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Southern Indian Ocean Fisheries Agreement
Accord relatif aux Pêches dans le Sud de l'Océan Indien

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Fishery Summary: tarakihi (*Nemadactylus macropterus*) 2023

The SIOFA Secretariat

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Abstract	
<p>This paper presents the SIOFA fishery summary for tarakihi (<i>Nemadactylus macropterus</i>) 2023. A template of the Fishery Summary type of document was first presented to and approved by SERAWG4 and SC7 in 2022, and it was adapted to this species as requested by SC7.</p>	



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Recommendations

The SIOFA Secretariat recommends that the SC8:

- **notes** the work done by the Secretariat in preparing the SIOFA Fishery Summary for tarakihi 2023.
- **provides** any comments or edits to the SIOFA Fishery Summary for tarakihi 2023 during the SC meeting.
- **endorses** the SIOFA Fishery Summary for tarakihi 2023 and **recommends** that this is further developed for SC9 and before publication.
- **considers** the frequency with which the Secretariat is to update the SIOFA Fishery Summary for tarakihi 2023.



Fishery Summary: tarakihi (*Nemadactylus macropterus*) 2023

Version 1.0 Date 25.02.2023 | Revised by XX | Endorsed by XX

Next review date: 20XX

Prepared by the SIOFA Secretariat

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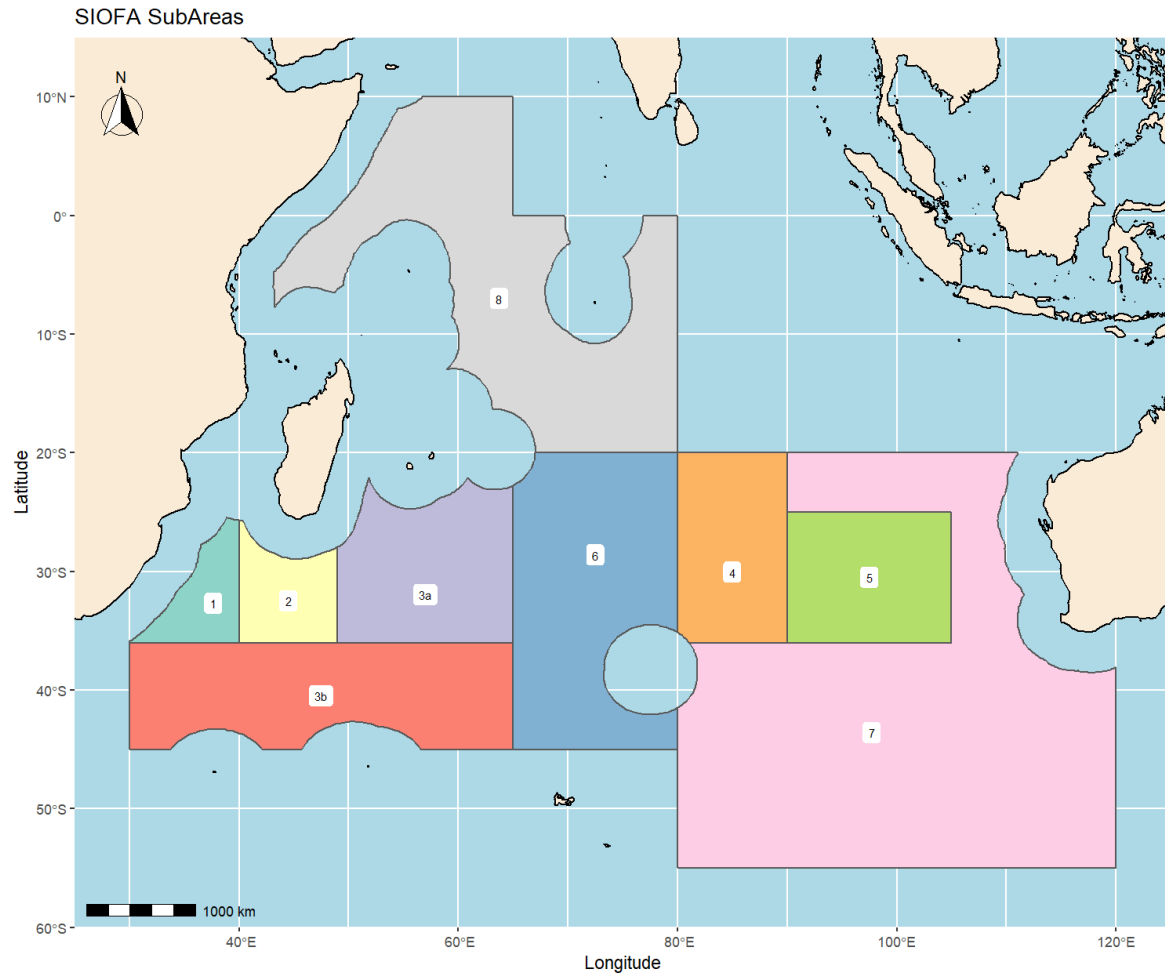
Contents

1. Species Summary	10
2. Biological Summary.....	10
3. Description of the fishery.....	11
3.1 Fleet and gear	11
3.2 Fishing areas.....	11
3.3 Assessment Areas	12
3.4 Catch and effort	12
3.4.1 Catch limits.....	13
3.5 Illegal Unreported and Unregulated (IUU) catch.....	13
3.6 Other sources of fishing mortality	13
4. Stock assessment and status	13
4.1 Stock assessment	13
4.2 Harvest strategy and reference points	14
4.3 Stock structure and status	14
5. Data collection	14
5.1 Biological data summaries	14
5.2 Tag data.....	14
6. Summaries of abundance indices and other observational data	15
6.1 Scaled length frequencies	15
6.2 Scaled age frequencies	15
6.3 CPUE indices.....	15
6.4 Acoustic biomass indices	15
6.5 Trawl survey indices.....	15
6.6 Tag based abundance estimates.....	15
7. Biological parameters	16
7.1 Natural mortality.....	16
7.2 Growth parameters.....	16
7.3 Length/age relationship.....	17
7.4 Maturity and spawning	17
7.5 Stock recruitment relationship	17
7.6 Tag parameters	17
8. Target/non-target catch and ecosystem impacts.....	17
9. Interactions with seabirds, mammals, turtles, sharks and other species of concern	17
10. Effects of the fishery on the ecosystem.....	18
11. References	18

1. Purpose of this document

The SIOFA Fisheries Summaries are public document that describe specific SIOFA fisheries in the SIOFA Area (Figure 1) and summarizes the available information for each species, and their biology and ecology. This document is targeted at the general public and institutions and countries wanting to better understand SIOFA fisheries.

The SIOFA Ecosystem Summary ([link](#)) provides more detailed information on effects of SIOFA fisheries on ecosystems and species in the SIOFA Area. The SIOFA Fisheries Overview ([link](#)) integrates these documents and describes general trends for the main fisheries in the SIOFA Area.



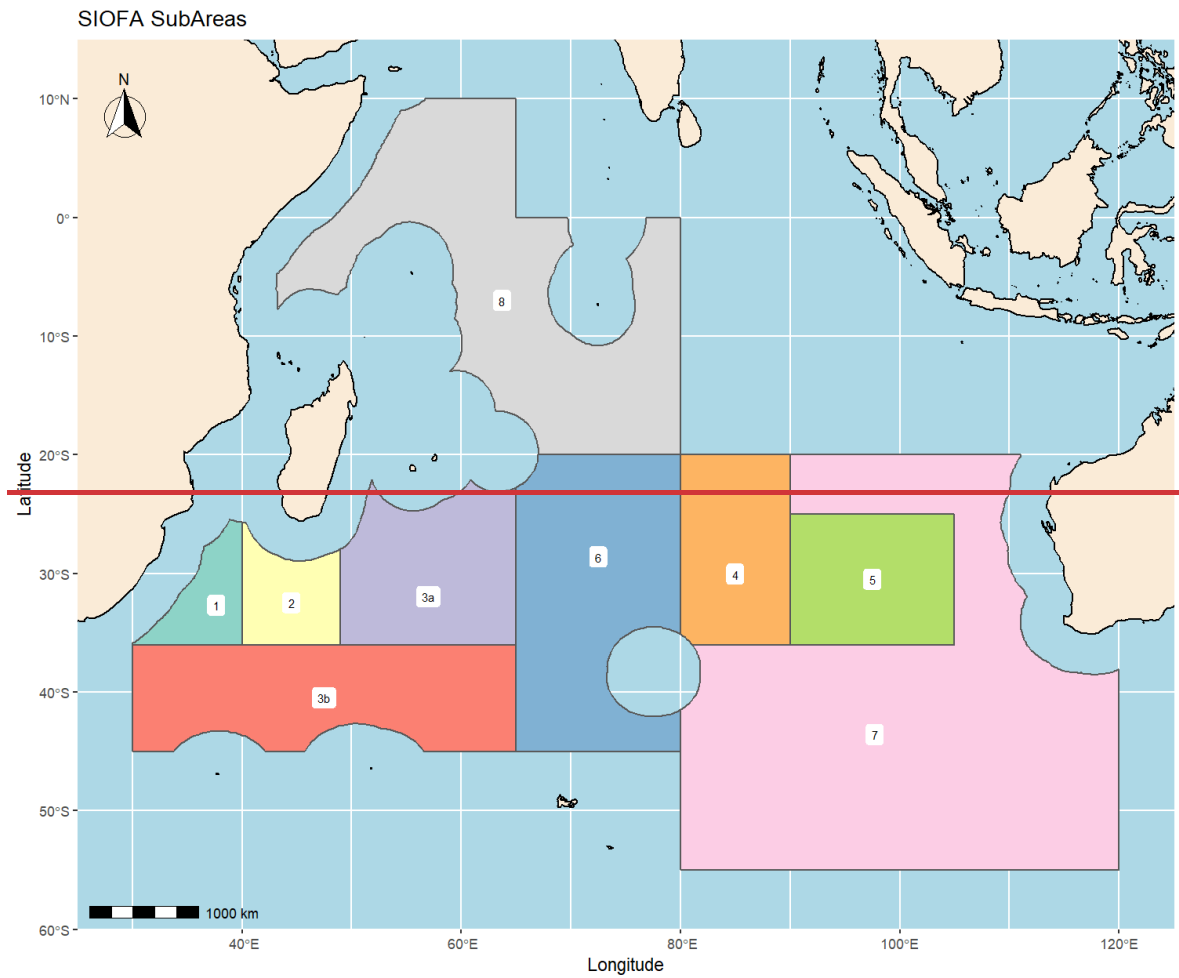


Figure 1 – The SIOFA Area and subareas (source: SIOFA Spatial Database). The subarea numbers and colour codes are used consistently throughout this Summary to identify subareas.

2. Data sources - Data availability

There are thirteen Contracting Parties, Cooperating non Contracting Parties, and Participating Fisheries Entities of SIOFA (CCPs) that are the members of SIOFA. The SIOFA Secretariat receives data from CCPs pertaining to their fishing activities, biological sampling, and observer reports as per [CMM 2021/02](#) (Conservation and Management Measure for the Collection, Reporting, Verification and Exchange of Data relating to fishing activities in the Agreement Area). The SIOFA Secretariat acts as custodian for these data on behalf of its members. Requests to release or publish these data (e.g., for scientific purposes) is regulated under [CMM 2016/03](#) (Conservation and Management Measure for Data Confidentiality and Procedures for access and use of data). Data requests can be made through the Secretariat (secretariat@siofa.org).

The SIOFA databases are organized as follows:

- AggregatedCatchEffort: this database contains the catch and effort data aggregated at different spatial resolutions, varying from the whole SIOFA Area to 20' squares, for years from 2000 to 2019.
- HBHCatchEffort: this database contains haul-by-haul catch and effort data at recorded at a range of spatial resolutions, varying from degrees to seconds, for the years from 1998 to 2021.
- SIOFA Observer Database: this database contains data from Scientific Observers including biological sampling and operational data, for the years from 2012 to 2021

The SIOFA databases are supported by other data assets such as:

- Spatial data layers (in various formats), including the GIS spatial layers available to the Secretariat (e.g., boundaries of the SIOFA Subareas, Management Unit boundaries, etc.). These are stored at the SIOFA Secretariat
- Codes, including countries, gears and FAO species codes etc. These are stored at FAO.

SIOFA databases and supporting data assets have been described in the reports of project SEC2021-05 (e.g., SC-07-08), where it was noted that some data are repeated in the AggregatedCatchEffort and HBHCatchEffort databases.

Further data (e.g., the number of active vessels) are available from Annual National Reports that SIOFA CCPs submit to the Scientific Committee each year. These are available from the SIOFA website (<https://siofa.org/meetings/groups/Scientific%20Committee%20Meeting>).

3. Species Summary

Common name	Tarakihi
Scientific name	<i>Nemadactylus macropterus</i>
Scientific synonyms	
FAO species code	TAK
Year of this report	2023
Assessment Areas/ Management Units	Not defined
Assessment method	None
Most recent assessment	None
Year of next assessment	Not specified
Harvest strategy	Not defined
Summary of current stock status	Unknown

This report describes the catch of tarakihi (TAK, *Nemadactylus macropterus*) in SIOFA fisheries and available biological parameters for this species. There are no target fisheries for tarakihi in the SIOFA area; tarakihi is caught only as bycatch in other fisheries, primarily in demersal longline fisheries targeting hapuka.

A revision of this document during the 8th meeting of the SIOFA Scientific Committee has highlighted that updates of this document are of low priority.

No management advice has been agreed for tarakihi in the SIOFA area.

A harvest strategy for the tarakihi stocks in the SIOFA area has not yet been developed.

No stock assessment is available for tarakihi stocks in the SIOFA area.

4. Biological Summary

Very little information is known about the biology of tarakihi in the SIOFA area.

Information is available from other areas, especially the Pacific Ocean areas around Australia and New Zealand where there are developed fisheries for this species, and is summarised here in the interim.

In those areas, tarakihi is a demersal species with juveniles living in shallower and adults living in deeper areas on the continental shelf and upper slope (May & Maxwell 1986) to depths of 450 m. Tarakihi reach sexual maturity at roughly 4-6 years age and 25-35 cm length, and can live up to 50 years. Typical specimens caught in fisheries are closer to 20 years, 35-50 cm of length and 1.8 kg of weight.

Tarakihi typically feeds on invertebrates (e.g. polychaete worms, crustaceans, molluscs and echinoderms, Godfriaux, 1974).

5. Description of the fishery

5.1 Fleet and gear

Tarakihi are not targeted in the SIOFA area but are caught as bycatch, primarily in demersal longline fisheries targeting hapuka. In recent years, participation in the fishery has involved **XX** vessels per year.

5.2 Fishing areas

Tarakihi catches have been reported within a relatively small area in the western portion of the SIOFA area, mainly in subareas 3a and 3b (Figure 1).

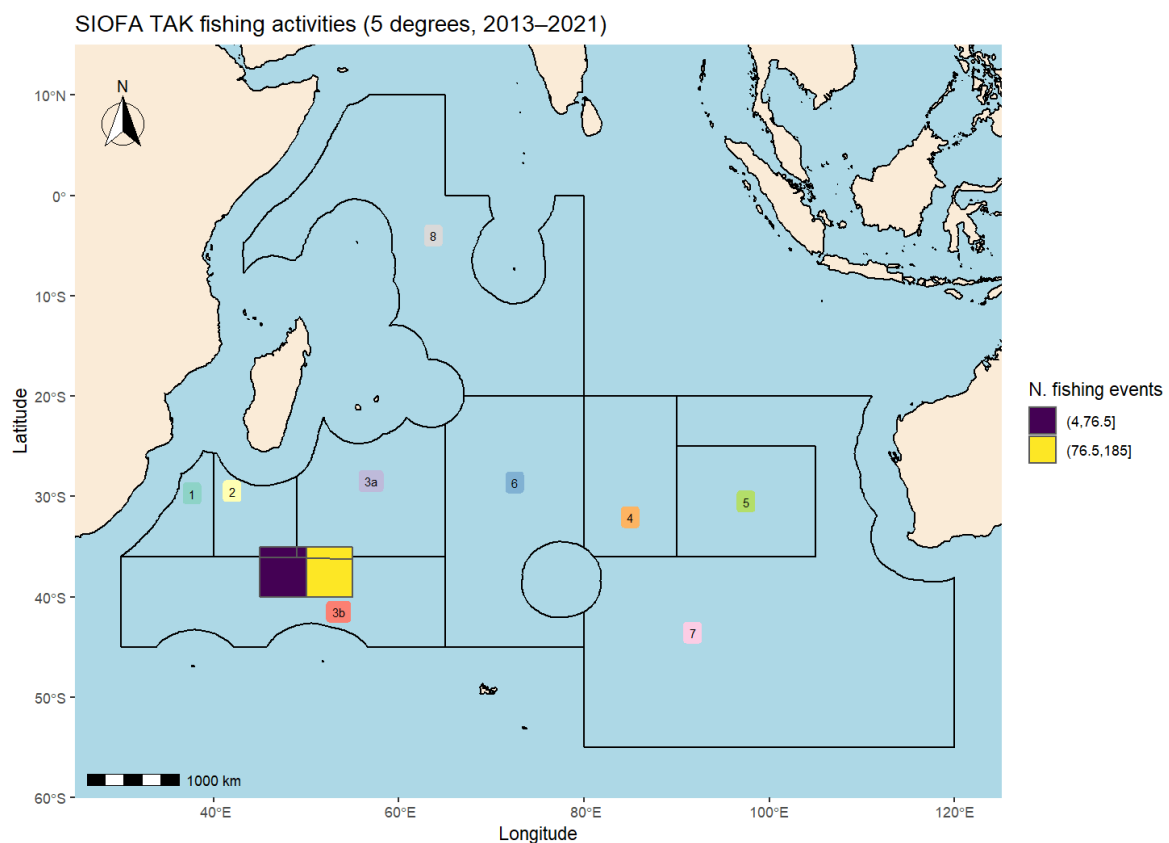


Figure 1 – Spatial distribution of fishing activities that caught tarakihi in the SIOFA Area, derived from haul-by-haul level fishing data, aggregated at a 5 x 5 degree resolution (source: SIOFA HBHCatchEffort databases 2013–2021). This map represents all fishing events that caught any TAK, irrespective of declared target species.

5.3 Assessment Areas

No management units or areas for the purpose of stock assessment have been defined for tarakihi.

5.4 Catch and effort

Tarakihi are not a target fishery species in the SIOFA area, so data in this section include all fishing events that captured tarakihi regardless of fishing method or target species. In this context CPUE as depicted here cannot be considered a reliable index of abundance. Total catches are very low, in the range of 0.5–3 tons per year.

Catches of tarakihi in the SIOFA area were first reported in 2016, at very low levels (less than a ton). Catches were higher in a single year, in 2019, at 3 tons (Figure 2). Unstandardised CPUE (Figure 3) are unlikely to constitute a meaningful index of abundance.

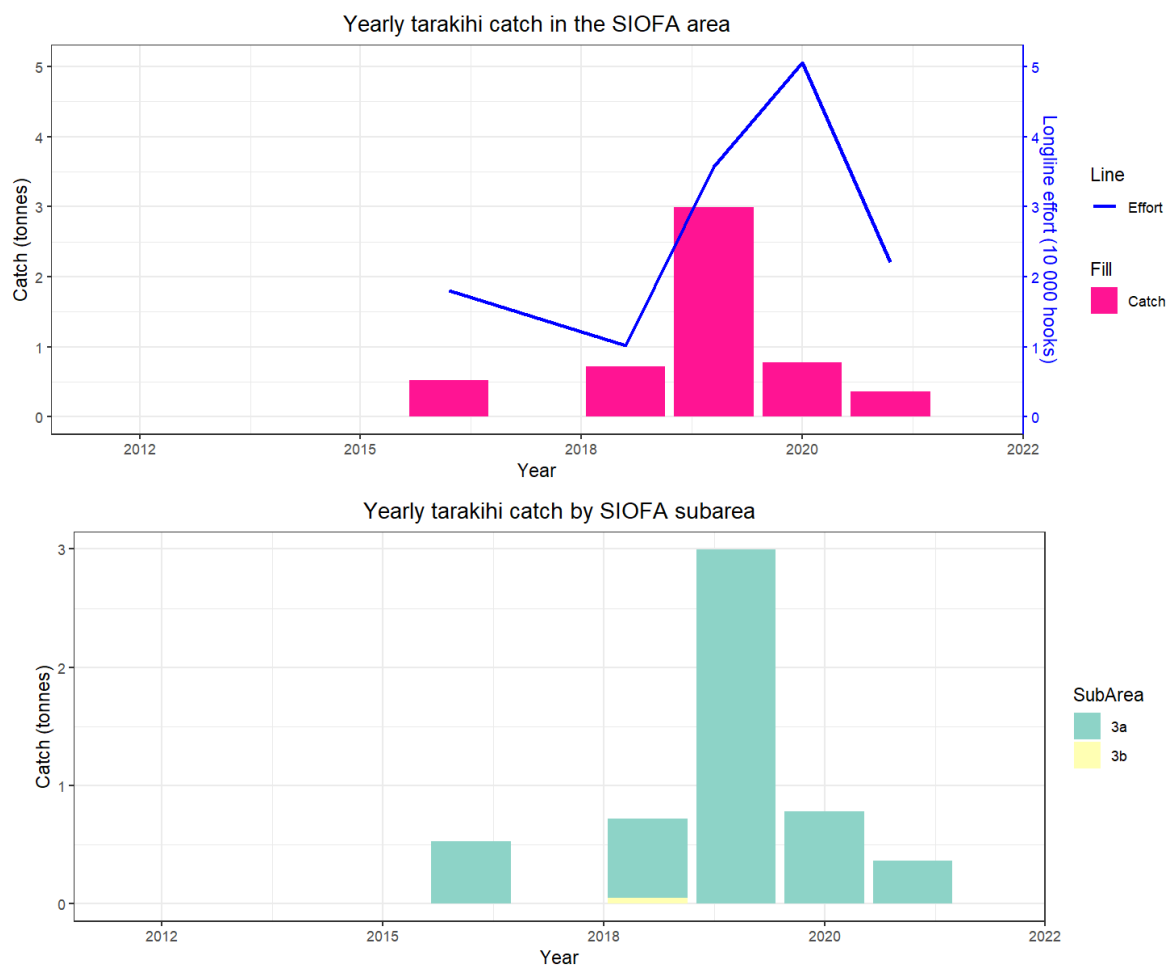


Figure 2a and b — Yearly catch of tarakihi (tonnes) and effort (10 thousand hooks) in the SIOFA area (upper panel, a) and in different SIOFA subareas (lower panel, b) (source: SIOFA AggregatedCatchEffort and HBHCatchEffort databases 2013–2021).

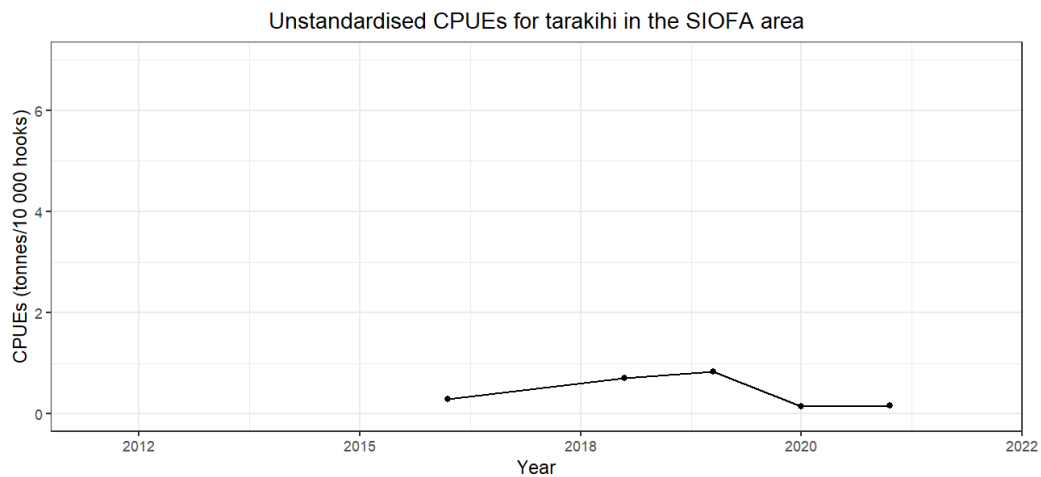


Figure 3 – Unstandardised catch per unit effort (CPUE) of tarakihi in the SIOFA area (tonnes/tow) (source: SIOFA AggregatedCatchEffort and HBHCatchEffort databases 2013–2021).

5.4.1 Catch limits

There are currently no catch limits set for tarakihi in the SIOFA area.

5.5 Illegal Unreported and Unregulated (IUU) catch

No claims of Illegal Unreported and Unregulated (IUU) catches of tarakihi have been reported to SIOFA.

5.6 Other sources of fishing mortality

As in other species caught on longlines, some unaccounted mortality may be expected to occur arising from whale depredation, whereby killer whales and/or sperm whales are known to remove fish from longlines during hauling (Gasco et al. 2021). However whale depredation is mostly associated with toothfish fisheries, and in any event captures of tarakihi in SIOFA fisheries are very low; so the extent to which whale depredation affects incidental catches of tarakihi is unknown but is likely to be very minor.

6. Stock assessment and status

6.1 Stock assessment

No stock assessment has been completed for tarakihi in the SIOFA area.

6.2 Harvest strategy and reference points

Specific harvest strategies for tarakihi have not been discussed by the SIOFA Scientific Committee.

6.3 Stock structure and status

The stock structure and status of tarakihi have not been defined.

7. Data collection

Catch and effort data collected are collected and submitted by the different CCPs participating in SIOFA fisheries. A summary of these data is not available at this time.

Scientific observer data are collected as a requirement of CMM2021/02, submitted by different CCPs participating in SIOFA fisheries. A summary of these data is provided in the following sections.

7.1 Biological data summaries

Biological data of a total of 57 individuals of tarakihi have been collected by SIOFA scientific observers in 2021.

Table 1 summarises the length, weight and sex determination information available for tarakihi.

Table 1 – Average length, weight, and sex ratio data on tarakihi collected by scientific observers in the SIOFA area

Year	N individuals	Length method	Average length (cm)	Average weight (kg)	Sex ratio
2021	57	LCF	45.60	1.71	F/M 0.75/0.25

7.2 Tag data

SIOFA does not require or conduct any tagging of tarakihi.

8. Summaries of abundance indices and other observational data

8.1 Scaled length frequencies

Scaled length frequency data are not available for tarakihi.

8.2 Scaled age frequencies

Scaled age frequency data are not available for tarakihi.

8.3 CPUE indices

Because tarakihi is not a target species for any SIOFA fishery, CPUE indices are not considered to be particularly meaningful. Please note that unstandardised CPUE figures are provided in Section 3.4.

8.4 Acoustic biomass indices

It is considered infeasible to utilise acoustic survey methods to assess tarakihi in the SIOFA area.

8.5 Trawl survey indices

No trawl surveys have been undertaken for tarakihi in the SIOFA Area.

8.6 Tag based abundance estimates

SIOFA does not require or conduct tagging of tarakihi and no tarakihi tagging experiments in the SIOFA area have been reported to SIOFA.

9. Biological parameters

Biological parameters have not been estimated for tarakihi from data collected specifically from SIOFA fisheries.

Table 2 – Biological parameters for tarakihi (*Nemadactylus macropterus*).

Relationship	Parameter (units)	Area	Value			References
			Both	Male	Female	
Natural mortality	M (y^{-1})					
Von Bertalanffy growth coefficient	t_0 (y)					
	k (y^{-1})					
	L_{∞} (cm)					
	c.v.					
Length-weight	a ($t \cdot cm^{-1}$)					
	b					
Maturity	a_{50} ($\pm a_{t0.95}$)					
	L_{50} ($\pm L_{t0.95}$)					
Stock recruitment relationship						
Stock recruitment steepness	h					
Recruitment variability	σ_R					
Ageing error type	Normal					
Ageing error parameters	c.v.					

9.1 Natural mortality

Natural mortality has not been estimated specifically for tarakihi in the SIOFA Area.

9.2 Growth parameters

Growth parameters have not been estimated specifically for tarakihi in the SIOFA Area.

Table 3 – Growth parameters for tarakihi.

Parameter	Combined sex	Male	Female
L-inf (cm)			

kappa			
Average age at maturity			
Maximum age			

9.3 Length/age relationship

No length-age relationship is available for tarakihi sampled specifically in the SIOFA area.

9.4 Maturity and spawning

No maturity analysis is available derived from tarakihi sampled specifically in the SIOFA area.

9.5 Stock recruitment relationship

The stock-recruitment relationship for tarakihi has not yet been investigated in the SIOFA area.

9.6 Tag parameters

SIOFA does not require or conduct any tagging for tarakihi.

10. Target/non-target catch and ecosystem impacts

Because tarakihi is not targeted in SIOFA fisheries but caught only as bycatch, no meaningful analysis can be performed on target vs. non-target catch for this species.

11. Interactions with seabirds, mammals, turtles, sharks and other species of concern

Because tarakihi is not targeted in SIOFA fisheries but caught only as bycatch, incidental captures of protected species are summarised elsewhere with reference to the associated target fishery (i.e. hapuka target fishery), unrelated to associated catches of tarakihi.

12. Effects of the fishery on the ecosystem

The effects of tarakihi catches on the ecosystems are unknown but likely to be low.

13. References

Godfriaux, B.L., 1974. Food of tarakihi in western Bay of Plenty and Tasman Bay, New Zealand. N.Z. J. Mar. Freshwat. Res. 8:111-153.

Gasco, N., Tixier, P., and Guinet, C (2021). Protocol for documenting marine mammals interaction in deep sea demersal longline fisheries. 3rd Meeting of the Stock and Ecological Risk Assessment Working Group (SERAWG3). SERAWG-03-06, 10pp.

May, J.L. and J.G.H. Maxwell, 1986. Trawl fish from temperate waters of Australia. CSIRO Division of Fisheries Research, Tasmania. 492 p.