

ECOLOGICALLY OR BIOLOGICALLY SIGNIFICANT MARINE AREAS

in the Benguela Current Large Marine Ecosystem



Shackleton Seamount Complex

REVISED DESCRIPTION

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SHACKLETON SEAMOUNT COMPLEX

Revised Description



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Shackleton Seamount Complex (Formerly Agulhas Slope and Seamounts)

Revised EBSA Description

General Information

Summary

The outer margin along the southern tip of the Agulhas Bank is a dynamic offshore area with high productivity and high pelagic and benthic habitat heterogeneity. The Agulhas and Southern Benguela ecoregions meet at this point, and sporadic shelf-edge upwelling enhances the productivity along the outer margin. The area is recognized as a spawning area for sardine, anchovy, horse mackerel and hake, and this apex area of the Agulhas Bank is recognized as a critical area for retention of spawning products. Here, eddies help recirculate water inshore and link important nursery areas with spawning habitat on the shelf edge. Notably, this EBSA also contains the Mallory, Shackleton and Natal Seamounts. This area was identified as a priority through a national spatial plan because of high habitat diversity. Since the original description, the boundary of this EBSA has been refined to better represent the underlying EBSA features, and split into two: Shackleton Seamount Complex, and Mallory Escarpment and Trough. Although a recent cruise surveyed two sites at the northern edge of Shackleton Seamount Complex, deteriorating weather conditions limited operations; further research and *in situ* surveys of the unexplored hard shelf edge and seamounts are recommended in this area.

Introduction of the area

Shackleton Seamount Complex includes the outer margin along the southern tip of the Agulhas Bank in South Africa. It is a dynamic offshore area with high pelagic and benthic habitat heterogeneity. The area includes outer shelf, shelf edge, slope and seamount habitats. The Agulhas and Southern Benguela ecoregions meet at this point (Sink et al., 2012), and sporadic shelf edge upwelling enhances the productivity along the outer margin (Lagabrielle, 2009, Roberson et al., 2017). The site is recognized as a spawning area for sardine, anchovy, horse mackerel and hake, and this apex of the Agulhas Bank is recognized as a critical area for retention of spawning products (Hutchings et al., 2002). Here, eddies help recirculate water inshore and link important nursery areas with spawning habitat on the shelf edge. Leatherback turtles also frequent these seamounts along their migrations (Harris et al., 2018). This area was identified as a priority through a national plan to identify focus areas for offshore protection (Sink et al., 2011) because it has relatively high habitat diversity and can meet multiple benthic and pelagic habitat conservation targets in a small area.

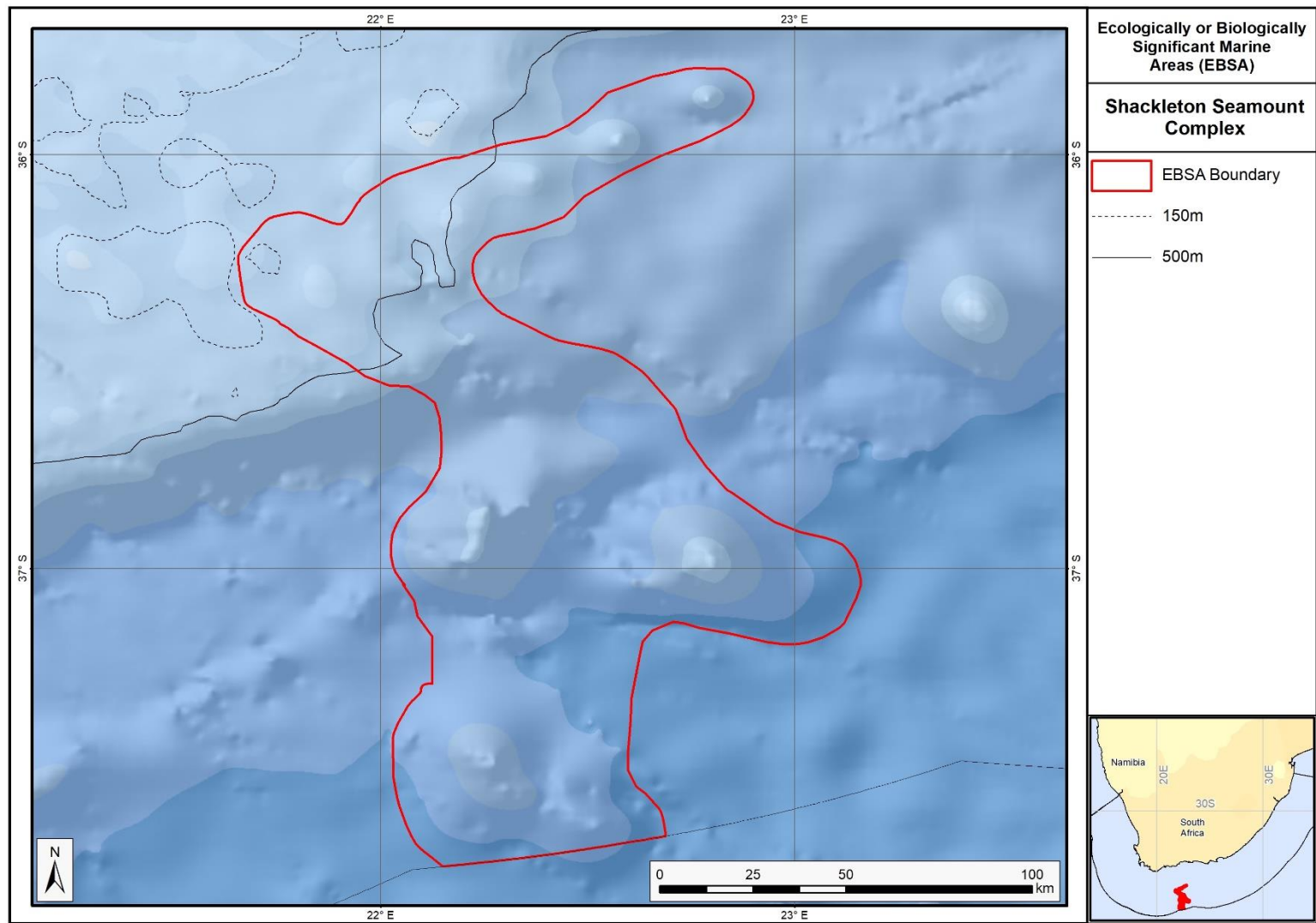
Description of the location

EBSA Region

Southern Indian Ocean

Description of location

The EBSA is at the apex of the Agulhas Bank at the southern tip of the continental shelf edge off southern Africa. It is directly south of Mossel Bay in the Agulhas-Falkland Fracture Zone, and is entirely within South Africa's EEZ. It contains the Mallory, Shackleton and Natal Seamounts, and lies immediately east of the Mallory Escarpment and Trough EBSA.



Proposed revised boundaries of the Shackleton Seamount Complex EBSA.

Area Details

Feature description of the area

The area includes benthic and pelagic features, including shelf edge, slope and seamounts, shelf-edge-driven upwelling, and fragile and sensitive habitat-forming species. Habitat diversity is thus particularly high, with eight ecosystem types occurring in this dynamic area. It consequently supports numerous ecological processes, such as spawning and foraging, and comprises a rich diversity of both resident (e.g., benthic gorgonians) and transient (e.g., migrating leatherbacks) species. Two sites at the northern edge of the EBSA were recently surveyed; however, deteriorating weather conditions limited research operations (Sink 2016). Nevertheless, the sites were reported to be less muddy than expected, and samples of yellow scleractinian coral, stylasterine corals and bryozoans were collected (Sink 2016).

The delineation of this EBSA was refined since its first description, based on the best available evidence (e.g., De Wet 2012; GEBCO Compilation Group 2019; Harris et al., 2014; Holness et al., 2014; Majiedt et al., 2013; Sink et al., 2012, 2019). It is now split into two EBSAs: one for the seamounts, and one for the escarpment and trough features. The revision was based on high selection frequency of sites in the two systematic biodiversity plans covering the area, tighter alignment to the benthic topography (from a new national dataset: De Wet 2012), MPA expansion in South Africa, presence of fragile and sensitive habitat-forming species, and presence of threatened benthic ecosystem types. Effectively, these new data helped to improve the precision of the EBSA boundary so that it better reflects the underlying features. It is presented as a Type 2 EBSA because it contains “spatially stable features whose individual positions are known, but a number of individual cases are being grouped” (sensu Johnson et al., 2018).

Feature conditions and future outlook of the proposed area

The shelf edge and seamounts have not been sampled, although *in-situ* research is recommended in this area. Nevertheless, there are various fisheries operating in the area, but some of the hard grounds in the EBSA are outside of the trawl footprint. Broadly speaking, there is relatively little pressure in this area at present, and the ecosystem types are in good condition.

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Other relevant website address or attached documents

Summary of ecosystem types and threat status for the Shackleton Seamount Complex EBSA. Data from Sink et al. (2019).

Threat Status	Ecosystem Type	Area (km ²)	Area (%)
Least Concern	Agulhas Basin Abyss	3403.0	28.4
	Agulhas Outer Shelf Reef Coarse Sediment Mosaic	805.8	6.7
	Agulhas Rocky Shelf Edge	1003.6	8.4
	Southwest Indian Lower Slope	1765.0	14.7
	Southwest Indian Mid Slope	1260.7	10.5
	Southwest Indian Seamount	2072.4	17.3
	Southwest Indian Slope Seamount	888.7	7.4
	Southwest Indian Upper Slope	733.0	6.1
Grand Total		11932.2	99.6

Assessment of the area against CBD EBSA criteria

C1: Uniqueness or rarity **Medium**

Justification

This area includes 3 of 4 known seamounts within the Davie Seamount cluster (Sink et al., 2011, 2012). These seamounts are relatively isolated and are thus likely to host distinct communities.

C2: Special importance for life-history stages of species High

Justification

Shackleton Seamount Complex is recognized as a spawning area for small pelagic fish (sardine, anchovy, horse mackerel) and hake (Hutchings et al., 2002, Sink et al., 2011). This apex area of the Agulhas Bank is also recognized as a critical area for retention of spawning products. Eddies in this area help re-circulate water inshore and link important nursery areas with spawning habitat on the shelf edge. The shelf edge constitutes foraging area for offshore seabirds (Birdlife data, see references below), and the seamounts are a foraging area for leatherback turtles (Harris et al., 2018). It is also an important Mako shark nursery area.

C3: Importance for threatened, endangered or declining species and/or habitats Medium

Justification

One of the pelagic ecosystem types in the area is characterised by elevated productivity and frequent fronts due to shelf-edge upwelling (Lutjeharms et al., 2000, Lagabrielle 2009, Roberson et al., 2017). Consequently, regionally Critically Endangered leatherback turtles frequent this area (Petersen et al., 2009a; Harris et al., 2018), and the shelf edge is a feeding area for threatened seabirds such as albatross (Petersen et al., 2009b).

C4: Vulnerability, fragility, sensitivity, or slow recovery High

Justification

This area includes hard shelf edge and seamounts (some of the hard grounds are untrawled). These are likely to support fragile long-lived biota. Video images of the shelf edge show cold-water corals, gorgonians and large sponges (Sink et al., 2011). Vulnerable biota that use this area include long-lived seabirds, turtles and sharks, and the area has been identified by analyses aimed at identifying priority areas for reducing by-catch in the large pelagic fishery (Sink et al., 2011.)

C5: Biological productivity High

Justification

There is higher productivity here, which is related to the eastern limit of the Benguela upwelling on the outer shelf (Pelagic ecosystem type Ab3) and very frequent SST and chlorophyll fronts (Lutjeharms et al., 2000, Lagabrielle 2009, Sink et al., 2011, 2012, Roberson et al., 2017). Cool productive water is advected onto the shelf in this sheer zone through Agulhas Current-driven upwelling cells (Lutjeharms et al., 2000).

C6: Biological diversity High

Justification

This area has high pelagic and benthic habitat heterogeneity. Four pelagic ecosystem types (Ab3, Bc1, Cb3 and Cb4) and occur in this dynamic area (Sink et al., 2011, 2012), with eight ecosystem types present that include shelf, slope, seamount and abyssal types (Sink et al., 2019).

C7: Naturalness High

Justification

Rough grounds and strong currents already offer some protection from pressures to this area (Sink et al., 2011, 2012). Relatively lower levels of disturbance occur in this area (Sink et al., 2012), and most of the local hard areas fall outside of the hake trawl footprint (Sink et al., 2011).

Status of submission

The Agulhas Slope and Seamounts EBSA was recognized as meeting EBSA criteria by the Conference of the Parties. The revised Shackleton Seamount Complex EBSA name, description, and boundaries still need to be submitted to COP for approval.

COP Decision

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End of proposed EBSA revised description

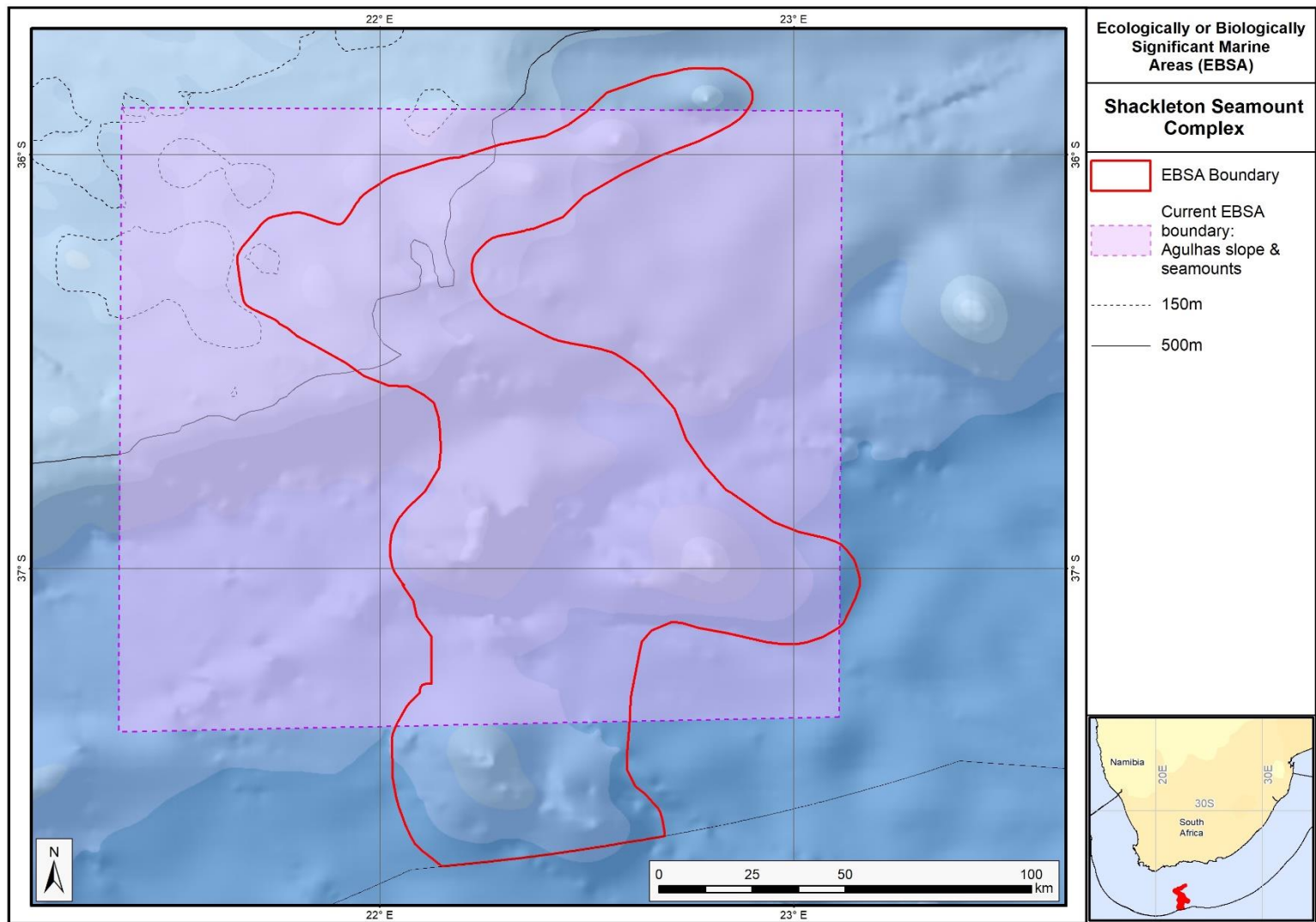
Motivation for Revisions

Significant changes have been made to the delineation of the original Agulhas Slope and Seamounts EBSA and to the description, such that it is necessary to split the original EBSA into two, and revise the name of this EBSA to Shackleton Seamount Complex to accurately reflect the features. Additional references have been added and updates to the description were made. A supplementary table of the habitats represented in the EBSA and their associated threat status was also included.

An important change has been the significant delineation change of this EBSA to focus the EBSA more closely on the key biodiversity features in this area that support its EBSA status. The delineation process included an initial stakeholder review which identified the need to update boundaries, a technical mapping process and then an expert review workshop where boundary delineation options were reviewed, revised again and then finalised. The delineation process used a combination of Systematic Conservation Planning and Multi-Criteria Analysis methods. The features used in the analysis were:

- Key physical features (i.e. the seamounts, escarpment and trough) identified from the latest GEBCO data (GEBCO Compilation Group 2019), global benthic geomorphology mapping (www.bluehabitats.org, Harris et al., 2014), new national bathymetric data (De Wet 2012), the National Biodiversity Assessment 2011, 2018 (Sink et al., 2012, 2019) and BCC spatial mapping project (Holness et al., 2014) were incorporated.
- Irreplaceable and near irreplaceable (i.e. very high selection frequency) sites, and focus areas identified in the Systematic Conservation Plans undertaken for the West Coast by Majiedt et al. (2013), offshore areas (Sink et al., 2011) and by Holness et al. (2014) were incorporated.
- Delineations and threat status of constituent ecosystem types in the area were included in the analysis and used to refine the boundary of the EBSA.
- Areas of high relative naturalness of benthic and coastal systems and pelagic systems identified in the National Biodiversity Assessment 2011, 2018 (Sink et al., 2012a, 2019) were included in the analysis.
- Distributions of known fragile, vulnerable and sensitive habitat-forming species were included (Unpublished SANBI and SAEON data).

The multi-criteria analysis resulted a value surface. The cut-off value used to determine the extent of the EBSA was based on expert input and quantitative analysis of effective inclusion of the above features. This entailed taking an iterative parameter calibration-based approach whereby the spatial efficiency of the inclusion of the targeted features was evaluated. The approach aimed to identify a cut-off that most efficiently included prioritised features while minimizing the inclusion of impacted areas. The final boundaries shown in the map were validated in a national workshop.



The proposed revised boundaries for the Shackleton Seamount Complex EBSA in relation to the original Agulhas Slope and Seamounts EBSA.