8: Central Atlantic Ocean

FAO Major Fishing Area 31, most of Area 34, plus a portion of Area 41

Summary

The high seas of the Central Atlantic has few fishable features confined mainly to some seamounts in the Corner Rise group on the western side and those of the Mid-Atlantic Ridge southwest of the Azores on the eastern side. Benthic productivity appears to be very low and most of the waters are too deep to support any demersal fisheries. There have been sporadic catches of mainly alfonsino on the eastern side, amounting to nearly 100 t in 2002, but typically much lower than this and often less that 10 t per year being reported. The are no reported catches for the western side in recent years, though the southern part of the Corner Rise seamounts likely yielded catches in the past. No significant catch of deep-sea species was recorded in 2014.

Geographic Description

For the purposes of this review, the tropical and subtropical portions of the north and south Atlantic Oceans are considered to form the central Atlantic region (Figure 8.1). The marginal seas within those limits are included (except the Mediterranean Sea). More than half of the region falls within the high seas, though the EEZs around the island chains from the Bahamas to the Windward Islands form a continuous band. Almost all of the sea area further west falls under national jurisdictions, apart from two small enclaves in the Gulf of Mexico where the seabed is too deep for bottom fishing. The region's high seas form a contiguous area of open ocean, though interrupted by EEZs around several island groups: Madeira (Portugal), the Canary Islands (Spain), Cabo Verde, São Tomé and Príncipe, Annobón (Equatorial Guinea), St. Peter and St. Paul Rocks (Brazil), Fernando de Noronha (Brazil) and Bermuda. The Azores (Portugal) lie outside the Central Atlantic to the north but the surrounding EEZ extends into the region.

The high seas of the region are predominantly deep ocean, though traversed by the Mid-Atlantic Ridge and dotted with seamounts. Only 61 000 km^2 are mapped as shallower than 2 000 m, of which just 3 000 km^2 has depths of less than 400 m (Table 8.1). Among the seamounts, only the Corner Rise group (which straddles the boundary of the northwest Atlantic), Ampere Seamount (in the extreme northeast of the Central Atlantic) and a few on the Mid-Atlantic Ridge outside the EEZ around the Azores have been of note for bottom fishing. There is also a group of seamounts extending southwest from the Guinea Terrace and another extending southwest from the Gulf of Guinea, though the extent of fishing on these is unknown.

Ecosystems and Resource Species

The oceanography of the region is dominated by the westward-flowing North and South Equatorial Currents, and by the subtropical gyre of the North Atlantic (Figure 8.2). That system, like its analogues in the Pacific and Indian oceans, has not proven to be highly productive of deep-living fishery resources. Most of what is available is found in the warm-temperate, northernmost part of the region, rather than the tropical and equatorial belts further south.

A variety of resource species are available for small-boat fisheries around islands, including on a few of the high sea seamounts near the Azores. However, the only species offering catch rates sufficient to support large vessels, working far from land, are alfonsino, silver scabbardfish and black scabbardfish, particularly from the Mid-Atlantic Ridge eastwards (Figure 8.3). Alfonsino have been harvested across the region's temperate latitudes but predominate in catches from the seamounts in the northwest.

Management of High Seas Bottom Fisheries

At present, there is no regional management body with competence over high seas bottom fisheries in the central Atlantic. There are, however, two regional fisheries bodies, the Fishery Committee for the Eastern Central Atlantic (CECAF) and the Western Central Atlantic Fishery Commission (WECAFC). The area of competence of the former encompasses all of FAO Major Fishing Area 34, while that of WECAFC comprises Area 31 and such of Area 41 as falls within the region.

Fishery Committee for the Eastern Central Atlantic (CECAF)

The Fishery Committee for the Eastern Central Atlantic (CECAF)[1] was established by the FAO Council in 1967, as an FAO Article VI regional fisheries body. It is advisory in nature and adopts non-binding recommendations. The Committee has a broad role within its stated purpose of promoting sustainable utilization of living marine resources through management and fisheries development. All living marine resources are included within its area of competence, which includes both the high seas and national jurisdictions. CECAF currently has 34 members, including 20 coastal States, 13 other States and the EU. The area has been divided into divisions and sub-divisions for fisheries catch reporting purposes (Figure 8.4).

The Committee established a Scientific Sub-Committee in 1998, which in turn established a permanent working group on demersal fisheries. However, to date, CECAF's attention to such fisheries has been confined to coordination of, and support for, work on resources and fisheries under national jurisdictions.

[1] http://www.fao.org/fishery/rfb/cecaf/en

Western Central Atlantic Fishery Commission (WECAFC)

The Western Central Atlantic Fishery Commission (WECAFC)[2] is also an advisory FAO Article VI regional fisheries body, established by the FAO Council in 1973. While the formal wording of its objectives and principles differ from those adopted by CECAF, WECAFC has a similarly broad role within the objective of promoting conservation, management and development of living marine resources. All living marine resources are included within its areas of competence, which again includes both the high seas and national jurisdictions. The Commission currently has 34 members, including 30 coastal States, three distant-water fishing States and the EU. The Secretariat is provided by FAO's sub-regional Office for the Caribbean. WECAFC has a five-member Scientific Advisory Group, which meets biennially in parallel to the Commission. Since 2014, there has been consideration of transitioning WECAFC from an FAO Article VI advisory body to an FAO Article XIV RFMO (WECAFC, 2014).

Much of WECAFC's work is undertaken by working groups established by the Commission, which are time-bound and given specific terms of reference. Many of the Groups are jointly organized with other regional bodies. The WECAFC Working Group on the Management of Deep-Sea Fisheries, was established in 2012 by the Commission alone. Its terms of reference concerned collection and review of data and information, plus making recommendations to the Commission. The Working Group hosted a *Technical Workshop on Bottom Fisheries in the High Seas Areas of the Western Central Atlantic* during 2014 (WECAFC, 2015).

Description of High Seas Bottom Fisheries

1883-1999

The Central Atlantic region saw early development of deep bottom fisheries, with line fishing for black scabbardfish, which began off Madeira in 1839 (Leite, 1989; Martins and Ferreira, 1995), and trawling for European hake off Morocco from soon after 1900 (Alward, 1932; Hickling, 1935). Deep fishing in the western central Atlantic has been a much more recent development. Those fisheries, however, were and are confined to waters that are now under national jurisdiction. High seas bottom fisheries have been limited to such small proportions of the local fishing around archipelagoes (primarily the Azores) as has extended more then 200 nautical miles from land and to seamount fishing by distant-water fleets. As expected for a low-latitude region, the latter's activity has been limited.

Trawlers from the then-USSR fished seamounts around Madeira and the Canary Islands from 1970, primarily using midwater trawls to take pelagic species, though there was

[2] http://www.fao.org/fishery/rfb/wecafc/en

some bottom trawling and some targeting of silver scabbardfish. Most of the fished locations are now in EEZs, leaving only Ampere and Josephine seamounts in the high seas – the latter immediately outside the boundary of the central Atlantic region. Total catches from the two were generally been less than 1 000 t per year, much of which comprised pelagic species. That fishery ceased during the 1980s but resumed at a low level in the following decade (Clark *et al*., 2007; Vinnichenko and Kakora, 2008). The fleets of the then-USSR also fished seamounts on the Mid-Atlantic Ridge south of the Azores from 1973, taking black scabbardfish at first and, from 1976, alfonsino, as well as pelagic species. The total catch of these two demersal species over five years was 10 000 t and 4 000 t respectively. After 1977, some of the fished seamounts were within the EEZ around the islands but the fishery continued outside on an occasional basis (Clark *et al*., 2007; Vinnichenko and Kakora, 2008).

The then-USSR extended its seamount fishing to the Corner Rise Seamounts from 1976. The overall catch that year exceeded 10 000 t, mostly composed of alfonsino that were primarily caught by midwater trawls, though there was some bottom trawling. Only some 800 t could be taken the following year and the Seamounts were left to exploration and research vessels for the next ten years, though annual catches could be as high as 530 t. Commercial trawlers returned in 1987, taking 2 300 t. In 1994, a single vessel took 400 t, the following year as many as five vessels took 3 500t between them but in 1996 the catch dropped again to 600 t and the fishery seems to have been essentially abandoned thereafter. Throughout, alfonsino was the principal species taken but cardinalfish, black scabbardfish, wreckfish and others were landed. Alfonsino aggregations were mostly found at 420–750 m depth, while they and other species were taken as deep as 950 m (Vinnichenko, 1997; Vinnichenko and Kakora, 2008). Much of the fishing was on the feature alternatively known as *Perspektivnaya* or the Kükenthal Peak of Corner Rise Seamount, though *Vybornaya* (C-3 Seamount) and *Reservnaya* (Milne-Edwards Peak of Caloosahatchee Seamount) were also fished. The first two lie north of 35°N and hence in the northwest Atlantic region. Bottom trawls were only deployed on Kükenthal Peak (Vinnichenko, 2015). Thus, catches from the central Atlantic portion of the Corner Rise area were small and perhaps all taken without bottom contact.

2000 onwards

It is challenging to separate the catches in the high seas from those within national waters. Distant-water vessels from China, Republic of Korea, and Russia, have reported catching alfonsino and scabbardfish from most of the purely coastal sub-divisions between Sahara coastal (1.3) to the southern Gulf of Guinea (3.6), owing to agreements with coastal States. Nevertheless, it is seen that since the turn of the century, the central Atlantic high seas bottom fisheries have continued at around the same sporadic low level they reached in the 1990s. The available sources do not permit full separation of information on such fisheries from those using off-bottom gear or those operating in national waters. There is some finer scale reporting to CECAF at the sub-division level, but in all cases the high seas oceanic areas include a small amount of EEZ waters (Figure 8.4). Further, catches of typical deep-water demersal species have been reported by non-Coastal States Catches have been reported from the northern oceanic (2.0), southwestern

oceanic (4.2), and southwestern Gulf of Guinea (4.1) sub-divisions, but the latter two areas reported only alfonsino in 2005 at 46 t, trivial catches (<2 t) in 2002 and 2016, and no other reported catches of any demersal species. Catches of alfonsino, blackbelly rosefish and scabbard fish in the northern oceanic area have been reported by Spain, Portugal and Russia either in the Azores EEZ portion or the extension of the Mid-Atlantic Ridge to the southwest (Table 8.2). Catches have been sporadic and dominated by alfonsino, being above 10 t per year in six of years for 2000–2016. Minor catches of blackbelly rosefish have been reported, along with a single recent catch of 210 t of black scabbardfish in 2016 by Portugal (FAO, 2017). It is likely that much, if not all, of the above catch was taken by midwater trawling.

Russian, French and Japanese vessels worked in the Corner Rise area early in the present century but took little catch (Clark *et al*., 2007). In 2004, a Spanish vessel fished with both midwater and bottom trawls, the latter confined Kükenthal Peak and hence in the North-West Atlantic region. There was further fishing in subsequent years, with the maximum catch of 1,200 t taken in 2005, but little (if any) of the fishing effort was south of the regional boundary and that apparently used midwater trawls exclusively (Kulka *et al*., 2007; Thompson and Campanis, 2007; Vinnichenko, 2015).

There has been no known high seas bottom fishing in the region by any of the coastal States in the Americas (WECAFC, 2015). No equivalent information is available from the eastern Central Atlantic, though it may be supposed that Azorean fishermen still sometimes fish more than 200 nautical miles from their islands.

Catches of deep-sea species taken by bottom-contact gear for 2014 from the high seas of the central Atlantic appear to be very small. The catches given above, mainly alfonsino and scabbardfish, were likely taken mainly with deep mid-water trawls gears and longlines for the latter species. The only recorded catch in 2014 was 8 t of blackbelly rosefish, probably caught incidentally along with other “pelagic” species.

References

Alward, G.L. 1932. *The Sea Fisheries of Great Britain and Ireland*. Albert Gait, Grimsby: xxiii+474p, plus appendices.

Clark, M.R., Vinnichenko, V.I., Gordon, J.D.M, Beck-Bulat, G.Z., Kukharev, N.N. & Kakora, A.F. 2007. Large-scale distant-water trawl fisheries on seamounts. Chapter 17. *in*: T.J. Pitcher, T. Morato, P.J.B. Hart, M.R. Clark, N. Haggan & R.S. Santos (eds). *Seamounts: ecology, fisheries and conservation. Fish and Aquatic Resources Series*. Blackwell, Oxford, pp. 361-399.

FAO. 2017. Fisheries and aquaculture software. FishStatJ - software for fishery statistical time series. In: *FAO Fisheries and Aquaculture Department* [online]. Rome. Release 3.04.6. http://www.fao.org/fishery/

Hickling, C.F. 1935. *Hake and the Hake Fishery: Being the Buckland Lectures for 1934*. Edward Arnold, London. 142p.

Kulka, D.W., Hood, C. & Huntington, J. 2007. *Recovery Strategy for Northern Wolffish (*Anarhichas denticulatus*) and Spotted Wolffish (*Anarhichas minor*), and Management Plan for Atlantic Wolffish (*Anarhichas lupus*) in Canada*. Fisheries and Oceans Canada, Newfoundland and Labrador Region,. St. John's, NL.: x+103p.

Leite, A.M. 1989. The deep-sea fishery of the black scabbard fish *Aphanopus carbo* Lowe, 1839 in Madeira Island waters. *in*: *Proceedings World Symposium of Fishing Gear and Fishing Vessel Design 1988*. Marine Institute, St. John's: 240-243.

Martins, R. & Ferreira, C. 1995. Line fishing for black scabbardfish (*Aphanopus carbo* Lowe, 1839) and other deep water species in the eastern mid Atlantic to the north of Madeira. *in*: A.G. Hopper (ed.) *Deep-water Fisheries of the North Atlantic Oceanic Slope*. Kluwer Academic Publishers, Dordrecht, pp. 323-335.

Thompson, A.B. & Campanis, G.M. 2007. Information on fishing on and around four closed seamount areas in the NRA. *NAFO SCR Doc.* 07/06, Serial No. N5347: 10p.

Vinnichenko, V.I. & Kakora, A.F. 2008. History of Russian fisheries on seamounts in the Atlantic. *ICES CM* 2008/C:10: 11p.

Vinnichenko, V.I. 1997. Russian investigations and deep water fishery on the Corner Rising Seamount in Subarea 6. *NAFO Scientific Council Studies* 30: 41–49.

Vinnichenko, V.I. 2015. On stock size and fishery management of splendid alfonsino (*Beryx splendens*) on the Corner Rise Seamount. *NAFO SCR Doc.* 15/006, Serial No. N6425.

WECAFC. 2014. Report of the WECAFC Reorientation and Strategic Planning Workshop, Gosier, Guadeloupe, 29–30 January 2014. *FAO Fisheries and Aquaculture Report* 1068: 19p.

WECAFC. 2015. Report of the first meeting of the WECAFC Working Group on the Management of Deep-sea Fisheries, Christ Church, Barbados, 30 September–2 October 2014. *FAO Fisheries and Aquaculture Report* 1087: 61p.

Table 8.1. Area statistics for the central Atlantic Ocean.

Total sea area in Region	31,563,000 km^2
Area of High Seas in Region	17,752,000 km^2
Area of High Seas shallower than 200 m	526 km^2
Area of High Seas shallower than 400 m	3,000 km^2
Area of High Seas shallower than 1,000 m	10,000 km^2
Area of High Seas shallower than 2,000 m	61,000 km^2

Table 8.2: catches (t) of typical deep-sea demersal species for 2000–2014 from the high seas (sub-divs 2.0, 4.1 and 4.2) eastern central Atlantic. Blank cells indicate no reported catches. (Source: FAO, 2018).

Species	Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Alfonsinos nei	Portugal								36	60		28						
	Russian Federation					69												
	Spain			93	18				2									
Blackbelly rosefish	Portugal								11	1				6	2	6		
	Spain								6						1	2		
Silver scabbardfish	Portugal											1						
Black scabbardfish	Portugal															1		201

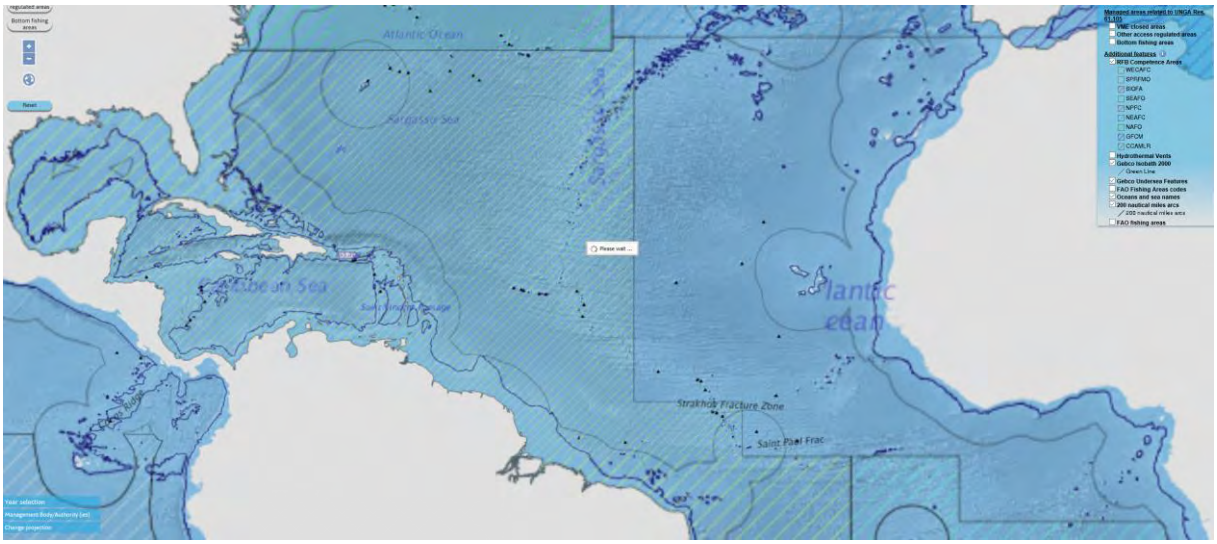


Figure 8.1: Map of region in review's standard format, EXCEPT that it should identify the Corner Rise Seamounts and Ampere Seamount, plus the WECAFC/CECAF boundary

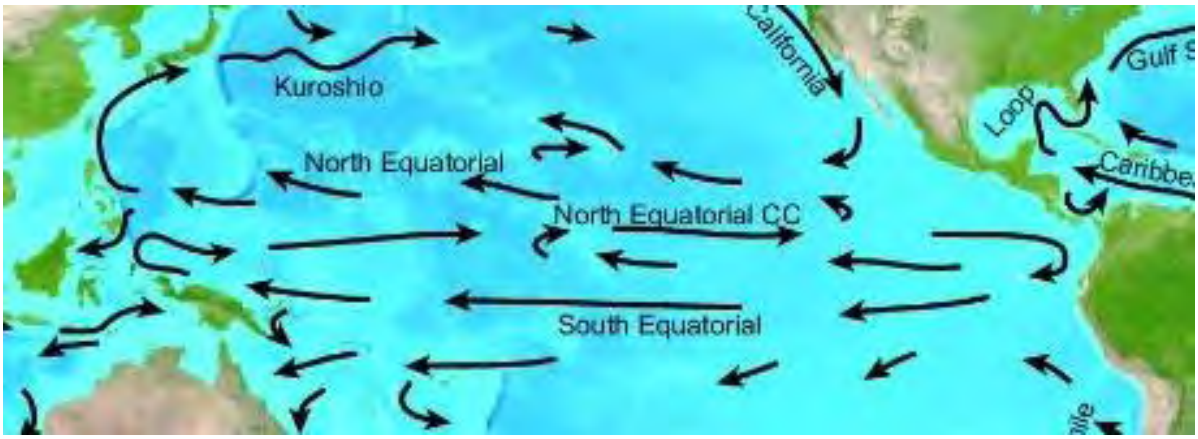


Figure 8.2. Dominant ocean currents in the central Atlantic Ocean.

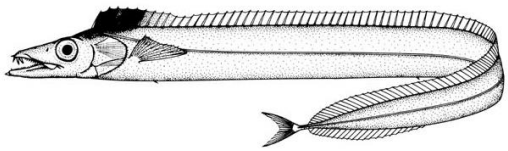
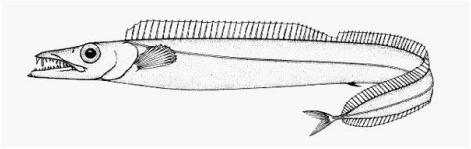
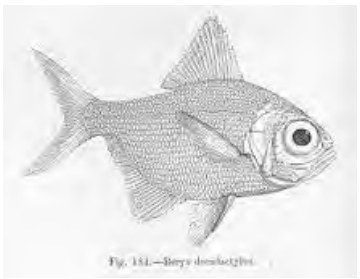
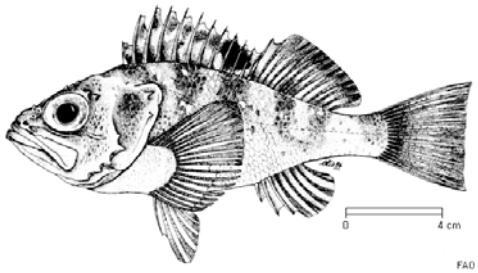
Silver scarbardfish *Lepidopus caudatus*  http://www.fao.org/fishery/species/3270/en	Black scabbardfish Aphanopus carbo  http://www.fao.org/fishery/species/2469/en
Alfonsino *Beryx decadactylus*  https://en.wikipedia.org/wiki/Alfonsino	Blackbelly rosefish *Helicolenus dactylopterus*  http://fishbase.org/photos/PicturesSummary.php?StartRow=9&ID=76&what=species&TotRec=12

Figure 8.3: Illustration of regional resource species.

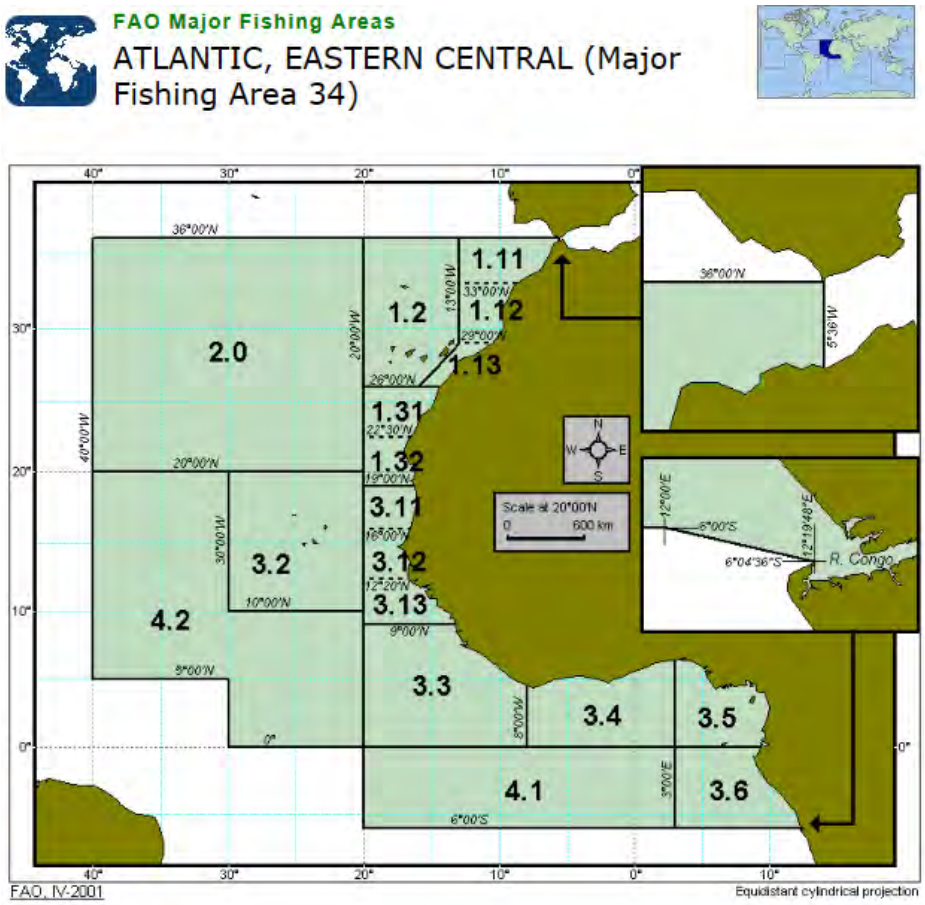


Figure 8.4. Divisions and sub-divisions of the CECAF area of competence.

http://www.fao.org/fishery/area/Area34/en