Preliminary Assessment of the Bottom Fishing Impact (BFIA) for the EU fisheries in the Southern Indian Ocean Fisheries Agreement (SIOFA) Convention Area – Update 2021

EU-Spain LONGLINE FLEET BFIA

Contents

PRELIMINARY ASSESSMENT OF BOTTOM FISHING IMPACT FOR THE EU FISHERIES IN THE SIOFA CA - UPDATE 2021

1. Fishing gear description

1.1 Vessels and gears

In 2019 and 2020 only one vessel using Autoline has been fishing in the SIOFA convention area.

Two EU vessels were active in the SIOFA area in 2017 and 2018 each of them with a different gear configuration[1] namely Spanish line and Autoline.

1.1.1 Bottom Longline - Spanish System

This gear has been used by the EU F/V TRONIO in 2018.

The double system (Spanish LL) (Fig. 1a,b,c) consists of an upper line (secondary line) and a mean line from which the hooks are attached by a branch line. The diameter of the upper line is 16 mm. Mean line materials are made of nylon (4 mm of ∅) in the first and last sections of the gear while most of the gear is monofilament rope (5 mm of ∅).

Hooks are Mustad/Stell and attached to the mean line with a nylon branch line of 3mm ∅ and 60-70 cm length. The gear consists on 40-200 magazines (≈15,000 m long). Every magazine has 63 hooks distributed in three sections of a length of 40 m and 23 hooks. The mean distance between hooks is 160 cm. There are two types of weights, 5 k made of iron (the most common) and 8.5-10k granite / cement block, both attached by an 8 mm ∅ polypropylene line of 25 m length. Every 23 hooks a weight is inserted.

Anchors of ≈ 80k are used at the beginning and the end of the gear to fasten the mean line to the sea floor, with 9 iron chains (30 k each). Attached with a buoy line to every anchor it is placed a radio buoy and up to 30 yellow floats. The length of the buoy line depends on the bottom depth. Both, Secondary line and mean line have a positive buoyancy. Below is a diagram of the gear used and the fixing system of the first section of the gear.

The main considerations before line setting are the bottom depth, wind and tidal movement as well as local seabird activity. The vessel deploys the buoys at the desired location sailing at a speed of 7-8.5 knots. (Buoys are clearly marked for identification of the vessel such as the name of the vessel and radio call sign). The mean setting time is about 1.3 hours and the hauling time 7 hours. In the water there are usually between 3 and 4 gears simultaneously, but it depends on the sea conditions. The minimum soak time is about 12 h.

[1] Spanish bottom longline system has a secondary floating line while the Mustad-autoline system has a single line with integrated weights.

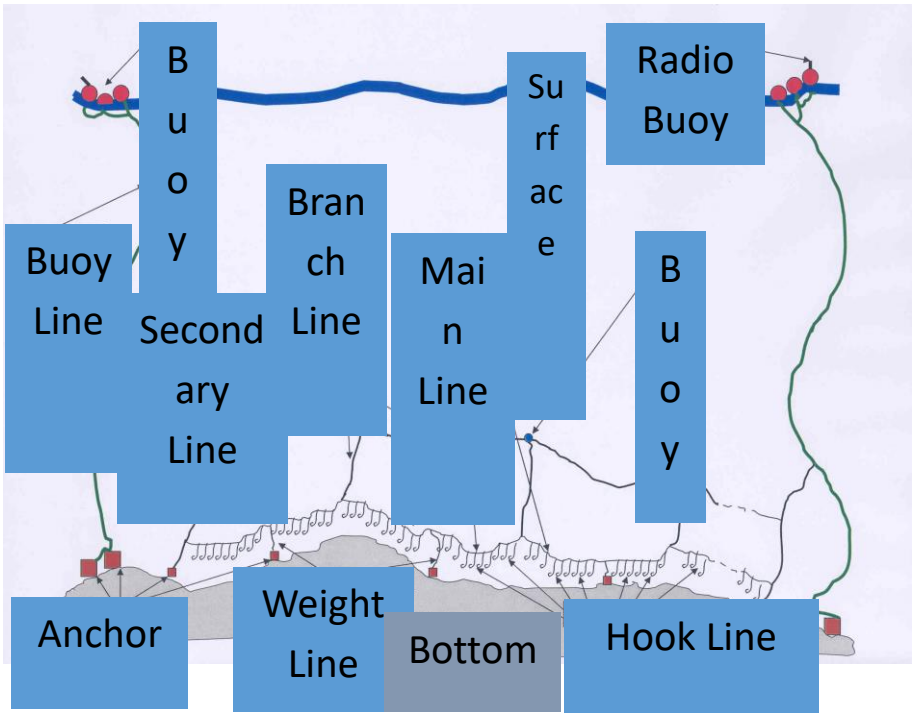


Figure 1a: The Spanish Bottom Longline system deployed on Spanish vessels.

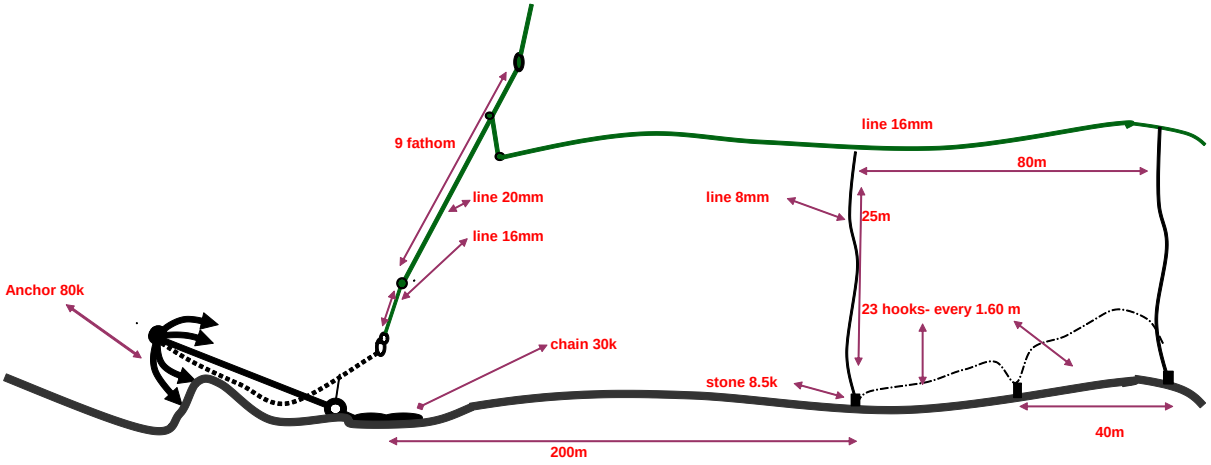


Figure 1b: Fixing system of the Spanish BLL and first section of the rig.

Hook line, nylon 3mm ⌀.

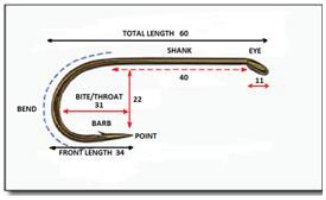


Diagram of the hook,
circular J/J/ (Mustad/Stell)

Granite / cement block in the polypropylene line,
8 mm ⌀, y 25 m length

Standard iron weight in the polypropylene line,8 mm ⌀,
y 25 m length

Radio-buoy (BB-60)

Radio-buoy and floats attached to the anchor

Figure 1c: Other gear devices in the BLL Spanish system.

1.1.2 Bottom Longline – Mustad-autoline System

This gear is used by the EU F/V IBSA QUINTO.

The Integrated Weighted Line (IWL) (Fig. 2a,b) is used as a backbone, which has lead embedded in the core to assist sinking as a seabird mortality mitigation measure, with sink rate of 0.4-0.59 m/s. The line, with a diameter of 11.5 mm, is made of polyester-polysteel mix, and its weighting is about 155 g per meter of backbone. The length ranged between 7560 and 18900 m.

The number of hooks (EZ 14/0 - Steel) per line ranged between 6272 and 13440 units. The hooks and snoods are normally spaced at 1.4 m intervals and connected to rotors and swivels that are permanently attached to the backbone. Line range between 7 and 15 magazines in length (each magazine holds about 896 hooks). Several consecutive setting lines up to 69715 hooks can be deployed. The average length of backbone on each magazine is between 1.08 (6 parts) to 1.26 km (7 parts) in length.

When the downline is fully deployed a length of chain (80 kg) is thrown over followed by a grapnel or anchor. Four concrete weights of about 20 kg each (separated 200 meters between them) is attached at the start of the line at a distance of 200 m to the anchor, and one concrete weight at the end of the line.

Floats usually consist of 5 windy buoys with a GPS, or radio beacon. A streamer line is deployed during longline setting and hauling to deter birds from approaching the hookline.

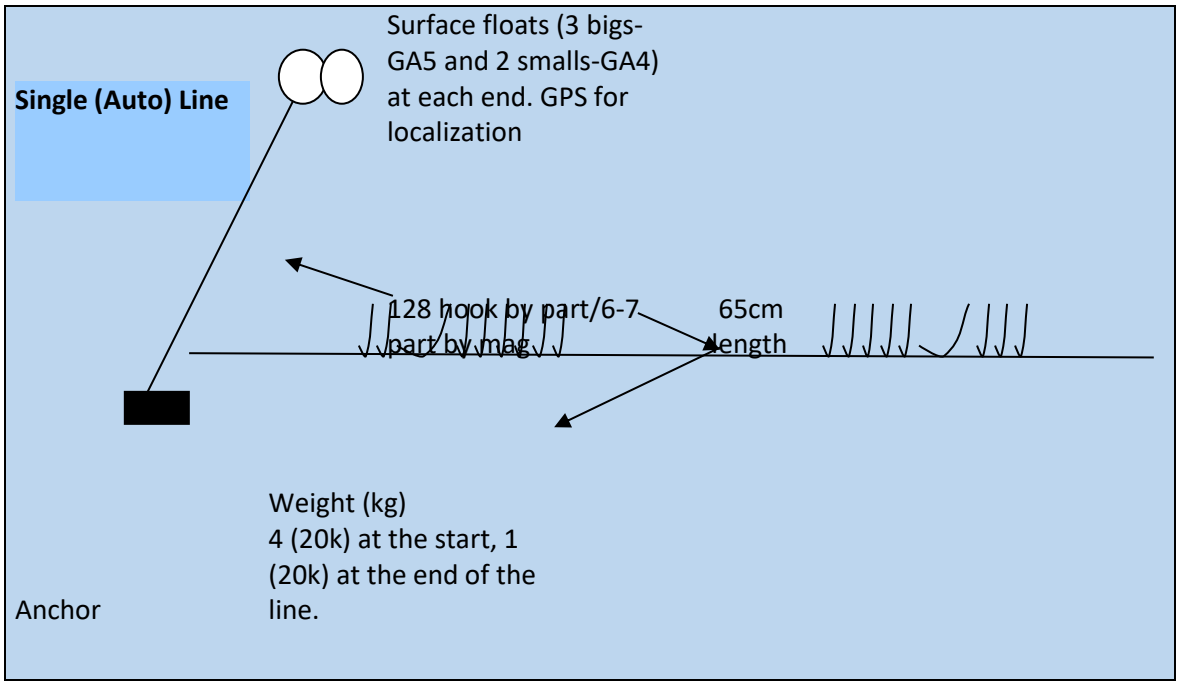
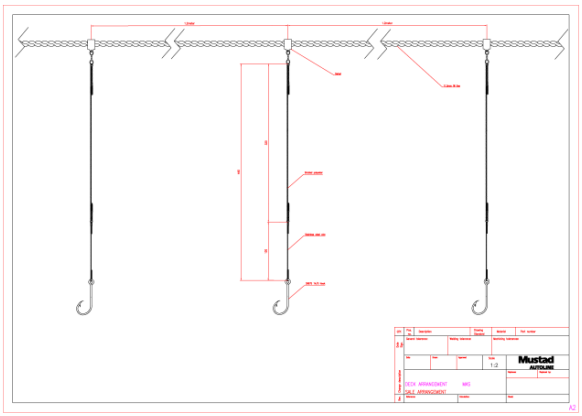
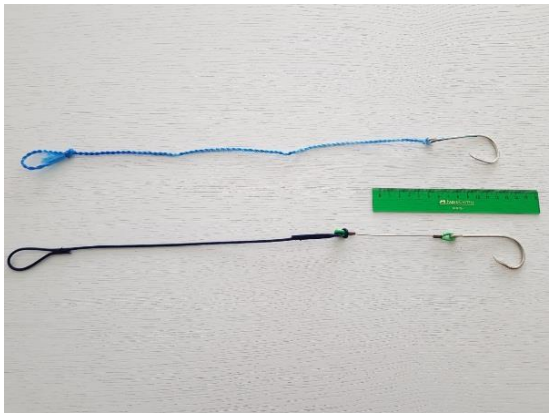


Figure 2a: Single bottom auto longline diagram.





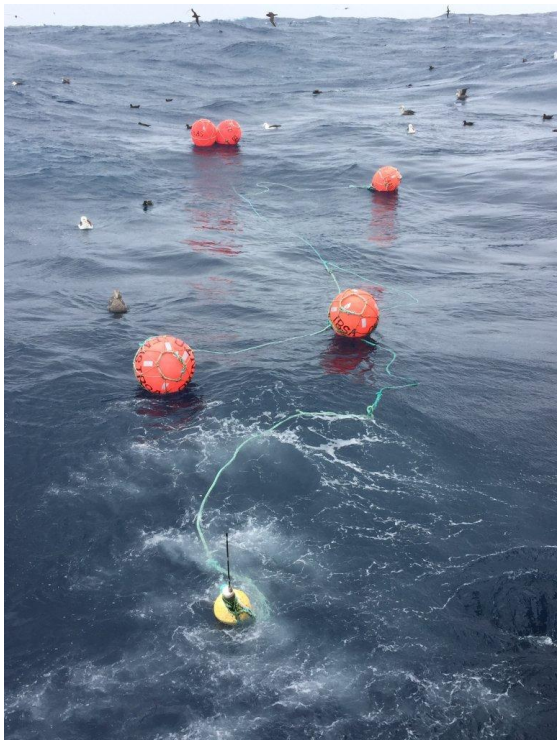


Figure 2b: Diagram and photographs of the hook line and the header of the gear.

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

2. Fishing footprint

2.1 Description of fishing activities

The bottom fisheries within the SIOFA-CA historically are made by one or two fishing vessels per year (EU-Spain).

From April 2015 to the present only bottom longlines are used as well as between 2003 and 2009. From 2013 to March 2015 they have also been used gillnets while in 2000 and 2001 some bottom trawl and traps have been operating in the area.

Data from April 2015 to the end of 2020 have been used in the assessment period where only bottom longline have been operating, taking into account that this is the only gear that it is expected to be operating within the SIOFA CA in the future.

Table 1 shows the number of vessels and the total effort (in km of length) of the longlines by year and SIOFA area, from 2015 to 2020. The length has been calculated with ArcMap as the length of the drawn line from the start to the end of the setting.

Table 1: Number of EU-Spain vessels and total length of fishing gears (km) by fishing season and area.

		Fishing season					
Area		2015	2016	2017	2018	2019	2020
2	Nº Vessels	1	1	1	1	1	1
	LLS (km)	3861.4	5530.5	2575	1652.3	2634	1165
3a	Nº Vessels						1
	LLS (km)						297.3
3b	Nº Vessels			1	2	1	1
	LLS (km)			2012.7	3257.1	697	1039.2
4	Nº Vessels						1
	LLS (km)						63.1
7	Nº Vessels				1	1	1
	LLS (km)				2185.2	1530	695.1

In 2020, 3259,7 km of bottom longlines were deployed by the EU-Spain fleet in areas 2, 3a, 3b, 4 and 7, a decrease to 33% of the effort released the previous year 2019.

Set deployments distribution by depth strata (end position of the longline), for the last six years (2015-2020) using the six meaningful bathomes (*sensu* Last et al., 2010), is showed in Table 2 (n=2097).

Table 2: Set deployment distribution by depth strata.

Depth strata	Name	Number of sets	Percentage
0-200 m	Continental shelf	0	0
201-700 m	Shallow upper continental slope	94	4.48
701-1000 m	Deep upper continental slope	307	14.63
1001-1500 m	Shallow mid-continental slope	1417	67.51
1501-2000 m	Deep mid-continental slope	276	13.15
>2000m	Deep	5	0.24

Fishing grounds for this fleet are mainly located between 1000 and 1500 meters depth (67.5% of the total sets).

2.2 Estimation of footprint index and impact

The EU-Spain historical footprint from 2003 to 2017 has been defined by an area where the bottom longline are distributed in 10’ square grids, considering the total length of fishing sets to define grid intersections (Fig. 3). Most of the fishing activity took place in the areas 2 and 3b of SIOFA CA, and most of the grids has been moderately fished (1-25 sets per grid).

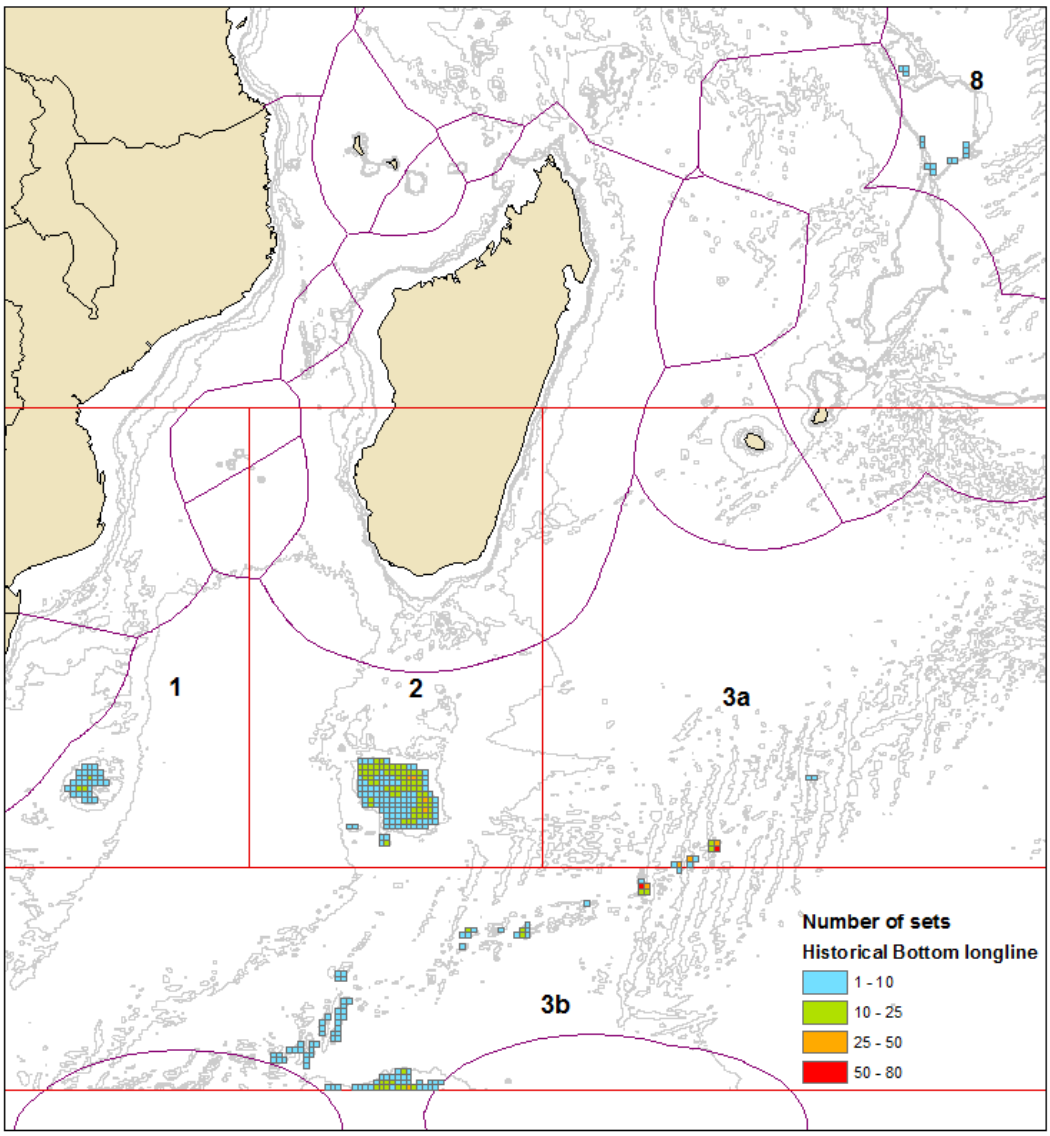


Figure 3: EU-Spain historical footprint up to 2017

In the last three years the footprint has changed when comparing with previous years (Figure 4). A new fishing has started in Williams ridge and in a seamount to the East in area 7 (Figure 4b) and some sets have been located in area 4 (Ninety degrees East Ridge) in 2020.

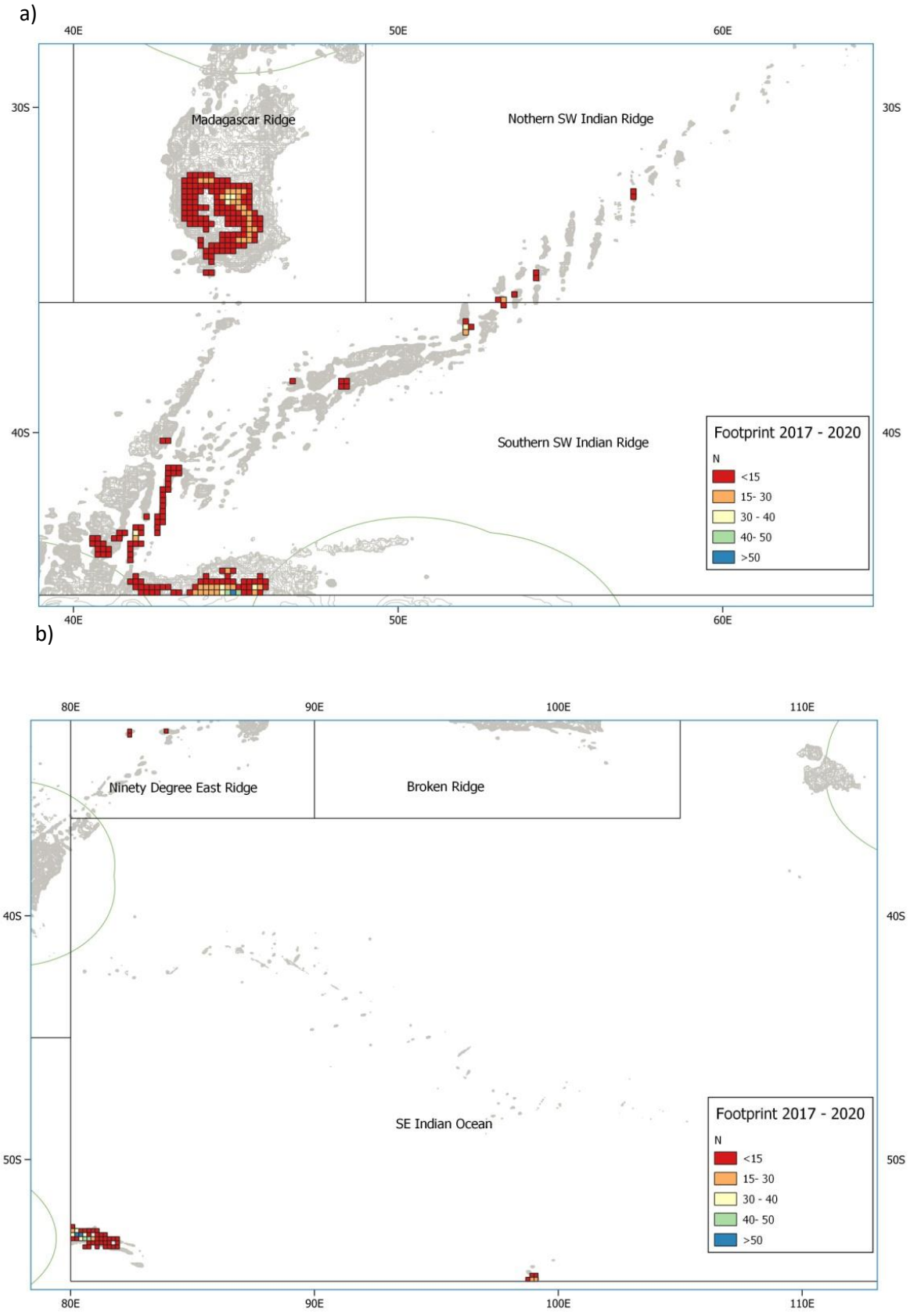


Figure 4: EU-Spain 2017-2020 footprint. West SIOFA in the figure above a) and East SIOFA in figure b) below.

The overlap of the EU-Spanish footprint (10'x10' grid) in the SIOFA Area has been calculated for the historical data as well as for the last fishing year (2020). The historical footprint overlap covers 0.43% of the total SIOFA area, being the footprint of the last year 0.21%. When comparing the same data using the SIOFA area up to 2000m, the overlap results are 24.9% for the historical data and 12% for the year 2020 (Table 3). As there are not SIOFA official surface areas available, it has been used the estimations provided by Australia in the 2011 report for SIOFA (CSIRO, 2011).

Table 3: Overlap of EU-Spain fishing footprint with fishable seabed.

Years	Footprint area (km^2)	Total SIOFA area[1] (km^2)	Overlap [1] (%)	SIOFA area [2] <2000m (km^2)	Overlap [2] (%)
2003-2018	115 934	26 880 647	0.43	466 050	24.9
2018	59 682	26 880 647	0.22	466 050	12.8
2019	32 039	26 880 647	0.12	466 050	6.9
2020	55 936	26 880 647	0.21	466 050	12.0

(1) Total SIOFA seabed
(2) SIOFA seabed <2000 m

However, this approach overestimates the impacted bottom surface because in our estimation we have considered the whole grid (10*10) as an impacted area even when a single portion of a line is crossing a grid.

Effort density estimations (longline km/km^2 of fishable area) reach values of 0.007 in 2020. This estimation considers the effort impact as lineal, without taking into account the seabed cumulated impact.

Estimates of fishing "footprint index" (km^2 per unit of fishing effort) and "impact index" have been developed for Autoline systems in CCAMLR (SC-CAMLR XXX, Annex 7, Appendix D) and for the Spanish Longline by the Spanish CCAMLR delegation (SC-CAMLR-XXXV/BG/05)

Footprint index: mean = 4.3×10^{-3} (km^2 of seabed area per km of longline deployed)

Impact index: mean = 3.3×10^{-3}

VME taxa incidental catches

Since 2017, VME data are gathered from scientific observations onboard EU-Spain fishing vessels.

VME catches have never reached the threshold of 10 or more VME indicator units.

The CCAMLR VME Taxa Classification Guide 2009 has been used until an official list is adopted in SIOFA.

Data on taxa potentially impacted are Sponges (Demospongia (DMO) and Hexactinellida(HXY), Cnidarians from the Stylasteridae family (AXT), Cnidarians from the Order Gorgonacea (family Isidiidae and others-GGW), Cnidarians from the order Actiniaria (ATX) and Echinodermata from the Euryalidae family (OEQ). Data on VME by-catch taxa and its quantification have improved the last four years with the implementation of the scientific observation on board. From 2019, the EU-Spain bottom longline fleet is applying the protocols adopted by SIOFA in the CMM 2019-01. Before 2019 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. Vessels are marking their fishing lines

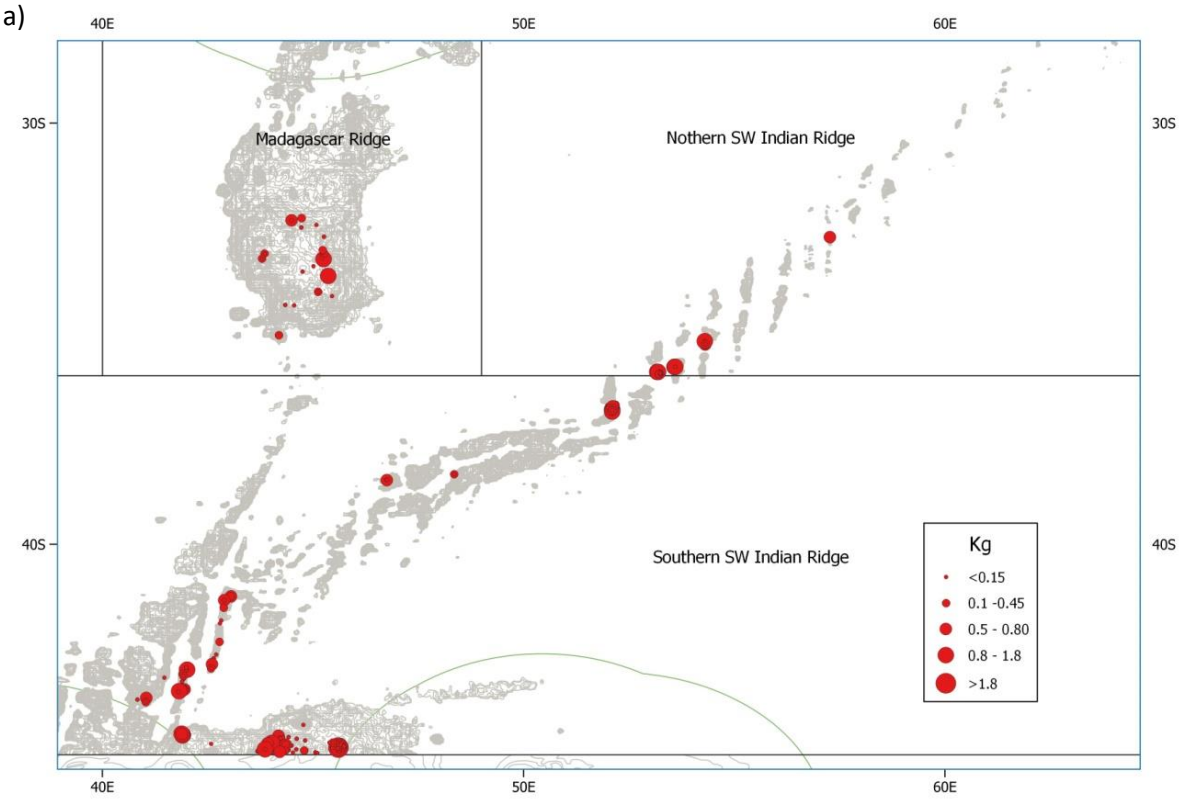
into line segments and collecting segment-specific data on the number of VME indicator units. It is required that if 10 or more VME indicator units are recovered in one line segment, to complete hauling any lines intersecting with the Risk Area without delay and not to set any further lines intersecting with the Risk Area. The vessel shall immediately communicate to the Spanish directorate the location of the midpoint of the line segment from which those VME indicator units were recovered along with the number of VME indicator units recovered.

Impacts on potential vulnerable marine ecosystems (VMEs) in the fisheries have been reduced through decisions of using the longline method instead of bottom trawling and to move away from clip on weights in favor of integrated weighted longlines.

EU countries will ensure that any vessels flying its flag comply with any Conservation Measures adopted at SIOFA for the purpose of preventing significant adverse impacts on VMEs.

The location and quantitative catch (k) of the VME taxa encounters from 2017 to 2020 is shown in Figure 5.

a)



b)

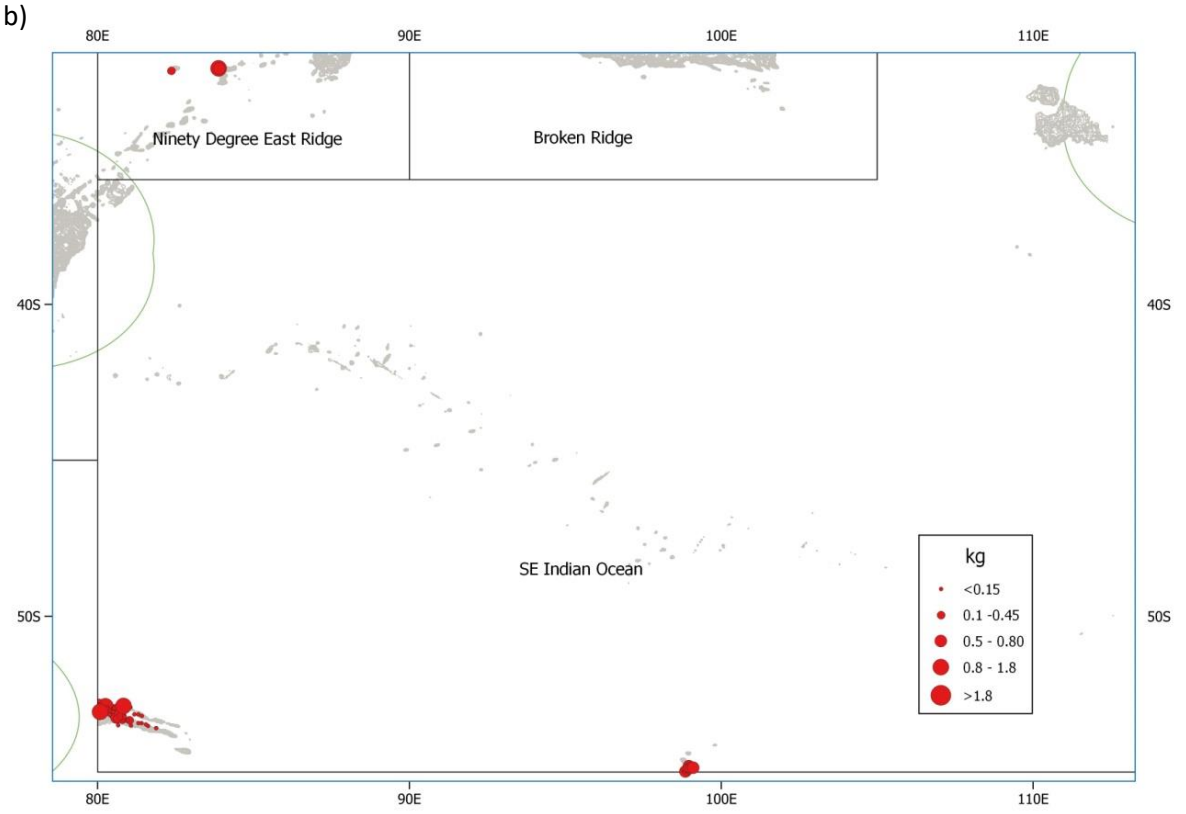


Figure 5: VME taxa encounters by the Spanish fleet from 2017 to 2020. West SIOFA in the figure above (a) and East SIOFA in figure (b) below.

3. Monitoring, Management and Mitigation of impact of proposed activities in the bycatch

The EU ensures that all vessels flying any of its Member flag comply with all Conservation and Management Measures (CMMs) adopted by SIOFA for the purpose of monitoring fishing activities in the SIOFA area.

All EU vessels carry Vessel Monitoring Systems (VMS). Compliance it is ensured through the routine monitoring of VMS data by national authorities. Vessels are also required to provide comprehensive fine-scale catch, bycatch and effort reports for all fishing activities.

Directed fishing for deep-sea sharks listed in Annex I of CMM 2019/12 is prohibited. For this purpose, a number of measures to avoid high bycatch rates to EU fishing vessels are applied:

- The species or group of species that is the largest percentage by weight of the total catch shall be considered as directed fishing in a haul.
  (a) The first time that the total weight of the catch of deep-sea sharks is the greatest percentage by weight of the total catch, the vessel shall immediately move at least 3 nautical miles from any position of the previous set. In this case it shall be considered as by-catch and the targeted fishing violation shall not apply.
  (b) If the same circumstance occurs in the second haul, it shall move at least 10 nautical miles and shall not return for at least 60 hours. In this case it shall also be considered as by-catch.

(c) On return to the initial location after at least 60 hours, a trial haul of no more than 3 hours shall be made. If the total weight of the deep-sea shark catches is the greatest percentage by weight of the total catch, in this case it shall not be considered as directed fishing, but the vessel shall change position in accordance with paragraphs a) and b).

- Any species caught shall be identified and reflected in the catch form.

(d) Regulation (EU) 605/2013 of the European Parliament and of the Council on the removal of fins of sharks on board vessels (OJEU of 29/06/2013) shall apply.

4. Residual risk of Significant Adverse Impacts on deep-water stocks and Vulnerable Marine Ecosystems

Given the current monitoring, mitigation and management arrangements, including effort limitation under CMM 2019/5, as well as those measures outlined above, the EU considers that the residual risk of EU vessels' activities in SIOFA CA causing or contributing to significant adverse impacts to deep-water stocks of the targeted species and associated bycatch species is low.

Since 2017 EU-Spain implemented the CCAMLR CM 22-07 until the entry into force the SIOFA CMM 2019-02. Taken into account that the VME catch threshold has never been achieved by EU vessels, the impact on VME taxa is considered to be low.

This assessment will be revised taking into account the results of all catches, the distribution and abundance of bycatch species and when a new assessment on the composition, distribution and abundance of VME indicator species becomes available.

5. References

CCAMLR VME Taxa Classification Guide. 4 pp. (2009).

CSIRO, 2011. Bottom Fishery Impact Assessment, Southern Indian Ocean Fisheries Agreement. October 2011.

Last P.R., Lyne V.D., Willians A., Davies C.R., Butler A.J., Yearsley G.K. (2010). A hierarchical framework for classifying seabed biodiversity with application to planning and managing Australia's marine biological resources. Biological Conservation 143:1675-1686.

SC-CAMLR. 2011. Report of the Working Group on Fish Stock Assessment, In: Report of the Thirtieth Meeting of the Scientific Committee (SC-CAMLR-XXX), Annex 7, Appendix D. CCAMLR, Hobart, Australia.