



**SCIENTIFIC COMMITTEE
EIGHTEENTH REGULAR SESSION**

ELECTRONIC MEETING

10 –18August 2022

PROGRESS AGAINST THE 2021-2025 SHARK RESEARCH PLAN

WCPFC-SC18-2022/EB-IP-04

23 July 2022

SPC-OFP¹ and Secretariat

¹ Dedicated contribution by Stephen Brouwer and Paul Hamer

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INTRODUCTION

The report of Project 97 (Shark Research Plan 2021-2025) was adopted by SC16 and endorsed by WCPFC17 in December 2020. The final report ([SC16-EB-IP-01rev1](#)) is posted on SC16 website.

The 2021-2025 Shark Research Plan (SRP) is the 3rd phase of the WCPFC's SRP that builds on the previous two plans. The 2021 – 2025 SRP is a living document that can evolve based on the information needs and priorities of the WCPFC. The purpose of this document is to review progress against the SRP tasks to facilitate future planning of WCPFC shark research. The updates on the 2021 - 2025 SRP are included in Table 1. In addition, Table 2 is provided which captures the Scientific Committee's assessment schedule.

For the (relatively) data rich “key” shark assessments undertaken by the Scientific Services Provider (SSP), the complex and disparate nature of the data implies an extended period of detailed preparatory analysis, including catch reconstructions, is required. Under the current arrangement, where a shark assessment may be funded as an SC ‘project’ separate to the priority stock assessment work assigned to the SSP, those projects are approved for funding at December Commission meetings. This means that the specific funding agreement between the WCPFC Secretariat and the SSP is typically not completed until February, and work might begin in late February/March, with the assessment due in July. Given that other key assessments are also occurring at the same time and the challenges in developing the best information, there is insufficient time to do these shark assessments justice.

It is therefore proposed that the schedule for a “key” shark assessment undertaken by the SSP is extended over two calendar years (see Table 2). This does not have cost implications for a specific assessment but does have initial implications for the ‘cash flow’ of the SC budget and would require SC funding to be confirmed across two calendar years. Under this approach, in ‘year 1’ for example, the data compilation, fishery characterization and catch reconstructions can be undertaken. The assessment is then completed by the SC meeting in the middle of ‘year 2’. We have made adjustments to table 2 that would be consistent with this rescheduling for assessments conducted by the SSP. We have not made adjustment to those assessments expected to be conducted by the ISC but they may also be interested a similar approach.

There is only one project scheduled in the SRP for 2022, the Pacific bigeye thresher shark assessment, that is not being reported on at SC18. The assessment was an ABNJ project that was not undertaken.

The following projects are listed to report to SC19/SC20 (and will need project descriptions and terms of reference developed for SC18 to consider: 1d) WCPO silky shark assessment; 1e) Pacific silky shark assessment; 1g) Pacific whale shark assessment (appendix 1). However, **we seek clarity from SC18 on the need for a WCPO silky shark assessment versus a Pacific wide silky shark assessment. It seems that there is need to decide between these two options.** Given the previous issues with data from the EPO, focusing the assessment on the WCPO may be preferred. There may be additional cost implications for Pacific wide assessment.

In addition, the Shark Research plan mid-term review should be undertaken in 2023. The project Terms of Reference are outlined in Appendix 1.

Table 1. SRP 2021 – 2025 Project List. SA = stock assessment.

Title	Priority	Start Year	End Year	Progress
1. Stock Assessment and Management				
1) Determine the stock status for WCPFC Key Sharks				
a) SW Pacific blue shark assessment	High	2020	2021	SPC. Scheduled to present at SC17 (P107) SC17-SA-WP-03 SC17-SA-IP-06 SC17-SA-IP-18 SC18-SA-WP-03 (Project 107b)
b) NW Pacific blue shark assessment	High	2021	2022	SC18-SA-WP-05
c) NW Pacific shortfin mako shark assessment	High	2023	2024	ISC. Indicator analysis in 2021; SA scheduled in 2024
d) WCPO silky shark assessment	High	2022	2023	Last SA in 2018; SA scheduled in 2023
e) Pacific silky shark assessment	Medium	2022	2023	Last SA in 2018; SA scheduled in 2023
f) Pacific bigeye thresher shark assessment	Medium	2021	2022	Last SA in 2017; – ABNJ project: Not done
g) Pacific whale shark assessment	Medium	2022	2023	Last SA in 2018
h) SW Pacific mako shark assessment	High	2021	2022	SC18-SA-WP-02 SC18-SA-IP-07 SC18-SA-IP-13
2) Develop reliable catch histories for WCPFC Key Sharks as far back in time as feasible				
a) Redefining the fleets currently assumed in the BSH stock assessment	Medium	2021	2022	SC17-SA-IP-06 SC17-SA-IP-18 (covers the SP only) SC17 (Project 107)
b) The development of alternative approaches to catch reconstructions based on estimates of the global fin trade	Medium	2024	2025	N/A
3) Test and improve Medium and Data Poor assessment methods to inform management decisions				
a) Test and improve data poor assessment methods	Medium	2024	2025	N/A
b) Include data poor assessment metrics as standard out-puts for data rich assessments	High	Ongoing	Ongoing	Included in SC17-SA-WP-03 SC18-SA-WP-012
4) Stock management				
a) P102 – Population projections for oceanic whitetip shark	High 1	2019	2021	SC17-SA-IP-21 SC18-EB-WP-02
2. Mitigation				
1) Provide advice on mitigation Sharks with non-retention policies and unwanted elasmobranchs				

a)	Investigate effective mitigation for WCPFC Key Sharks	Medium	2023	2025	SC17-EB-WP-01 (Project 101)
b)	Investigate mitigation method trade-offs between mitigation methods for sharks, seabirds and sea turtles	Medium	2023	2025	N/A
2) Provide advice on safe release methods and assess release survival of WCPFC Key Sharks					
a)	Estimate silky and oceanic whitetip shark post release survival from WCPO longline fisheries*	High	2021	2023	Shark post-release mortality: SC15-EB-WP-01 SC15-EB-WP-04 Project 101 to be presented at SC17
b)	Estimate whale shark post release survival from WCPO purse seine fisheries*	High	2021	2023	Proposed at SC16 – not approved
c)	Improving on deck best handling and release practices for sharks in tuna purse seiners using hopper with ramp devices	Work completed outside of the SRP project list		2021	SC17-EB-IP-13
d)	New assessment on accidentally captured silky shark post-release survival in the Indian Ocean tuna purse seine fishery	Work completed outside of the SRP project list		2021	SC17-EB-IP-14
3. Biological data improvements					
1) Increase the understanding of important biological parameters of WCPFC Key Sharks					
a)	Silky shark and oceanic whitetip shark reproductive biology and longevity*	High	2023	2025	N/A
b)	Biology and life history of hammerhead sharks*	High	2023	2025	N/A
c)	Resolving blue shark reproductive biology and reproductive schedule*	Medium	2023	2025	N/A
d)	Biology of the longfin mako shark*	Medium	2023	2025	N/A
e)	Life history of thresher sharks*	Medium	2023	2025	N/A
f)	Validated life history, biology and stock structure of the shortfin mako in the south Pacific*	Medium	2023	2025	N/A
g)	Age validation and stock structure of the silky shark and oceanic whitetip shark*	Low	2023	2025	N/A
h)	Stock structure and life history of southern hemisphere porbeagle shark*	Low	2023	2025	N/A
4. Observer data collection					
1) Improve spatio-temporal observer data for informing scientific needs					
a)	Training observers in the WCPO to be proficient in species identification	High	Ongoing	Ongoing	SPC. SC17-ST-IP-07 (Project 109)
b)	Training observers for extraction and storage of vertebrae and shark reproductive material	High	2021	Ongoing	SPC. SC17-ST-IP-07 (Project 109)

c) Training observers for on-deck reproductive staging of elasmobranchs	High	2021	Ongoing	SPC. SC17-ST-IP-07 (Project 109)
d) Measuring elasmobranchs on purse seine and longline vessels for length-length and length-weight conversion factor development	High	Ongoing	Ongoing	SPC. SC17-ST-IP-07 (Project 109)

* Projects on the "long list" from Chin and Simpfendorfer (2019).

Table 2. WCPFC's stock assessment schedule² for 2021-2025 (Update). Data comp = proposed data compilation and characterization work and catch reconstruction work.

Species	Stock	Last assessment	2022	2023	2024	2025	2026
Bigeye tuna	WCPO	2020		X			X
	Pacific	2015					
Skipjack tuna	WCPO	2019	X			X	
Yellowfin tuna	WCPO	2020		X			X
Albacore	S Pacific	2021			X		
	N Pacific	2020		X			X
Pacific bluefin	N Pacific	2020		X?			X
Striped marlin	SW Pacific	2019			X ³		
	N Pacific	2019			X		
Swordfish	SW Pacific	2021				X	
	N Pacific	2018		X			
Pacific blue marlin	Pacific	2021					X
Silky Shark	WCPO?	2018		Data comp	X		
	Pacific?	2018		Data comp	X		
Oceanic whitetip shark	WCPO	2019			Data comp	X	
Blue shark	SW Pacific	2021				Data comp	X
	N Pacific	2017	X				
Mako	SW Pacific		X				Data comp
	N Pacific	2018		X			
Bigeye thresher	Pacific	2017	X				
Porbeagle	S Pacific	2017					
Whale Shark	Pacific	2018		X			

² Tuna scheduled for assessment every 3 years; billfish every 4 years; and sharks every 5 years.

³ Note this is a 5-year gap between assessments but this is done to stagger the work that would otherwise clash with two major tuna assessments and a shark assessment all undertaken by the Scientific Services Provider in a single year.

Appendix 1

Project XX	Silky shark stock assessment in the WCPO
Objectives	Undertake a stock assessment of silky shark in the western Pacific Ocean
Notes	Depending on the priorities of the SC for the work to be undertaken by the Scientific Services Provider (SSP), this project may be undertaken within the service agreement with the SSP or alternatively as a standalone project with a separate funding allocation. This will need to be decided by the SC18 considering their other priorities.
Rationale	<p>This stock was last assessed as a Pacific wide stock in 2018 (SC14-SA-WP-08) using data from 1980-2016. The WCPO stock was last assessed in 2013 (SC9-SA-WP-03). As this species is unproductive and susceptible to overfishing, one objective of this assessment is to establish and examine key areas of uncertainty and the impacts on stock productivity estimates of stock status.</p> <p>Since the last assessment, more catch and effort data as well as observer data are available. The observer data will be an important component of this assessment as since CMM 2013-08 (and CMM 2019-04) came into force, silky sharks in the WCPO have had a non-retention policy and the catch data should therefore be absent from July 2014. However, release data are still available from observer records.</p> <p>This project is designed to assess the stock status of silky sharks in the western Pacific Ocean using the most informative approach with respect to the available data. The assessment should assess the stock status against conventional stock assessment metrics as well as those suggested in the WCPFC 2021-2025 Shark Research Plan (SC16-EB-IP-01 rev1).</p>
Assumptions	<ul style="list-style-type: none"> • Much of the existing fisheries and biological data are readily available. • Assessment personnel are available to undertake this work. • COVID implications on observer data can be expected to lead to poorer data in recent years, so updating the assessment may not provide reliable status estimates for recent years. A new assessment may be more focused on improvements on the previous assessment.
Scope	<ul style="list-style-type: none"> • Review the previous assessment in the WCPO as well as other subsequent shark assessments to assess and improve on methods to increase the understanding of data strengths and weaknesses, and update stock status. • Review of ways to deal with the input data for shark assessments (presented to a dedicated agenda item at the 2024 PAW). • Provide a data characterization, data compilation and catch reconstruction analyses. • Update WCPO longline catch estimates and abundance indices using recent observer data. • Present the stock status in terms of the metrics outlined in the 2021-2025 Shark Research Plan. • Prepare reports containing the above results for SC20. • If the data are too poor to undertake a full quantitative assessment, then a

	medium data assessment may be appropriate.
Timeframe	March 2023 - August 2024 March 2023 - April 2024 (data compilation, fishery characterization and catch reconstructions) March 2024 - August 2024 (Stock assessment)
Budget	1FTE (\$105,000) (\$50,000 – 2023, \$55,000 – 2024) Travel to SC20 (\$7,000) Total: \$112,000
References	SC16-EB-IP-01 rev1 SC14-SA-WP-08 SC9-SA-WP-03

Project XX	Pacific silky shark assessment
Objectives	Undertake a stock assessment of silky sharks in the Pacific Ocean
Note	This work could be included in the WCPO silky shark assessment (Project XX) as a model with two stock assumptions a Pacific and WCPO stock each assessed separately or as a standalone assessment. The alternative approaches will be included as two options in the budget.
Rationale	<p>This stock was last assessed in 2018 (SC14-SA-WP-08) using data from 1980-2016. SC14 noted that given the inherent uncertainty in the assessment, the estimates of stock status should be considered indicative only.</p> <p>Since the last assessment, more catch and effort data as well as observer data are available. The observer data will be an important component of this assessment as since CMM 2013-08 came into force, silky sharks in the WCPO have had a non-retention policy and the catch data should therefore be absent from July 2014.</p> <p>This project is designed to assess the stock status of silky sharks in the Pacific Ocean using the most informative approach with respect to the available data. The assessment should assess the stock status against conventional stock assessment metrics as well as those suggested in the WCPFC 2021-2025 Shark Research Plan (SC16-EB-IP-01 rev1).</p>
Assumptions	<ul style="list-style-type: none"> • Much of the existing fisheries and biological data are readily available from both the WCPO and EPO. • Assessment personnel are available to undertake this work. • COVID implications on observer data can be expected to lead to poorer data in recent years, so updating the assessment may not provide reliable status estimates for recent years. A new assessment may be more focused on improvements on the previous assessment.
Scope	<ul style="list-style-type: none"> • Reviewing the previous assessment in the WCPO to assess and improve on methods to increase the understanding of data strengths and weaknesses, and update stock status. • Update WCPO longline catch estimates and abundance indices using recent observer data. • Present the stock status in terms of the metrics outlined in the 2021-2025 Shark Research Plan. • Prepare a report containing the above results for SC20. • If the data are too poor to undertake a full quantitative assessment, then a medium data assessment may be appropriate.
Timeframe	18 months (March 2023 – August 2024)

	March 2023-December 2023 (data compilation, fishery characterization and catch reconstructions) March 2024-August 2024 (Stock assessment)
Budget	Standalone assessment: 1.1FTE (\$110,000) (\$50,000 – 2023, \$60,000 – 2024) Travel to SC20 (\$7,000) Total: \$117,000 Inclusion in the WCPO silky shark assessment: 0.3 FTE (\$20,000) Travel to SC20 (\$0) Total: \$20,000
References	SC16-EB-IP-01 rev1 SC14-SA-WP-08

Project XX	Pacific whale shark assessment
Objectives	Undertake a stock assessment of whale sharks in the Pacific Ocean
Note	Data for this stock is sparse and it is likely that only a data poor assessment (e.g. quantitative risk assessment) will be possible for this species.
Rationale	The whale shark (<i>Rhincodon typus</i>) was listed by the Convention on the Conservation of Migratory Species (CMS) in 1999, as well as the Convention on International Trade in Endangered Species (CITES) in 2003. Whale sharks interact with purse-seine fisheries targeting skipjack tuna, where, in the past, they were set on deliberately, but currently they are avoided, and only deep swimming juveniles are caught incidentally. Pacific whale sharks were last assessed in 2018 (SA-WP-12 - rev. 1). Due to their life-history, whale sharks are thought to be vulnerable to fishing mortality. The previous assessment (SA-WP-12 - rev. 1) found that there was a <20% risk that current mortality exceed a range of life history-based notional reference points.
Assumptions	<ul style="list-style-type: none"> • Much of the existing fisheries and biological data are readily available. • Assessment personnel are available to undertake this work.
Scope	<ul style="list-style-type: none"> • Reviewing the previous assessment in the WCPO to assess and improve on methods to increase the understanding of data strengths and weaknesses, and update stock status. • Update WCPO longline catch estimates and abundance indices using recent observer data. • Present the stock status in terms of the metrics outlined in the 2021-2025 Shark Research Plan. • Prepare a report containing the above results for SC19.
Timeframe	March 2023 – August 2023
Budget	0.5 FTE (\$50,000) Travel to SC19 (\$7,000) Total: \$57,000
References	SA-WP-12 (rev. 1)

Project XX	SRP mid-term review
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Objectives	Review the WCPFC Scientific Committee's 2021-2025 Shark Research Plan (SRP), to evaluate progress against the plan and assess future needs for shark research relevant to management of the WCPO shark stocks.
Note	
Rationale	<p>The first Shark Research Plan (SRP) covered 2010-2014. At its Tenth Session the Scientific Committee (SC10) agreed in 2014 on a programme of shark work for the Scientific Service Provider (SSP). This work was to be carried out in 2015 and included that the SSP draft a second SRP for consideration by SC11 to cover work in 2016-2020, which was then followed by the current 2021-2025 SRP. This project will evaluate progress against that plan and consider the future shark information needs of the WCPFC.</p> <p>This work will also evaluate the progress against the current SRP components:</p> <ul style="list-style-type: none"> • Assessments to be undertaken with existing and available data. • Coordination of research efforts to supplement biological and other assessment related information; and • Improvement of data from commercial fisheries.
Assumptions	SPC has the personnel (or contracted scientist) and budget available to undertake this work.
Scope	While this document will focus on the WCPFC key shark species, other elasmobranchs can be considered as required.
Timeframe	March 2023-August 2023
Budget	0.3 FTE, \$30,000
References	SC16-EB-IP-01 rev1