

**ROAD MAP FOR THE DEVELOPMENT OF MANAGEMENT STRATEGY EVALUATION (MSE) AND HARVEST CONTROL RULES (HCR)**

*Submitted by the USA*

This schedule is intended to guide the development of harvest strategies for priority stocks identified in Rec. 15-07 (North Atlantic albacore, North Atlantic swordfish, eastern and western Atlantic bluefin tuna, and tropical tunas). It builds on the initial roadmap that was appended to the 2016 Annual Meeting report. It provides an aspirational timeline that is subject to revision and should be considered in conjunction with the stock assessment schedule that is revised annually by the SCRS.\* Due to the amount of cross-disciplinary dialogue that may be needed, intersessional Panel meetings and/or meetings of the Standing Working Group to Enhance Dialogue between Fisheries Scientists and Managers (SWGSM) may be necessary. The aspirational nature of this timeline assumes adoption of a final management procedure for northern albacore in 2023 and interim management procedures for bluefin tuna and northern swordfish in 2021 and tropical tunas in 2023, however the exact timeline for delivery is contingent on funding, prioritization, and other work of the Commission and SCRS.

\* For 2015 through 2019, roadmap reflects progress to-date in some detail. For 2020 onward, more general steps for the SCRS and Commission are anticipated pending outcomes of the 2019 Annual Meeting.

	<i>Northern Albacore</i>	<i>Bluefin Tuna</i>	<i>Northern Swordfish</i>	<i>Tropical Tunas</i>
<b>2015</b>	- Commission established management objectives in Rec. 15-04			
<b>2016</b>	- SCRS conducted stock assessment - SCRS evaluated a range of candidate HCRs through MSE - PA2 identified performance indicators			- Commission identified performance indicators (Rec. 16-01)
<b>2017</b>	- SCRS evaluated the performance of candidate HCRs through MSE, using the performance indicators developed by PA2 - SWGSM narrowed the candidate HCRs and referred to Commission - Commission selected and adopted an HCR with associated TAC at the Annual Meeting (Rec. 17-04)	- SCRS conducted stock assessment - Core modeling group completed development of modeling framework	- SCRS conducted stock assessment	- SCRS reviewed performance indicators for YFT, SKJ, and BET - SWGSM recommended a multispecies approach for development of MSE framework
<b>2018</b>	- SCRS contracted independent expert to complete peer review of MSE code - Call for Tenders issued for peer review - SCRS tested the performance of the adopted HCR, as well as variations of the HCR, as requested in Rec. 17-04 - SCRS developed criteria for the identification of exceptional circumstances	- SCRS conducted joint MSE meeting on BFT/SWO - SCRS reviewed but could not adopt reference set of OMs - SCRS began testing candidate management procedures (MPs) - SWGSM considered qualitative management objectives - BFT WG reviewed progress and developed detailed road map - Commission adopted conceptual management objectives (Res. 18-03)	- SCRS conducted joint meeting on BFT/SWO MSE - SCRS contracted MSE technical expert to develop OM framework, define initial set of OMs, and conduct initial conditioning of OMs - SWGSM considered qualitative management objectives	- SCRS contracted with technical experts: start development of MSE framework (phase I) - SCRS conducted bigeye tuna stock assessment

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<b>2019</b>	<ul style="list-style-type: none"> <li>- SCRS addressed recommendations of the peer reviewer</li> <li>- SCRS updated performance of the interim HCR and variants</li> <li>- SCRS produced consolidated report on MSE</li> </ul> <p>1. COMM: PA2 to consider possible approaches that could be useful in developing guidance on a range of appropriate management responses if exceptional circumstances occur, including those implemented by other RFMOs</p>	<ul style="list-style-type: none"> <li>- SCRS held three BFT MSE Technical Group meetings with significant progress but advised at least one additional year of work needed</li> <li>- SCRS continued to evaluate candidate MPs</li> <li>- At intersessional meeting, PA2 reviewed and developed initial operational management objectives and identified performance indicators</li> <li>- SCRS to hold December webinar to review OM progress</li> </ul> <p>1. COMM: PA2 to review MSE progress and advise the Commission on next steps, including need for an update of the stock assessment to provide TAC advice for at least 2021</p>	<ul style="list-style-type: none"> <li>- SWO Species Group meeting</li> <li>- SCRS contracted with technical expert to develop initial MSE framework</li> <li>- Commission to consider, and if possible, adopt conceptual management objectives and performance indicators at the Annual Meeting</li> </ul>	<ul style="list-style-type: none"> <li>- SCRS conducted yellowfin tuna stock assessment</li> </ul>
<b>2020</b>	1. COMM (SWGSM/PA2) to develop guidance intersessionally on a range of appropriate management responses should exceptional circumstances be found to occur	1. SCRS to conduct stock assessment update and develop TAC advice for at least 2021		1. SCRS to conduct skipjack data preparatory meeting
	2. COMM (SWGSM/PA2) to review interim HCR and recommend MP to the Commission for possible adoption at the Annual Meeting	2. SCRS to continue development and testing candidate MPs	1. SCRS to continue development and testing candidate MPs	2. SCRS to continue MSE development, including evaluating candidate MPs
	3. SCRS to conduct NALB stock assessment	3. SCRS to initiate independent peer review of MSE	2. SCRS to initiate independent peer review of MSE	

	<i>Northern Albacore</i>	<i>Bluefin Tuna</i>	<i>Northern Swordfish</i>	<i>Tropical Tunas</i>
	4. SCRS to evaluate existence of exceptional circumstances	4. SCRS to propose criteria for determining exceptional circumstances	3. SCRS to propose criteria for determining exceptional circumstances	3. COMM (SWGSM/PA1) to review and provide feedback on MSE progress either intersessionally or during the Annual Meeting
	5. COMM to: a. review and endorse guidance developed intersessionally on management responses in the case of exceptional circumstances b. review the interim HCR and adopt a long-term MP, including the TAC, at the Annual Meeting.		4. COMM (SWGSM/PA4) to recommend initial operational management objectives and identify performance indicators either intersessionally or during the Annual Meeting	4. COMM (SWGSM/PA1) to recommend initial operational management objectives and to review and revise the performance indicators agreed by the Commission in 2016, either intersessionally or during the Annual Meeting.
			5. COMM (SWGSM/PA4) to review MSE progress, preliminary candidate MP results, and provide feedback to SCRS, either intersessionally or during the Annual Meeting	
			6. COMM (SWGSM/PA4) to develop guidance on a range of appropriate management responses should exceptional circumstances be found to occur, either intersessionally or during the Annual Meeting.	
		5. COMM to review candidate MPs at the Annual Meeting	7. COMM to review candidate MPs at the Annual Meeting	
		6. COMM to set TACs for at least 2021, based on stock assessment update, at the Annual Meeting		

	<i>Northern Albacore</i>	<i>Bluefin Tuna</i>	<i>Northern Swordfish</i>	<i>Tropical Tunas</i>
		[7. COMM (PA2) to finalize operational management objectives and performance indicators at the Annual Meeting]	8. [COMM (PA4) to finalize operational management objectives and performance indicators]	
<b>2021</b>	1. SCRS to continue intersessional work			1. SCRS to continue development and testing candidate MPs
		1. COMM (SWGSM/PA2) intersessionally to: <ul style="list-style-type: none"> <li>• review MSE progress, review preliminary candidate MP results, and provide feedback to SCRS;</li> <li>• [recommend final operational management objectives and identify performance indicators]; and</li> <li>• develop guidance on a range of appropriate management responses should exceptional circumstances be found to occur</li> </ul>		2. SCRS to propose criteria for determining exceptional circumstances
				3. COMM to review candidate MPs at the Annual Meeting
		2. SCRS to complete MSE, incorporating feedback from Commission through PA2/SWGSM	1. SCRS to complete MSE, incorporating feedback from Commission through PA4/SWGSM	4. COMM (PA1) to finalize operational management objectives and performance indicators
		3. SCRS to provide final advice to the Commission on criteria for determining exceptional circumstances	2. SCRS to provide final advice to the Commission on criteria for determining exceptional circumstances	5. SCRS to conduct skipjack stock assessment

	<i>Northern Albacore</i>	<i>Bluefin Tuna</i>	<i>Northern Swordfish</i>	<i>Tropical Tunas</i>
		4. COMM (SWGSM/PA2) and SCRS to refine MP(s) and to review and finalize, as needed, guidance on a range of appropriate management responses should exceptional circumstances be found to occur	3. COMM (SWGSM/PA4) and SCRS to: <ul style="list-style-type: none"> <li>• refine MP(s) and to review and finalize, as needed, guidance on a range of appropriate management responses should exceptional circumstances be found to occur; [and</li> <li>• recommend final operational management objectives and identify performance indicators]</li> </ul>	6. SCRS to initiate independent peer review of MSE
			4. SCRS to conduct stock assessment	7. COMM (SWGSM/PA1) to review MSE progress, preliminary candidate MP results, and provide feedback to SCRS either intersessionally or during the Annual Meeting
		5. COMM to: <ol style="list-style-type: none"> <li>a. review and endorse guidance developed intersessionally on management responses in the case of exceptional circumstances, and</li> <li>b. adopt an interim MP at the Annual Meeting, including the TAC</li> </ol>	5. COMM to: <ol style="list-style-type: none"> <li>a. review and endorse guidance developed intersessionally on management responses in the case of exceptional circumstances, and</li> <li>b. adopt an interim MP at the Annual Meeting, including the TAC</li> </ol>	8. COMM (SWGSM/PA1) to develop guidance on a range of appropriate management responses should exceptional circumstances be found to occur.
<b>2022</b>	1. SCRS to continue intersessional work			1. SCRS to complete MSE, incorporating feedback from Commission through SWGSM/PA1 2. SCRS to provide final advice to the Commission on criteria for determining exceptional circumstances

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				3. COMM (SWGSM/PA1) and SCRS to refine MP(s) and to review and finalize, as needed, guidance on a range of appropriate management responses should exceptional circumstances be found to occur
				4. COMM to: a. review and endorse guidance developed intersessionally on management responses in the case of exceptional circumstances, and b. adopt interim MP(s) at the Annual Meeting, including TACs, where applicable
<b>2023 and beyond*</b>	1. Once an MP is adopted, SCRS to conduct assessments on a routine basis to ensure that the conditions considered in MP testing are still applicable to the stock	1. Once an MP is adopted, SCRS to conduct assessments on a routine basis to ensure that the conditions considered in MP testing are still applicable to the stock	1. Once an MP is adopted, SCRS to conduct assessments on a routine basis to ensure that the conditions considered in MP testing are still applicable to the stock	1. Once an MP is adopted, SCRS to conduct assessments on a routine basis to ensure that the conditions considered in MP testing are still applicable to the stock
	2. On the predetermined timescale for MP setting, SCRS to evaluate existence of exceptional circumstances	2. On the predetermined timescale for MP setting, SCRS to evaluate existence of exceptional circumstances	2. On the predetermined timescale for MP setting, SCRS to evaluate existence of exceptional circumstances	2. On the predetermined timescale for MP setting, SCRS to evaluate existence of exceptional circumstances
	3. COMM to set TAC based on the MP at the Annual Meeting, on the predetermined timescale for MP setting	3. COMM to set TAC based on the MP at the Annual Meeting, on the predetermined timescale for MP setting	3. COMM to set TAC based on the MP at the Annual Meeting, on the predetermined timescale for MP setting	3. COMM to set TAC based on the MP at the Annual Meeting, on the predetermined timescale for MP setting

\*Assumes that the workplan is accomplished as described.

**List of acronyms:**

**BET = Bigeye tuna**

**BFT = Bluefin tuna**

**BFT WG = SCRS' Bluefin Tuna Working Group**

**HCR = Harvest Control Rule**

**MP = Management Procedure**

**MSE = Management Strategy Evaluation**

**OM = Operating Model**

**SCRS = Standing Committee on Research and Statistics**

**SWGSM = Standing Working Group on Dialogue between Fisheries Scientists and Managers**

**TAC = Total Allowable Catch**

**TRO = Tropical tunas**