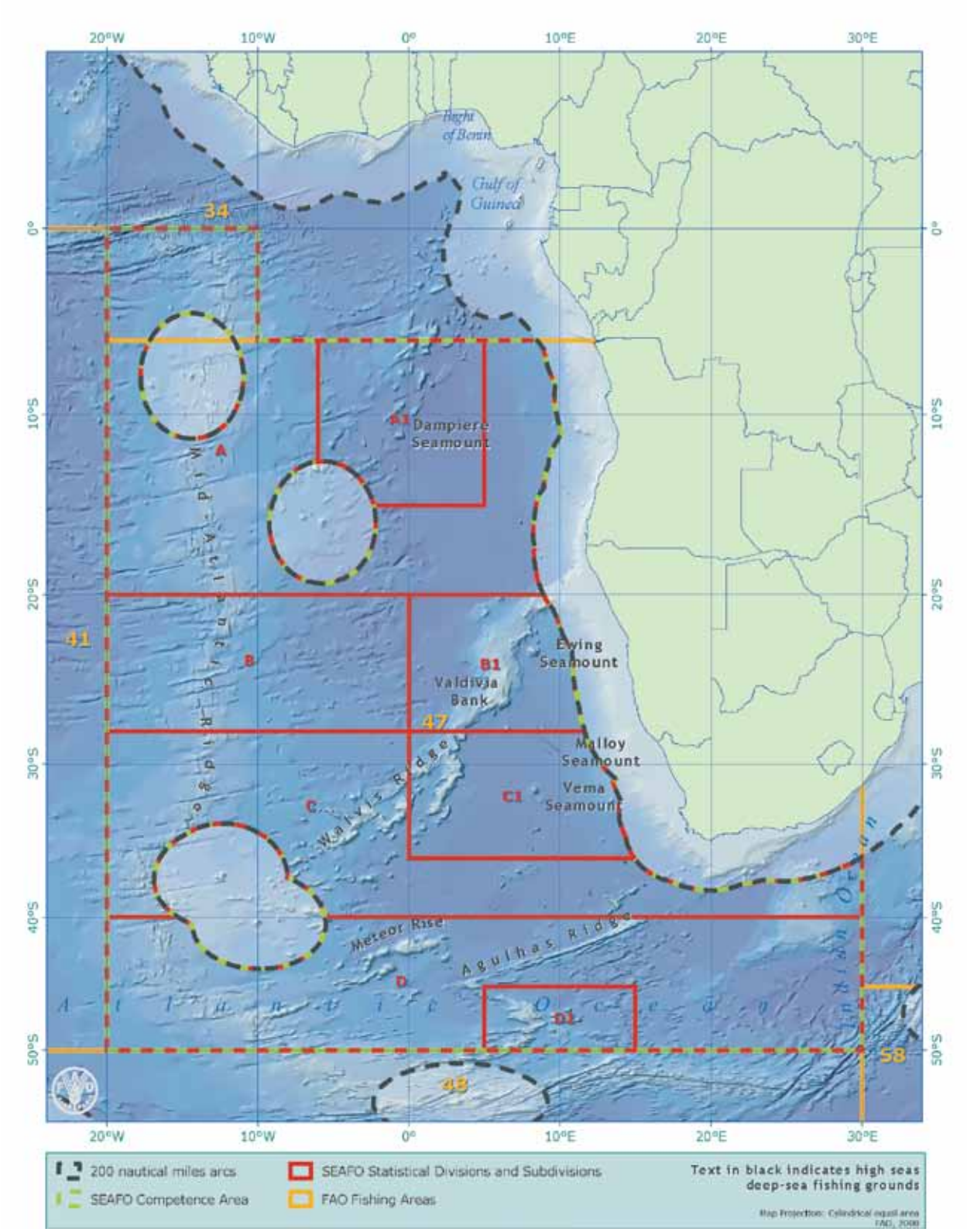


MAP 1
High seas deep-sea fishing grounds in the South East Atlantic Ocean

South East Atlantic Ocean

FAO Statistical Area 47 (and a portion of 34)

GEOGRAPHIC DESCRIPTION OF THE REGION

Angola, Namibia and South Africa are the three countries bordering the South East Atlantic Region (FAO Statistical Area 47) along the African coast. This region extends from the Central Atlantic in the north at 6°S to the Southern Ocean in the south at 50°S.

The western limit of the South East Atlantic is the 20°W meridian, which means that the southern Mid-Atlantic Ridge is within the region, at around 15°W, and extends over the entire region from north to south. Other important bottom topographic features in this region are the Walvis Ridge and the Valdivia Bank, joining the exclusive economic zone (EEZ) of Tristan da Cunha on the northern part of the Namibian continental shelf at around 18°S, and in the southern part, the Meteor Rise and the Agulhas Ridge. These are the areas largely targeted in the deep-sea bottom fisheries in the region, together with associated or isolated seamounts areas such as Ewing and Molloy Seamounts, Vema Seamount and those in SEAFO Subdivision A1 (SEAFO, 2007a). It is important to note that in the South East Atlantic, the continental shelf along the coasts does not extend beyond the EEZs of the coastal states.

MANAGEMENT REGIME APPLICABLE TO DEEP-SEA BOTTOM FISHERIES IN THE HIGH SEAS

Regional Fisheries Management Organization/Arrangement

The South East Atlantic Fisheries Organisation (SEAFO) was established in 2003 with the entry into force of the Convention on the conservation and management of fisheries resources in the South East Atlantic Ocean. The Convention applies within the Convention Area, which encompasses all areas outside the EEZs of Angola, Namibia, South Africa and United Kingdom overseas territory of Saint Helena and its dependencies in SEAFO Divisions A, C and D (see Map 1).

The SEAFO Convention Area covers about 16 million square kilometres (km^2). It is divided into four main Divisions (A–D), extending from the northern to the southern portions of the area, with each Division containing a Sub-Division (A1, B1, C1 and D1) where the majority of the bottom fishing on the high seas appears to have occurred (see Map 1). In addition to FAO Statistical Area 47, which has now been made consistent with SEAFO Sub-Divisions (Garibaldi and Hamukuaya, 2007), the SEAFO Convention Area also covers a portion of FAO Statistical Area 34 (SEAFO Sub-Division A2).

As of August 2008, contracting parties of the SEAFO Convention are: Angola, the European Union, Namibia, Norway and South Africa. The subsidiary bodies of SEAFO include the Commission, the Scientific Committee and the Compliance Committee as well as the Secretariat. The Commission has met annually since 2004 and the Scientific Committee has met annually since 2005.

DESCRIPTION OF DEEP-SEA BOTTOM FISHERIES IN THE HIGH SEAS

History of fisheries

The former Union of Soviet Socialist Republics (USSR) developed a fishery for alfonsino (*Beryx* spp.) in the South East Atlantic in the late 1970s, with reported catches ranging from approximately several hundred tonnes to 2 000 tonnes per year through the mid-1980s. Iceland, Norway, Poland, the Russian Federation and Spain all reported catches of alfonsino during the mid- to late 1990s. The highest reported catch

for all distant water fleets combined only reached approximately 3 500 tonnes in 1997. Since then, the reported catch has decreased to a few hundred tonnes per year, most of which has been caught by Namibia. Ukraine, South Africa and Namibia were also fishing for pelagic armourhead (*Pseudopentaceros richardsoni*) on the high seas in the mid-1990s with catches averaging a few hundred tonnes per year. (SEAFO, 2007a)

Deep-sea trawl fisheries for orange roughy (*Hoplostethus atlanticus*) began in the mid-1990s, primarily within the Namibian EEZ, with relatively high initial catches of between 10 000 and 20 000 tonnes per year, followed by a marked decrease to approximately 1 000–2 000 tonnes per year in the period 2002–2004. Norway reported very limited fishing on orange roughy in the region in 1997, 1998 and 2000 (FAO, 2008). The activity of one Norwegian vessel is also reported by the SEAFO Scientific Committee (SEAFO, 2006a) during the same period.

Current fisheries

The main species of commercial value exploited in the SEAFO region are orange roughy, alfonsino, deep-sea red crabs (*Geryon* spp.) and Patagonian toothfish (*Dissostichus eleginoides)* (SEAFO, 2007a) (see Table 1 and Figure 1).

Bluenose warehou (blue-eye trevalla) (*Hyperoglyphe antarctica*) is known to have been landed in the port of Cape Town by both bottom trawlers and demersal longliners in recent years (Spain and Uruguay have reported minor catches to FAO in this region); these catches were made in the South Atlantic in and around the waters of Tristan da Cunha (FAO Statistical Subarea 47.4), which could represent catch taken either in the high seas or the EEZ (D. Japp, CapFish, personal communication, 2008).

Bottom and mid-water trawl fisheries for orange roughy and alfonsino

The orange roughy and alfonsino fisheries are conducted using both mid-water and bottom trawls. The main fishing areas for these species appear to be in Divisions A–C with a large portion of the catch reported from Sub-Division B1. Pelagic armourhead, oreo, cardinal fish and other deep-sea species are taken as bycatch in these fisheries.

TABLE 1
Main species targeted by deep-sea species in the high seas of the South East Atlantic

Common name	Scientific name
Main target species – trawl fisheries	
Alfonsino	*Beryx* spp.
Orange roughy	*Hoplostethus atlanticus*
Main target species – other gear types	
Deep-sea (red) crabs (*Geryon* nei)	*Geryon* spp.
Patagonian toothfish	*Dissostichus eleginoides*
Other species	
Pelagic armourhead	*Pseudopentaceros richardsoni*
Bluenose warehou (blue-eye trevalla)	*Hyperoglyphe antarctica*
Boarfishes nei	Caproidae
Cardinal fishes nei	*Epigonus* spp.
Octopus	Octopodidae
Oreo dories nei	Oreosomatidae
Squid	Loliginidae
Sharks (deep-sea) nei	Selachimorpha
Rays and skates nei	Rajidae
Wreckfish	*Polyprion americanus*

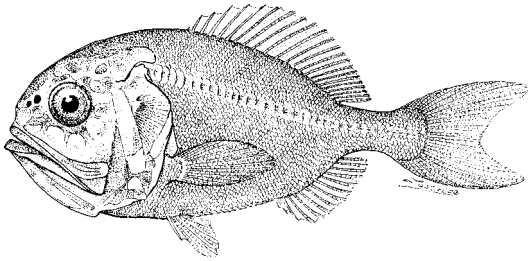
Namibia reported one vessel engaged in bottom fishing on the high seas of the South East Atlantic in 2006 with a catch of 36 tonnes, primarily orange roughy.[1] The Cook Islands reported that two high seas bottom trawl vessels operated in FAO Statistical Area 47 during the 2003–2006 period, but did not provide catch information.[2]

The Scientific Committee of SEAFO indicates that to date, only data from the Namibian orange roughy fishery provide enough information to attempt to analyse trends in stock abundance. The data available from Namibia are from 1995 to 2005 (not including 1998 when no high seas fishery occurred). During this period, seven Namibian

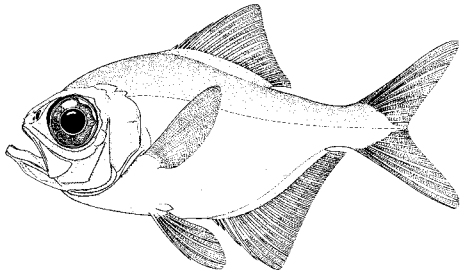
[1] Response from Namibia to 2007 FAO Questionnaire on High Seas Deep-sea Fisheries (hereinafter referred to as the FAO Questionnaire: see Appendix A).
[2] Response from the Cook Islands to FAO Questionnaire.

FIGURE 1
Examples of species targeted by bottom fisheries in the high seas of the South East Atlantic

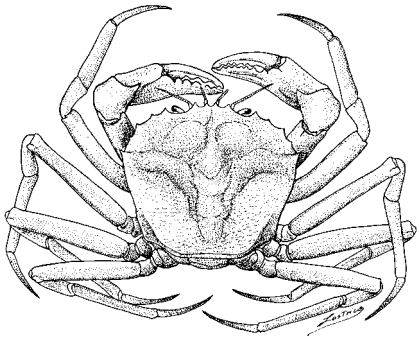
Orange roughy (*Hoplostethus atlanticus*)



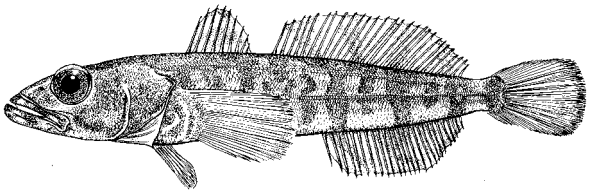
Alfonsino (*Beryx* spp.) (*Beryx decadactylus*)



Deep-sea (red) crab (*Geryon quinquedens*)



Patagonian toothfish *(Dissostichus eleginoides*)



Source: FAO.

vessels were fishing in the SEAFO Area for orange roughy and in total 1 270 trawls were made and approximately 1 000 tonnes of deep-sea species were caught. Of this amount, 290 tonnes were orange roughy and 303 tonnes were alfonsino. The Scientific Committee also reports that vessels flagged to Cyprus, Mauritius and the Russian Federation offloaded a combined total of 969 tonnes of alfonsino, 217 tonnes of squid, 46 tonnes of boarfish and 23 tonnes of pelagic armourhead in Walvis Bay, Namibia in 2004. The catch was presumed to have been taken in the SEAFO Area by vessels fishing with bottom trawl gear. (SEAFO, 2006a)

Longline fishery targeting Patagonian toothfish

The fishery for Patagonian toothfish is a bottom longline fishery largely conducted in the southern portion of the SEAFO Area, in Divisions C and D (SEAFO, 2006a). The Republic of Korea reportedly caught 243 tonnes of Patagonian toothfish in the SEAFO Area in 2003 and 10 tonnes in 2005 (SEAFO, 2007a). However, the Korean reply to the FAO Questionnaire does not mention activity in FAO Area 47 during the period 2003–2006. A Spanish vessel (or vessels) reportedly caught 101, 202 and 11 tonnes of Patagonian toothfish in the SEAFO Area in 2003, 2004 and 2006 respectively (SEAFO, 2007a). In its answer to the FAO Questionnaire, Japan reported one longliner operating in the area in 2006, targeting Patagonian toothfish (114 fishing days).[3]

[3] Response from Japan to FAO Questionnaire.

TABLE 2
Catch in tonnes by country of main species in bottom fisheries in the SEAFO Area, 2003–2006

Country	Orange roughy	Alfonsino	Pelagic armourhead/ boarfishes nei	Oreo dories	Patagonian toothfish	Red crabs	Unknown	Total (tonnes)
Cook Islands	/	/	/	/	/	/	142	142
Cyprus	/	/	22	/	/	/	437	459
Japan	/	/	/	/	230	624	/	854
Mauritius	/	/	25	/	/	/	115	140
Namibia	91*	7	4	9**	/	54	/	165
Portugal	/	5	/	/	/	/	/	5
Russian Federation	/	264	/	/	/	/	/	264
Spain	/	/	/	/	314	/	/	314
Republic of Korea	/	/	/	/	255	/	/	255
Others (combined reporting of Cyprus, Mauritius and the Russian Federation in Walvis Bay, Namibia in 2004)	/	969	46 (boarfish) / 23 (armourhead)	/	/	/	217 (squid)	1 255
Total tonnes	91	1 245	120	9	799	678	911	2 598

/ = Unknown.
* Includes catch of 31 tonnes of orange roughy in 2006; reported in the response from Namibia to the FAO Questionnaire.
** Includes catch of 4 tonnes of oreo in 2006; reported in the response from Namibia to the FAO Questionnaire.
Source: SEAFO, 2007a.

TABLE 3
Summary of available data, 2005–2006

Trawl (mid- and bottom trawl) fishery Orange roughy and alfonsino				
Country	**Year**	**Number of vessels**	**Catch[1] (tonnes)**	**Effort (number of fishing days)**
Cook Islands	2006	1[2]	/	/
Namibia	2006	1[2]	36[2]	/
Portugal	2006	/	0.3	/
Russian Federation	2005	/	54	/
Bottom longline fishery Patagonian toothfish				
Country	**Year**	**Number of vessels**	**Catch (tonnes)**	**Effort (number of fishing days)**
Japan	2006	1[2]	157	114[2]
	2005	/	73	/
Republic of Korea	2005	/	10	/
Spain	2006	1[1]	11	/
Pot fishery Deep-sea red crabs				
Country	**Year**	**Number of vessels**	**Catch (tonnes)**	**Effort (number of fishing days)**
Japan	2006	1[2]	543[2, 3]	116[2]
	2005	1[2]	234	/
Namibia	2005	1[1]	54	/

/ = Unknown.
[1] SEAFO, 2007a. All catch information comes from this source, unless noted otherwise.
[2] Returned questionnaires to FAO by respective country.
[3] There is a discrepancy between this information and that reported in SEAFO, 2007a.

Pot fishery targeting deep-sea red crab

Deep-sea red crabs are taken with pots, with a large percentage of the overall catch in the area taken in Sub-Division B1. In its answer to the FAO Questionnaire, Japan reported the activity of one trap setter in 2006, with a catch of 361 tonnes and 116 fishing days. The SEAFO Scientific Council reports the activity of one Namibian pot setter in 2005, with a total catch of 54 tonnes (SEAFO, 2006a). No information is available for other years for the 2003–2006 period.

Table 2 provides a summary of the catch by country of the main target species in 2003–2006.

Catch and effort summary

Table 3 provides a summary of the catch and effort of the above-mentioned fisheries.

Illegal, Unreported and Unregulated (IUU) fishing

Only Angola, the European Union, Namibia, Norway and South Africa are currently parties to the SEAFO Convention. Fishing for species regulated by SEAFO by vessels whose flag states are not parties to the Convention remains an issue. In this regard, the Annual Meeting of SEAFO in 2007 specifically raised concern regarding vessels from the Republic of Korea and Japan fishing in the area (SEAFO, 2007b).

A number of countries known to be fishing in the area in recent years have not fully reported catch. The report of the 2007 Meeting of the Scientific Committee of SEAFO (SEAFO, 2007a) states that vessels from Spain, Portugal, the Russian Federation, Cyprus, Mauritius, Japan, the Republic of Korea, Poland, Norway, South Africa and Namibia are known to have fished in the SEAFO Area. Most countries have provided incomplete statistics over the years and therefore an estimate of total annual catches is not possible with the data currently available. The amount of IUU fishing in the SEAFO Area is unknown (SEAFO, 2007a).

STATUS OF THE STOCKS, BYCATCH AND IMPACTS ON VULNERABLE MARINE ECOSYSTEMS

Status of target stocks

In 2006, the Scientific Committee of SEAFO indicated that, because of a lack of sufficient data for stock assessments, it was not possible to give specific management advice for any of the species harvested in the SEAFO Area. However, it did state that the stocks of deep-sea red crabs are not likely to be depleted.

Status of bycatch stocks

The status of bycatch species is unknown.

Impacts on Vulnerable Marine Ecosystems (VMEs)

The Census of Marine Life on Seamounts (CenSeam), a global study of seamount ecosystems, has identified the South Atlantic as a poorly known and sampled area in terms of global seamount biodiversity (SEAFO, 2007a). Impacts on VMEs are unknown but likely to have occurred as a result of bottom fisheries, in particular bottom trawling, on seamounts and ridge systems in the region (Clark *et al*., 2006).

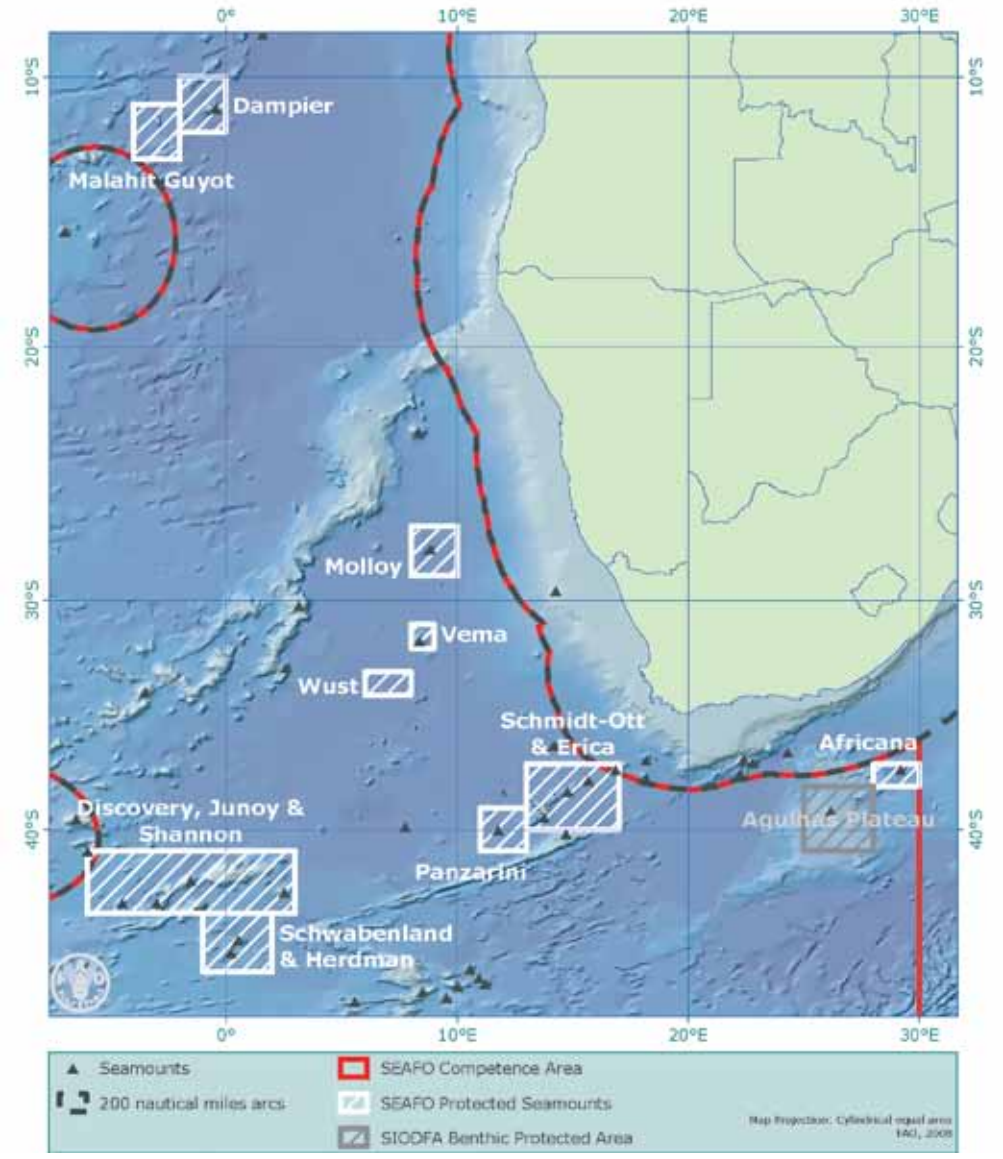
CONSERVATION AND MANAGEMENT MEASURES

Despite the lack of sufficient data for stock assessments, as mentioned above, the Scientific Committee has recommended an interim measure; for existing fisheries, fishing pressure should be reduced considerably and only be allowed to expand again very slowly if and when reliable assessments indicate that increased harvests are sustainable (SEAFO, 2006a).

In 2007, SEAFO adopted a catch limit of 200 tonnes of deep-sea red crabs in Sub-Division B1 (average of recent catch levels) and 200 tonnes in the remainder of the SEAFO Convention Area, based on a recommendation of the Scientific Committee. A quota of 260 tonnes per year of toothfish for 2008 and 2009 was also agreed. It should be noted that Patagonian toothfish is a transboundary species between the SEAFO and the CCAMLR Convention Areas and is therefore also managed by CCAMLR.[4]

To date, SEAFO has identified 13 vulnerable marine areas within the SEAFO Area. Of the 13 areas, ten are currently closed to all forms of bottom fishing (see Map 2 above): the Dampier Seamount (Area 1), the Malahit Guyot Seamount (Area 2), Molloy Seamount (Area 5), Vema Seamount (Area 6), Wust Seamount (Area 7), Africana Seamount (Area 8), Schmidt-Ott and Erica Seamounts (Area 9), Panzarini Seamount (Area 10), the Discovery, Junoy and Shannon Seamounts (Area 11), and the Schwabenland and Herdman Seamounts (Area 12). Six of these areas are considered to be unexploited while four – the Dampier, Malahit Guyot, Molloy and Vema Seamounts – have been fished to some extent in the past (SEAFO, 2006b). A further three areas – the Valdivia Bank (Area 3), Ewing Bank (Area 4) and Meter Seamounts (Area 13) – have been proposed for closure, but thus far remain open to fishing.

[4] Conservation Measure 10/07 fixing catch limits and related conditions for the Patagonian toothfish and red crab fisheries in the SEAFO Convention Area in 2008 and 2009. Adopted at the Annual Meeting of SEAFO in October 2007.



MAP 2
SEAFO Marine Protected Areas

SEAFO agreed in 2006 to close these ten areas temporarily until 2010, through the adoption of Conservation Measure 06/06 in October 2006. This measure stipulates that these areas could be reopened to exploratory fishing in 2008, based on advice from the Scientific Committee. However, in 2007, the Scientific Committee recommended maintaining the areas closed to any fishing pending an assessment of the impact of fishing and the extent to which VMEs were present in the closed areas. On the basis of the advice from the Scientific Committee, in 2007 SEAFO adopted Conservation Measure 11/07, which stipulates that the ten closed areas will only be reopened under the conditions presented in Box 1 below.

In 2007, the SEAFO Scientific Committee further recommended that the additional three areas – Areas 3, 4 and 13 – should be closed to bottom fishing and that there should be a temporary ban on all forms of trawling in the SEAFO Area, given the vulnerability to fishing of some of the species in this area, the paucity of data available for assessments, and the likely impact of trawling on vulnerable habitats on seamounts in areas that remain open to fishing in the SEAFO Area. It further recommended that for trawling to resume, vulnerable habitats (cold-water corals, sponges, etc.) should be mapped and proposals for mapping of resources, exploratory fishing and resumed

BOX 1
Extracts from Conservation Measure 11/07

"NO FISHING SHALL RESUME IN A CLOSED AREA UNTIL THE FOLLOWING PROCESSES HAVE BEEN RESPECTED;

a) Vulnerable marine ecosystems (including seamounts, hydrothermal vents and cold water corals) have been identified and mapped in the area and an assessment has been made on the impact of any resumption of fishing on such vulnerable marine ecosystems. This information shall be submitted to the Scientific Committee for its evaluation and recommendation to the Commission.

b) Subject to the decision of the Commission, Contracting Parties may submit Research Fishing Plans for evaluation by the Scientific Committee on its impact both on the sustainability of the fisheries resources and on their possible impact on vulnerable marine habitats. The Scientific Committee shall submit its recommendation to the Commission for decision on any re-opening of the area to fishing."

commercial fishing should be submitted to the SEAFO Scientific Committee for consideration before any activity takes place. Any resumption of trawling should be at a low level until it can be demonstrated that higher levels of fishing are sustainable. The Scientific Committee also recommended that all forms of gillnet fishing be banned until management measures relating to the total length of the nets and soak times can be introduced and enforced. The Scientific Sub Committee further recommended that exploratory fishing surveys in unexplored areas should not be permitted since they may cause irreversible damage to the seamounts (SEAFO, 2007a). However, at its Annual Meeting in 2007, SEAFO did not act on the broader recommendations of the Scientific Committee regarding trawling and bottom gillnet fishing in the Convention Area (SEAFO, 2007b).

INFORMATION AND REPORTING GAPS

In 2006, the Scientific Committee of SEAFO recognized a number of gaps in relation to information and reporting. For example, and as mentioned in earlier sections, there is a problem with incomplete submission of fishery data, such as catch and effort data, by countries. Thus, the Scientific Committee recommended steps to address these issues, including a need for regular reporting of accurate catch information; updating and improvement of historical data time series; the need to develop a robust scheme of collecting information appropriate for ecosystem management of fisheries; better enforcement of mandatory observer deployment for biological data collection; and improved understanding of seamount ecology and threats.

As indicated earlier, in addition to the above, the SEAFO Scientific Committee has recognized the need to map areas where vulnerable habitats occur, as well as the need for more accurate information on catch and bycatch.

Furthermore, assessments are needed on the impacts of bottom fisheries on non-target, associated and dependent species, and vulnerable benthic ecosystems.

SOURCES OF INFORMATION

In their reply to the FAO Questionnaire sent to states known as having a high seas deep-sea fishing fleet, the Cook Islands, Japan and Namibia officially responded with some information regarding deep-sea fishing in the high seas of the South

East Atlantic. Other sources used were SEAFO reports and the United Nations Environment Programme/Census of Marine Life reports, as well as others listed in the bibliography.

SUMMARY TABLE FOR 2006*

Main flag states involved in fisheries*	Cook Islands, Japan, Namibia and Spain
Estimated total number of vessels	6
Total reported catch (tonnes)	747.3

Main fisheries			
Gear	**Target species**	**Fishing grounds**	**Regional Area (FAO Area 47 and a small portion of 34)**
Mid-water trawl/bottom trawl	Orange roughy Alfonsino	Walvis Ridge (incl. Valdivia Bank, Ewing and Molloy Seamounts), Agulhas Ridge, Mid-Atlantic Ridge, Meteor Rise, Mt Vema Seamount	Throughout SEAFO Area
Pot	Deep-sea red crabs	SEAFO B1, D1	SEAFO Areas B1, D1
Longline	Patagonian toothfish	SEAFO C, D	SEAFO Areas C, D

* According to country responses to the FAO Questionnaire and SEAFO reports.
Note: poor reporting is a significant problem in relation to the management of the fisheries in this region.

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