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Information about tagged Patagonian toothfish (*Dissostichus eleginoides*) tagged in the CCAMLR Convention Area and recovered in the SIOFA management area by two Spanish vessels in 2017/18

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Introduction

Patagonian (*Dissostichus eleginoides*) and Antarctic toothfish (*D. mawsoni*) have circumpolar distributions and are generally associated with bathymetric features between 500 and 2250m (Eastman, 1993, Dunn et al., 2012). Patagonian toothfish are found around South America from Ecuador to Uruguay, and in the sub-Antarctic and Antarctic.

Information about tagged specimens released in the CCAMLR convention area but recaptured outside this area should be easily shared between RFMOs and CCAMLR. That is the reason why the Scientific Committee at the SC-CAMLR-XXXV meeting noted that the Secretariat has engaged in initial consultations with the Secretariat of the Southern Indian Ocean Fisheries Agreement (SIOFA) among others RFMOs that operate toothfish tagging programs in areas adjacent the Convention Area in order to discuss how they may share data on toothfish tagging programs where such data exchange may help to reduce duplication of effort and develop efficiency in and management.

Eleven tagged specimens of patagonian toothfish (*D. eleginoides*) that have been released in the CCAMLR management area have been recovered by two Spanish vessels fishing in the Indian ocean within the SIOFA management area (Figure 1).

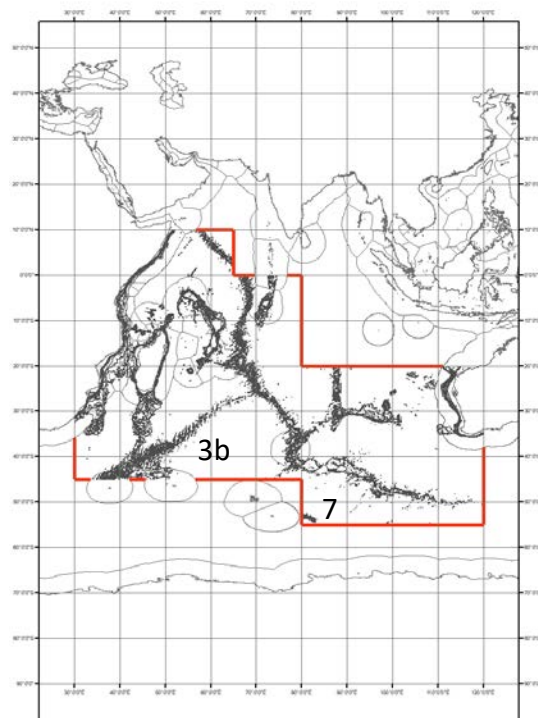


Figure 1. The SIOFA management Area, including management subareas mentioned in this analysis.

Methods

Two Spanish fishing vessels have been working in the SIOFA management area in 2017 (16/09/2017-27/02/2018) and 2018 (04/05/2018-16/08/2018).

The fish recaptured had two conventional T-bar tags. All specimens have been photographed together with the tag identification, sampled for length, weight and sex and the otoliths were extracted. One of the recaptured fish had additionally a PIT tag inside the muscle.

The trajectory have been calculated in ArcGIS and the distance traveled is linear. Obviously, the real trajectory is much longer than the one calculated.

Results

From the eleven patagonian toothfish (*D. eleginoides*) tagged and recovered, the release data from one of them is missing. It has likely been released in the 58.5.1 division.

The time elapsed between the release and recapture has been between 3 and 10 years at liberty (Table 1). All fish were small at release (between 75-93 cm) being the maximum increment in weight 5 kg and 26 cm in length.

ID	RELEASE				RECAPTURE				PARAMETERS			
	CCAMLR SSRU	sp	length	weight	Vessel	Area	length (cm)	weight (k)	Days at liberty	Distance (km)	Δ weight	Δ length
TR_01	58.5.2	TOA	76.5	4.42	TRONIO	FAO 57-SIOFA SUBAREA 7	81.4	5.2	1112	155	0.78	4.9
TR_02	58.5.2	TOA	79.2	4.96	TRONIO	FAO 57-SIOFA SUBAREA 7	80.2	5.2	1145	164	0.24	1
TR_03	58.5.1	TOA	61.4	2.07	TRONIO	FAO 57-SIOFA SUBAREA 7	72.4	3.3	2373	1137	1.23	11
TR_04	58.5.1	TOA	73.4	3.86	TRONIO	FAO 57-SIOFA SUBAREA 7	74.8	3.8	1292	1174	-0.06	1.4
TR_05	58.5.1	TOA	80.5	5.35	TRONIO	FAO 57-SIOFA SUBAREA 7	87.8	5.55	2035	1192	0.2	7.3
IB_01	58.5.1	TOA	61	2.12	IBSA V	FAO 51-SIOFA SUBAREA 3b	87	7.19	3353	1793	5.07	26
IB_02	58.6	TOA	70.9	3.57	IBSA V	FAO 51-SIOFA SUBAREA 3b	87	5.91	2694	380	2.34	16.1
IB_03	58.6	TOA	66.8	2.7	IBSA V	FAO 51-SIOFA SUBAREA 3b	75	4.02	1947	249	1.32	8.2
IB_04	58.5.1*	TOA	-	-	IBSA V	FAO 51-SIOFA SUBAREA 3b	93	8.36	-	-	-	-
IB_05	58.5.1	TOA	66.5	2.6	IBSA V	FAO 51-SIOFA SUBAREA 3b	82	5.01	2252	1665	2.41	15.5
IB_06	58.6	TOA	-	-	IBSA V	FAO 51-SIOFA SUBAREA 3b	68	2.76	3623	6	-	-

*Estimated, there is not release information available.

Specimens recaptured have traveled (straight line distance) from 6 to ~1800km, being 6 out of 10 a long distance movements exceeding 1000km (Figure 2).

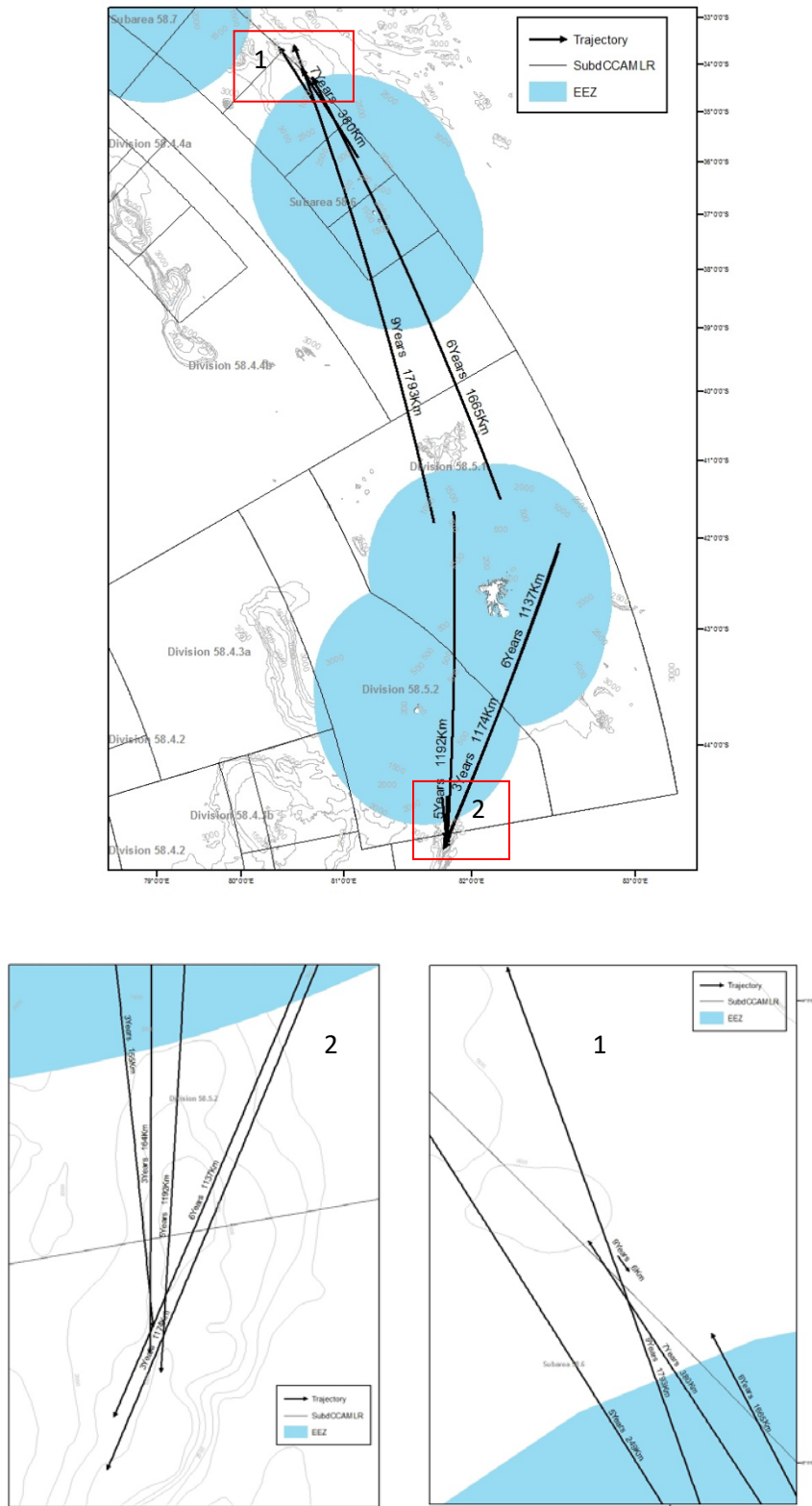


Figure 2. Trajectory showing the years at liberty and distance traveled (km).

The movement pattern is different depending on the area that the fish was released. Fishes that have traveled a distance longer than 1000km were all released within the 58.5.1 Division and moved in both directions (West-Northwest and Southeast) while all fish released in the Division 58.5.2 or subarea 58.6 traveled smaller distances and with directed movements Southwest and Northeast respectively.

Discussion

Between 2006-2016 there were 210 records of Patagonian and 14 Antarctic toothfish where fish had made movements greater than 200km. Of the fish making long-distance movements 91% of *D. eleginoides* moved in a counter-clockwise direction around Antarctica. The median distance between release and recapture is 12km (max 5 708km) (CCAMLR, 2017).

All specimens recaptured in SIOFA but one have moved more than 100km. 6 out of 10 traveled a very long distance exceeding 1000km. Curiously the only one that was released in the same spot as recaptured is the patagonian toothfish with more days at liberty (close to 10 years).

In the Patagonian toothfish fishery around Heard and McDonald Island, movements of over 100km were often directed to the North-Northwest of the Kerguelen Plateau (Welsford et al., 2014), but looking at the movements of the specimens in these surveys the only two that have been released in the 58.5.2 division have traveled more than 100km directed to the East, similar trajectory to 3 out of 5 specimens released in the 58.5.1 division which traveled very long distance, more than 1000km.

Unlike the fish tagged in the 58.6 subarea and 2 out of 5 in the 58.5.1 Division that have moved North-Northwest.

Data from tagged patagonian toothfish recaptured in the SIOFA area are not usually reported as there are not a tagging program for the fishing vessels operating in the area. Most of the recaptures notified come from fish tagged in the CCAMLR convention area. Although the movement pattern and biology of the recaptured fishes in the two Spanish surveys are not significant in number, it is worth to pay attention to the particular characteristics of the recaptured specimens that differs a bit from the general behaviour.

References

CCAMLR Secretariat. Long-distance movements of Patagonian (*Dissostichus eleginoides*) and Antarctic toothfish (*D. mawsoni*) from fishery-based mark-recapture data. WG-FSA-17/06.

Welsford, D.C., Péron C., Ziegler, P.E. and Lamb T.D. 2014. Development of the Patagonian toothfish (*Dissostichus eleginoides*) tagging program in Division 58.5.2, 1997-2014. Document WG-FSA-14/43. CCAMLR, Hobart, Australia: 27pp.