

Excerpted Review Draft from *Status of the U.S. West Coast Fisheries for Highly Migratory Species through 2018*. Stock Assessment and Fishery Evaluation.

Contents

CHAPTER 13	Status of HMS Stocks.....	1
13.1	HMS Stock Assessments.....	2
13.1.1	Organizations That Conduct HMS Stock Assessments	2
13.1.1.1	Inter-American Tropical Tuna Commission (IATTC)	2
13.1.1.2	Secretariat of the Pacific Community Oceanic Fisheries Program (SPC-OFP)	3
13.1.1.3	International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean (ISC)	3
13.1.1.4	National Marine Fisheries Service (NMFS).....	3
13.1	Assessment of Stock Status.....	4
13.1.1	Current Status Determination Criteria for HMS FMP Stocks	5
13.1.2	RFMO Consideration of Biological Reference Points and Harvest Strategies.....	10
13.2	Catches of HMS Management Unit Species in West Coast Fisheries	10
13.3	Current Stock Assessments for Species Managed under the HMS FMP.....	11

CHAPTER 13 STATUS OF HMS STOCKS

Under the Magnuson-Stevens Act, Councils must identify status determination criteria which can be used to decide whether overfishing is occurring (fishing mortality is above a maximum fishing mortality threshold) or the stock is overfished (biomass is less than a minimum stock size threshold). Chapter 4 in the [HMS FMP](#) describes how these status determination criteria may be determined. They are derived from an estimate of maximum sustainable yield (MSY), “the largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological, environmental conditions and fishery technological characteristics (e.g., gear selectivity), and the distribution of catch among fleets.” Frequently MSY is difficult to estimate for HMS stocks, either due to stock dynamics or the lack of sufficient information to conduct a stock assessment. In those cases, proxy values may be determined for MSY and related status determination criteria. In general, the Council considers the biological reference points, or proxies approved by regional fishery management organizations to be the ‘best available science.

In the case of HMS in the Pacific, most stock assessments are conducted by several international organizations, established through conventions that function akin to treaties among sovereign governments. This makes it difficult, if not impossible, for the U.S., or any participating country,

to unilaterally peer review the assessments sponsored by these organizations. Therefore, NMFS employs “other peer review processes” to determine whether the assessments constitute the best scientific information available for these transboundary stocks ([81 FR 54561; August 16, 2016](#)), including through participation by the U.S. government in these organizations. Once NMFS makes a best scientific information available (BSIA) determination on the outputs of an assessment produced by an international organization, the agency uses this information to determine the status of stocks relative to SDC identified in the FMP for the purposes of domestic management.

13.1 HMS Stock Assessments

13.1.1 Organizations That Conduct HMS Stock Assessments

Stock status is most reliably determined from stock assessments that integrate fishery and life history information across the range of the stock. A list of current stock assessments is provided in Section 13.3.

13.1.1.1 Inter-American Tropical Tuna Commission (IATTC)

In the Eastern Pacific Ocean (EPO) scientific staff employed by the Inter-American Tropical Tuna Commission (IATTC) conduct stock assessments mainly for tropical tunas (bigeye, yellowfin, and skipjack) and some billfish (striped marlin, swordfish). The [Fishery Status Reports](#) summarize fisheries and stock status and the most recent stock assessment reports may be accessed on their 2018 [Scientific Advisory Committee meeting page](#). All IATTC staff assessments and analyses are reviewed by the Scientific Advisory Committee.

In 2017, the IATTC Scientific Staff assessed stocks of bigeye tuna (*T. obesus*) and yellowfin tuna (*T. albacares*) in the eastern Pacific Ocean (EPO), and completed an indicator analysis for the EPO stock of skipjack tuna (*Katsuwonus pelamis*). NMFS determined that the EPO bigeye and yellowfin stocks were not subject to overfishing and not overfished based on BSIA, which is included in Table 1 and Table 2. The last status determination for skipjack was in 2011, and it was not subject to overfishing and not overfished.

In 2018, IATTC Scientific Staff assessed the EPO stock of yellowfin tuna and completed another indicator analysis for the EPO stock of skipjack tuna. The results from these stock analyses are considered BSIA and provided in Table 1 and Table 2, and NMFS’ status determinations are pending.

The IATTC Scientific Staff also assessed and conducted an indicator analysis for the stock of bigeye tuna in the EPO in 2018. However, the IATTC Scientific Staff determined, and their Scientific Advisory Committee agreed, that uncertainties identified in the assessment raise questions about its use for management purposes. Therefore, the IATTC Scientific Staff completed an indicator analysis, which suggests that the stock is under increasing fishing pressure. NMFS considers the indicator analysis BSIA and its status determination is pending. The 2018 analyses were considered by the IATTC when it met in August 2018.

13.1.1.2 Secretariat of the Pacific Community Oceanic Fisheries Program (SPC-OFP)

In the Western and Central Pacific Ocean (WCPO), the Secretariat of the Pacific Community Oceanic Fisheries Program (SPC-OFP) conducts stock assessments as the science provider to the Western and Central Pacific Fisheries Commission (WCPFC). Like the IATTC, they tend to focus on the tropical tunas, but have also completed stock assessments for South Pacific albacore tuna and striped marlin. Their stock assessments may be accessed by visiting the [WCPFC stock assessment webpage](#).

In 2017, SPC staff assessed the WCPO stocks of bigeye tuna and yellowfin tuna. Both stocks were determined to not to be overfished and not subject to overfishing based on the BSIA presented in Table 1 and Table 2. SPC staff also conducted an assessment of the southwest Pacific swordfish stock; however, NMFS does not make status determinations for this stock.

In 2018, SPC staff assessed the South Pacific stock of albacore. This assessment is now under review by the WCPFC Scientific Committee. NMFS does not make status determinations for this stock. The 2018 assessment will be considered by the WCPFC when it meets in December 2018.

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

In the North Pacific Ocean (NPO) the International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean (ISC) conducts stock assessments, also as a science provider for the WCPFC, and specifically that organization's Northern Committee. The ISC has formed working groups for North Pacific albacore, Pacific bluefin tuna, billfish (marlins and swordfish), and sharks. Shark species of interest include blue, shortfin, mako, bigeye thresher, pelagic thresher, silky, oceanic whitetip, and hammerhead species. The ISC Plenary reviews assessments and analyses, and [ISC annual Plenary Reports](#) provide stock status updates and conservation recommendations. ISC stock assessments can be found on its [Stock Assessment webpage](#).

In 2017, ISC Working Groups assessed stocks of albacore (*Thunnus alalunga*) and blue shark (*Prionace glauca*) in the North Pacific Ocean (NPO). NMFS determined that neither stock was overfished nor subject to overfishing based on the BSIA.

In 2018, ISC Working Groups assessed Pacific bluefin tuna (*T. orientalis*) and shortfin mako shark (*Isurus oxyrinchus*) in the NPO, and the swordfish stock (*Xiphias gladius*) in the Western Central North Pacific Ocean (WCNPO). NMFS determined that the bluefin assessment is BSIA and status the determinations are pending for the WCNPO swordfish and shortfin mako stock. The 2018 assessments were considered by the Western and Central Pacific Fisheries Commission (WCPFC) Northern Committee (NC) in September 2018.

13.1.1.4 National Marine Fisheries Service (NMFS)

In 2016, NMFS Southwest Fisheries Science Center (SWFSC) scientists, in collaboration with scientists from Mexico, assessed the status of the stock of common thresher shark (*Alopias vulpinus*) along the West Coast of North America. This is the first assessment completed for this stock. This assessment was peer reviewed in 2017 and revised in 2018. NMFS has determined that

the information presented in section 13.1.1 reflects BSIA for this stock, and a status determination is pending.

13.1 Assessment of Stock Status

National Standard 2 requires using the best scientific information available in management. This requires periodic updating of stock status for comparing against status determination criteria. HMS FMP Chapter 4 describes the management reference points used to assess stock status and the methods for determining the values for these reference points. These reference points are:

Maximum sustainable yield (MSY): MSY is the largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological, environmental conditions and fishery technological characteristics (e.g., gear selectivity), and the distribution of catch among fleets. For management purposes MSY is usually expressed in terms of the following reference points:

MSY fishing mortality rate (F_{MSY}): The fishing mortality rate that, if applied over the long term, would result in MSY.

MSY stock size (B_{MSY}): The long-term average size of the stock or stock complex, measured in terms of spawning biomass or other appropriate measure of the stock's reproductive potential that would be achieved by fishing at F_{MSY} .

Status determination criteria (SDC) are quantifiable thresholds (or their proxies) that are used to determine if overfishing has occurred, or if the stock or stock complex is overfished. "Overfished" relates to biomass of a stock or stock complex, and "overfishing" pertains to a rate or level of removal of fish from a stock or stock complex. SDC are:

Maximum fishing mortality threshold (MFMT): The level of fishing mortality (F), on an annual basis, above which overfishing is occurring. The MFMT or reasonable proxy may be expressed either as a single number (a fishing mortality rate or F value), or as a function of spawning biomass or other measure of reproductive potential.

Overfishing limit (OFL): The annual amount of catch that corresponds to the estimate of MFMT applied to a stock or stock complex's abundance and is expressed in terms of numbers or weight of fish. The OFL is an estimate of the catch level above which overfishing is occurring.

Minimum stock size threshold (MSST): The level of biomass below which the stock or stock complex is considered to be overfished.

Optimum yield (OY): The amount of fish that will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities and taking into account the protection of marine ecosystems.

HMS FMP section 4.2 describes the considerations for determining MSY. As part of the biennial process, the HMSMT will review recent stock assessments or other information as described below, and submit a draft SAFE document for review at the September Council meeting containing

MSY estimates, noting if they are a change from the current value. At the request of the Council, the Scientific and Statistical Committee (SSC) will review these estimates and make recommendations to the Council on their application in management decisions. Based on this advice, the Council may recommend revisions to MSY estimates to NMFS.

HMS FMP section 4.4 describes how SDC are computed. NMFS uses the following status determination criteria to identify stocks subject to overfishing or that have become overfished as specified at MSA section 304(e).

MFMT equals F_{MSY} . The OFL is the annual amount of catch that corresponds to the estimate of MFMT applied to a stock or stock complex's abundance and is expressed in terms of numbers or weight of fish. Overfishing occurs when fishing mortality F is greater than the MFMT mortality or catch exceeds OFL for one year or more.

MSST is calculated as the greater of:

$$B_{MSST} = (1-M)B_{MSY} \text{ when } M \text{ (natural mortality)} \leq 0.5, \text{ or}$$
$$B_{MSST} = 0.5B_{MSY} \quad \text{when } M > 0.5$$

MSST or a reasonable proxy must be expressed in terms of spawning biomass or other reproductive potential. Should the estimated size of an HMS stock in a given year fall below this threshold, the stock is considered overfished.

In the case of species under international management, the Council should recommend that the appropriate RFMO consider adopting the SDCs determined pursuant to the HMS FMP as limit reference points for international management (see FMP Section 2.1).

13.1.1 Current Status Determination Criteria for HMS FMP Stocks

NMFS West Coast Region and Southwest Fisheries Science Center (SWFSC) make BSIA and status determinations for some but not all stocks of HMS FMP management unit species. The Pacific Islands Regional Office and Pacific Islands Fisheries Science Center (PIFISC) are the lead in making status and BSIA determinations for stocks occurring in the Western Pacific. Table 13-1 lists stock assessments used to make status determinations for the management unit species by the year the assessment was conducted, the organization conducting the assessment, and the lead NMFS Science Center for that stock. Table 13-2 and Table 13-3, provide estimates of the MSY, MFMT, MSST, any reference points adopted by RFMOs, and current status determinations. As noted above, NMFS uses these estimates as a basis for making status determinations.

Table 13-1. Current assessments for key stocks.

Stock	Assessment Year	Assessment Lead	Lead NMFS Science Center
North Pacific albacore tuna	2017	ISC	SWFSC
Blue shark in the NPO	2017	ISC	PIFSC/ SWFSC
Pacific bluefin tuna in the NPO	2018	ISC	SWFSC
Shortfin mako shark in the NPO	2018	ISC	PIFSC/ SWFSC
WCNPO swordfish	2018	ISC	PIFSC
Bigeye tuna in the EPO	2017	IATTC	SWFSC
Bigeye tuna in the EPO	2018	IATTC	SWFSC
Yellowfin tuna in the EPO	2017	IATTC	SWFSC
Yellowfin tuna in the EPO	2018	IATTC	SWFSC
Skipjack tuna in the EPO	2018	IATTC	SWFSC
Skipjack tuna in the EPO	2017	IATTC	SWFSC
Common thresher shark	2018	NMFS	SWFSC
Bigeye tuna in the WCPO	2017	SPC	PIFSC
Yellowfin tuna in the WCPO	2017	SPC	PIFSC

Table 13-2. Stock assessment information for the purposes of determining whether HMS stocks are subject to overfishing.

Stock	Assessment Year	MFMT (F _{MSY} or Proxy)	Current F _{msy} or proxy quantity estimate	Current F quantity estimate	RFMO Ref. point (if adopted)	F/ F _{MSY} ratio	Subject to Overfishing?
North Pacific albacore tuna	2017	1-SPR _{MSY}	0.84	1-SPR ₂₀₁₂₋₁₄ = 0.51	NA	0.61	No
Blue shark in the NPO	2017	F _{MSY}	0.35	F ₂₀₀₂₋₁₄ = 0.13	NA	0.37	No
Pacific bluefin tuna in the NPO	2018	1-SPR _{MSY}	0.788	1-SPR ₂₀₁₅₋₁₆ = 0.921	NA	1.17	Determination pending
Shortfin mako shark in the NPO	2018	1-SPR _{MSY}	0.26	1-SPR ₂₀₁₃₋₁₅ = 0.16	NA	0.62	Determination pending
WCNPO swordfish	2018	F _{MSY}	0.68	F ₂₀₁₃₋₁₅ = 0.32	NA	0.47	Determination pending
Bigeye tuna in the EPO	2017	F _{MSY}	NA	F ₂₀₁₄₋₁₆ = NA	NA	F ₂₀₁₄₋₁₆ / F _{MSY} = 0.87	No
Bigeye tuna in the EPO	2018	NA	NA	NA	NA	NA	Determination pending
Yellowfin tuna in the EPO	2017	F _{MSY}	NA	F ₂₀₁₄₋₁₆ = NA	NA	F ₂₀₁₄₋₁₆ / F _{MSY} = 0.97	No
Yellowfin tuna in the EPO	2018	F _{MSY}	NA	F ₂₀₁₅₋₁₇ = NA	NA	F ₂₀₁₅₋₁₇ / F _{MSY} = 1.01	Determination pending
Skipjack tuna in the EPO	2018	NA	NA	NA	NA	NA	Determination pending
Skipjack tuna in the EPO	2017	NA	NA	NA	NA	NA	No*
Common thresher shark	2018	1-SPR _{MSY}	0.45	1-SPR ₂₀₁₂₋₁₄ = 0.097	NA	0.21	Determination pending
Bigeye tuna in the WCPO	2017	F _{MSY}	0.5	F ₂₀₁₅ = NA†	NA	0.83	No
Yellowfin tuna in the WCPO	2017	F _{MSY}	0.12	NA	NA	0.74	No‡

*Last status determination was in 2011.

†For the 2017 WCPO bigeye tuna assessment, the ratios of F/F_{msy} and B/B_{msy} were calculated, but the separate F, F_{msy}, B, and B_{msy} estimates were not available. No minimum stock size threshold (MSST)/overfished threshold could be calculated, but because the stock was above B_{msy}, it had to be above MSST.

‡Last status determination was in 2014.

Table 13-3. Stock assessment information for the purposes of determining whether HMS stocks are overfished

Stock	Assessment Year	B _{MSY} or proxy	Current B _{MSY} or proxy quantity estimate	Current B quantity estimate	MSST (1-M* B _{MSY} or 0.5 B _{MSY})	Current B/MSST	RFMO Ref. point (if adopted)	Overfished?
North Pacific albacore tuna	2017	SSB _{MSY}	32,638 mt	SSB ₂₀₁₅ = 80,618 mt	16,972 mt	4.75	20% SSB _{current} , F=0 =32,614 mt	No
Blue shark in the NPO	2017	SSB _{MSY}	179,539 mt	SSB ₂₀₁₅ = 308,286	136,450-154,608 mt*	2.0 - 2.3	NA	No
Pacific bluefin tuna in the NPO	2018	SSB _{MSY}	135,874 mt	SSB ₂₀₁₆ = 21,331 mt	101,905.5 mt	0.21	NA	Determination pending
Shortfin mako shark in the NPO	2018	SA _{MSY}	633,700 female sharks	SA ₂₀₁₆ = 860,200 female sharks	(1-0.128) * 633700 = 552,586 female sharks	1.6	NA	Determination pending
WCNPO swordfish	2018	SSB _{MSY}	15,702 mt	SSB ₂₀₁₆ = 29,403 mt	(1-0.22) *15702 = 12,248 mt	2.4	NA	Determination pending
Bigeye tuna in the EPO	2017	B _{MSY} (biomass of age 3+ quarters old fish at MSY)	96,360 mt	B (biomass of age 3+ quarters old fish at beginning of 2017) = 118,523	48,130 mt	2.9	NA	No
Bigeye tuna in the EPO	2018	NA	NA	NA	NA	NA	NA	Determination pending
Yellowfin tuna in the EPO	2017	S _{MSY} (unitless index of spawning biomass at MSY)	3,624	S = 3,117	1,812	1.72	NA	No
Yellowfin tuna in the EPO	2018	S _{MSY} (unitless index of spawning biomass at MSY)	3,634	S = 3,925 (S is an unitless index of spawning biomass)	1,817	2.1	NA	Determination pending
Skipjack tuna in the EPO	2018	NA	NA	NA	NA	NA	NA	Determination pending
Skipjack tuna in the EPO	2017	NA	NA	NA	NA	NA	NA	No†

Stock	Assessment Year	B_{MSY} or proxy	Current B_{MSY} or proxy quantity estimate	Current B quantity estimate	MSST (1-M* B_{MSY} or 0.5 B_{MSY})	Current B/MSST	RFMO Ref. point (if adopted)	Overfished?
Common thresher shark	2018	SSB_{MSY}	101,500 mature females	$SSB = 136,800$ mature females	97,500 mature females	1.4	NA	Determination pending
Bigeye tuna in the WCPO	2017	SSB_{MSY}	454,100 mt	558,543 mt	NA	NA‡	NA	No
Yellowfin tuna in the WCPO	2017	$SBF=0$	2,178,220 mt	NA	NA	NA	20% $SBF=0$ where $SBF=0$ is average over 2005–2014	No§

*Blimit = 136,450-154-608 b/c mortality changes w/ age and ranges from 0.24-0.14 for mature fish; females are 50% mature at age 5-6.

†Last status determination was in 2011.

‡For the 2017 WCPO bigeye tuna assessment, the ratios of F/F_{msy} and B/B_{msy} were calculated, but the separate F , F_{msy} , B , and B_{msy} estimates were not available. No minimum stock size threshold (MSST)/overfished threshold could be calculated, but because the stock was above B_{msy} , it had to be above MSST.

§Last status determination was in 2014.

13.1.2 RFMO Consideration of Biological Reference Points and Harvest Strategies

The WCPFC has adopted harvest strategies for two stocks relevant to two HMS FMP management unit species for which status determination criteria have been established: North Pacific albacore and Pacific bluefin tuna. The North Pacific albacore harvest strategy includes a biomass-based limit reference point (LRP) of $20\%SSB_{current_{F=0}}$. The target reference point (TRP) for this stock will be determined following a comprehensive analysis under a management strategy evaluation (MSE) approach. The Pacific bluefin harvest strategy includes an initial rebuilding target of the median SSB estimated for the period 1952 through 2014, to be reached by 2024 with at least 60% probability, and a second rebuilding target of $20\%SSB_{F=0}$, to be reached by 2034, or 10 years after reaching the initial rebuilding target, whichever is earlier, with at least 60% probability. $SSB_{F=0}$ is the expected spawning stock biomass under average recruitment conditions without fishing. The Northern Committee will develop limit and target reference points through an MSE process.

The WCPFC maintains a [webpage](#) describing its current harvest strategies. The WCPFC intends to adopt harvest strategies for key stocks and fisheries in its Convention Area consistent with Conservation and Management Measure [2014-06](#).

The IATTC adopted the elements of the Pacific bluefin tuna harvest strategy in [Resolution C-18-02](#). This harvest strategy is based on recommendations from the Joint IATTC/WCPFC Northern Committee Working Group, which met concurrently during the 2016, 2017, and 2018 Northern Committee meetings.

13.2 Catches of HMS Management Unit Species in West Coast Fisheries

Table 13-4 compares estimates of stockwide and U.S. West Coast catch of HMS management unit species. This information can inform considerations of the “relative impact of U.S. fishing vessels on the stock” when the Council considers responses to a notification that a stock is subject to overfishing or overfished “due to excessive international fishing pressure.” When notified by NMFS, Magnuson-Stevens Act section 304(i) requires the Council to develop recommendations for domestic regulations and international actions taking into account this relative impact.

Table 13-4. Stockwide and regional catches for HMS management unit species (x1,000 mt round weight), 2012–16.

Species (stock)	Stockwide Catch	U.S. West Coast Catch		Average Annual Fractional Catch
		Commercial	Recreational ⁶	
<u>TUNAS</u>				
Albacore (NPO)	53–83 ¹	10–14	0.7-1	0.20
Bluefin (NPO)	11–15 ¹	<0.4	0.1-0.3	0.05
Bigeye (EPO)	85–105 ²	<0.05-0.5	<0.01	<0.01
Skipjack (EPO)	270–338 ²	<0.1	<0.01–0.1	<0.01
Yellowfin (EPO)	231–260 ²	0.01-1	0.1–0.8	<0.01
<u>BILLFISHES</u>				
Striped Marlin (EPO)	1.3–2.8 ²	<0.01 ³	0.02 ⁴	0.01
Swordfish (EPO)	10–11 ¹	0.5–0.7	<0.01	0.14
<u>SHARKS</u>				
Common Thresher	Unknown	<0.1	0.01-0.03	
Shortfin Mako	Unknown	<0.05	0.01-0.02	
Blue (NPO)	18-31 ¹	<0.06 ³	<0.01	<0.01
<u>OTHER</u>				
Dorado	4.5–5.5 ⁵	<0.01	0.01–0.2	0.01

Notes:

Data are from updated commercial (HMS SAFE [Table 3](#)), CPFV and private recreational catches (HMS SAFE [Tables R-1, R-4, R-6](#)) with weight conversions of 8.7 kg/albacore, 8.7 kg/bluefin, 10.0 kg/bigeye tuna, 3.0 kg/skipjack, 4.9 kg/yellowfin, 57.9 kg/striped marlin, 113 kg/swordfish, 29.2 kg/common thresher, 16.8 kg/mako, 8 kg/blue shark, and 5.6 kg/dorado.

¹ [International Scientific Committee Eighteenth Plenary Report Catch Tables](#), July 2018.

² IATTC public domain data, [EPO total estimated catch by year, flag, gear, species](#) (Oct. 2017).

³ Striped marlin and blue shark commercial catches include estimates from the drift gillnet observed catch.

⁴ Striped marlin recreational catch is estimated at 300 fish/year based on club records plus CPFV logbook recorded catch.

⁵ FAO Area 77 catch [FAO global fishery production dataset](#). Extracted October 1, 2018

⁶ 2014-2016, U.S. EEZ.

13.3 Current Stock Assessments for Species Managed under the HMS FMP

The most current assessment for FMP MUS and the publication year are listed below.

Tunas

- **North Pacific Albacore (2017):** [Stock Assessment of Albacore Tuna in the North Pacific Ocean in 2017](#). Report of the Albacore Working Group. International Scientific Committee for Tuna and Tuna-Like Species in the North Pacific Ocean 12-17 July 2017, Vancouver, Canada.
- **South Pacific Albacore (2018):** [Stock Assessment of South Pacific albacore tuna](#). Tremblay-Boyer L., J. Hampton, S. McKechnie and G. Pilling. Oceanic Fisheries Programme, The Pacific Community (SPC). WCPFC-SC14-2018/ SA-WP-05 Rev. 2. August 2, 2018.
- **Pacific Bluefin (2018):** [Stock Assessment of Pacific Bluefin Tuna in the Pacific Ocean in 2018](#). ISC Pacific Bluefin Tuna Working Group. Prepared for the Eighteenth Meeting of the ISC, July 11-16, 2017, Yeosu, Republic of Korea.
- **Bigeye (EPO) (2018):** [Status of Bigeye Tuna in the Eastern Pacific Ocean in 2017 and Outlook for the Future](#). Haikun Xu, Carolina Minte-Vera, Mark N. Maunder, and Alexandre Aires-da-Silva. Prepared for the Ninth Meeting of the Inter-American Tropical Tuna Commission (IATTC) Scientific Advisory Committee, May 14-18, 2018, La Jolla, California, USA. Doc SAC-09-05 and [Stock Status Indicators for Bigeye Tuna](#). Maunder

M., Cleridy E. Lennert-Cody, and Marlon Román. Prepared for the Ninth Meeting of the IATTC SAC, May 14-18, 2018, La Jolla, California USA. Doc SAC-09-16

- **Bigeye (WCPO) (2017):** [Stock Assessment of Bigeye Tuna in the Western and Central Pacific Ocean](#). S. McKechnie, G. Pilling, and J. Hampton. Scientific Committee Thirteenth Regular Session, Rarotonga, Cook Islands, August 9-17, 2017. WCPFC-SC13-2017/SA-WP-05.
- **Skipjack (EPO) (2018):** [Updated Indicators Of Stock Status for Skipjack Tuna in the Eastern Pacific Ocean](#). Maunder, M. Prepared for the Ninth Meeting of the IATTC SAC, May 14-18, 2018, La Jolla, California USA. Doc SAC-09-07
- **Skipjack (WCPO) (2016):** [Stock Assessment of Skipjack Tuna in the Western and Central Pacific Ocean](#). S. McKechnie, J Hampton, G. M. Pilling , N. Davies. Scientific Committee Twelfth Regular Session. Western and Central Pacific Fisheries Commission, August 3-11, 2016. WCPFC-SC12-2016/SA-WP-04.
- **Yellowfin (EPO) (2018):** [Status of Yellowfin Tuna in the Eastern Pacific Ocean in 2017 and Outlook for the Future](#). Carolina Minte-Vera, Mark Maunder, and Alexandre Aires-da-Silva. Prepared for the Ninth Meeting of the Inter-American Tropical Tuna Commission (IATTC) Scientific Advisory Committee, May 14-18, 2018, La Jolla, California, USA. Doc SAC-09-06
- **Yellowfin (WCPO) (2017):** [Stock Assessment of Yellowfin Tuna in the Western and Central Pacific Ocean Rev 1](#) (August 4, 2017). L. Trembaly-Boyer, S. McKechnie, and J. Hampton. Scientific Committee Thirteenth Regular Session, Rarotonga, Cook Islands, August 9-17, 2017. WCPFC-SC13-2017/SA-WP-06.

Billfishes

- **Striped marlin (WCPO) (2015):** [Stock Assessment Update for Striped Marlin \(*Kajikia audax*\) in the Western and Central North Pacific Ocean Through 2013](#). Report of the Billfish Working Group. International Scientific Committee for Tuna and Tuna-Like Species in the North Pacific Ocean, July 15-20, 2015, Kona, Hawaii, USA.
- **Striped marlin (EPO) (2009):** [Assessment of Striped Marlin in the Eastern Pacific Ocean In 2008 and Outlook for the Future](#). Michael G. Hinton. Inter-American Tropical Tuna Commission. Stock Assessment Report 10. An update with data through October 30, 2010, is reported in [Fishery Status Report No. 12, Tunas and Billfishes in the Eastern Pacific Ocean in 2013](#).
- **Swordfish (WCNPO) (2018):** [Stock Assessment of Swordfish \(*Xiphias gladius*\) in the Western and Central North Pacific Ocean Through 2016](#). ISC Billfish Working Group. Prepared for the Eighteenth Meeting of the ISC, July 11-16, 2017, Yeosu, Republic of Korea.
- **Swordfish (EPO) (2011):** [Status of Swordfish in the Eastern Pacific Ocean in 2010 and Outlook for the Future](#). Michael G. Hinton and Mark N. Maunder. Inter-American Tropical Tuna Commission Scientific Advisory Committee 2nd Meeting. La Jolla, California (USA), 9-12 May 2011.
- **Swordfish (SWPO) (2013):** [Stock Assessment of Swordfish \(*Xiphias gladius*\) in the Southwest Pacific Ocean](#). Davies, N., G. Pilling, S. Harley, and J. Hampton Secretariat

of the Pacific Community (SPC), Ocean Fisheries Programme (OFP), Noumea, New Caledonia (July 17, 2013).

Sharks

- **Blue shark (NPO) (2017):** [Stock Assessment and Future Projections of Blue Shark in the North Pacific Ocean Through 2015](#). Report of the Shark Working Group. International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean. 12-17 July 2017, Vancouver, Canada.
- **Common Thresher Shark (EPO) (2018):** [Status of Common Thresher Sharks, *Alopias Vulpinus*, along the West Coast of North America: Updated Stock Assessment Based on Alternative Life History](#). Teo, S., Garcia Rodriguez, E. and Sosa-Nishizaki. O. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-SWFSC-595. <https://doi.org/10.7289/V5/TM-SWFSC-595>
- **Shortfin Mako Shark (NPO) (2018):** [Stock Assessment of Shortfin Mako Shark in the North Pacific Ocean through 2016](#). Report of the Shark Working Group. International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean. July 11-16, 2018, Yeosu, Republic of Korea.

Others

- **Dorado (SEPO) (2016):** [Exploratory Stock Assessment of Dorado \(*Coryphaena Hippurus*\) in the Southeastern Pacific Ocean \(DRAFT\)](#). Alexandre Aires-da-Silva, Juan L. Valero, Mark. N. Maunder, Carolina Minte-Vera, Cleridy Lennert-Cody, Marlon H. Román, Jimmy Martínez-Ortiz, Edgar J. Torrejón-Magallanes and Miguel N. Carranza. Inter-American Tropical Tuna Commission, Scientific Advisory Committee Sixth Meeting. May 9-13, 2016.