

# ECOLOGICALLY OR BIOLOGICALLY SIGNIFICANT MARINE AREAS

in the Benguela Current Large Marine Ecosystem



**Protea Seamount Cluster**

PROPOSED DESCRIPTION

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## PROTEA SEAMOUNT CLUSTER

### Proposed Description



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## Protea Seamount Cluster

### *Proposed EBSA Description*

#### **Abstract**

The Protea Seamount Cluster is in the south Atlantic abyss off the SSW flank of the Agulhas continental shelf, within the South African EEZ. It is a unique feature in that it is the only seamount cluster in the south Atlantic abyss in South Africa's EEZ. The seamounts support more productivity and diversity compared to adjacent sites, and offer a site for migratory species to aggregate around. Notably, the Protea Seamount Cluster contains vulnerable and sensitive ecosystems and species, some of which are threatened, e.g. the site is visited by regionally Critically Endangered leatherback turtles. It is in good condition given the currently low anthropogenic pressure in the area, promoting the importance of its protection. This EBSA is particularly relevant for its: Uniqueness and rarity; Importance for threatened or declining species and habitats; Vulnerability and sensitivity; and Naturalness.

#### **Introduction**

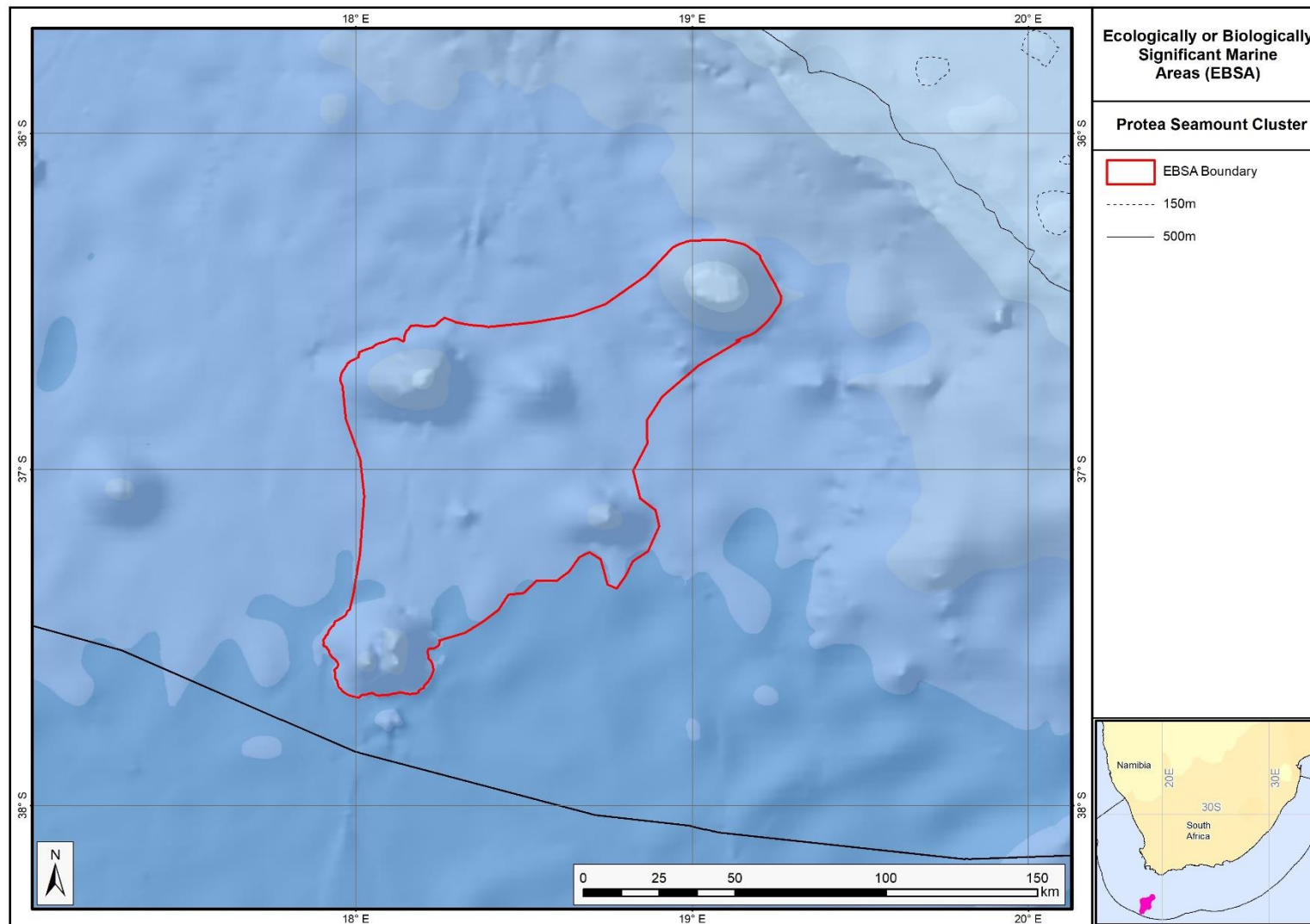
The Protea Seamount Cluster focus area lies on the SSW flank of the Agulhas continental shelf: an oceanic plateau that extends several hundreds of kilometres south of South Africa. The focus area is south west of the Browns Bank EBSA, entirely within the South African EEZ. The site includes the base of the lower slope, but falls mainly within the south Atlantic abyss. Late Eocene volcanism created the seamount cluster in this focus area, including Protea and Argentina Seamounts (among others). The Agulhas Current, which flows south-westward along the eastern coast of South Africa, has its retroflexion in this area. Given this position, and its location relative to the Agulhas basin and Agulhas continental shelf, the seamount cluster is an important aggregation site for several migratory species, such as sharks, tuna, and turtles. These animals are also likely attracted to the site for the higher local productivity that is usually associated with seamounts. The Protea Seamount Cluster also contains vulnerable, fragile and sensitive ecosystems and species, and thus the EBSA includes and is important for both benthic and pelagic features. It is highly relevant in terms of these EBSA criteria: "Uniqueness and rarity", "Importance for threatened or declining ecosystems and species", and "Naturalness".

This site was recognised as important at the original South Eastern Atlantic Workshop for EBSA Identification in 2013, but that there was not enough information available to score it against the EBSA criteria at the time (see UNEP/CBD/RW/EBSA/SEA/1/4 Annex 6, Area 5). However, some new data and information have now made description and delineation of the EBSA possible (e.g., GEBCO Compilation Group 2019; Harris et al., 2014; Holness et al., 2014; Majiedt et al., 2013; Sink et al., 2012, 2019), although criterion rankings still rely heavily on inferred information in many cases. Therefore, the criteria were benchmarked against those ranks given to other EBSAs described for seamounts specifically (see the section: Other relevant website address or attached documents). The seamounts are the underpinning feature of this EBSA, but it also comprises additional features and ecosystems that are connected by seamount-related ecological processes. Consequently, it is proposed as a Type 2 EBSA (*sensu* Johnson et al., 2018).

#### **Description of the location**

##### **EBSA Region**

South-Eastern Atlantic



*Proposed boundaries of the Protea Seamount Cluster EBSA.*

## **Location**

The Protea Seamount Cluster focus area occurs within the national jurisdiction of South Africa. It is found in the south Atlantic abyss off the SSW flank of the Agulhas continental shelf: an oceanic plateau that extends several hundreds of kilometres south of South Africa. It lies south west of the Browns Bank EBSA, and extends almost to the boundary of South Africa's EEZ.

## **Feature description of the proposed area**

The Protea Seamount Cluster area is important for both its benthic and pelagic features, notably for supporting threatened habitats and species, and vulnerable, fragile and sensitive ecosystems and species. It comprises a seamount cluster that includes the Protea Seamount, and a few others, that rise from the southeast Atlantic abyss. The Agulhas Current, which flows south-westward along the eastern coast of South Africa, has its retroflexion in this area. Given this position, and its location relative to the Agulhas basin and Agulhas continental shelf, local productivity is high at the site. Consequently, it serves as an important aggregation site for migratory species, such as sharks, seabirds (Halpin et al., 2009), and tuna. Further, adult female leatherback turtles have been satellite tracked to these seamounts and surrounds following nesting (Luschi et al., 2003, 2006, Robinson 2014, Harris et al., 2018), with the site likely used by juvenile turtles as well. There has been one previous scientific expedition to Protea Seamount (in 2001), which was focused on deep-sea pelagic birds.

The Protea Seamount Cluster had a high selection frequency in two systematic conservation plans to represent biodiversity efficiently (Majiedt et al., 2013; Sink et al., 2011). The EBSA was delineated based on this selection frequency, key features (seamounts, fragile and sensitive habitat-forming species, and portions of threatened habitat in good condition), and to align with a national initiative to expand MPAs in South Africa. Protecting this site is important because of its vulnerability to both pelagic fishing and benthic trawling. Although no research is currently planned for this area, it is recommended for this EBSA, particularly towards informing appropriate spatial management of this site.

Note that there are other seamounts in the surrounding area that are not included in the delineation of the EBSA because they are much smaller, unnamed, or there are no records of fragile, habitat-forming species for these sites and they are considered data deficient. There is a matrix of abyssal and bathyal habitat in between the seamounts that is included in the delineation because it represents the broader area where the top predators aggregate in the water column in response to the elevated productivity of the site, likely also encompassing the full extent of seamount-related ecological processes. In addition, it is an efficient way to include a natural, near-pristine portion of these ecosystem types in the EBSA network that is likely to be taken up in spatial management processes for the seamounts themselves, especially because these areas were identified as a priority in the two systematic conservation plans mentioned above.

## **Feature condition and future outlook of the proposed area**

Sink et al. (2012, 2019) estimated the threat status of marine ecosystem types in South Africa by assessing the cumulative impacts of various pressures (e.g. extractive resource use, pollution and others) on each ecosystem type. The latest assessment (Sink et al., 2019) shows the whole area to be in natural ecological condition, with a portion of the EBSA recently proclaimed as a marine protected

area. The EBSA is in a good condition, largely because it has been subjected to relatively little extractive resource use (e.g. fishing, mining) pressure, and is relatively remote and often subjected to high seas with winds of around 50 knots.

## References

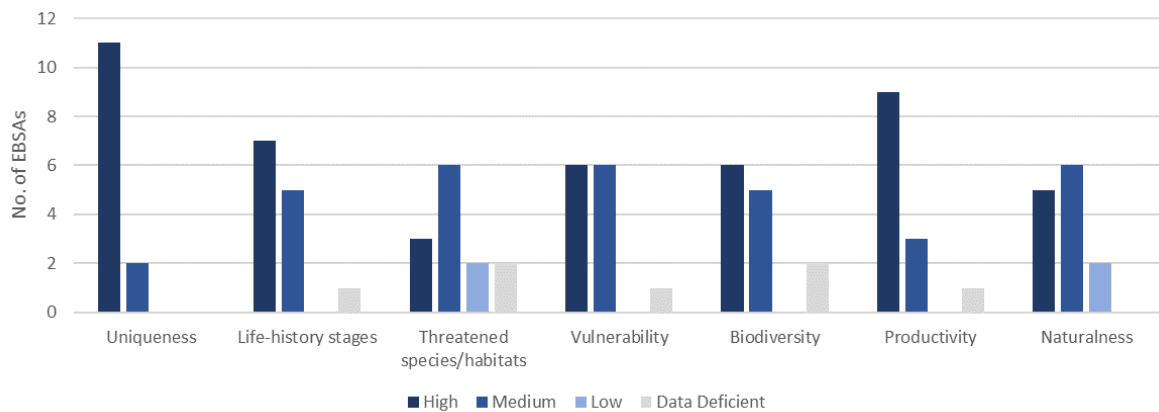
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## Other relevant website address or attached documents

*Summary of ecosystem types and threat status for Protea Seamount Cluster. Data from Sink et al. (2019).*

Threat Status	Ecosystem Type	Area (km <sup>2</sup> )	Area (%)
<b>Least</b>			
<b>Concern</b>	Cape Basin Abyss	1241.9	13.8
	Cape Basin Complex Abyss	5318.4	59.0
	Southeast Atlantic Lower Slope	0.2	0.0
	Southeast Atlantic Seamount	1576.3	17.5
	Southeast Atlantic Slope		
	Seamount	882.7	9.8
<b>Grand Total</b>		<b>9019.5</b>	<b>100.0</b>

To benchmark the criteria ranking for this proposed EBSA, the frequency of all criteria ranks were plotted for seamount-related EBSAs in the global network (figure below).



*Frequency of the criteria ranks for EBSAs in the global network that are described specifically for seamounts (n=13): Juan Fernández Ridge Seamounts; Emperor Seamount Chain and Northern Hawaiian Ridge; North-east Pacific Ocean Seamounts; New England and Corner Rise Seamounts; Tabou Canyon and Seamount; Cayar Seamount; Atlantis Seamount; Coral Seamount and Fracture Zone Feature; Agulhas Slope and Seamounts; Central Louisville Seamount Chain; Monowai Seamount; Seamounts of West Norfolk Ridge; and Sagami Trough and Island and Seamount Chain of Izu-Ogasawara.*

## Assessment of the area against CBD EBSA Criteria

CBD EBSA Criteria (Annex I to decision IX/20)	Description (Annex I to decision IX/20)	Ranking of criterion relevance
<b>Uniqueness or rarity</b>	Area contains either (i) unique (“the only one of its kind”), rare (occurs only in few locations) or endemic species, populations or communities, and/or (ii) unique, rare or distinct, habitats or ecosystems; and/or (iii) unique or unusual geomorphological or oceanographic features.	Medium
<p><i>Explanation for ranking</i></p> <p>This is the only seamount cluster in the Atlantic Ocean portion of the South African EEZ, although there are other seamount clusters in the surrounding area beyond national jurisdiction.</p>		
<b>Special importance for life-history stages of species</b>	Areas that is required for a population to survive and thrive.	Medium
<p><i>Explanation for ranking</i></p> <p>Data are relatively limited for assessing this criterion. However, given the locally high productivity in the focus area, it is expected that the Protea Seamount Cluster is a key foraging site for migratory species in particular. Further, all other EBSAs globally that include seamounts rank the site at medium or high importance for this criterion, indicative of the ecological role that the feature plays in offshore systems that can be inferred here too. OBIS-SEAMAP (Halpin et al., 2009) shows 1-10 records of megavertebate (marine mammal, seabird, sea turtle and ray and shark) observations for most of the area around these seamounts in the southeast Atlantic, and a 10-100 records within the EBSA region.</p>		
<b>Importance for threatened, endangered or declining species and/or habitats</b>	Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.	Medium
<p><i>Explanation for ranking</i></p> <p>This is a site where regionally Critically Endangered leatherback turtles have been recorded based on satellite tracking data (Harris et al., 2018), and a site where other threatened species (e.g., tuna, sharks and seabirds) are expected or known to occur. Global rankings for seamount-specific EBSAs are either High or Medium for this criterion; data are limited for this site specifically, thus it is scored as Medium.</p>		
<b>Vulnerability, fragility, sensitivity, or slow recovery</b>	Areas that contain a relatively high proportion of sensitive habitats, biotopes or species that are functionally fragile (highly susceptible to degradation or depletion by human activity or by natural events) or with slow recovery.	High
<p><i>Explanation for ranking</i></p> <p>Almost all other seamount-specific EBSAs rank this criterion as Medium or High. This is because seamounts are habitats for many indicator species of vulnerable marine ecosystems (Watling &amp; Auster 2017). Therefore, within Protea Seamount Cluster, it is likely that there are fragile, sensitive species, such as corals and sponges, that are vulnerable to impacts on the seabed and that would</p>		



take a long time to recover if impacted. This is supported by known presence localities of fragile, vulnerable and sensitive habitat-forming species (Unpublished SANBI and SAEON data) within the EBSA area. Further, the top predators that frequent this site (e.g., Harris et al., 2018) are also slow to recover from population impacts, particularly leatherback turtles given how long they take to reach sexual maturity, and the low survivorship from hatchling to adult (approximately 1 in 1000 survive).

<b>Biological productivity</b>	Area containing species, populations or communities with comparatively higher natural biological productivity.	Medium
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*Explanation for ranking*  
Seamounts are considered to be relatively productive systems, with most other EBSAs for seamounts ranking this criterion as High. No data are available for the Protea Seamount Cluster; however, Chlorophyll-a concentrations (MODIS-Aqua data on the NASA Giovanni Portal: <https://giovanni.gsfc.nasa.gov/giovanni>) show marginally higher values within this area compared to the surrounding abyss.

<b>Biological diversity</b>	Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.	Medium
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*Explanation for ranking*  
No are data available, however, given the habitat heterogeneity as a result of the seamount cluster, local biodiversity is expected to be higher than adjacent sites, which is confirmed by the global rankings of seamount-specific EBSAs that score this criterion either High or Medium. Further, given the productivity and physical location that makes aggregation of migratory species likely, biodiversity is expected to be higher than the surrounding area. This is supported by the relatively greater abundances (likely representing a greater diversity of species) of megavertebrates in the EBSA region compared to that of the surrounding area (Halpin et al., 2009), and records of up to 100 species of animals in the OBIS database (<http://www.iobis.org>) within this EBSA. There are three main ecosystem types that make up this EBSA, with a very small portion of a fourth ecosystem type (Sink et al., 2019).

<b>Naturalness</b>	Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.	High
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*Explanation for ranking*  
The area is all assessed to be in natural/good ecological condition (Sink et al., 2012, 2019), largely because the area has been subjected to relatively low levels of anthropogenic pressures because it is relatively remote and often subjected to rough seas with winds of around 50 knots. This contrasts with many seamounts further north in the Benguela system that are not in good ecological condition because they have high fishing pressure.

## **Status of submission**

Area to be submitted to the Conference of the Parties for acknowledgement of meeting EBSA criteria once review process is finalized.

## **COP Decision**

Not yet submitted.

### *End of proposed EBSA revised description*

### *Motivation for Submission*

A previous tentative description for a Protea Seamount EBSA was previously compiled, but was not submitted to CBD due to data limitations. Subsequent expert and systematic review of gaps in the EBSA network highlighted the requirements for the Protea Seamount Cluster EBSA, and delineation and description became possible due to improved spatial datasets. Initial draft EBSA boundaries were determined, and these were then evaluated against the EBSA criteria. Once it was determined that the area would meet EBSA criteria a formal boundary delineation and evaluation process was undertaken. The delineation process included an initial stakeholder review, a technical mapping process and then an expert review workshop where boundary delineation options were 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 and seamount linked ecosystems) from the National Biodiversity Assessment 2011, 2018 (Sink et al., 2012, 2019) and BCC spatial mapping project (Holness et al., 2014) were incorporated. These data were refined using the latest GEBCO data (GEBCO Compilation Group 2019) and global benthic geomorphology mapping ([www.bluehabitats.org](http://www.bluehabitats.org), Harris et al., 2014).
- Irreplaceable and near irreplaceable (i.e. very high selection frequency) sites which relate closely to the EBSA criteria of “Uniqueness and rarity”, as well as focus areas identified in the SCP undertaken for the BCLME by Holness et al. (2014) and Majiedt et al. (2013) were incorporated. In addition, focus areas for marine protection identified by Sink et al. (2011) were included.
- Threatened and under-protected ecosystem types. The analysis attempted to focus on the inclusion of the most threatened and under-protected ecosystem types found in the area (Sink et al., 2012, 2019; Holness et al., 2014). However, as all types in the broader area were Least Concern and not protected, this aspect was not informative. (Although, since delineated, a new marine protected area has been proclaimed in the EBSA).
- Areas of high relative naturalness identified in the National Biodiversity Assessment 2011 (Sink et al., 2012), the West Coast (Majiedt et al., 2013) and the BCLME spatial assessments (Holness et al., 2014) were included in the analysis. Both pelagic and benthic and coastal condition were incorporated.
- 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.