increase their numbers of fishing vessels targeting albacore in the southern waters of the Convention Area beyond 2005 or recent historical (2000–04) levels.

WCPFC has a harvest strategy workplan for key tuna species that is currently focused on the purse seine/pole-and-line skipjack fishery and the southern longline/troll albacore fishery (WCPFC 2024g). The most progress has been made for skipjack within this workplan, but there are plans to eventually create a mixed fishery harvest strategy framework that will include bigeye.

Adaptive Management

The CPUE increase objective helps guide managers in setting the TRP for South Pacific albacore, which will be revised if the CPUE increase goal becomes unattainable (ibid). The TRP is reviewed every 3 years and is meant to be reached in a maximum 20-year timeline. The development of model-based management procedures will help lead to the development of a harvest strategy that will further dictate management goals and decisions for this stock.

Currently, management progress for yellowfin includes noting management objectives for the stock and identifying performance indicators for longline fisheries targeting the stock, but no management procedures or monitoring strategies have been proposed or adopted. There is no plan for a yellowfin MP, but the stock will be managed indirectly via other stocks' MPs in a multispecies framework.

An interim skipjack MP was passed in 2022, and the MP will be run in 2026 to assess performance. There is also a monitoring strategy in place for the skipjack MP (SPC-OFP 2024).

3.2 Bycatch strategy

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Ineffective

FAD-set purse seines in the WCPO incidentally capture a number of sensitive species, including marine mammals, sea turtles, sharks, and rays. Entanglement mortality of sharks has been shown to be quite high in other areas such as the Indian Ocean (Filmalter et al. 2013). Bycatch limits are not in place; instead, the WCPFC focuses on release requirements and retention bans. Recent measures have been put in place to decrease the use of entangling FADs, but these measures are too new to determine their effectiveness in minimizing incidental entanglements in FADs. Because there are no bycatch limits for nontarget species and it is unclear that management measures are effective at maintaining population levels of bycatch species, bycatch strategy is considered "ineffective" (per line 1 in table 3.2.1 of the Seafood Watch Standard).

Supplementary information

The WCPFC has adopted several management measures to protect vulnerable bycatch species. Members of the WCPFC are to implement the FAO Guidelines to Reduce Sea Turtle Mortality in Fishing Operations. Proper handling and release guidelines should be followed when hard-shell turtles are incidentally captured (WCPFC 2008b). In addition, fisheries' observers record and report interactions with seabirds and turtles (WCPFC 2012e; WCPFC 2008b). Sea turtles are also required to be released from FADs and other gear types (WCPFC 2024f). Members are further required to report any updates on modified FAD designs that will help reduce sea turtle entanglement (ibid).

Purse seines are prohibited from setting on sea turtles and are prohibited from setting on whale sharks and cetaceans unless the shark/cetacean is not seen before the set begins (WCPFC 2008b; WCPFC 2012e). There is a further landings prohibition on mobula (WCPFC 2024f). This landings prohibition became active in 2021, and there are not yet enough data available to determine its effectiveness. It is also unclear if efforts to reduce whale shark sets have been successful, given the number of whale sharks seen in the latest purse seine bycatch data.

Members of the WCPFC are prohibited from retaining, transshipping, storing, or landing oceanic whitetip and silky sharks, and any incidentally caught sharks should be released and the incident recorded and reported (WCPFC 2012g) (WCPFC 2013f). But the success of this is highly dependent on the quick release of silky shark, because its post-release mortality rate increases with time (Hutchinson et al. 2013). Members are also to implement the FAO International Plan of Action for the Conservation and Management of Sharks and National Plans of Action, and should have policies in place to reduce waste and discarding of sharks. Information on catch and effort for key species is to be reported, and shark finning is banned (5% ratio) (WCPFC 2010a).

It has been suggested that sea turtle and shark bycatch could be reduced by restricting setting on FADs or through the implementation of bycatch avoidance/mitigation devices {Gilman et al. 2011}, which have largely not been implemented by the WCPFC.

As of 2024, new FADs deployed in the WCPO cannot use mesh nets, must use nonentangling material on rafts, and must use nonentangling materials on subsurface structures; these measures are meant to reduce entanglement of nontarget and sensitive species (WCPFC 2024f). Members are also encouraged to use biodegradable materials to reduce ghost fishing and marine debris, though no biodegradable FAD requirement decisions will be made by the Commission until 2026. Members are encouraged to attempt to retrieve and report lost FADs, an effort that aims to reduce ghost gear issues with this fishery. But drifting FADs in the WCPO deployed from 2017 to 2019 were only found to have a recovery rate of ≈13%, creating a high potential impact from both ghost fishing and beaching events (Banks and Zaharia 2020). Therefore, there is still much progress to be made in managing post-fishing FAD impacts.

Finally, FAD-set purse seine fisheries in the WCPO comprise three different set types: FAD-sets, log-sets, and whale- and whale shark-sets. Although higher numbers of whale sharks and marine mammals are reported for unassociated purse seine sets, it is unclear if these catches are stemming from unassociated sets or from whale- and whale shark-sets for which data are shared under the “unassociated purse seine” header, despite a prohibition on whale shark sets since 2014 and a reiteration of this prohibition in a CMM passed in 2024 (see (Peatman and Nicol 2021) (WCPFC 2024f)). While WCPFC prohibits setting purse seines on whale sharks if they are sighted before setting, whale shark sets remain a reported category in WCPFC data, and catch composition data show that bycatch in whale shark sets is more similar to that seen in FAD and log sets than in unassociated sets. The numbers of captured whales and whale sharks are not specifically provided for whale or whale shark purse seine sets, because bycatch of these species in these sets is reported under “unassociated purse seines” for public data sharing purposes. This allows FADs in the WCPO to remain a potential threat to marine mammal and whale shark stocks. According to the latest compliance report, all but one CCM was compliant with the WCPFC’s measure to prohibit setting on whale sharks and retaining whale sharks in 2021–22 (WCPFC 2023g). Further compliance information on other purse seine bycatch measures, as well as more recent FAD-specific measures, is not available.

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central - Western and Central Pacific Fisheries Commission (WCPFC)

Moderately effective

Although bycatch in unassociated purse seine fisheries is typically lower than in FAD-set purse seine fisheries, WCPFC bycatch data show that unassociated purse seines contribute to bycatch of elasmobranchs, marine mammals, and sea turtles. In general, WCPFC unassociated purse seines capture more sea turtles and mobulid rays than associated sets, though FAD sets capture higher numbers of sharks and dolphins. Some bycatch measures are in place, though many WCPFC measures focus more on FADs and longlines than unassociated purse seines. Because some measures are in place but bycatch of sensitive species still occurs in nonnegligible amounts, the effectiveness of these reduction measures is uncertain, so bycatch strategy is considered "moderately effective" (per line 2 in table 3.2.1 of the Seafood Watch Standard).

Supplementary information

Though higher numbers of whale sharks and marine mammals are reported for unassociated purse seine sets, it is unclear if these catches are stemming from unassociated sets or from whale- and whale shark-sets for which data are shared under the "unassociated purse seine" header, despite a prohibition on whale shark sets since 2014 and a reiteration of this prohibition in a CMM passed in 2024 (see (Peatman and Nicol 2021) (WCPFC 2024f)). Purse seines are prohibited from setting on sea turtles and are prohibited from setting on whale sharks and cetaceans unless the shark/cetacean is not seen before the set begins (WCPFC 2008b; WCPFC 2012e). There is a further landings prohibition on mobula (WCPFC 2024f). This landings prohibition became active in 2021, and there are not yet enough data available to determine its effectiveness. It is also unclear if efforts to reduce whale shark sets have been successful, given the number of whale sharks seen in the latest purse seine bycatch data.

Unassociated purse seines contribute to the bycatch of hammerhead sharks (nei), which are not specifically protected by WCPFC. But WCPFC does prohibit shark finning and asks its members to take reasonable steps to release (alive) any sharks that are not retained; hammerhead sharks are not retained on purse seine vessels (Peatman et al. 2017b; WCPFC 2024f). Unassociated purse seines may also contribute to whale shark bycatch; whale sharks are prohibited from being retained onboard (WCPFC 2024f). WCPFC members are also directed by WCPFC to create plans of action for sharks, based on the FAO's shark IPOA (ibid). Mobula also cannot be targeted during purse seine sets and are prohibited from being retained (ibid).

Although other bycatch prevention measures are in place for WCPFC purse seines, they focus on FADs. Therefore, bycatch measures for unassociated purse seines primarily focus on retention bans, setting restrictions, and safe handling and release practices.

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Ineffective

Bycatch data in longlines are provided via expanded estimates based on (low) observer coverage rates. Based on these data, longlines have the potential to affect significantly more stocks and at significantly higher catch levels than purse seines or other gear types. Many of these stocks are species of concern (e.g., oceanic whitetip shark, other sharks, marine mammals, seabirds, and sea turtles). WCPFC has a number of measures in place regarding bycatch species, but these are primarily focused on retention bans and safe handling and release practices. Bycatch measures largely lack catch limits, closures or other consequential actions, and mitigation requirements. Given the high potential for ecosystem impacts from longlines, there is a need for more stringent and effective mitigation measures, so bycatch strategy is considered “ineffective” (per line 1 in table 3.2.1 of the Seafood Watch Standard).

Supplementary information

The Western and Central Pacific Fisheries Commission (WCPFC) has adopted management measures to protect vulnerable bycatch species. For example, WCPFC members are asked to implement the International Plan of Action for Reducing Incidental Catches of Seabirds in Longline Fisheries. Vessels fishing north of 23° N. in the WCPO are required to use at least two mitigation measures, including at least one of the following: side setting, night setting, tori line, or weighted branch line. Members must submit annual reports detailing the mitigation measures used and are encouraged to undertake additional mitigation research (IATTC 2011b) (WCPFC 2012e) (WCPFC 2017b). In the WCPO, small longliners fishing north of 23° N. must use one of these mitigation measures (WCPFC 2017b). But even in these zones, the management system provides only a menu of mitigation methods to choose from. Some of those methods are known to be effective only under certain conditions, but because the fishers can choose which to use, they can select the least costly and likely least effective method. Therefore, even meeting the mitigation requirements to the letter does not mean that effective mitigation methods are being used.

Members of the WCPFC must implement the FAO Guidelines to Reduce Sea Turtle Mortality in Fishing Operations. Proper handling and release guidelines should be used when hard-shell turtles are incidentally captured, and longline vessels must carry line cutters and de-hookers to allow for the safe handling and release of turtles. Longline fisheries are also urged to research mitigation techniques such as the use of circle hooks {WCPFC 2008} (IATTC 2007).

Vessels conducting shallow-set fishing targeting swordfish also must comply with mitigation measures (e.g., circle hooks, whole bait, or other reviewed technique) (WCPFC 2008b). In addition, fisheries observers record and report interactions with seabirds and turtles (WCPFC 2012e) (WCPFC 2008b).

Members of WCPFC are prohibited from retaining, transshipping, storing, or landing oceanic whitetip and silky sharks; any incidentally caught sharks should be released, and the incident recorded and reported (WCPFC 2012f) (WCPFC 2013f). Vessels must comply with one of the following mitigation measures to reduce shark interactions: prohibit the carrying/using of wire trace as branch lines or leaders, or prohibit the use of branch lines running directly off the longline floats, known as "shark lines" (WCPFC 2014). Members must also implement the FAO International Plan of Action for the Conservation and Management of Sharks, and National Plans of Action should have policies in place to reduce waste and discarding of sharks. Information on catch and effort for key species should be reported, and shark finning is banned (5% ratio) (WCPFC 2010a).

Despite these measures, longline fisheries are still responsible for significant bycatch quantities of sharks, rays, sea turtles, and marine mammals, all of which lack adopted bycatch limits. Clarke identified that compliance with implementing WCPFC-adopted management measures specific to sharks is at best 60%, and lower for some measures (Clarke 2013). There are additional compliance issues with the implementation of sea turtle, shark, and seabird management measures (WCPFC 2016). Given this history, improved compliance may be needed to make measures more effective.

Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean - Hand-operated pole-and-lines - Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Highly effective

The best available estimate of discard rates in pole-and-line fisheries targeting tuna is 0.4%, with global handline fisheries (no target species specified) estimated as having a discard rate of 2% (Kelleher 2005). Both tuna pole-and-line and general handline fisheries are considered to have "very low to negligible" discard rates (ibid). Though discards do not always include bycatch (e.g., IATTC considers discards and bycatch separately, where discards are only undersize tunas and bycatch are other nontarget species), handlines and pole-and-lines are both selective gear types, so bycatch is likely low (ibid). Bycatch is not reported separately for troll, handline, or pole-and-line fisheries by the WCPFC because of a lack of observers, but bycatch is not thought to be a significant issue in these fisheries (hence, they lack a need for an observer program). Because bycatch and discards are likely quite low, bycatch strategy is considered "highly effective" (per the initial statement in table 3.2.1 of the Seafood Watch Standard).

Northwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Highly effective

Bycatch in trolling line, hand-operated pole-and-line, and handline fisheries is extremely low. All nontarget species in these fisheries are retained, and their management is assessed in factor 3.1. Because bycatch is likely quite low, bycatch strategy is considered “highly effective” (per the initial statement in table 3.2.1 of the Seafood Watch Standard).

3.3 Scientific data collection and analysis

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Highly effective

Tropical tunas (bigeye, skipjack, yellowfin) are regularly assessed through a peer-reviewed process, as are some nontarget (but retained) other pelagic species in WCPFC purse seine fisheries. Though bycatch is often considered a larger issue in FAD-set purse seines than in unassociated purse seines, WCPFC bycatch data indicate that it is a concern in both fleets. WCPFC requires an observer to be carried on all purse seines operating between 20° N. and 20° S., though this requirement is not always met. Still, observer coverage across purse seines remains high enough (see Justification) to adequately assess purse seine impacts on bycatch species and on targeted catch. Because thorough stock assessments are regularly performed for the target species in purse seine fleets and sufficient data are collected through the regional observer program, scientific data collection and analysis is “highly effective” (per lines 1–5 in table 3.3.1 of the Seafood Watch Standard).

Supplementary information

Observer coverage from 2010 to 2020 did not meet the required level of 100% in all applicable areas, but it was relatively high (Figure 22). Although coverage dipped during 2020–22 (from the lifting of the requirement during the global pandemic), it returned to its usual high levels in 2023.

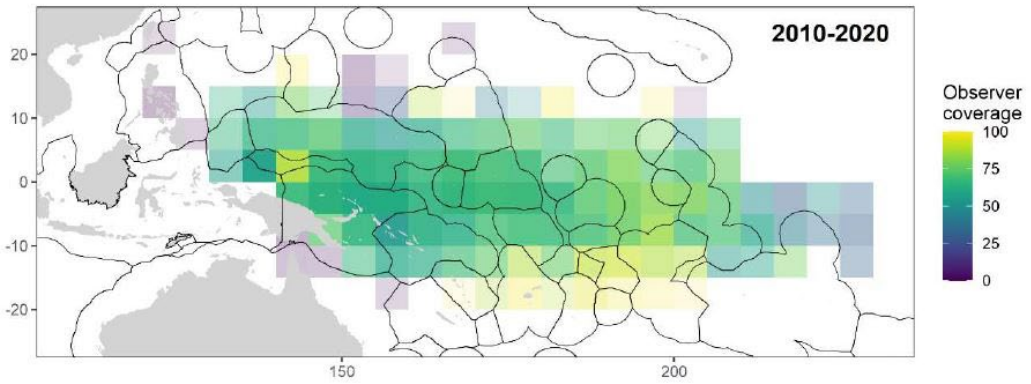


Figure 11: Large-scale purse seine observer coverage from 2010 to 2020 (% of sets for which observer data are available). Source: (Peatman and Nicol 2021).

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Ineffective

Target tuna (albacore, tropical tunas, bluefin) and swordfish stocks are regularly assessed through peer-reviewed processes. Nontarget pelagic species are also captured in longlines, some of which are also regularly assessed.

WCPFC longline vessels are required to achieve an observer rate of 5% across all effort; however, this coverage rate is not always obtained by all countries. From 2013 to 2023, total observer coverage in longlines (all countries included) ranged from 2.6% (2014) to 5.3% (2019). Based on the number of sensitive species that longlines interact with, as well as the frequency of these interactions, an observer coverage rate of 5%, even if fully achieved, is likely still too low to fully assess the impact of these fleets on bycatch species. Because of a low required observer coverage rate and even lower realized coverage rates, scientific data collection and analysis is considered “ineffective” in longline fleets (per line 2 in table 3.3.1 of the Seafood Watch Standard).

Supplementary information

Geographically, some areas reached observer coverage rates as high as 25% from 2015 to 2021, but average rates were much lower across all applicable areas (Figure 23).

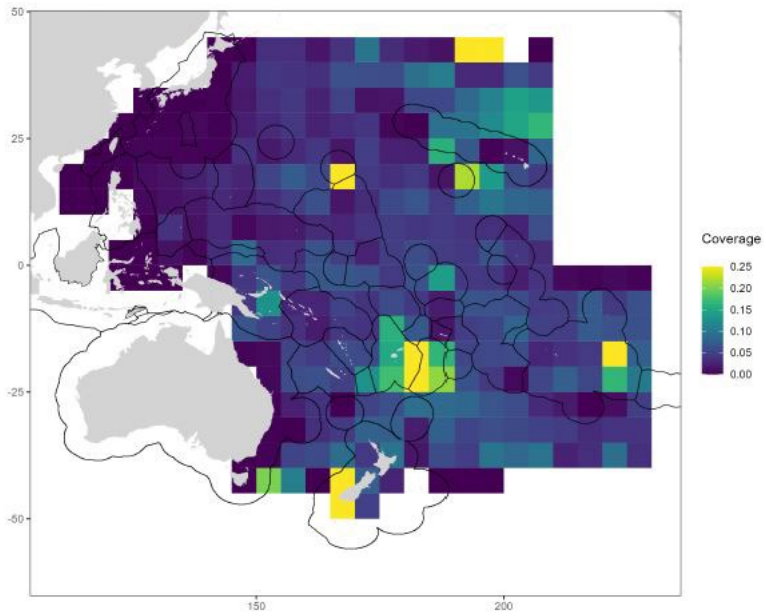


Figure 12: WCPFC longline observer coverage (across all member states) from 2015 to 2021. Source: (Peatman and Nicol 2023).

In 2021, while several WCPFC members met the 5% observer rate (maximum rate in 2021 in a single member's fleet was 23.1%), several others did not, bringing down the average across WCPFC longlines (Figure 24). In 2022 and 2023, the average coverage across all longlines was 4.5% and 4.8%, respectively (TCC 2024).

			REGIONAL OBSERVER PROGRAMME (ROP) DATA COVERAGE (minimum required for ROP is 5%)						
CCM Fleet	Fishery	Metric selected for Coverage	Total estimated effort	As reported by flag state		Total estimated effort	As per data submission		See NOTES
				Observer	%		Observer	%	
AUSTRALIA	Domestic	No. of Hooks							2, 17
CHINA	Ice/Fresh	Days fished	37,820	3,724	9.8%	37,820	2,073	5.5%	3, 10, 11, 22
	Frozen								
COOK ISLANDS	Pacific Islands	Days at Sea	1,516	90	5.9%	1,516	90	5.9%	8
EUROPEAN UNION	Distant-water	No. of Trips	22	0	0.0%	22	0	0.0%	4, 10, 19, 28
FSM	Pacific Islands	No. of Trips							26, 27
FIJI	Pacific Islands	No. of Trips	443	72	16.3%	64	13	20.3%	7
FRENCH POLYNESIA	Pacific Islands	Days at Sea							2
INDONESIA	Domestic	No. of Trips							2, 19, 21
JAPAN	Ice/Fresh, short-trip	Days fished	20,006	20	0.1%	20,006	33	0.2%	10, 18
	Frozen, long-trip	Days fished	5,578	0	0.0%	5,578	0	0.0%	10, 18, 28
KIRIBATI	Pacific Islands	No. of Trips							2
MARSHALL ISLANDS	Pacific Islands	No. of Trips							2, 25
NEW CALEDONIA	Pacific Islands	No. of Hooks							2
NEW ZEALAND	Domestic	No. of Hooks							2
PALAU	Pacific Islands	No. of Trips							2
PAPUA NEW GUINEA	Pacific Islands	No. of Trips							2
PHILIPPINES	Distant-water	No. of Trips							1, 16
REPUBLIC OF KOREA	Distant-water	Days at Sea	31,252	618	2.0%	31,252	618	2.0%	10, 20, 23
SAMOA	Pacific Islands	No. of Trips							2
SOLOMON ISLANDS	Pacific Islands	No. of Trips							2, 7, 9
TONGA	Pacific Islands	No. of Trips							2
TUVALU	Pacific Islands	No. of Trips							2,
CHINESE TAIPEI	Small longline – STLL	Days at Sea	59,742	5,928	9.9%	59,742	1,418	2.4%	10, 14
	Distant-water – DWLL	Days at Sea	17,508	2,685	15.3%	17,508	445	2.5%	10
USA	HAWAII/California-based	No. of Trips	1,206	275	22.8%	1,206	279	23.1%	6
	AMERICAN SAMOA	No. of Trips							2, 6
VANUATU	Pacific Islands and DW	No. of Trips	383	0	0.0%	383	0	0.0%	7, 28

Figure 13: 2021 WCPFC longline observer coverage rates, by state. Source: (Panizza et al. 2023).

Note that members with domestic longline fleets exclusively fishing in their own EEZs (those with a 2 in the "See NOTES" column of Figure 24) are not subject to the 5% observer requirement. Further, while some states have worked to increase their electronic monitoring (EM) in their longline fleets (e.g., Australia), the WCPFC Scientific Committee has noted that EM coverage does not yet count toward observer coverage required under the WCPFC Regional Observer Program (Panizza et al. 2023).

Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean - Hand-operated pole-and-lines - Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Moderately effective

Target tunas (albacore, tropical tunas) and swordfish in the Western Pacific are regularly assessed through a peer-reviewed process, and the latest assessments for each stock were completed between 2021 and 2023. Bycatch is thought to be minimal in handline and troll fisheries, but there are no WCPFC observer coverage mandates for these gear types, so there is a lack of regular, independent data to confirm that bycatch is low. Though it is likely that these fisheries have minimal impacts on bycatch species, the lack of EM or observer data to confirm this independently leads to a "moderately effective" score (per line 1 in table 3.3.1 of the Seafood Watch Standard).

3.4 Enforcement of and compliance with management regulations

All fisheries

Moderately effective

The Western and Central Pacific Fisheries Commission (WCPFC) has a compliance monitoring scheme in place that assesses members' compliance with obligations, identifies areas of conservation and management that may need refinement, responds to noncompliance, and monitors and resolves noncompliance issues. The Commission annually evaluates compliance by members with respect to catch and effort limits and reporting for target species, spatial and temporal closures, observer and vessel monitoring systems (VMS) coverage, and provision of scientific data (WCPFC 2012a).

VMS are required on all vessels fishing for highly migratory species in the WCPO south of 20° N. and east of 175° E. The area north of 20° N. and west of 175° E. had a VMS activation date of December 31, 2013 (WCPFC 2012c). According to the latest compliance and monitoring report (CMR), seven members were noncompliant with VMS requirements for multiple consecutive years, ending in 2022 (WCPFC 2023f) There are measures in place allowing for the boarding and inspection of vessels in the Convention Area (WCPFC 2006), and the WCPFC maintains a list of illegal, unreported, and unregulated vessels (IUU) {WCPFC 2010}. But assessing the effectiveness of these enforcement measures is difficult because there is a general lack of transparency of information regarding surveillance activities, infractions, and enforcement actions and outcomes (Gilman et al. 2013). Final CMRs are available publicly on WCPFC's website, but meetings around draft and provisional reports in which compliance scores are decided are confidential and thus not open to observers (WCPFC 2023f).

In 2021 and 2022, many CMMs were met with 100% compliance, though compliance for some CMMs dipped as low as 67% and 64% in each year, respectively (WCPFC 2023f). According to the latest bycatch reports, many fleets were also noncompliant in recent years with observer coverage requirements for longlines and purse seines (see factor 3.3 for details). In addition, one Philippines-specific CMM was not met (0% compliance) during both 2021 and 2022, and several member countries were noncompliant with specific CMMs for multiple consecutive years (two to six) (ibid). The primary themes of CMMs that were not met with 100% compliance in 2021 and/or 2022 were bycatch in purse seines and longlines and purse seine limitations (ibid). Further, several members have been noncompliant with VMS requirements for multiple consecutive years, bringing uncertainty into the effectiveness of surveillance measures. Finally, WCPFC "strongly encourages" members to resolve CMM implementation issues but does not take direct action to ensure this outcome.

Enforcement and/or monitoring is in place to ensure that goals are successfully met, but the effectiveness of enforcement/monitoring is uncertain, given that members have been noncompliant with multiple CMMs for multiple consecutive years; therefore, enforcement and compliance is considered "moderately effective" (per table 3.4.1 of the Seafood Watch Standard).

3.5 Stakeholder inclusion

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central - Western and Central Pacific Fisheries Commission (WCPFC)

Moderately effective

The Western and Central Pacific Fisheries Commission allows for accredited observers to participate in most meetings. Historically, the WCPFC has lacked transparency in some factors, but this has improved in recent years (Gilman et al. 2013; WCPFC 2013c}. Despite improvements, WCPFC compliance meetings are still largely closed to observers (observer delegations cannot attend, but observers in member state delegations can attend), leading to a lack of transparency around how well members are following CMMs (Carver 2024). Media members have also been prevented from sitting in on annual WCPFC general meetings (ibid). Further, the International Scientific Committee for Tuna and Tuna-Like Species in the North Pacific Ocean (ISC) performs stock assessments and provides scientific advice for North Pacific albacore, Pacific bluefin tuna, Pacific blue marlin, North Pacific striped marlin, and North Pacific swordfish. ISC does not allow observers into working group meetings for these species. Although there is some transparency in WCPFC's internal processes and meetings, some aspects still lack full transparency for all stakeholders and there is a lack of transparency in the assessment process for ISC stocks; thus, stakeholder inclusion is considered "moderately effective" (per lines 1–2 in table 3.5.1 of the Seafood Watch Standard).

Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean - Hand-operated pole-and-lines - Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Moderately effective

The Western and Central Pacific Fisheries Commission allows for accredited observers to participate in most meetings. Historically, the WCPFC has lacked transparency in some factors, but this has improved in recent years (Gilman et al. 2013; WCPFC 2013c}. Despite improvements, WCPFC compliance meetings are still largely closed to observers (observer delegations cannot attend, but observers in member state delegations can attend), leading to a lack of transparency around how well members are following CMMs (Carver 2024). Media members have also been prevented from sitting in on annual WCPFC general meetings (ibid). Although there is some transparency in WCPFC's internal processes and meetings, some aspects still lack full transparency for all stakeholders, so stakeholder inclusion is considered "moderately effective" (per lines 1–2 in table 3.5.1 of the Seafood Watch Standard).

Criterion 4: Impacts on the habitat and ecosystem

This Criterion assesses the impact of the fishery on seafloor habitats, and increases that base score if there are measures in place to mitigate any impacts. The fishery's overall impact on the ecosystem and food web and the use of ecosystem-based fisheries management (EBFM) principles is also evaluated. Ecosystem Based Fisheries Management aims to consider the interconnections among species and all natural and human stressors on the environment. The final score is the geometric mean of the impact of fishing gear on habitat score (factor 4.1 + factor 4.2) and the Ecosystem Based Fishery Management score. The Criterion 4 rating is determined as follows:

- Score >3.2 = **Green** or Low concern
- Score >2.2 and ≤3.2 = **Yellow** or Moderate concern
- Score ≤2.2 = **Red** or High concern

Guiding principles

- Avoid negative impacts on the structure, function or associated biota of marine habitats where fishing occurs.
- Maintain the trophic role of all aquatic life.
- Do not result in harmful ecological changes such as reduction of dependent predator populations, trophic cascades, or phase shifts.
- Ensure that any enhancement activities and fishing activities on enhanced stocks do not negatively affect the diversity, abundance, productivity, or genetic integrity of wild stocks.
- Follow the principles of ecosystem-based fisheries management.

Rating cannot be Critical for Criterion 4.

Criterion 4 summary

Fishery	Physical Impact of Fishing Gear on the Habitat/Substrate	Modifying Factor: Mitigation of Gear Impacts	Ecosystem-based Fisheries Management	Score
Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)	Score: 5	Score: 0	High Concern	Yellow (3.162)
Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)	Score: 5	Score: 0	Moderate Concern	Green (3.873)
Northwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)	Score: 5	Score: 0	Moderate Concern	Green (3.873)
Southwest Pacific Ocean - Hand-operated pole-and-lines - Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)	Score: 5	Score: 0	Moderate Concern	Green (3.873)
Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)	Score: 5	Score: 0	High Concern	Yellow (3.162)
Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)	Score: 5	Score: 0	Moderate Concern	Green (3.873)
Southwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)	Score: 5	Score: 0	Moderate Concern	Green (3.873)

Fishery	Physical Impact of Fishing Gear on the Habitat/Substrate	Modifying Factor: Mitigation of Gear Impacts	Ecosystem-based Fisheries Management	Score
Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)	Score: 5	Score: 0	Moderate Concern	**Green (3.873)**
Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central - Western and Central Pacific Fisheries Commission (WCPFC)	Score: 5	Score: 0	Moderate Concern	**Green (3.873)**

Criterion 4 assessment

Scoring guidelines

Factor 4.1 - Physical impact of fishing gear on the habitat/substrate

Goal: The fishery does not adversely impact the physical structure of the ocean habitat, seafloor or associated biological communities.

- *5 - Fishing gear does not contact the bottom*
- *4 - Vertical line gear*
- *3 - Gears that contacts the bottom, but is not dragged along the bottom (e.g. gillnet, bottom longline, trap) and is not fished on sensitive habitats. Or bottom seine on resilient mud/sand habitats. Or midwater trawl that is known to contact bottom occasionally. Or purse seine known to commonly contact the bottom.*
- *2 - Bottom dragging gears (dredge, trawl) fished on resilient mud/sand habitats. Or gillnet, trap, or bottom longline fished on sensitive boulder or coral reef habitat. Or bottom seine except on mud/sand. Or there is known trampling of coral reef habitat.*
- *1 - Hydraulic clam dredge. Or dredge or trawl gear fished on moderately sensitive habitats (e.g., cobble or boulder)*
- *0 - Dredge or trawl fished on biogenic habitat, (e.g., deep-sea corals, eelgrass and maerl)*
  Note: When multiple habitat types are commonly encountered, and/or the habitat classification is uncertain, the score will be based on the most sensitive, plausible habitat type.

Factor 4.2 - Modifying factor: mitigation of gear impacts

Goal: Damage to the seafloor is mitigated through protection of sensitive or vulnerable seafloor habitats, and limits on the spatial footprint of fishing on fishing effort.

- *+1 —>50% of the habitat is protected from fishing with the gear type. Or fishing intensity is very low/limited and for trawled fisheries, expansion of fishery's footprint is prohibited. Or gear is specifically modified to reduce damage to seafloor and modifications have been shown to be effective at reducing damage. Or there is an effective combination of 'moderate' mitigation measures.*
- *+0.5 —At least 20% of all representative habitats are protected from fishing with the gear type and for trawl fisheries, expansion of the fishery's footprint is prohibited. Or gear modification measures or other measures are in place to limit fishing effort, fishing intensity, and spatial footprint of damage caused from fishing that are expected to be effective.*
- *0 —No effective measures are in place to limit gear impacts on habitats or not applicable because gear used is benign and received a score of 5 in factor 4.1*

Factor 4.3 - Ecosystem-based fisheries management

Goal: All stocks are maintained at levels that allow them to fulfill their ecological role and to maintain a functioning ecosystem and food web. Fishing activities should not seriously reduce ecosystem services provided by any retained species or result in harmful changes such as trophic cascades, phase shifts or reduction of genetic diversity. Even non-native species should be considered with respect to ecosystem impacts. If a fishery is managed in order to eradicate a non-native, the potential impacts of that strategy on native species in the ecosystem should be considered and rated below.

- *5 — Policies that have been shown to be effective are in place to protect species' ecological roles and ecosystem functioning (e.g. catch limits that ensure species' abundance is maintained at sufficient levels to provide food to predators) and effective spatial management is used to protect spawning and foraging areas, and prevent localized depletion. Or it has been scientifically demonstrated that fishing practices do not have negative ecological effects.*
- *4 — Policies are in place to protect species' ecological roles and ecosystem functioning but have not proven to be effective and at least some spatial management is used.*
- *3 — Policies are not in place to protect species' ecological roles and ecosystem functioning but detrimental food web impacts are not likely or policies in place may not be sufficient to protect species' ecological roles and ecosystem functioning.*
- *2 — Policies are not in place to protect species' ecological roles and ecosystem functioning and the likelihood of detrimental food impacts are likely (e.g. trophic cascades, alternate stable states, etc.), but conclusive scientific evidence is not available for this fishery.*
- *1 — Scientifically demonstrated trophic cascades, alternate stable states or other detrimental food web impact are resulting from this fishery.*

4.1 Physical impact of fishing gear on the habitat/substrate

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Score: 5

Although purse seine fishing does not typically result in the nets coming in contact with the bottom, anchored FADs could result in contact with the bottom (Beverly et al. 2012). Still, the majority (> 86%) of FAD operations in the WCPFC are drifting rather than anchored, so seafloor impacts of the fleet as a whole are likely minimal (Peatman and Nicol 2021). Because this gear rarely contacts the bottom and is targeting pelagic species, a score of 5 is assigned (per table 4.1.1 of the Seafood Watch Standard).

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central - Western and Central Pacific Fisheries Commission (WCPFC)

Score: 5

Unassociated purse seine sets do not typically come in contact with the bottom. Because this gear does not contact the bottom and is targeting pelagic species, a score of 5 is assigned (per table 4.1.1 of the Seafood Watch Standard).

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Score: 5

Pelagic longlines are surface fisheries that do not interact with the seafloor. Because this gear does not contact the bottom and is targeting pelagic species, a score of 5 is assigned (per table 4.1.1 of the Seafood Watch Standard).

Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean - Hand-operated pole-and-lines - Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Score: 5

Vertical gear rarely affects bottom habitats. Tuna are pelagic species, so trolling line and handline fisheries targeting them operate in deep water where bottom contact is unlikely. Because this gear does not contact the bottom and targets pelagic species, a score of 5 is assigned (per table 4.1.1 of the Seafood Watch Standard).

4.2 Modifying factor: mitigation of gear impacts

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Score: 0

Although there are restrictions on when FAD sets can be made (WCPFC 2013b), there are no restrictions on where FADs can be placed in the region, so we have awarded a score of “no effective mitigation” regarding habitat impacts.

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Score: 0

Pelagic longline gear typically does not come in contact with bottom habitats.

Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean - Hand-operated pole-and-lines - Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Score: 0

Vertical fishing gear does not come in contact with bottom habitats.

4.3 Ecosystem-based fisheries management

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Unassociated purse seine (non-FAD) - Pacific, Western Central - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Southwest Pacific Ocean | Western Central Pacific Ocean - Floating object purse seine (FAD) - Pacific, Western Central | Pacific, Northwest | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Moderate concern

Purse seine fisheries' main retained species include both small and large tunas. Larger tunas are often top ecosystem predators. One of the core articles of the WCPFC Convention is to assess the impacts of fishing on target and nontarget species. Management measures are in place to protect bycatch and target species, ecological risk assessments are being conducted, and there is an Ecosystem Monitoring and Analysis section within the Secretariat of the Pacific Community, which provides scientific assistance to the WCPFC (SPC 2010). Since 2015, WCPFC has been considering the application of ecosystem indicators in its management, and a set of candidate ecosystem and climate indicators was proposed at the 2022 Scientific Committee meeting (Hare et al. 2025). These indicators will continue to be presented and discussed at Scientific Committee meetings, and the Commission plans to develop triggers for them. But the current indices are largely focused on climatic conditions (e.g., sea surface temperature changes), and fish condition presented as a fattiness percentage is the only nonclimate indicator proposed in 2022 (ibid). Thus, food web indicators are lacking; however, the WCPFC has initiated studies to monitor changes to the food web and to examine predator-prey relationships (Allain 2010) (Allain et al. 2012). It is unknown if this fishery causes detrimental impacts to the food web (though it is unlikely), and it is possible that more stringent measures are needed. Therefore, ecosystem-based fisheries management is considered a "moderate" concern (per line 2.a in table 4.3.1 of the Seafood Watch Standard).

Northwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Drifting longlines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

High concern

The pelagic longline fisheries in the WCPO catch a number of ecologically important species including other tunas, billfish, and sharks. Sharks are top predators in many ecosystems and play a critical role in how these ecosystems are structured and function (Piraino et al. 2002) (Stevens et al. 2000). The loss of these predators can lead to changes in prey abundances that can cascade throughout the food web (Myers et al. 2007) (Duffy 2003) (Ferretti et al. 2010) (Schindler et al. 2002), and also lead to behavioral changes (Heithaus et al. 2007). In the North Pacific Ocean, the removal of blue shark and tunas by longline fisheries has caused an increase in the number of short-lived, fast-growing species such as mahi mahi (Polovina 2009).

Since 2015, WCPFC has been considering the application of ecosystem indicators in its management, and a set of candidate ecosystem and climate indicators were proposed at the 2022 Scientific Committee meeting (Hare et al. 2025). These indicators will continue to be presented and discussed at Scientific Committee meetings, and the Commission plans to develop triggers for them. But the current indices are largely focused on climatic conditions (e.g., sea surface temperature changes), and fish condition presented asa fattiness percentage is the only nonclimate indicator proposed in 2022 (ibid). Thus, food web indicators are lacking.

WCPFC has begun identifying key shark species affected by fisheries in the Convention Area, and has to date completed stock assessments on two species (oceanic white tip and silky sharks) and adopted several management measures to protect bycatch species (Rice and Harley 2013) (Rice and Harley 2012b). In addition, the WCPFC has initiated studies to monitor changes to the food web and to examine predator-prey relationships (Allain 2010) (Allain et al. 2012). But hammerhead sharks, which may be retained in the longline fisheries, are not provided with species-specific protections or ecological-specific protections. Further, blue shark, which is retained and has targeted longline fisheries in the WCPFC, also lacks management. Research on food web relationships has not yet been incorporated into management measures. This is particularly concerning for longline fisheries because of their much larger catches of high trophic level species, compared to that of other gear types. Because this fishery catches exceptional species, and though there are some efforts to incorporate their ecological roles into management, these roles are not fully protected by management and detrimental food web impacts are possible, ecosystem-based fisheries management is considered a "high concern" (per lines 1.a–b in table 4.3.1 of the Seafood Watch Standard).

Northwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Handlines and hand-operated pole-and-lines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean - Hand-operated pole-and-lines - Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Northwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines - Pacific, Western Central | Pacific, Northwest - Western and Central Pacific Fisheries Commission (WCPFC)

Southwest Pacific Ocean | Western Central Pacific Ocean - Trolling lines - Pacific, Western Central | Pacific, Southwest - Western and Central Pacific Fisheries Commission (WCPFC)

Moderate concern

One of the core articles of the WCPFC Convention is to assess the impacts of fishing on target and nontarget species. There are management measures in place to protect bycatch and target species, ecological risk assessments are being conducted, and there is an ecosystem monitoring and analysis section within the Secretariat of the Pacific Community, which provides scientific assistance to the WCPFC (SPC 2008). But trolling line and hand-operated pole-and-line fisheries rely on live baitfish, which could include "exceptional species" such as anchovy or sardines; the effect of the removal of these species on the ecosystem is unknown, and few baitfish fisheries are managed (Gillett 2010) (FAO 2014). Since 2015, WCPFC has been considering the application of ecosystem indicators in its management, and a set of candidate ecosystem and climate indicators were proposed at the 2022 Scientific Committee meeting (Hare et al. 2025). These indicators will continue to be

presented and discussed at Scientific Committee meetings, and the Commission plans to develop triggers for them. But the current indices are largely focused on climatic conditions (e.g., sea surface temperature changes), and fish condition presented as a fattiness percentage is the only nonclimate indicator proposed in 2022 (ibid). Thus, food web indicators are lacking; however, the WCPFC has initiated studies to monitor changes to the food web and to examine predator-prey relationships (Allain 2010) (Allain et al. 2012). It is unknown if this fishery causes detrimental impacts to the food web (though it is unlikely), and it is possible that more stringent measures are needed. Because of these uncertainties, ecosystem-bazsed fisheries management is considered a "moderate concern" (per line 2.a in table 4.3.1 of the Seafood Watch Standard).

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Scientific review does not constitute an endorsement of the Seafood Watch® program, or its seafood recommendations, on the part of the reviewing scientists. Seafood Watch® is solely responsible for the conclusions reached in this report.

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Appendix A: Bycatch in purse seines and longlines

Species	Longline bycatch	FAD-set PS bycatch	Unassociated PS bycatch	Retained PS?	Retained LL?	Main Species FAD?	Main Species uPS?	Main Species LL?
Skipjack Tuna	9,916	3,157,500	3,270,000		Yes	Yes (>20% mortality)	Yes (>20% mortality)	No
Yellowfin Tuna	294,382	662,250	995,000		Yes	Yes (>20% mortality)	Yes (>20% mortality)	No
Bigeye Tuna	277,961	264,250	39,900		Yes	Yes (>20% mortality)	No	Yes (>20% mortality)
Albacore	388,547	61	206	Yes	Yes	No	No	Yes (>20% mortality)
Other Teleosts	24,231			Yes	No	No	No	Yes (>20% mortality)
Escolars	14,161			No	No	No	No	Yes (>20% mortality)
Wahoo	13,345	288	4	Yes	Yes	No	No	Yes (>20% mortality)
Opah	9,997			Yes	Yes	No	No	Yes (>20% mortality)
Longsnouted Lancetfish	6,468				No	No	No	Yes (>20% mortality)
Mahi	5,293	596	23	No	Yes	No	No	Yes (>20% mortality)
Mackerel Scad		5,432	73	No	Yes	Yes (>20% mortality)	No	No
Rainbow Runner		5,200	203	No		No	No	No
Great Barracuda	1,181			No	Yes	No	No	No
Pomfrets	1,139	7	1	No	Yes	No	No	Yes (>20% mortality)
Frigate and Bullet Tuna		794	249	Yes	Yes	No	No	No
Ocean Triggerfish		800	18	No		Yes (>20% mortality)	No	No
Kawakawa		182	224	Yes		No	No	No
Barracudas		84	14	No	Yes	No	No	No
Golden Trevally		76	1	Yes	No	No	No	No
Amberjacks		61	3	Yes		No	No	No
Carangids		39	2	Yes		No	No	No
Sunfish		24	17	No	No	No	No	No
Sea Chubs		32	1	No	No	No	No	No
Scombrids		14	6	No	Yes	No	No	No
Trevallies		17	1	Yes	Yes	No	No	No
Marine Fishes		10	3	No	No	No	No	No
Batfishes		7	0	Yes	No	No	No	No
Filefishes		6	0	No		No	No	No
Triple-Tail		3	1	No		No	No	No

Figure 14: Bycatch (MT) in WCPO purse seine and longline fisheries from 2017 to 2021 (longlines) and 2018 to 2022 (purse seines). Data sources: (Peatman et al. 2017b; Peatman et al. 2018; Peatman and Nicol 2023; Peatman et al. 2024). Figure 10 in (Peatman et al. 2017b) was used to determine the fate (retained/discarded) in purse seine fisheries, and table 3a in (Peatman et al. 2024) was used to determine bycatch teleost species in purse seines. Figure 13 in (Peatman et al. 2018) was used to determine the fate in longline fisheries, and table A-4 in (Peatman and Nicol 2023) was used to determine bycatch teleost species in longlines.

The WCPFC periodically publishes bycatch estimates for purse seines and longlines under its purview. Bycatch data are presented for some species in metric tons (Figure 9) and for others in number of individuals (Figure 10). The latest updates for purse seines were published using data up to 2022, and those for longlines were published using data up to 2021 (Peatman and Nicol 2023) (Peatman et al. 2024). Although the latest iterations of bycatch summaries do not include the fate of captured species, older iterations do, and the last published bycatch fate data were used to determine retained species (> 50% retention rate) in the two tables (Figures 9–10) (Peatman et al. 2017b; Peatman et al. 2018). In Figure 9, species that had very little weight captured over a 4-year period (e.g., < 100 MT) are considered a "negligible" part of the catch and thus are not considered main species. For species in Figure 9 that were included in both the catch data and the bycatch estimates from the WCPFC, catch and bycatch have been summed together. In Figure 10, the same is true for species with very few individuals captured (e.g., < 100 individuals). Although the primary tuna species in Figure 9 (tropical tunas, albacore) are considered main species in some fisheries via the bycatch dataset, they are also found in the WCPFC's primary catch dataset, so their final main species determinations were made using both sets of data (see the Criterion 2 Summary for the main species lists). The same is true for some non-tunas in Figure 10; e.g., swordfish, blue shark, marlins, and silky shark. Gaps in both tables represent an absence of data in the WCPFC reports. Main species in these tables are included in Criteria 1 and 2 in this assessment, and main, retained species are used in the scoring of factors 3.1 and 4.3. Species that are considered main species because of ETP status are those listed by the IUCN as "Endangered," "Threatened," "Critically Endangered," or "Near Threatened" (considered overfished by SFW standards) and that have an

unknown sustainable level of mortality; thus, it cannot be determined if the fishery contributes to under 5% of a sustainable F level. Those considered main species under the "> 20% mortality" designator either have at least 20% of their total fishing mortality (estimated from WCPFC fisheries combined) stemming from one fishery or have an unknown total fishing mortality level, so it cannot be determined if the fishery contributes to less than 20% of total mortality. Further, species whose inclusion would be repetitive ("other teleosts," "elasmobranchs nei," and "sea turtles") based on other main species in each fishery have not been added to Criterion 2. For example, "sea turtles" are not added to longline fisheries because all sea turtle species, individually, are already main species in these fisheries.

Species	Longline bycatch	FAD-set PS bycatch	Unassociated PS bycatch	Retained in PS?	Retained LL?	Main Species FAD?	Main Species uPS?	Main Species LL?
Blue Shark	4,013,000	61	74	No	No	No	No	Yes (>20% mortality)
Pelagic Stingray	1,472,000	330	317	No	No	No	No	Yes (>20% mortality)
Swordfish	1,136,000	127	70	Yes	Yes	No	No	Yes (>20% mortality)
Blue Marlin	981,000			No	Yes	No	No	Yes (>20% mortality)
Silky Shark	547,700	289,750	181,000	No	No*	Yes (>20% mortality)	No	Yes (>20% mortality)
Elasmobranchs nei	410,400	2,510	2,395	No	No	No	No	Yes (>20% mortality)
Striped Marlin	319,000	1,186	1,050	No	Yes	No	No	Yes (>20% mortality)
Shortfin Mako	306,800			No	No	No	No	Yes (>20% mortality)
Bigeye Thresher	205,500			No	No	No	No	Yes (>20% mortality)
Indo-Pacific Sailfish	181,700	612	1,030	No	Yes	No	No	Yes (>20% mortality)
Oceanic Whitetip	147,000	3,577	1,475	No	No	No	No	Yes (>20% mortality)
Thresher Sharks	109,310	72	30	No	No	No	No	Yes (>20% mortality)
Mobulid Rays	77,020	6,273	15,450	No	No	Yes (ETP status)	Yes (ETP status)	Yes (>20% mortality)
Black Marlin	48,370			No	Yes	No	No	Yes (>20% mortality)
Olive Ridley	23,940	121	179	No	No	Yes (ETP status)	Yes (ETP status)	Yes (>20% mortality)
Sea Turtles	23,940	15	32	No	No	No	No	Yes (>20% mortality)
Loggerhead	17,770	98	156	No	No	Yes (ETP status)	Yes (ETP status)	Yes (>20% mortality)
Black & Blue Marlin		11,685	11,050	No	Yes	No	No	No
Marine Mammals	9,180	3	25	No	No	No	No	Yes (>20% mortality)
Green Turtle	6,863	92	222	No	No	Yes (ETP status)	Yes (ETP status)	Yes (>20% mortality)
Dolphins		2,807	960	No	No	Yes (ETP status)	Yes (ETP status)	No
False Killer Whale		1,442	1,410	No	No	Yes (ETP status)	Yes (ETP status)	No
Leatherback	2,596	22	25	No	No	Yes (ETP status)	Yes (ETP status)	Yes (>20% mortality)
Hawksbill	2,109	64	129	No	No	Yes (ETP status)	Yes (ETP status)	Yes (>20% mortality)
Whale Shark		221	2,070	No	No	Yes (ETP status)	Yes (>20% mortality)	No
Short-Billed Spearfish		163	260	No	Yes	No	No	No
Hammerhead Sharks		240	153	No	Yes	Yes (ETP status)	Yes (ETP status)	No
Mako Sharks		64	36	No	No	No	No	No
Baleen Whales		21	1,770	No	No	No	Yes (ETP status)	No
Short-Finned Pilot Whale		305	246	No	No	No	No	No
Risso's Dolphin		133	88	No	No	No	No	No
Blackfish		106	78	No	No	No	No	No
Beaked Whales		3	102	No	No	No	No	No
Toothed Whales		4	80	No	No	No	No	No

Figure 15: Bycatch (number of individuals caught) in WCPO purse seine and longline fisheries from 2017 to 2021 (longlines) and 2018 to 2022 (purse seines). Note that FAD purse seine data comprise log sets, anchored FAD sets, and drifting FAD sets. Data sources: (Peatman et al. 2017b; Peatman et al. 2018; Peatman and Nicol 2023; Peatman et al. 2024). Figures 11, 14, and 16 in (Peatman et al. 2017b) were used to determine the fate of billfish, sharks, marine mammals, and sea turtles in purse seine fisheries, and tables 3b–e in (Peatman et al. 2024) were used to determine bycatch nonteleost species in purse seines. Figures 16, 19, and 21 in (Peatman et al. 2018) were used to determine the fate of billfish, sharks, marine mammals, and sea turtles in longline fisheries, and tables A-5, A-7, and A-9 in (Peatman and Nicol 2023) were used to determine bycatch nonteleost species in longlines.

In Figure 10, though striped marlin (SW stock) and oceanic whitetip are considered species of concern, they are not main species in either purse seine fishery because, based on average weights for both species, the average annual catch of both stocks in unassociated and FAD-set purse seines is below 5% of the latest available estimate of MSY. Baleen whales, though not indicated by the data (and thus not noted in Figure 10) are also considered main species in the FAD-set purse seine fishery, based on how WCPFC reports marine mammal interactions in whale-set purse seine operations. These interactions are reported under unassociated purse seines, but Seafood Watch considers whale sets to be FAD sets. For more information, see the Criterion 2 Summary. Although short-finned pilot whale and Risso's dolphin are marine mammals, which are often considered species of concern, both species are listed as "Least Concern" by IUCN. Based on both species' estimated level of catch in the Japanese whaling industry, WCPFC

purse seines are responsible for under 20% of total fishing mortality for them (Kasuya 2018). Past observer data (2010–20) suggest that the cetacean species most commonly interacted with in WCPFC longlines are false killer whale, toothed whales nei, bottlenose dolphin, and rough-toothed dolphin (Williams et al. 2021). But extrapolated data for these interactions across the entire longline fleet are not available, so only marine mammals as a broad cateogry is included as a main species.

* While older bycatch reports indicate that > 50% of silky shark were retained (from 2003 to 2017, aggregated) in longlines, a retention ban went into place in 2013, so it is not considered a retained species in this assessment (Peatman et al. 2018) (WCPFC 2024f). Retention data indicate that blue shark and shortfin mako shark are not retained at a rate > 50%, so they are not considered retained species; however, they are not fully discarded (retention rates of ≈10% and ≈30%, respectively), so a rating is produced for both species in longline fisheries in this assessment (Peatman et al. 2018).

Appendix B: Catch composition table—wcpo purse seine fisheries

Species	Catch (mt)	Main Species?
Skipjack Tuna	7,503,232	Yes (>5% of catch)
Yellowfin Tuna	1,930,212	Yes (>5% of catch)
Bigeye Tuna	332,137	Yes >(20% mortality)
Pacific Bluefin Tuna	21,373	Yes (>20% mortality)
Albacore	11,291	
Blue Marlin	3,411	
Black Marlin	2,076	
Whale Shark	554	Yes (>20% mortality)
Swordfish	375	
Striped Marlin	133	

Figure 16: Catch (MT) in WCPO purse seine fisheries from 2018 to 2022. Data source: (WCPFC 2024i).

Catch composition data, unlike bycatch data, are not separated by purse seine set type, so the above-identified main species are included for both FAD-set purse seines and unassociated/free-school purse seines. The only exception is Pacific bluefin tuna, which is not targeted by and is rarely captured in FAD sets, so it is only included as a main species in the unassociated purse seine fishery. While albacore is not a main species, the northern stock is included in C1 for unassociated purse seines in order to produce a rating.

Appendix C: Catch composition tables—wcpo troll fisheries

Species	Catch (mt)	Main Species?
Yellowfin Tuna	12,111	Yes (>5% of catch)
Skipjack Tuna	9,190	Yes (>5% of catch)
Pacific Bluefin Tuna	3,130	Yes (>5% of catch)
Albacore	874	No
Bigeye Tuna	658	No
Striped Marlin	49	No
Swordfish	1	No

Figure 17: Catch (MT) in NW Pacific troll fisheries from 2017 to 2021. Data source: (WCPFC 2024i).

Species	Catch (mt)	Main Species?
Albacore	18,058	Yes (>5% of catch)
Yellowfin Tuna	2,078	Yes (>5% of catch)
Skipjack Tuna	1,558	Yes (>5% of catch)
Bigeye Tuna	194	No
Striped Marlin	5	No

Figure 18: Catch (MT) in SW Pacific troll fisheries from 2018 to 2022. Data source: (WCPFC 2024i).

Note that the WCPFC provides three catch datasets: one for the full WCPO, one for the north portion of the WCPO (all catch north of the equator), and one for the south portion of the WCPO (all catch south of the equator). North and south datasets were used to determine main species in north and south fisheries. But the north and south datasets do not include all species that are found in the WCPO dataset; thus, some main species not included in north/south datasets were determined from the larger WCPO dataset. Because of the nature of the data presented by WCPFC, all north/south fisheries also include the FAO WCPO area.

Appendix D: Catch composition tables—wcpo handline fisheries

Species	Catch (mt)	Main Species?
Skipjack Tuna	400,580	Yes (>5% of catch)
Yellowfin Tuna	225,890	Yes (>5% of catch)
Albacore	75,463	Yes (>5% of catch)
Bigeye Tuna	14,078	No
Swordfish	95	No
Pacific Bluefin Tuna	58	No

Figure 19: Catch (MT) in NW Pacific handline fisheries from 2017 to 2021. Data source: (WCPFC 2024i).

Species	Catch (mt)	Main Species?
Yellowfin Tuna	683,943	Yes (>5% of catch)
Skipjack Tuna	512,872	Yes (>5% of catch)
Bigeye Tuna	36,038	No
Albacore	314	No
Swordfish	20	No

Figure 20: Catch (MT) in SW Pacific handline fisheries from 2018 to 2022. Data source: (WCPFC 2024i).

While Pacific bluefin and swordfish are not main species in the NW handline and pole-and-line fishery, they are included in Criterion 1 to produce a rating. Similarly, albacore is included in the SW pole-and-line fishery in order to produce a rating, and albacore, bigeye, and swordfish are included in Criterion 1 in the SW handline and pole-and-line fishery in order to produce a rating.

Appendix E: Catch composition tables—wcpo longline fisheries

Species	Catch (mt)	Main Species?
Yellowfin Tuna	131,407	Yes (>5% of catch)
Albacore	108,643	Yes (>5% of catch)
Bigeye Tuna	76,607	Yes (>5% of catch)
Swordfish	43,948	Yes (>5% of catch)
Striped Marlin	9,172	Yes (>20% of mortality)
Pacific Bluefin Tuna	8,562	No
Skipjack Tuna	1,969	No

Figure 21: Catch (MT) in NW Pacific longline fisheries from 2017 to 2021. Data source: (WCPFC 2024i).

Species	Catch (mt)	Main Species?
Albacore	302,613	Yes (>5% of catch)
Yellowfin Tuna	110,609	Yes (>5% of catch)
Bigeye Tuna	37,166	Yes (>5% of catch)
Swordfish	31,773	Yes (>20% of mortality)
Skipjack Tuna	8,259	No
Striped Marlin	5,487	Yes (>20% of mortality)
Pacific Bluefin Tuna	179	No

Figure 22: Catch (MT) in SW Pacific longline fisheries from 2018 to 2022. Data source: (WCPFC 2024i).

Appendix F: Catch in all wcpo fisheries

	Purse seines	Longlines	Poles	Other	Small-fish handlines	Large-fish handlines	Ringnets	Gillnets	Trolls
Skipjack Tuna	7,368,889	17,493	796,642	442,429	120,337	8,640	134,343	114,508	11,644
Yellowfin Tuna	1,896,997	439,142	113,201	280,489	552,947	239,959	33,215	3,930	14,448
Bigeye Tuna	329,405	304,388	11,594	51,014	29,969	8,378	2,732	880	725
Albacore	11,255	413,895	85,814	2,299	920	918	36	326	20,355
Blue Shark		159,135							
Swordfish	375	73,771		2,848		110		4,126	1
Blur Marlin	3,111	47,148		1,772		4,863	300	6,419	1,142
Pacific Bluefin Tuna	21,373	11,427	22	9,038					3,371
Striped Marlin	133	13,428		608				902	57
Mako Sharks		13,776							35
Black Marlin	1,776	4,750		178		1,305	300	2,246	319
Porbeagle		8,720							
Thresher Sharks nei		3,460							
Silky Shark		2,111						3	
Oceanic Whitetip Shark		2,009						76	
Hammerhead Sharks		1,735							
Indo-Pacific Sailfish		831							8
Whale Shark	554								

Figure 23: Catch (MT) across WCPO fisheries from 2018 to 2022. Cells highlighted in blue indicate 20% of mortality, and those highlighted in orange indicate 5% of catch. Data source: (WCPFC 2024i).

Note that because fewer species are included in the catch composition data that are geographically separated (N and S datasets), species that are included in only this dataset are considered main species for both NW and SW fisheries if the gear type associated with those fisheries is responsible for at least 20% of mortality (or if total mortality, and thus the fishery's contribution, is unknown). For example, Indo-Pacific sailfish is included in both NW and SW drifting longline fisheries; however, porbeagle is only considered a main species in the SW longline fishery because this species is not found in the North Pacific.

Appendix G: Southern bluefin tuna catches

Note that though southern bluefin tuna (SBT) is not included in the above tables, catches of SBT do occur in WCPFC longline fisheries. WCPFC collects SBT catch data and relays them to CCSBT, who reports them. From 2018 to 2022, approximately one-fourth of total SBT catches came from the Pacific. Thus, SBT is a main species in the SW longline fishery because this fishery is responsible for > 20% of the stock's total mortality across all fisheries. The flag states fishing SBT in the Pacific are Australia, Japan, and New Zealand, with a negligible amount caught by Taiwan as well (see {CCSBT 2025} for more information on catches by flag state).

Gear Type	Indian Ocean	Pacific Ocean	Atlantic Ocean
LL	26,051	20,355	11,672
PS	24,305		
UNCL	1,146	181	
TROL	36	25	
BB	15		8

Figure 24: Total catch (MT) of southern bluefin tuna across gear types and ocean basins from 2018 to 2022. Catch in the Pacific takes place in CCSBT statistical areas 4–7, which are located in the SW Pacific. Source: "Catch by year, month, gear, ocean and 5 degree grid from 1965 to 2023 inclusive," via {CCSBT 2025}.

Appendix H: Summary of changes october 2025

Scoping

Longline, handline, and troll fisheries were consolidated from three per gear type to two: one in the NW and one in the SW.

Japan-specific ratings were extended to RFMO-level ratings.

The U.S. albacore handline rating was removed based on very little U.S. handline albacore catch in the WCPO.

The Pacific bluefin northern unassociated purse seine rating was removed.

Dolphinfish ratings were added in each longline fishery.

A pole-and-line fishery in the SW was added to better reflect gear use in the SW Pacific, where Indonesia uses handlines and pole-and-lines but other WCPFC members only use pole-and-lines.

An albacore rating was added to the SW handline/pole-and-line fishery.

Criterion 1

Where relevant, C1 species were updated with their latest stock assessments. PSAs were updated with new information where possible/necessary. Scoring that was not affected by new information was validated to ensure consistency with the SFW Standard version 4.

Criterion 2

New bycatch estimates were available for purse seine and longline fisheries, so the main species were updated according to the latest estimates. Previous estimates that included the species' fate were used to determine retained vs. discarded species. Because no data were available to verify a complete lack of bycatch in troll, pole, and handline fisheries, the SFW Unknown Bycatch Matrices were used to determine any Criterion 2 species in these fisheries. Where applicable, scores were updated based on new stock assessments.

Criterion 3

Factor 3.1 was updated based on new determinations of main, retained species and relevant management measures. Factor 3.2 was updated based on new discarded species and relevant management measures. Factor 3.3 was updated based on latest stock assessments and observer coverage rates. Factors 3.4 and 3.5 were updated based on the latest available information and compliance reports.

Criterion 4

Factor 4.3 was adjusted for longline fisheries based on their retention of some sharks and possible ecosystem impacts, plus for FAD fisheries' lack of retention of nontarget tunas.