SC-03-INFO-12

3rd Meeting of the Southern Indian Ocean Fisheries Agreement (SIOFA) Scientific Committee

20-24 March 2017, Saint Denis, La Reunion

Sensitivity Analyses supporting the Ecological Risk Assessment for Deepwater Chondrichthyans in the Southern Indian Ocean

Relates to agenda item: 7.2   Working paper ☐ Info paper ☒

Delegation of Australia

Abstract

This paper describes the data sensitivity analyses undertaken on the PSA and SAFE parameters that describe the overlap between species distribution and fishing effort in the Ecological Risk Assessment for Deepwater Chondrichthyans in the Southern Indian Ocean. The analyses evaluated increases and decreases in the extent of overlap between species range and fishing effort of up to 30%. The analyses indicate that the results presented in working paper SC-03-07.2.1(01) are relatively robust to changes in overlap of this magnitude. The SAFE results for extreme and high risk species were more sensitive to a decrease overlap than species categorised into high risk using PSA.

Sensitivity Analyses supporting the Ecological Risk Assessment for Deepwater Chondrichthyans in the Southern Indian Ocean

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Purpose of this paper

This paper describes the data sensitivity analyses undertaken on the PSA and SAFE parameters that describe the overlap between species distribution and fishing effort in the Ecological Risk Assessment for Deepwater Chondrichthyans in the Southern Indian Ocean.

It provides the Scientific Committee with relevant information for determining the robustness of the results presented in working paper SC-03-07.2.1(01) to changes in species distribution and fishing effort overlap.

Methods

Productivity Susceptibility Analyses (PSA)

To evaluate sensitivities to the overlaps between fishery effort and species range the estimated overlap used to calculate the S1 Availability attribute (i.e. horizontal overlap) was varied by both positive and negative 10%, 20%, 30% increments. The S1 attribute was then re discretised into the attribute scores and susceptibility score re-calculated. The number of species changing to a lower or higher risk category were recorded.

Sustainability Assessment for Fishing Effects (SAFE)

To evaluate sensitivities to the overlaps between fishery effort and species range the susceptibility attribute in SAFE was varied by both positive and negative 10%, 20%, 30% increments. The number of species changing to a lower or higher risk category were recorded.

Results

Table 1 provides a summary of the sensitivity analyses for increases and decreases in overlap by 10%, 20% and 30%. Table 2 identifies the species categorised as high risk by PSA in working paper SC-03-07.2.1(01) that change to a lower risk category when the overlap was decreased. Table 3 identifies the species categorised as extreme and high risk species by SAFE in working paper SC-03-07.2.1(01) that change to a lower risk category when the overlap was decreased.

Table 1. The number of species changing risk category as a result of increasing or decreasing the species overlap by 10%, 20% and 30% for PSA and SAFE analyses.

Fishery	PSA			SAFE		
	10%	20%	30%	10%	20%	30%
Demersal Trawl	1	3	6	4	6	8
Midwater Trawl	1	3	3	0	1	4
Demersal Longline	1	3	5	2	4	6
Gillnet	0	1	1	2	3	5

Table 2 Species ranked as High Risk in SC-03-07.2.1(01) using PSA analyses (without any data deficiency). The X marks those species whose risk rank changed when overlap was changed by 10%, 20% and 30%.

Species	DT			MT			DLL			GN		
	10	20	30	10	20	30	10	20	30	10	20	30
Centrophorus granulosus												
Centroselachus crepidater			X						X			
Dalatias licha	X	X	X					X	X			
Deania calceus												
Deania profundorum			X									
Etmopterus viator												
Lamna nasus												
Odontaspis ferox												
Plesiobatis daviesi												
Pseudotriakis microdon												
Scymnodon plunketi		X	X									
Somniosus antarcticus			X				X	X	X		X	X
Zameus squamulosus					X	X						

Table 3 Species ranked as Extreme or High Risk in SC-03-07.2.1(01) using SAFE analyses (without any data deficiency). The X marks those species whose risk rank changed when overlap was changed by 10%, 20% and 30%.

Species	DT			MT			DLL			GN		
	10	20	30	10	20	30	10	20	30	10	20	30
Centrophorus granulosus												X
Centroselachus crepidater							X	X	X			X
Dalatias licha	X	X	X				X	X	X			
Deania calceus			X									
Deania profundorum												
Etmopterus alphus		X	X		X	X						
Etmopterus granulosus												
Etmopterus pusillus	X	X	X			X						
Etmopterus viator	X	X	X									
Scymnodalatias albicauda												
Scymnodon plunketi									X			
Somniosus antarcticus	X	X	X									
Zameus squamulosus		X	X			X						