SC-07-16

7th Meeting of the Southern Indian Ocean Fisheries Agreement (SIOFA) Scientific Committee (SC7)
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National Report of the European Union (2022)

Relates to agenda item: 3 Working paper ☒ Info paper ☐

Delegation of the EU

ABSTRACT

This report presents an overview of the fishery data available from the European Union (EU) fleets operating at SIOFA area updating previous reports to the end of 2021.

Information about Catch, CPUE, Data collection, VME and other data of interest are included. All catch and effort data for fishing operations during 2021 will be submitted to SIOFA in accordance with CMM 2021/02.

While France did not request any authorisation in 2021 and therefore did not fish in the SIOFA area, Spanish fishing activities (one active vessel) have been focused in three fishing grounds, namely Walter Shoals (Area 2), Southwest Indian Ridge (Area 3b and 3a) and more recently in the SE Indian Ocean (Area 7).

No VME indicator thresholds were triggered during 2021.

The report will be made publicly available in perpetuity on the SIOFA website.

RECOMMENDATIONS

It is recommended that the SC:

- Notes the National Report provided by the EU.
- Notes that the EU has complied with the annual reporting requirements of the SIOFA Scientific Committee.

European Union 2022 annual report on fishing activities in the Southern Indian Ocean Fisheries Agreement Area

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1. Description of fisheries

1.1. Fleet composition

This section includes fleet composition data from the EU Member States active in SIOFA (France and Spain) during the period 2000-2021 as indicated in Tables 1 and 2 respectively for France (2009-2021) and Spain (2000-2021).

Table 1: Summary of EU-France fleet activity in the SIOFA Area.

Year	Number of vessels
2009	2
2010	2
2011	2
2012	2
2013	2
2014	1
2015	Interruption
2016	1
2017	1
2018	0
2019	0
2020	0
2021	0

Two EU-France longliners, less than 25m, have a demersal fishery history in the SIOFA Area, in the Saya de Malha Bank, in addition of their tuna directed activities. There was no request for any authorisation in 2021 and therefore, there was no fishing in the SIOFA area.

EU-Spain fishing activities within the SIOFA Convention Area (CA) have been focused in three fishing grounds, namely Walter Shoals (Area 2), Southwest Indian Ridge (Area 3b and 3a) and more recently in the SE Indian Ocean (Area 7). Historically have also been some activities in the Madagascar ridge (Area 1) while some fishing sets have also been located in the Ninety Degree East Ridge (Area 4) in 2020

Information on Table 2 summarizes the fishing periods by gear (trawl, trap, bottom longline and bottom gillnet) conducted by the EU-Spain fleets within the SIOFA CA.

Only bottom longlines have been used from April 2015 up to now, mainly using the Autoline system. In 2018 a second vessel has participated using the bottom Spanish system LL. In 2021 only one vessel has been fishing with Autoline system (307 fishing days).

Table 2: Summary of EU-Spain fleet activity in the SIOFA Area.

Year	Number vessels	Fishing period	Gear
2000	1	May - November	Bottom trawl / Midwater trawl
2001	1	October - November	Bottom trawl / Midwater trawl
2003	1	May - June	Bottom longline
2004	2	August - November September - December	Bottom longline
2005	2	August - November January-February & November - December	Bottom longline
2006	2	August - December January & November - December	Bottom longline
2007	2	January - December January - February & December	Bottom longline
2008	2	January - May January - December	Bottom longline
2009	1	January - March	Bottom longline
2013	1	January - December	Gillnet
2014	1	January - December	Gillnet
2015	1	January - December	Gillnet: January-March Bottom longline: April-December
2016	1	January - December	Bottom longline
2017	1	January & May - December	Bottom longline
2018	2	January-February & April-October (1 vessel) May - August (1 vessel)	Bottom longline
2019	1	January - December	Bottom longline
2020	1	January - December	Bottom longline
2021	1	January - December	Bottom longline

1.2. Fishing footprint

The fishing footprint of the EU-Spain fleet in 2021 is shown in Figure 1 (below), using a 10'x10' grid. Fishing took place in Areas 2, 3a, 3b and 7. Grid colours are classified by the number of sets in a grid.

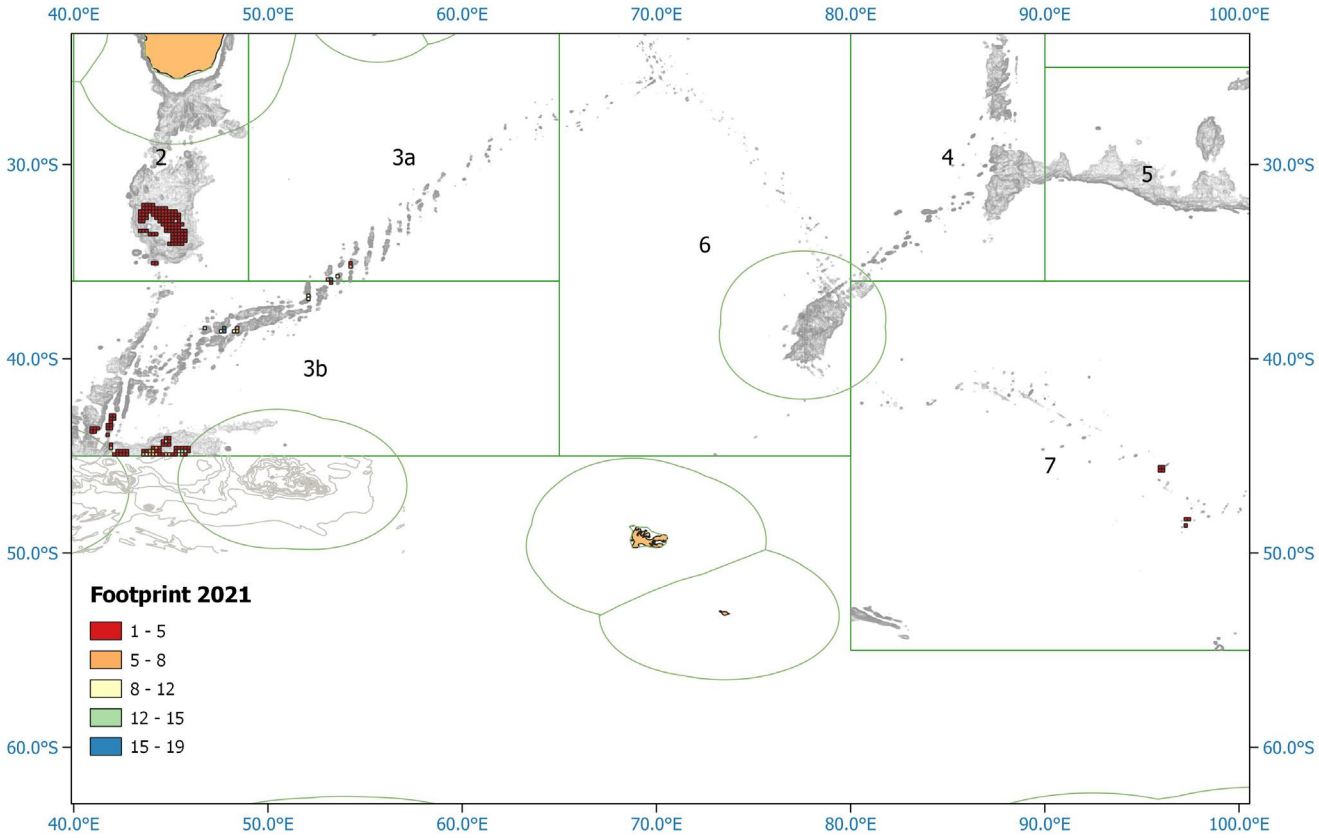


Figure 1 EU-Spain 2021 footprint

2. Catch, Effort and CPUE summaries

2.1. Catch

Historically, the target species of EU fleet operating in SIOFA seamounts were: Alfonsino (*Beryx* spp.); Orange roughy (*Hoplostethus atlanticus*); Wreckfish (*Polyprion* spp.); Portuguese dogfish (*Centroscymnus coelolepis*); Southern boarfish (*Pseudopentaceros richardsoni*); and Patagonian toothfish (*Dissostichus eleginoides*). Within the by-catch species of commercial interest it can be highlighted: the Bluenose warehou (*Hyperoglyphe antarctica*); Blackbelly rosefish (*Helicolenus dactylopterus*); Common mora (*Mora moro*); Oilfish (*Ruvettus pretiosus*); Black cardinal fish (*Epigonus telescopus*); Birdbeak dogfish (*Deania calcea*); Kitefin shark (*Dalatias licha*); Gulper sharks (*Centrophorus* spp); Lanternshark (*Etmopterus* spp); Roudi escolar (*Promethichthys prometheus*); Violet warehou (*Schedophilus velaini*); Oreo dories (*Oreosomatidae*) and others. Identification of all deep-seas sharks to the lowest taxonomical level is not possible where no scientific observer is onboard. Surveys with observer coverage identify most of the sharks to the species level.

From 2017 all fishing vessels targeting Patagonian toothfish have 100% observer coverage.

Following the entry into force of CMM-2019-12, the EU fleet has ceased the fishery targeting sharks and performance measures were adopted in the case of by-catch of these species. The

EU have submitted a document to the SERAWG4 about Monitoring, Management and Impact Mitigation in the shark bycatch (SERAWG-04-13).

Tables 3 and 4 show the total catch (tons) from 2014 to 2021 by area and gear (GN above and LLS below).

*Table 3 Retained GN catch (t) by area**

Year	Area 2
2014	1527.3
2015	515.0

*Table 4 Retained LLS catch (t) by area**

Year	Area				
	2	3a	3b	4	7
2015	1384.1	0.0	0.0	0.0	0.0
2016	1840.8	0.0	0.0	0.0	0.0
2017	1060.2	0.0	253.6	0.0	0.0
2018	1406.1	0.0	314.4	0.0	362.6
2019	1014.3	0.0	106.5	0.0	183.9
2020	619.7	79.8	275.6	12.7	87.1
2021	1001.1	51.12	346.9	0.0	2.5

Table 5 shows the catch by year of the 8 most fished species (from 2001 to 2021). Although the vessel usually takes all the catch, there is always some specimens that are discarded. Tables 6 and 7 show the discards of the most retained species and the most discarded species respectively.

*Table 5 Retained catch (t) by species**

Year	CYO	SCK	DCA	TOP	RIB	GUP	SHL	WRF	Others	Total
2001	0.0	3.1	0.0	0.0	0.6	0.0	0.0	0.8	27.6	32.0
2003	0.0	0.0	0.0	24.5	0.0	0.0	0.0	0.0	0.0	24.5
2004	419.8	0.0	0.0	1.2	6.6	0.0	0.0	85.8	87.3	600.7
2005	0.0	0.0	0.0	0.0	3.9	0.0	0.0	51.4	94.4	149.7

Year	CYO	SCK	DCA	TOP	RIB	GUP	SHL	WRF	Others	Total
2007	0.0	0.0	0.0	3.5	2.7	0.0	0.0	2.3	12.7	21.2
2008	293.2	224.7	186.8	0.0	90.2	106.1	0.0	11.1	143.1	1055.1
2009	76.7	74.6	62.5	0.0	5.5	43.6	0.0	0.0	9.9	272.7
2013	316.1	409.9	369.9	0.0	143.2	127.7	0.0	1.1	144.3	1512.2
2014	505.0	341.4	314.5	0.0	159.1	106.1	0.0	0.0	101.2	1527.3
2015	924.9	365.9	290.7	0.0	128.2	133.7	0.0	0.8	54.9	1899.1
2016	1276.6	266.6	130.9	0.0	56.7	74.4	0.0	0.0	35.7	1840.8
2017	519.3	210.6	104.0	139.6	53.7	22.7	74.7	0.0	183.5	1308.2
2018	814.1	323.6	22.3	503.7	24.3	6.9	74.5	0.1	267.3	2036.9
2019	716.2	12.8	0.1	217.7	15.6	4.4	189.2	6.9	134.9	1297.8
2020	442.7	65.1	2.9	188.5	39.4	2.3	78.9	140.1	114.7	1074.6
2021	805.8	41.5	4.1	121.0	72.3	0	41.7	108.1	207.1	1401.6

*CYO: *Centroscymnus coelolepis*; SCK: *Dalatias licha*, DCA: *Deania calcea*, TOP: *Dissostichus eleginoides*, RIB: *Mora moro*, GUP: *Centrophorus granulosus*, SHL: *Etmopterus spp*, WRF: *Polyprion americanus.*

Table 6 Discarded catch (t) of the main retained species by year*

Year	CYO	SCK	DCA	TOP	RIB	GUP	SHL	WRF	Others	Total
2001	0.0	0.0	0	0	0.0	0	0.0	0.0	3.6	3.6
2004	1.0	0.0	0	0	7.3	0	26.0	0.1	34.2	68.6
2005	0.0	0.0	0	0	0.0	0	0.0	0.0	6.3	6.3
2007	0.1	0.2	0	0	0.0	0	0.9	0.0	4.2	5.4
2017	0.0	0.0	0	0	0.0	0	0.0	0.0	6.1	6.1
2018	0.0	0.0	0	0	0.0	0	0.2	0.0	46.4	46.6
2019	0.0	0.0	0	0	0.0	0	0.0	0.0	6.8	6.8
2020	0.0	0.0	0	0	0.0	0	0.0	0.0	3.9	3.9
2021	0.0	0.0	0	0	0.0	0	0.0	0.0	2.7	2.7

*CYO: *Centroscymnus coelolepis*; SCK: *Dalatias licha*, DCA: *Deania calcea*, TOP: *Dissostichus eleginoides*, RIB: *Mora moro*, GUP: *Centrophorus granulosus*, SHL: *Etmopterus spp*, WRF: *Polyprion americanus.*

*Table 7 Discards (t) by species and year **

Year	GRV	SHL	RFA	ANT	COX	RIB	QUB	PRP	Others	Total
2001	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.6	3.6
2004	0.0	26.0	0.0	0.1	3.8	7.3	5.1	4.0	22.4	68.6
2005	0.0	0.0	0.0	0.0	3.4	0.0	0.0	0.0	2.8	6.3
2007	0.0	0.9	0.0	2.1	0.4	0.0	0.0	0.0	2.1	5.4
2017	0.0	0.0	5.1	0.0	0.0	0.0	0.0	0.0	1.1	6.1
2018	22.5	0.2	12.1	6.6	0.1	0.0	0.0	0.0	5.1	46.6
2019	0.0	0.0	0.5	0.5	0.2	0.0	0.0	0.0	1.8	6.8
2020	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.0	2.1	3.9
2021	0.0	0.0	0.0	2.6	0.1	0.0	0.0	0.0	0.1	2.7

* GRV: *Macrourus* spp; SHL: *Etmopterus* spp; RFA: *Amblyraja taaf*; ANT: *Antimora rostrata*; COX: *Congridae*; RIB: *Mora moro*; QUB: *Squalus blainville*; PRP: *Promethichthys Prometheus*

2.2. Fishing effort

The fishing effort in 2014 was high although only one vessel using gillnets was operating (Fig. 2). In 2015 the vessel using gillnets replaced the gear to bottom longline Autoline. Effort remained stable in the period 2016-2017 at a level of around 3 200 000 hooks per year (one vessel), in 2018 increased up to 5 432 000 hooks (two vessels), finally decreasing in 2019 and 2020. In 2021 the fishing effort was slightly higher if compared with the previous year.

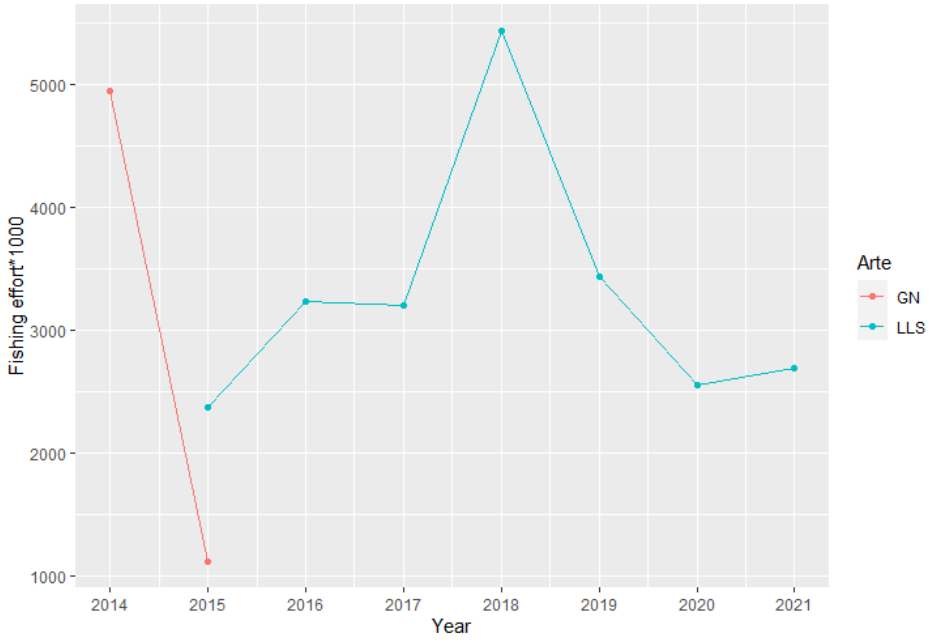


*Figure 2 EU-Spain Fishing effort by gear (Bottom Longliners: nº hooks*1000, Gillnets: km) from 2014 to 2021.*

Effort by year, gear and area are shown in Tables 8 and 9.

Table 8 Gillnet effort (km) by year and area

Year	Area 1	Area 2	Area 3b
2008	760.1	4004.0	NA
2009	NA	898.6	NA
2013	275.0	5034.0	133.1
2014	NA	4945.2	NA
2015	NA	1121.3	NA

*Table 9 Bottom Longline effort (nº hooks*1000) by year and area.*

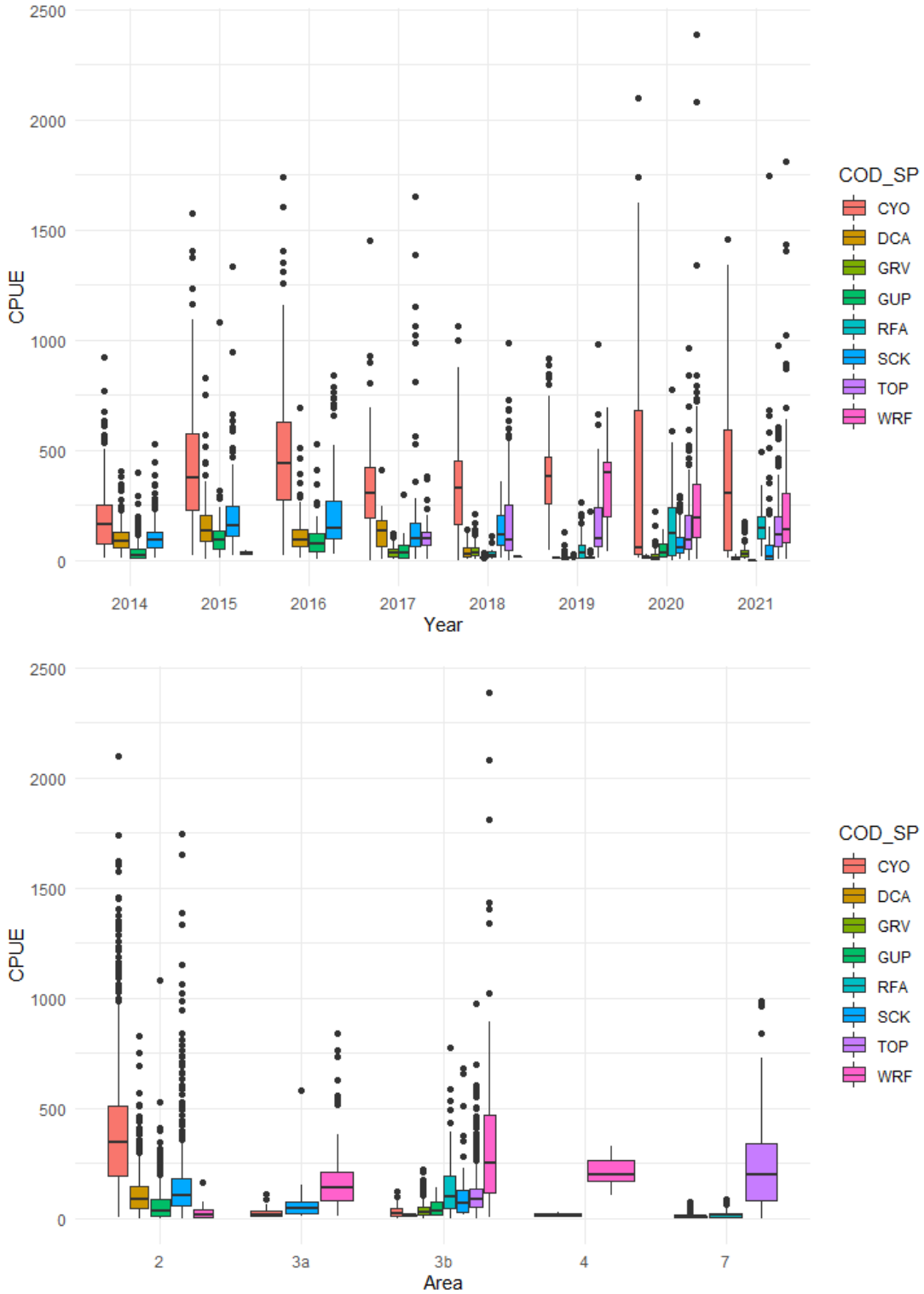
Year	2	3a	3b	4	7	Total
2015	2370.4	0.0	0.0	0.0	0.0	2370.4
2016	3223.5	0.0	0.0	0.0	0.0	3223.5
2017	1793.6	0.0	1403.3	0.0	0.0	3196.9
2018	2383.9	0.0	2119.3	0.0	928.8	5432.0
2019	1902.5	0.0	552.5	0.0	980.6	3435.6
2020	910.7	249.1	810.1	50.8	530.6	2551.2
2021	1536.4	207.5	904.9	0.0	42.1	2690.9

2.3. Catch per unit effort (CPUE)

Figure 3 presents the CPUE (k/1000 hooks) by year (up) and area (down) of the LLS EU-Spain fleet (period 2014- 2021).

In Area 2 the main targeted species is the wreckfish (*Polyprion* spp.) and secondly the common mora (*Mora moro*), although significant shark bycatches are also achieved in this area. In 2021, the highest CPUE (catch by 1000 hooks) has been reached fishing the wreckfish (WRF) with a maximum of 1808k/1000 hooks. (Figure 3).

In Del Cano rise and Williams ridge the main species caught is the Patagonian toothfish (TOP). In 2021 the highest CPUE has been 978 k/1000 hooks being the mean CPUE for the entire period 150 k/1000 hooks.



CYO: *Centroscymnus coelolepis,* DCA*: Deania calcea,* GRV:*Macrourus* spp, GUP: *Centrophorus granulosus*, RFA: *Amblyraja taaf,* SCK: *Dalatias licha*, TOP: *Dissostichus eleginoides*, WRF: *Polyprion americanus.*

Figure 3 CPUE (k/1000 hooks) by year (up) and area (down) of the EU-Spain LLS fleet (period 2014-2021).

3. Fisheries data collection and research activities

3.1. Data collection

EU data are obtained from different sources: Logbook data (provided to SIOFA in accordance with SIOFA CMM 2021/02), declaration system, records from the master and scientific observation, when available.

C2 and observer logbook data are collected in an Excel spreadsheet and processed at the IEO (Spanish Institute of Oceanography) for storage in a linked Access database. Analysis of the data are made using R.

3.2. Toothfish tagging/recaptures

In 2021 *Dissostichus spp* specimens caught have been tagged and released at a rate of at least 5 fish per tonne green weight caught, in agreement with the CMM 2021/15. A minimum overlap statistic of at least 60% shall apply for tag release.

The tagging is made by the scientific observer with the help of the crew when needed. CCAMLR Scientific Committee protocols and CCAMLR tagging material have been applied.

1. *Selection of specimens*
   Fish were chosen in good condition, without serious injuries and with a good chance of survival after release.

2. *Tagging material*
   White T-bar tags were used, with double tagging by placing one tag on each side of the dorsal fin with the aid of a "pistol" type applicator. Fish were measured with an ichthyometer placed either on the side of the tank or on the side of the trolley.

3. *Handling according to size*
   (a) Fish less than 100 cm
   A holding tank of $1m^3$ is used, placed on deck and with constant water renewal, keeping the volume at about half the tank capacity. The number of fishes in the tank never exceeded 5.

Figure 4 Holding tanks and tag application

Fish were kept in the tank for a few minutes to condition them and lower their stress level, then the hook is removed to be measured and tagged.

The fish is released shortly after tagging, although in some cases the specimen was returned to the tank for a short period of time. In both cases the release is done carefully (head first into water) throwing them from the side of the boat.

Figure 5 Tagged toothfish being released

(b) Fish over 100 cm

Toothfish are measured and tagged on the same hauling deck to minimise their time out of the water. In 2021, a total of 812 TOPs has been tagged from two trips. The approximate overlap between the Total Length of the retained TOP and those released has been of 78% on the first trip and 69% on the second one.

4. *Recaptures*

On the first trip, two TOP specimens were recaptured, one of them in Area 3b and one in Area 7. Both were tagged by Australia. Five tagged TOPs have been recaptured on the second trip, all of them in Area 3b. Tagging was done by Australia (2) and France (3).

3.3. Marine mammal interaction

An analysis of the Marine Mammal interaction with fishing activities targeting Patagonian toothfish was also reported to CCAMLR in 2019 (CCAMLR, Gasco et al., 2019).

3.4. Previous relevant research activities

López-Abellán in 2005 presented a document to CCAMLR regarding a Spanish Patagonian toothfish fishery in the statistical FAO area 51: « Patagonian toothfish in international waters of the Southwest Indian Ocean (statistical area 51) » that has been published in CCAMLR Science, Vol. 12 (2005): 207-214.

An analysis of tag recaptures in the SIOFA convention area from Patagonian toothfish tagged in the CCAMLR convention area was presented at CCAMLR WG-FSA-18 (Sarralde and Barreiro, 2018).

Also, several analysis of the Patagonian toothfish stock in the SIOFA CA from data collected from observers on board vessels that operated between 2017 and 2019 in SIOFA 51.7 and 57.4 areas have been presented both in SIOFA WG-SERA-19 (Sarralde and Barreiro, 2019) and CCAMLR WG-FSA-19 (Sarralde et al, 2019).

Three documents were submitted to SERAWG and/or the SIOFA Scientific Committee in March 2020 and 2021:

- Gasco N, Tixier P, Massiot-Granier F, Péron C, Selles J, Sarralde R, Soeffker M. 2020. No boundaries for whales interacting with fishing activities targeting Patagonian toothfish. SERAWG-2020.

- Sarralde R, F. Massiot-Granier2, J. Selles2, Soeffker M. 2020. Preliminary analysis of the Patagonian toothfish fishing data of the Del Cano Rise SIOFA. SERAWG-2020.

- Preliminary Assessment of Bottom Fishing Impact for the EU fisheries in the SIOFA CA - Update (2021) EU-Spain.

4. VME Thresholds

From 2019, the EU bottom longline fleet is applying the protocols adopted by SIOFA in the CMM 2019-01. Previously the fishing vessels followed the rules adopted by the Fishing Administration, similar to those applied in SEAFO and CCAMLR in the definition of the VME encounter and thresholds (see SC-06-21 for details).

The annual catch (k) by main VME taxa is shown in Table 10. Gorgonians (GGW) and Scleractinians (CSS) are the most abundant taxa.

The maximum encounters (in k) by taxa* in a line segment randomly selected for sampling, from the last Spanish surveys (from 2017 to 2021) within the SIOFA convention areas are shown in Table 11.

The threshold of 10 or more VME indicator units by segment has never been reached.

Table 10 VME bycatch (kg) of the main taxa by year*

Year	GGW	CSS	DMO	AJH	AXT	ATX	CWD	BZN	Others	Total VME
2017	0.5	0.0	0.6	0.0	0.0	0.4	0.0	0.0	0.1	1.7
2018	0.6	1.6	3.4	0.0	0.0	0.0	0.0	0.0	0.5	6.0
2019	4.4	4.8	4.5	0.0	0.0	0.5	1.5	0.1	2.0	17.8
2020	17.8	16.6	4.4	3.5	2.7	0.9	0.0	1.3	2.7	49.9
2021	16.2	10.1	1.0	0.0	4.3	1.4	0.3	1.5	4.2	39.1

Table 11 Maximum bycatch of the main VME taxa(k) by year*

COD_SP	2017	2018	2019	2020	2021
AJH	0.00	0.00	0.00	1.50	0.00
AJZ	0.00	0.00	0.00	0.40	0.60
AQZ	0.00	0.00	0.10	0.40	0.50
ATX	0.30	0.00	0.30	0.20	0.60
AXT	0.00	0.00	0.00	0.90	0.70
AZN	0.00	0.00	0.10	0.01	0.03
BWY	0.00	0.00	0.00	0.01	0.00
BZN	0.00	0.00	0.04	0.45	0.80
CSS	0.00	0.47	1.80	1.20	2.50
CVD	0.00	0.00	0.00	0.00	0.00
CWD	0.00	0.00	1.30	0.02	0.20
CXV	0.00	0.00	0.00	0.00	0.00
DMO	0.51	0.30	0.70	1.40	0.30
GGW	0.49	0.07	1.67	1.80	3.00
HXY	0.03	0.00	0.03	0.03	0.00
NTW	0.00	0.00	0.22	0.27	0.10
OEQ	0.05	0.08	0.00	0.01	0.40
PFR	0.00	0.00	0.00	0.01	0.40
SZS	0.00	0.00	0.14	0.00	0.00
WOR	0.00	0.00	0.01	0.00	0.00
ZOT	0.00	0.00	0.00	0.30	0.50

* AJH: Anthozoa; AJZ: Alcyonacea; AQZ:Antipatharia; ATX:Actiniaria; AXT: Stylasteridae; AZN: Anthoathecatae; BWY: Bathylasmatidae ;BZN:Briozoan; CSS:Scleractinia; CVD:Cidaridae; CWD:Stalked crinoids; CXV: Chemosynthetic; DMO: Demospongiae; GGW: Gorgonacea; HXY: Hexactinellida; NTW: Pennatulacea; OEQ: Euryalida; PFR: Porifera; SZS: Serpulidae ; WOR: Polychaeta; ZOT: Zoanthidea

5. Biological sampling and length/age composition of catches

Since 2017 biological and size composition sampling by species are conducted by scientific observers on board the EU-Spanish vessels.

Table 12 below shows the biological sampling information of the species in 2021 when more than 100 specimens have been sampled. Information about sex and maturity is also available. Macrourid length measures are made to the Total length and additionally Anal length.

Table 12 Sampling information by species, number and total length (cm) min, max and mean

Sp	Scientific_name	Num	Min	Max	Mean
TOP	*Dissostichus eleginoides*	1542	41.0	156.0	82.2
CYO	*Centroscymnus coelolepis*	498	68.0	142.0	96.2
RIB	*Mora moro*	453	35.0	74.0	57.6
ANT	*Antimora rostrata*	450	38.0	76.0	57.2
ETM	*Etmopterus granulosus*	427	2.4	79.0	61.1
MCH	*Macrourus holotrachys*	391	47.0	102.0	68.2
GRV	*Macrourus spp*	291	43.0	93.0	61.4
RFA	*Raja taaf*	246	57.5	138.0	85.3
BYR	*Bathyraja irrasa*	211	61.0	99.0	81.3
WRF	*Polyprion americanus*	160	59.0	158.0	93.0
GUQ	*Centrophorus squamosus*	122	55.0	148.0	108.7
BRF	*Helicolenus dactylopterus*	102	26.0	51.5	35.7

6. Description of data verification mechanisms

Data from the EU fleet are reviewed searching for outliers on catch and effort data; species names; and fishing set position errors. In the periods where scientific observation is available, data from the vessels are contrasted with the observer's data.

Vessels are also controlled through VMS positioning system.

7. Summary of observer and port sampling programs

Scientific observers have been deployed on board the EU-Spain fishing vessels operating in the region since 2017. Reports on the scientific observations and information on toothfish

recaptures were prepared and provided to SIOFA Secretariat. Three fishing trips have taken place in 2021, one straddling the year 2020 and another straddling the year 2022 (the latter is still unfinished).

In 2021 a total of two trips out of three have been covered by an on-board observer corresponding 100% of the TOP targeted fishing days and 43% of the fishing days targeting other species from a total of 307 fishing days.

The scientific observers (Biologist or Marine Science degree) are trained at the *Instituto Español de Oceanografía*, specific training is also adapted for all fleets that are monitored.

No accidental catch data have been collected for birds or marine mammals in 2021.

Bird scare (tori) lines are deployed in most of the setting/hauling (if weather permits).

The EU has no port sampling program for vessels fishing within the SIOFA CA.

8. Relevant social and economic information (optional)

Catches are landed frozen on Reunion Island.

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