ECOLOGICALLY OR BIOLOGICALLY SIGNIFICANT MARINE AREAS

in the Benguela Current Large Marine Ecosystem

New and Revised EBSA Descriptions

On behalf of:
Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection
of the Federal Republic of Germany

Ecologically or Biologically Significant Marine Areas in the Benguela Current Large Marine Ecosystem

New and Revised EBSA Descriptions

ANGOLA

Descriptions of new and revised EBSAs in Angola. Other existing EBSAs that extend beyond national jurisdiction are not covered by the review and remain unchanged.

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Revised EBSAs

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Revised EBSA Description

General Information

Summary

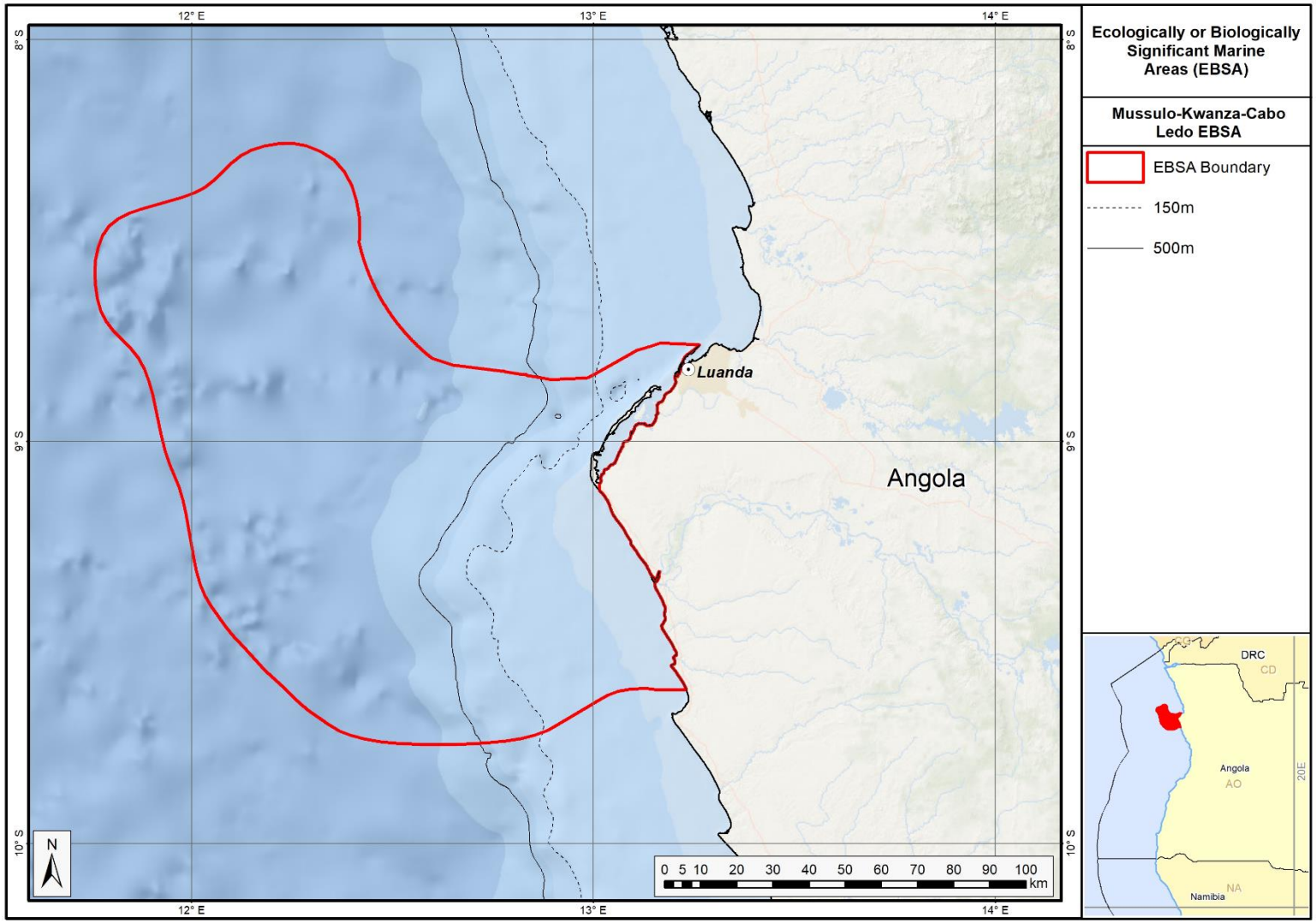
The Mussulo-Kwanza-Cabo Ledo Complex is largely a significant seaward extension of the existing inscribed Ramiros–Palmeirinhas Coastal Area EBSA, south of Luanda, Angola. This area includes two estuaries, small coastal islands, mangroves and sandy beaches. The coastal vegetation is dominated by low-growing saltmarsh species and other flora that inhabit intertidal flats, and the wetland areas are a proposed Ramsar site. It also contains an Important Bird Area for aquatic birds, especially migratory species, an important breeding site for threatened marine turtles and a nursery area for crabs, with a diversity of other species. It has since been shown that the adjacent inshore area is also an important nursery for horse mackerel, with the eggs and larvae getting exported offshore to -1300 m. Evidence from other systems indicates that canyons can play and important role in retention of fish spawning products, and thus the boundary of the EBSA was expanded to include the shelf-incising canyons that likely play a key role in this nursery function. The largest adjacent seamounts are included because they are also recognised habitat important for leatherback foraging. The canyons and seamounts thus also contribute to the rich diversity of the site and add to its vulnerability because these features are known to support fragile habitat-forming species. The important role of ecological processes associated with the rivers (nutrient and sediment delivery) that drives many attributes of the site was also not sufficiently recognised previously, and thus the EBSA boundary was also expanded southward to include the full extent of these processes based on a new habitat map. All features added to the EBSA were identified as priority areas in a systematic conservation plan for the region. The key attributes of this site of thus that it is of “special importance for life-history stages of species” and for “threatened, endangered or declining species and/or habitats”; it is also notable for its diversity, productivity and vulnerability.

Introduction of the area

The coastal Mussulo-Kwanza-Cabo Ledo Complex is located to the south of Luanda city, in the province of Luanda, in the northern portion of the Benguela Current Large Marine Ecosystem. It is a Type 2 EBSA (sensu Johnson et al., 2018) because it comprises a cluster of spatially fixed ecosystems and features but that are all connected by the same ecological processes and thus are evaluated as a single unit. The area extends from the coast to the lower slope, and includes two estuaries with mangroves, low-growing saltmarsh species, intertidal flats, sandy-, mixed- and rocky shores, lagoon habitat, the shelf and shelf edge, upper and lower slope, seamounts and shelf-incising canyons. It is an important site for bird aggregations and breeding turtles, and as nursery habitat for many species, including crabs and fish, notably for the horse mackerel. The site also includes representative portions of 13 threatened ecosystems, including two Critically Endangered and nine Endangered types. By implication, therefore, the site also includes some of the last remaining habitat for many threatened

species. Information for the site, especially offshore, is relatively limited but some surveys have been completed.

With the accession of Angola to the Ramsar Convention on Wetlands, it was proposed to create and protect certain wetlands which have fundamental ecological functions for the regulation of water regimes and also serve as a habitat for flora and fauna especially for waterbirds. The 1,616 hectares area of Saco dos Flamingos (within the EBSA) has been proposed as a Ramsar site. The Kitabanga – Conservação de Tartarugas Marinhas project has been in place since 2003. Currently, it monitors about 12km in the beach of the Palmeirinhas. Nests densities recorded between 2011 and 2015 were as follows: 45 nests.km^{-1} for the olive ridley turtle and 2.6 nests.km^{-1} for the leatherback turtle (Morais, 2015). In 2006 there was a multidisciplinary sampling of estuaries in Angola, which included that of the Kwanza River in the southern region of the extended area (da Silva Neto, 2007). The project included biodiversity studies (birds, fish, invertebrates, and vegetation) and hydrological processes. The results form part of the motivation for extending the EBSA southwards.



Proposed revised boundaries of the Mussulo-Kwanza-Cabo Ledo Complex EBSA.

Description of location

The coastal area encompasses the bays of Corimba, Luanda and Mussulo (including Saco dos Flamingos and Ilhéu dos Pássaros). The revised boundaries now include the mouth of the Kwanza River and ends north of Cabo Ledo. It has about 110 km of coastline and the furthest boundary is approximately 125 km offshore, including seamounts and shelf-incising canyons.

Feature description of the area

The coastal vegetation in the area is dominated by mangroves (*Rhizophora mangle*, *Laguncularia racemosa* and *Avicenna germinans*), with low-growing saltmarsh species of intertidal flats (*Sesuvium portulacastrum*, *S. mesembritemoides* and *Salicornia* sp.). The site is important for aquatic birds, with 61 congregatory waterbird species recorded, some of which occur in numbers which are at least nationally significant (BirdLife International, 2005). These include significant numbers of resident waterbirds as well as waders from the Palearctic while migrating south in the austral spring and returning in the late summer, for which the lagoon and intertidal flats are important foraging areas (Dean 2001). The threatened Cape gannet *Morus capensis* and Damara tern *Sterna balaenarum* are important non-breeding visitors to the inshore area (BirdLife International 2013). According to the IUCN Red List, these two species are classified as "Endangered" and "Vulnerable", respectively (http://www.iucnredlist.org/). The intertidal flats are an important nursery ground for crabs. Marine turtles, including the green *Chelonia mydas* (Endangered), leatherback *Dermochelys coriacea* (regionally Critically Endangered; globally Vulnerable) and olive ridley *Lepidochelys olivacea* (Vulnerable) occur in the area. Weir et al. (2007) surveyed the area and found that leatherback and olive ridley turtles were nesting on the beaches in the vicinity of the mangroves, with the nest density of the latter as high as 32 km^{-1} at Palmeirinhas. In 2006, a multidisciplinary survey of the estuaries of Angola, including the Kwanza River estuary at the southern extent of the proposed area, was conducted (da Silva Neto, 2007). The project included studies of biodiversity (birds, fish, invertebrates, vegetation) and hydrological processes. Intertidal zones are important nurseries for crabs. The biological diversity in the area of the Kwanza bar reveals the presence of specimens of crustaceans such as shrimp (*Penaeus* sp.) and crab (*Callinectes* sp.). The ichthyofauna includes species that are ecologically adapted to the brackish environment, with emphasis on some species of the *Clariidae* and *Mugilidae* family. Also included are fish species of the families *Soleidae*, *Lutjanidae*, *Lobotidae* and *Plynemidae* (Holisticos, 2014). The inshore area is also an important nursery for horse mackerel, with the eggs and larvae getting exported offshore to -1300 m. Evidence from other systems indicates that seamounts and canyons can play and important role in retention of fish spawning products (Rojas & Landaeta, 2014), and thus the boundary of the EBSA was expanded to include the shelf-incising canyons that likely play a key role in this nursery function. The largest adjacent seamounts are also included, additionally because they are also recognised habitat important for leatherback foraging.

Although specific detailed biodiversity data on the offshore seamounts and canyons are lacking, these are significant features that are subject to fairly low levels of impact and hence are likely to be in good condition and support a representative range of biodiversity. These ecosystems also characteristically support fragile, habitat-forming species, such as sponges and corals, which add to the site's vulnerability. Despite limited biodiversity information, 13 of the 23 ecosystem types represented in

this EBSA are threatened, including two Critically Endangered and nine Endangered types. By implication, therefore, the site is also important for threatened species.

Feature conditions and future outlook of the proposed area

The Mussulo area is a confirmed Important Bird Area (BirdLife International 2013). The mangrove ecosystem of the area is not represented in mangrove communities elsewhere on the Angolan coast, and their botanical interest alone has been used to justify its conservation (Huntley 1974, UNEP 2007). The mangroves are threatened by the human occupation of coastal areas (BirdLife International 2005) and associated activities, which lead to damage, fragmentation and loss, with implications for their function as refuge, breeding or foraging areas for diverse species, including turtles, birds, fish and crustaceans. Other threats, particularly for the estuaries, include invasive alien plants, coastal erosion and artisanal fishing using set-nets and gill nets (da Silva Neto et al., 2007). Offshore pressures relate largely to fisheries. Revision of the EBSA boundary has largely excluded areas of direct impact, and therefore most of the EBSA area is in a good (57%) or fair ecological condition (29%) (Holness et al., 2014). Nevertheless, the area is likely to be significantly impacted by activities directly adjacent to the EBSA (particularly from Luanda Bay), and this assessment of condition is likely to be highly optimistic. Further research for the area is recommended, particularly in terms of fully understanding the role of the canyons and seamounts in enhancing productivity and supporting species' life-histories within this EBSA.

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Summary of ecosystem types and threat status for Mussulo-Kwanza -Cabo Ledo Complex. Data from Holness et al. (2014).

Threat Status	Ecosystem Type	Area (km^2)	Area (%)
Critically Endangered	Luanda Inshore	38.5	0
	Luanda Reflective Sandy Beach	30.3	0
Endangered	Bengo Shelf	556.2	3
	Bengo Shelf Edge	475.2	3
	Kwanza Inshore	737.5	4
	Kwanza Intermediate Sandy Beach	34.4	0
	Kwanza Mixed Shore	28.8	0
	Kwanza Shelf	1 868.1	11
	Kwanza Shelf Edge	961.3	6
	Luanda Lagoon Coast	151.4	1
	Luanda Mixed Shore	0.8	0
Vulnerable	Kwanza Estuarine Shore	1.2	0
	Luanda Sheltered Rocky Shore	0.1	0
Least Threatened	Bengo Lagoon Coast	0.4	0
	Bengo Mixed Shore	0.0	0
	Bengo Upper Slope	3 779.6	23
	Congo Lower Slope	2 619.5	16
	Congo Seamount	508.9	3
	Kwanza Lower Slope	501.5	3
	Kwanza Reflective Sandy Beach	40.9	0
	Kwanza Sheltered Rocky Shore	8.1	0
	Kwanza Upper Slope	4 212.2	25
	Luanda Intermediate Sandy Beach	0.0	0
Grand Total		**16 554.8**	**100**

Assessment of the area against CBD EBSA criteria

C1: Uniqueness or rarity: Medium

Justification

The mangrove ecosystem of the area, which consists of *Rhizophora mangle*, *Laguncularia racemosa* and *Avicenna germinans* is not represented in mangrove communities elsewhere on the Angolan coast, and their botanical interest alone has been used to justify its conservation (UNEP 2007).

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

Justification

The Islands of Migratory Birds (Ilhéu dos Pássaros) is internationally recognized as an Important Bird Area – it is a vital feeding and resting site for large numbers of migrating waterbirds (Birdlife International 2005, 2013). The beaches are used for breeding by globally Vulnerable leatherback turtles as well as Vulnerable olive ridley turtles, which have been found to have high nesting densities at Palmeirinhas by Weir et al. (2007). The densities of nests recorded in Palmeirinhas between 2011

and 2015 were 45 nests.km^{-1} for the olive ridley turtle nests and 2.6 nests.km^{-1} for the leatherback turtle (monitored beach 12 km). The area is reported to be an important nursery ground for crabs (Simão pers.comm.). Horse mackerel also spawn in the area, with the eggs and larvae transported offshore to about -1300 m. Other studies have suggested that canyons and seamounts can act to aid retention of these products (Rojas & Landaeta, 2014), which is proposed for the adjacent seamounts and shelf-incising canyons in this EBSA.

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

Justification

The beaches are used for breeding by globally Vulnerable leatherback turtles as well as Vulnerable olive ridley turtles that have high nesting densities at Palmeirinhas (Weir et al., 2007). Threatened bird species Cape gannet *Morus capensis* and Damara tern *Sterna balaenarum* are important non-breeding visitors to the inshore area (Birdlife 2005, 2013). The West African manatee *Trichechus senegalensis* (IUCN Vulnerable) is also reported from this area (Kwanza River) (Morais et al., 2006; da Silva Neto et al., 2007), with the estuarine habitat being considered important for this threatened species (Morais et al., 2006; Powell and Kouadio, 2008).

The BCC spatial assessment (Holness et al., 2014) identified two Critically Endangered ecosystems (Luanda Inshore and Luanda Reflective Sandy Beach), nine Endangered ecosystems (Bengo Shelf, Bengo Shelf Edge, Kwanza Inshore, Kwanza Intermediate Sandy Beach, Kwanza Mixed Shore, Kwanza Shelf, Kwanza Shelf Edge, Luanda Lagoon Coast and Luanda Mixed Shore), and two Vulnerable types (Kwanza Estuarine Shore and Luanda Sheltered Rocky Shore). In the absence of more specific biodiversity information, it can be assumed that these threatened ecosystems support similarly threatened communities of species.

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

Justification

The area is key for several relatively long-lived species that reproduce slowly and recover slowly from population declines, such as turtles and manatees (Sarti Martinez 2000, Powell and Kouadio 2008), not to mention mangroves. The mangroves, estuaries and associated low-growing saltmarsh and flat intertidal habitat are all sensitive to anthropogenic pressures such as traffic, pollution, deforestation, development and associated fragmentation, with implications for their function as refugia, breeding or foraging areas. Restoration of degraded mangroves is an extremely complex, costly, long-term process, and hence protection of intact mangroves is a far more preferable option. The canyons and seamounts represented in the EBSA are also highly likely to support fragile habitat-forming species such as corals and sponges, as is characteristic of these features.

C5: Biological productivity: Medium

Justification

Mangroves are among the most productive terrestrial ecosystems (FAO 1994) and provide the highly productive coastal lagoons and tidal estuaries with which they are interlinked with essential organic nutrients; they are also critical breeding grounds and nurseries for larval and juvenile stages of important fisheries species (Shumway 1999). The seamounts and canyons may also play a role in enhancing local productivity.

C6: Biological diversity: Medium

Justification

The area contains 23 different ecosystem types (estuaries, lagoons, mangroves, saltmarshes, flat intertidal habitats, beaches and inshore areas), with associated diversity of species. At least 61 congregatory waterbird species use this area as well as non-breeding waterbird (BirdLife International 2005, 2013), several breeding sea turtle species (Weir et al., 2007), aquatic mammals such as the manatee (da Silva Neto et al., 2007), crabs, shrimps, sea snails and fishes. Field research has confirmed high diversity in this area, although this is still being included in reports.

C7: Naturalness: Medium

Justification

Much of the area is currently relatively pristine but coastal development (BirdLife International 2005) and vehicles in the coastal zone are having some impact in the area. It is also affected by effluent, e.g. from hospitality industry, bungalows, etc, and offshore pressures relate mostly to fisheries. Overall, however, the BCC spatial assessment showed that most of the EBSA area is in a good (57%) or fair ecological condition (29%), with only 14% in poor ecological condition Holness et al., 2014). Nevertheless, the area is likely to be significantly impacted by activities directly adjacent to the EBSA (particularly from Luanda Bay), and this assessment of condition is likely to be highly optimistic.

Status of submission

The Ramiros–Palmeirinhas EBSA was recognized as an area described as meeting EBSA criteria that were considered by the Conference of the Parties. The revised name, description and boundaries have been submitted to the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) for consideration by the Conference of the Parties to the Convention on Biological Diversity.

COP Decision

dec-COP-12-DEC-22

End of proposed EBSA revised description

New EBSAs

Chiloango Mangroves

Proposed EBSA Description

Abstract

The Chiloango Estuary is in the Angolan province of Cabinda. The proposed EBSA is strongly coastal and includes the Chiloango Estuary and 6 km of coastline surrounding the estuary mouth. The mangroves and riverine forest are key features at this site; they are less noteworthy in a global context but are very significant in a local context. In fact, three of the four habitats represented in the area are threatened. Most importantly, this area supports many species whose growth and reproduction rates are slow, particularly globally threatened species such as olive ridley and leatherback turtles (that nest in the area) and manatees (that are resident in the area). The latter have been hunted throughout their range and, despite limited quantitative data, are showing extirpations in many places. Current anthropogenic pressure in the mangroves is also visible and worrying, with signs of advanced habitat degradation and destruction. The area is highly relevant in terms of the EBSA criteria: "Importance for threatened, endangered or declining species and/or habitats" and "Vulnerability, fragility, sensibility or slow recovery".

Introduction

There are two estuaries in Cabinda: the Cabinda and Chiloango Estuaries in the north and south of the provice, respectively. At the boundary with the Republic of the Congo in the north, the Cabinda River reaches the sea through the Massabi Lagoon. The proposed EBSA, however, lies at the mouth of the Chiloango River in the south, which flows into the sea through the estuary (Giresse and Kouyoumontzakis, 1985). The river is approximately 168 km long, originating from springs in the Democratic Republic of Congo (DRC), and in some places forms the boundary that separates DRC from the province of Cabinda in Angola (Sonangol, 2012). It is a coastal EBSA that is a discrete site centred around the mangroves and its associated threatened species, and is thus a Type 1 EBSA (sensu Johnson et al., 2018).

The Chiloango Estuary EBSA comprises four biotypes: marine, estuarine, riverine forest, and wetland areas. There are approximately 130 hectares of wetland areas encompassing small lagoons, surrounded by Endangered mangroves. The mangroves and riverine forest associated with the river were fundamental in choosing this site as a proposed EBSA; although not globally significant, these mangroves are of key local significance. Consequently, the reason this EBSA was not included in the original set of EBSAs at the South Eastern Atlantic Workshop in 2013 (UNEP/CBD/RW/EBSA/SEA/1/4) is because this local knowledge was not available at that meeting and is better than the information included in international datasets (e.g., WCMC and the World Mangrove Atlas).

In the EBSA, the mangroves and riverine forest are bounded by a sandy beach, surrounded by the estuary, and extend to the river and margins of the lagoon. The mangroves cover the alluvial areas of the Chiloango River mouth, corresponding to sites subjected to temporary flooding resulting from changing tides, and are populated by *Rhizophora mangle* (Diniz, 2006). Mangrove forest is scattered along the Angolan coastline and forms a transition ecosystem between land and sea of enormous biological and ecological importance, providing shelter and nurseries for crustaceans and fish that are of economic and tourism importance to the country (EPANB, 2006). The EBSA supports a rich diversity

of avifauna, herpetofauna and ichthyofauna (MINAMB et al., 2015). Most importantly, it provides critical habitat for threatened species, such as African manatees that are threatened throughout their range and showing signs of local extirpations (Keith Diagne, 2015), and olive ridley and leatherback turtles that nest on the adjacent beaches.

Habitat loss in the proposed EBSA is largely due to infrastructure development that has fragmented forests through the construction of roads and buildings, such as the construction of a motorway linking the Town of Cabinda with Belize. It is believed that mangrove degradation in the Chiloango Estuary is also caused by fragmentation due to road construction, among other factors (Kuedikuenda & Xavier, 2009). Nevertheless, this site is still sufficiently intact to warrant conservation attention.

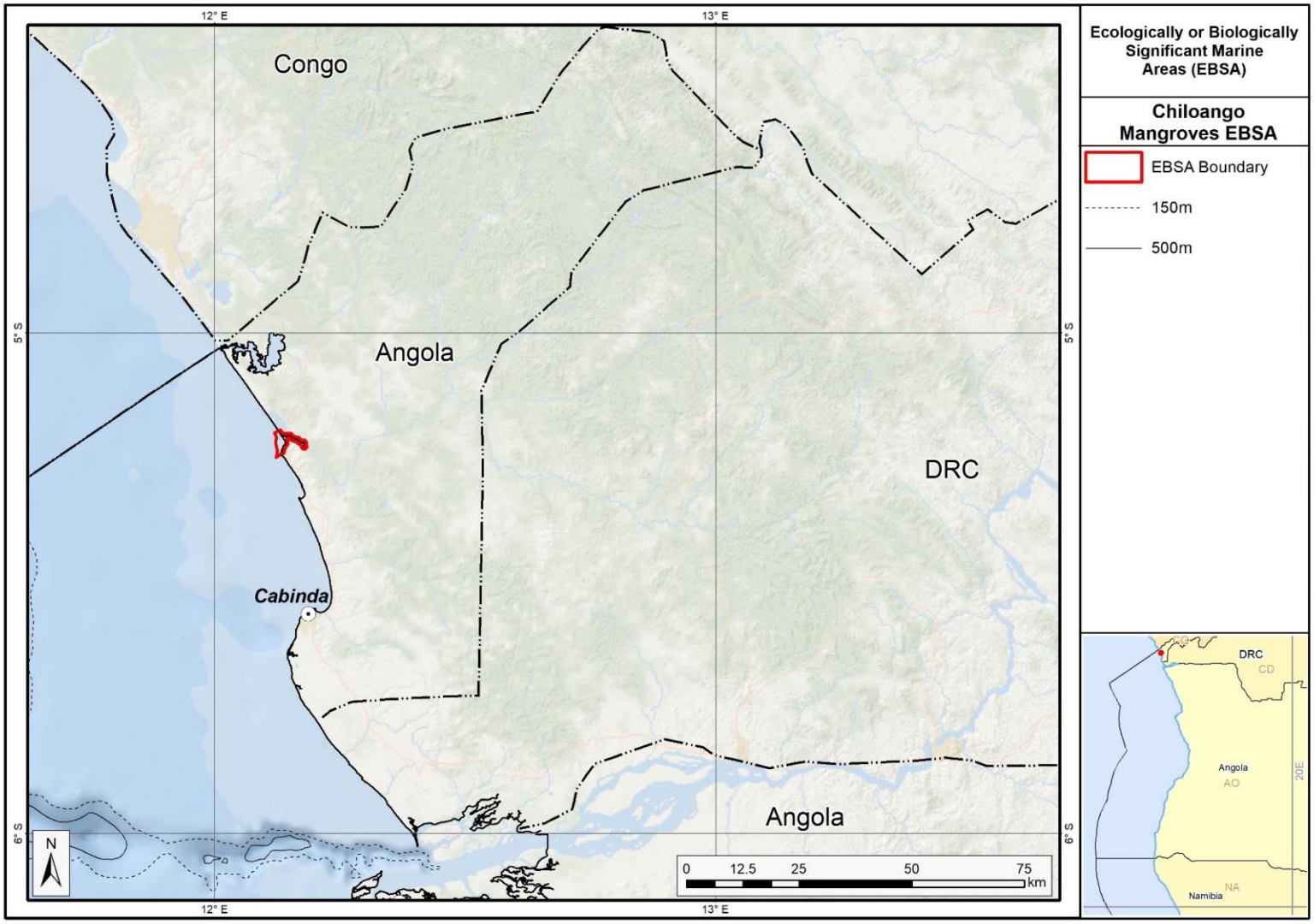
Description of the location

EBSA Region

South-Eastern Atlantic

Location

The EBSA is in the northern half of the Cabinda province of Angola, including the Chiloango Estuary and 6 km of rocky, sandy and mixed shores adjacent to the mouth. The area includes around 130 ha of wetland areas encompassing small lagoons surrounded by Endangered mangroves. The furthest extent inland is approximately 1.2 km from the coastline. The whole of the proposed area lies entirely within Angola's national jurisdiction.



Proposed delineation of the Chiloango Mangroves EBSA.

Feature description of the proposed area

The Chiloango River mouth is dominated by muds from the river. Fresh-water flow out of the Chiloango River also forms a plume of low-salinity water in the adjacent coastal area that, in turn, affects the nearshore coastal processes. These features, as well as the local extent of the turtle nesting beaches, contributed to defining the alongshore extent of the EBSA. Because this is a coastal EBSA, it is described primarily for its benthic features, although the overlying water column in the estuary, surf and inner shelf is very tightly coupled to the key features and species of this site.

The mangrove forests of the region include species such as *Rhizophora* (*R. mangle, R. racemosa* and *R. harrisonii*), which tolerate high levels of salinity. The mangroves cover the whole Chiloango riverbed up to the high tide mark and extend up to the wetland area associated with the river. The Chiloango River is the southern hydrographic basin included in the Lower Guinea ichthyofaunal province, which is one of the 10 ichthyofaunal provinces as defined by Roberts (cited in Darwall et al., 2011). The Lower Guinea ichthyofaunal province extends from the Chiloango River to the Cross River in the north, and shares a boundary with the Congo River basin to the east. This region contains a rich diversity of species, and more than half of the freshwater or marine fish species seen here are endemic to the region. This region also has relatively high numbers of freshwater fish species that are threatened and have limited geographic ranges (Darwall et al., 2011). Further, a species of fresh water crab belonging to the tropical African endemic family, *Potamonautidae*, is found in the rivers of Cabinda (Darwall et al., 2011). Although biodiversity data are largely limited for Angola, this region is known to have the highest diversity of dragonflies and damselflies (Odonata) within the whole of Africa.

In terms of birds, it is important to mention the rich diversity that includes resident, visiting and seasonal migratory birds that feed and rest here. Among these, it is worth mentioning the presence of cattle egrets, white chest crows, spotted kingfishers, white chested mouse birds and black bishops, among others. In terms of the most relevant reptiles, olive ridley and leatherback turtles can be observed nesting in the region. The beaches here thus provide critical habitat to support important life-history stages of these two threatened species. Marine mammals are also found along the coastline, such as the common whale, humpback whale, common dolphin and spotted dolphin (ACEPA, 2012). The West African Manatee (*Trichechus senegalensis*) is another threatened marine mammal that is important in the areas, and is classified by the IUCN as Vulnerable largely due to species declines due to hunting and habitat loss (Powell & Kouadio, 2008; Keith Diagne, 2015). Historically, its presence has been recorded in the Chiloango River, but the current distribution is unknown (MINUA, 2006; Morais, 2006), and local extirpations of this species are known across its distribution (Keith Diagne, 2015).

Feature condition and future outlook of the proposed area

Across the system, the ecological condition of the mangrove varies a lot, i.e., from pristine areas to fully deforested areas. Current anthropogenic pressure is visible and worrying, with signs of advanced habitat degradation and destruction in some places (MINAMB et al, 2015). Further, Tati Luemba regrets the level of destruction of the mangrove as a result of stagnant water caused by the limited water mixing between river and sea (Tati Luemba press comm., 2015). It is thus important that the Chiloango Mangroves are protected to prevent the extinction or extirpation of fauna and flora that contribute to the region's ecological integrity (press comm. Tati Luemba, 2015), especially the iconic and threatened manatee and turtle species. An assessment of ecological condition based on

cumulative pressures indicates that 77% of the area is in poor ecological condition and the remainder in good ecological condition, suggesting notable degradation, but that some of the biodiversity and ecological processes are still intact. This means that establishing the proposed EBSA and implementing appropriate conservation and management measures in this area will contribute to protecting the existing biodiversity.

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Summary of types of habitats and status of threats for the Chiloango Estuary - Cabinda. Data from Holness et al. (2014).

Threat Status	Ecosystem Type	Area (km^2)	Area (%)
Endangered	Cabinda Reflective Sandy Beach	4.7	28
	Cabinda Sheltered Rocky Shore	0.3	2
Vulnerable	Cabinda Mixed Shore	4.7	27
Least Threatened	Cabinda Estuarine Shore	7.4	43
Least Threatened Total		**7.4**	**43**
Grand Total		**17.1**	**100**

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**
Uniqueness or rarity	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
Explanation for ranking Systems comprising the complex of river, estuary, shore, mangrove and forest are relatively rare in the area, and this particular site comprises the second largest mangrove forest in the country. Further, more than half of the freshwater or marine fish species seen here are endemic to the region. It is also a biodiversity hotspot for dragonflies and damselflies: it has the highest diversity of these insects in all of Africa. This system has unique ecological characteristics as it associates different aquatic ecosystems. The estuary has riverine (Chiloango River), brackish (estuary), marine (Atlantic Ocean) and wetland areas (the Usanka Lagoon, as the largest wetland area). The interaction of different areas/ components of this system and its abiotic conditions allowed for the establishment of different fauna and flora species. This location has already been described as a coast sensitive location (MINAMB, 2015).		
Special importance for life-history stages of species	Areas that is required for a population to survive and thrive.	High
Explanation for ranking The proposed EBSA is important for as a foraging and resting site for multiple bird species, and as nesting grounds for olive ridley and leatherback turtles. The mangroves also provide key habitat as nursery areas for fish and crustaceans in the estuary. The migratory birds use the area for resting. Furthermore, the olive ridley and leatherback turtles that are threatened species are also found here. The African Manatee (*Trichechus senegalensis*) is also found within this area. The Manatee features in the IUCN Red List (in Category V) and is defined as a species that is vulnerable to extinction (Annex I) by the Convention for Threatened Species International Commerce (*CITES*) and at the same time features in the Annex I of Hunting Law currently in force in Angola providing total protection (MINUA, 2005b).		
Importance for threatened, endangered or declining species and/or habitats	Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.	High

Explanation for ranking

Olive ridley and leatherback turtles are both Vulnerable species that nest on the beaches in this EBSA. Given that these and green turtles nest a little further south at Malongo (monitored as part of the Cabinda Gulf Oil Company—Chevron (CABGOC) environment programme: Malongo Sea Turtle Protection Program; Fancony & Abel, 2012), it is likely that the latter species nests in Chiloango Mangroves as well. The African Manatee (*Trichechus senegalensis*) is also a Vulnerable species found within this area. Sites that support manatees are particularly important because this mammal has been extirpated from many sites in its distribution due to hunting and habitat fragmentation (Keith Diagne, 2015). For example, one hunter in Angola was identified in a 40-km area around the Congo River mouth, and said in an interview that he had hunted three manatees a week for the last 30 years, another fisherman from around the Bengo River noted that 77 manatees had been killed in the area in one year, and manatee meat has been seen for sale in Luanda (Keith Diagne, 2015). That this site supports both manatees and nesting turtles thus makes this EBSA particularly important for threatened species. In terms of ecosystems, the more than half the EBSA area comprises threatened ecosystem types, including Endangered rocky and sandy shores, and Vulnerable mixed shores.

Vulnerability, fragility, sensitivity, or slow recovery	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

Explanation for ranking

The EBSA comprises several features that are fragile, sensitive to disturbance and that will take a long time to recover. Sensitive species with slow recovery include the turtles, manatee, and some of the birds; the mangroves are also sensitive, slow growing and take long to recover from disturbance.

Biological productivity	Area containing species, populations or communities with comparatively higher natural biological productivity.	Medium

Explanation for ranking

Mangroves are among the most productive ecosystems (FAO 1994) and provide highly productive coastal lagoons and estuaries and contains essential organic nutrients. Mangroves are also an important site for reproduction and growth (nursery) of larvae and juvenile stages of important species (Shumway, 1999). This is considered the second biggest mangrove section of the country (MINAMB, 2015).

Biological diversity	Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.	High

Explanation for ranking

All habitats in this site present a set of favorable conditions for the existence of different species of plants and animals. The mangroves offer areas for feeding, reproduction, development and resting for an important component of the biodiversity. This biodiversity is noticeable through the presence of a high number of shellfish and a vast diversity of species of marine and fresh water fish. The visiting and seasonal migrating birds can also be seen. The reptiles are diverse and found along all zones, including marine reptiles (olive ridley and leatherback turtle), terrestrial reptiles (pythons) and fresh water reptiles (crocodiles). In relation to mammals, cetaceans and manatees are most relevant, but the small primates, rodents and other small herbivores in the surrounding forests are worth mentioning. This site also has the highest diversity of dragonflies and damselflies (Odonata) within the whole of Africa.		
Naturalness	Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.	Medium
Explanation for ranking Part of the area remains natural, however, a fairly large area has been negativey impacted subsistence agriculture, opening of waterways by local people, wood cutting and coal making (wood from the mangroves), and pollution from discarded waste. A systematic assessment of ecological condition based on cumulative pressures indicates that 77% of the area is in poor ecological condition and the remining 23% is in good ecological condition, suggesting notable degradation, but that some of the biodiversity and ecological processes are still intact.		

Status of submission

The description of Chiloango Mangroves has been submitted to the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) for consideration by the Conference of the Parties to the Convention on Biological Diversity.

COP Decision

Not yet submitted.

End of proposed EBSA description

Ponta Padrao Mangroves and Turtle Beaches

Proposed EBSA Description

Abstract

The Ponta Padrao Mangroves and Turtle Beaches on the Sereia Peninsula is located in Soyo, at the Congo River mouth in northern Zaire, Angola. The proposed area consists of 17 km of coastline and some of the most important mangroves in Angola associated with the Congo River. There is a network of canals and coves that link to the bay, the most noteworthy being the Pululu, Moita Seca and Soyo

Canals, which are largely covered by mangrove forest. It has a particularly rich diversity of plants, birds, mammals, reptiles, fish and invertebrates from both the terrestrial and marine realms, most significantly providing critical habitat for Vulnerable manatees (which are facing local extirpations due to hunting and habitat degradation) and Vulnerable nesting turtles. The ecosystem shows some degree of anthropogenic degradation from construction of new artificial canals, mangrove logging, and coastal development. Several species (including manatees, turtles, birds, mangroves and dunes) are sensitive to disturbance, and have slow growth and/or reproduction rates. The area is thus highly relevant in terms of the EBSA criteria: "Importance for threatened, endangered or declining species and/or habitats" and also "Vulnerability, fragility, sensibility or slow recovery", and "Biological Diversity".

Introduction

The Ponta Padrao Mangroves and Turtle Beaches on the Sereia Peninsula, in Soyo, which is along the northern border of Angola's Zaire Province at the Congo River mouth. It falls in the savannah forest and Angolan woods ecoregion that is composed of palm trees, forest remnants, bush, mangroves and coastal areas. The coastal influences are key to the formation of the Sereia Peninsula, which in turn is fundamental to the maintenance of the estuarine character of Diogo Cão Bay (ERM, 2006a). The Sereia Peninsula has tree- and shrub-form mangroves that serve as a shelter for bird and turtle nests, as well as fulfilling other ecological roles. Apart from the widely distributed and sensitive mangrove habitats, there is a unique area comprising remnants of Atlantic forest that is important in terms of biodiversity. In fact, it represents the last large area of this type in the region (ERM, 2006b).

The zonation of the Sereia mangroves differs from the general zonation of the West African mangrove communities, as described by Chapman (1976), Tomlinson (1986) and Saenger and Bellan (1995). The sandy soil plays a major role in the system laying down fine materials, clay and *limos,* in the mangroves or near to it. It is confined to the Moita Seca Canal, some sites of the Pululu Canal and is prevalent near Diogo Cão Bay. These locations are clearly identified by the presence of tall mangrove forms. In most other similar sites in West Africa, sandy sediments are colonized by *Avicennia germinans*, although *R. racemosa* may act as the pioneer of low-salinity sands (Lebigre, 1983). Bottom sediments along the outer side of Diogo Cão Bay and along the transport canal to the Base of Kwanda have high concentrations of mud (20-95%), while equivalent sediments of the Base of Kwanda up to the furthest points of the Pululu canal are predominantly sand (CSIR, 2003b; Herod, 2003). The Sereia Peninsula mangroves together with the mangroves in the south of the Kwanda Base occupy approximately 39 km^2. This is relatively small (8%) in comparison to the broader distribution of mangroves (i.e., in the estuary of the Congo River as a whole), but locally it represents a significant habitat (ENSR, 2005). The mangroves contribute vast amounts of organic carbon to the waterbody of the estuary in the way of leaves, debris and dissolved materials (ERM, 2006a), which elevates the local productivity.

A critical feature of the site is the beaches that line the mangroves. The nearly the full spectrum of beach morphodynamic types is represented, from reflective to dissipative-intermediate types, with the bulk being intermediate. These beaches provide excellent habitat for turtles to nest, particularly for olive ridleys. Green turtles and leatherbacks are also present in the area, with the former recorded nesting there too. However, only a 15 km section of the coast is monitored, and local turtle nest densities may be higher than currently reported.

The mangroves and riverine forest associated with the river were fundamental in choosing this site as a proposed EBSA; although not globally significant, these mangroves are of key local significance. Consequently, the reason this EBSA was not included in the original set of EBSAs at the South Eastern Atlantic Workshop in 2013 (UNEP/CBD/RW/EBSA/SEA/1/4) is because this local knowledge was not available at that meeting and is better than the information included in international datasets (e.g., WCMC and the World Mangrove Atlas). Further, the turtle monitoring programme in the area had barely started at the time of the first workshop, and again, the nest data that were just starting to be collected were not available at that meeting; it was not known at the time how important this site is for these threatened species. Because this is a discrete site that is centred around the mangroves and its associated threatened species, it is a Type 1 EBSA (sensu Johnson et al., 2018).

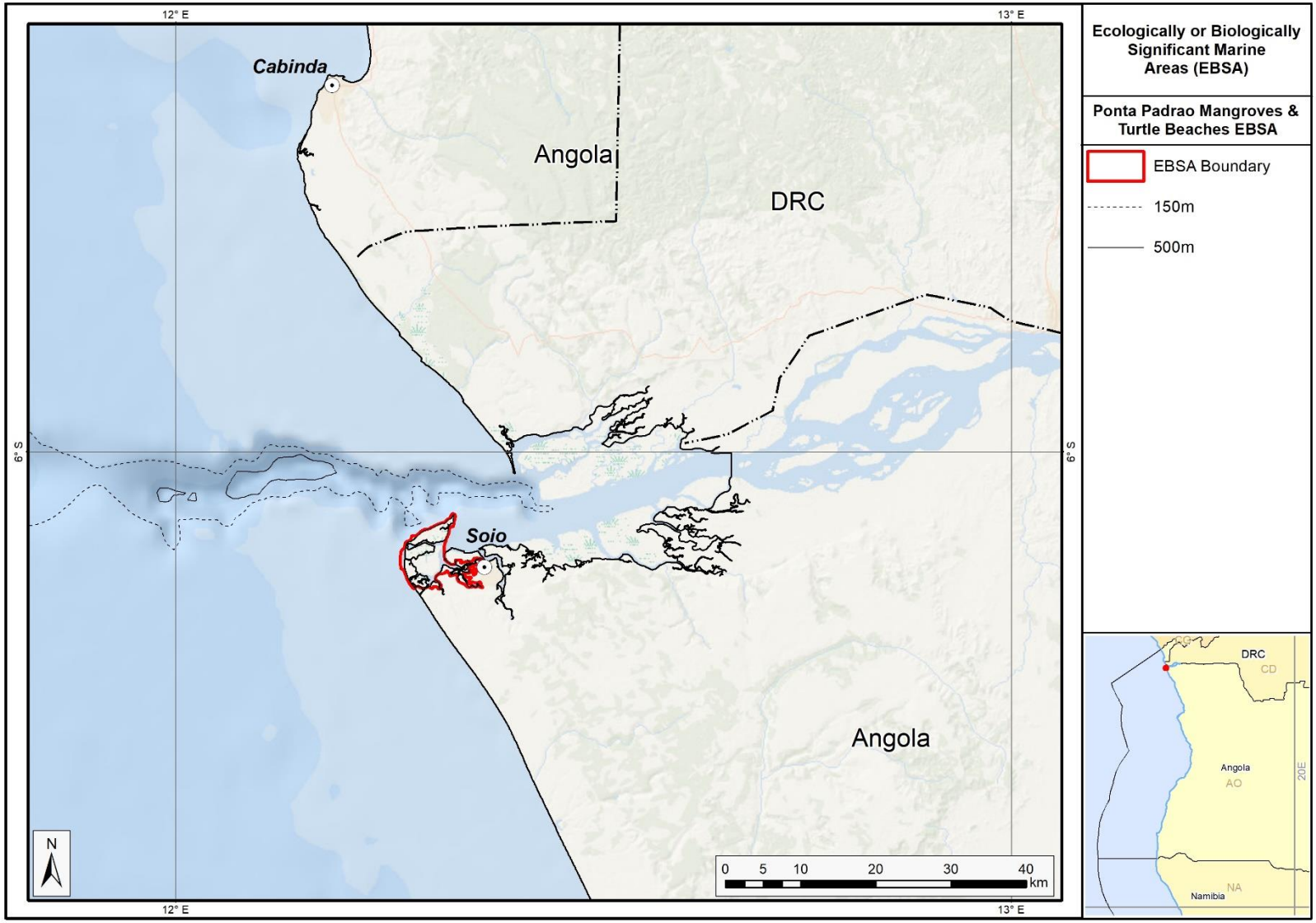
Description of the location

EBSA Region

South-Eastern Atlantic

Location

The Ponta Padrao Mangroves and Turtle Beaches on the Sereia Peninsula is a coastal area located in the town of Soyo, in the extreme north of the Zaire province and bordering the Congo River mouth. The proposed area comprises approximately 50 km^2 and 17 km of coastline. The whole of the proposed area lies entirely within Angola's national jurisdiction.



Proposed delineation of the Ponta Padrao Mangroves and Turtle Beaches EBSA.

Feature description of the proposed area

Ponta Padrao Mangroves and Turtle Beaches is a coastal EBSA and is thus described primarily for its benthic features, although the overlying water column in the estuary, surf and nearshore is tightly coupled to the key features and species at this site. The mangroves in the study area are part of the East Atlantic forest, and indigenous knowledge indicates that these mangroves around the Congo River mouth are some of the most important mangroves in Angola. The EBSA comprises tree- and shrub-form mangroves of two main species: *Rhizophora racemosa* and *R. harrisonii,* with *R. mangle* also present but less abundant. Mangroves made up of the African *Rhizophora* are very tolerant to fresh water (Saenger & Bellan, 1995; Lebigre, 1983, 1999) but may also survive under high salinity levels for at least part of the year. This is consistent with observations of the mangroves in this area; they are almost exclusively fresh water in some places and dominated by *R. racemosa* and *R. harrisonii*. In some places, the transitional mangroves have a terrestrial component whose characteristic species are ferns *Bolbitis auriculata* and the thorny shrub *Drepanocarpus lunatus* (CSIR, 2005c).

Plant diversity at the site extends to the adjacent forest and dunes as well. The only area of true forest in the EBSA occurs in the Sereia Forest. It covers an area of approximately 4 ha (ERM, 2006). The species of forest trees generally include a variety of fig species, African nutmeg (*Pycanthus kombo*) and woody species such as *Entandrophragma angolensis*. It is likely that there is an important component of shrubs and numerous lianas (ERM, 2006a). Although forests are terrestrial systems, they are included in this EBSA because they are interspersed with canals and tributaries that define the extent of the mangroves and other strongly coast-associated features. Similarly, the dunes behind the turtle nesting beaches are a key component of the coastal system because the critical linkages between beaches and dunes are important to maintain to secure resilience of sandy shores in the face of global change, and especially sea-level rise. The dune vegetation of the coastline is dominated by pioneering species. This flora is typical of the Central and West African coast (Lebrun, 1954; Davies and Le Maitre, 2003; CSIR, 2003a), comprising of a variety of herbs (*Sesuvium crystallinum*, *Ipomoea pes-caprae*, *Canavallia obtusifolia*), grasses (*Sporobolus virginicus*, *Eragrostis linearis*, etc.) and shrubs (*Scaevola plumieri* and *Chrysobalanus icaco*) (ERM, 2006a).

Bird diversity is also rich, including resident, migrating, visiting, and seasonal birds that use the area as a resting and feeding place. The mangroves of Soyo have similar bird communities to the mangroves of the *Park des Mangroves* in the Democratic Republic of Congo (DRC), which is a designated Ramsar site. Coastal birds found in the area include *Phalaropus fulicarius*, *Larus fuscus*, *Larus dominicanus*, *Sterna albifrons* and *S. maxima* (Dean, 2000; Dowsett and Simpson, 1991; Urban et al., 1986). Birds that feed on fish are uncommon within Diogo Cão Bay, although certain species of birds such as the *Ceryle maxima*, *H. chelicuti* and *H. senegalensis*, wader birds and bigger aquatic birds such as Cape cormorants (*Phalacrocorax capensis*) and small and great white egrets (*Egretta alba* and *E. garzetta*) use the margins of the mangrove canals as feeding grounds. The palm-nut vulture (*Gypohierax angolensis*) and the African fish eagle (*Haliaeetus vocifer*) are commonly seen over the river-mouth waters and the former over the palm tree savannah as well. A series of threatened and endemic species were identified in Angola, although only some of them exist in the area because there is not enough adequate habitat to support them.

Given the diverse habitats in the area, the EBSA also supports a variety of mammal species. In terms of terrestrial mammals, notable species are the side-striped jackal and wildcat. Marine mammals

include cetaceans such as the blue whale, Rorquais, common dolphin and spotted dolphin that are found along the whole of the Angolan coastline. Perhaps most important of all, this site seems to be especially significant for Vulnerable manatees, with these mammals being reported as common in the Congo River (Keith Diagne, 2015). Manatees are in a general state of population decline, with local extirpations reported across its range due to hunting and habitat destruction (Keith Diagne, 2015), making sites where these animals are abundant even more important. Manatees have been hunted in the Congo River, with one hunter noting that he had killed three manatees per week for 30 years (Keith Diagne, 2015). However, current data on the abundance of manatees are limited.

The local reptiles include snakes and marine turtles that nest in the region. Up to five species of turtles (all of which are listed by the IUCN as threatened) use the Atlantic beach in the southeast of *Ponta do Padrão* as a nesting place (ENSR, 2005), although the site is primarily recognized as a rookery for Vulnerable olive ridley turtles. There are no records of nests in the inner coastline (to the east) of the Peninsula within Diogo Cão Bay, possibly due to high levels of human activity and low salinity (CSIR, 2005). The Kitabanga Project for conservation of marine turtles that was set up in 2003 currently monitors approximately 15 km of the beach of Soyo. The densities of nests recorded between 2011 and 2015 were as follows: 61 nests.km^{-1} for olive ridley turtles, 0.2 nests.km^{-1} for green turtles, and no records for leatherback turtles.

The diversity of marine and freshwater fish species is also particularly high. The following commercial species of fish predominate: corvina, sardines, grouper, saw fish, snapper, hammer shark, flounder, stingray, bagre, barracuda, red snapper, grey reef sharks, twaite shad, big eyed haemulidae, beltfish, mullets, and Guinea corvina (ACEPA, 2012). Many of these fish rely on the local zooplankton, which are abundant in the EBSA. There are many invertebrates in the area, including crabs, snails, oysters and shrimps, although the latter are commercially over-exploited. Despite the significant organic flow to Diogo Cão Bay originating from the mangrove and aquatic vegetation, the available data suggest that the benthos is actually impoverished (CSIR, 2005). Within the mangrove margins, macrofauna is limited to mudskippers (*Periopthalmus sp*) and mangrove crabs (*Sesarma sp*).

Feature condition and future outlook of the proposed area

The lack of basic infrastructure surrounding the area, such as drinking water, electricity and access roads, makes establishing private settlements in the vicinity very unlikely. However, tourists who come to see the classified historical monument, Ponta do Padrão, do occasionally visit the beach. Overall, the site mostly in poor ecological condition (85%) based on an assessment of cumulative pressures, but there is a small portion that is in good (15%) or fair (<1%) ecological condition.

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Summary of types of habitats and status of threats for the Sereia Peninsula. Soyo-Zaire. Data from Holness et al. (2014).

Threat Status	Ecosystem Type	Area (km^2)	Area (%)
Critically Endangered	Congo Intermediate Sandy Beach	4.9	10
Endangered	Congo Inshore	0.3	1
Vulnerable	Congo Dissipative-Intermediate Sandy Beach	0.4	1
Least Threatened	Congo Estuarine Shore	41.5	83
	Congo Reflective Sandy Beach	3.0	6
Grand Total		**50.1**	**100**

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**
Uniqueness or rarity	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
Explanation for ranking Apart from largely distributed habitats of sensitive mangrove, there is only a single area of remnants of important Atlantic forest in terms of biodiversity, which represents the very last area of this kind of habitat in the region.		
Special importance for life-history stages of species	Areas that is required for a population to survive and thrive.	High
Explanation for ranking Turtle nesting occurs on the Atlantic beaches along the whole peninsula. It is also a nesting and breeding site for many bird species and a feeding and resting place of many other species. The vast mangroves are of extreme importance for fish reproduction in the Congo River mouth. The calm waters of the mangrove forest act as nurseries for juvenile fish and shrimps and the aerial roots, low-level logs and the mud surfaces generally support a varied fauna of oysters, snails, crabs and other invertebrates (Morais et al., 2005).		
Importance for threatened, endangered or declining species and/or habitats	Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.	High
Explanation for ranking Most importantly, this area supports many threatened species, notably turtles, manatees, and birds. The Kitabanga Project is a marine turtle conservation program that was set up in 2003. It currently monitors approximately 15 km of the Soyo beaches. Densities of turtle nests recorded between 2011 and 2015 are as follows: 61 nests.km^{-1} for Vulnerable olive ridley turtles, 0.2 nests.km^{-1} for Endangered green turtles and no records for the Vulnerable leatherback turtle (Morais, 2016). The Congo River is also a site where Vulnerable manatees are commonly found. African manatees are in a general state of population decline, with local extirpations reported across its range due to hunting and habitat destruction (Keith Diagne, 2015), making sites where these animals are abundant even more important. Manatees have been hunted in the Congo River, with one hunter noting that he had killed three manatees per week for 30 years (Keith		

Diagne, 2015), which is more than 4500 animals. However, current data on the abundance of manatees are limited. There are also several threatened bird species that use the site as a nesting, breeding, foraging and resting site.

In terms of habitats, there is only one area where remnants of the important Atlantic forest remain; thus, the proposed EBSA contains the very last area of this kind of habitat in the region. It also contains Critically Endangered and Vulnerable sandy beach types, and an Endangered inshore ecosystem.

Vulnerability, fragility, sensitivity, or slow recovery	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

Explanation for ranking

The proposed EBSA comprises several features that are fragile, sensitive to disturbance and that will take a long time to recover. The mangroves are the most sensitive ecosystem in the proposed EBSA. Sensitive species with slow recovery following impacts to populations include the turtles (around 30 years to sexual maturity), manatees (30-year generation time) and some of the birds. Further, although beaches are largely resilient ecosystems, the adjacent dune systems are very sensitive to disturbance, and the more mature dune forests can take centuries to recover from disturbance.

Biological productivity	Area containing species, populations or communities with comparatively higher natural biological productivity.	Medium

Explanation for ranking

Mangroves are among the most productive ecosystems (FAO 1994) and provide coastal lagoons and estuaries with essential organic nutrients. Mangroves are also an important breeding and nursery area for larvae and important species in juvenile stages, especially for the fish and crustaceans in this area (Shumway, 1999).

Biological diversity	Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.	High

Explanation for ranking

The diversity of habitats on the peninsula provide favorable conditions for many species from the marine, coastal, estuarine and terrestrial realms to occur. The site supports particularly diverse assemblages of birds, fish, turtles, invertebrates, small mammals, and snakes. For example, bird species include resident, migrating, visiting, and seasonal birds that comprise similar communities to those at Park des Mangroves in the Democratic Republic of Congo (DRC), which is a designated Ramsar site. The mammals include terrestrial species, such as jackals and wildcats, and marine

species, such as a variety of dolphins and whales, and importantly, manatees. Reptiles similarly include terrestrial and marine representatives, including snakes and sea turtles. Both marine and freshwater fish are present, with species ranging from teleost fish to sharks and stingrays. Invertebrates are also diverse, including some commercially important species, such as shrimp. The plant diversity is particularly notable, with the combination of dune, mangrove and forest species represented in the area, over and above the likely rich communities of microflora that are associated with the high organic loads from the mangroves.		
Naturalness	Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.	Medium
Explanation for ranking The ecosystem shows some degree of anthropogenic degradation caused by existent populations as well as by the setting up of new artificial canals, mangrove wood cutting and the presence of communities. An assessment of ecological condition of the area based on cumulative pressures show that 15% of the benthic area is in good ecological condition, <1% is in fair ecological condition, and the remaining 85% is in poor ecological condition. This suggests that, although there is widespread modification of the area, some biodiversity and ecological processes are still intact.		

Status of submission

The description of Ponta Padrao Mangroves and Turtle Beaches has been submitted to the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) for consideration by the Conference of the Parties to the Convention on Biological Diversity.

COP Decision

Not yet submitted.

End of proposed EBSA description

Longa Coastline

Proposed EBSA Description

Abstract

The proposed Longa Coastline EBSA is in Cuanza-Sul Province in central Angola, and has an approximate area of 470 km^2. It includes the Longa River mouth, which comprises a mostly undisturbed, high-energy marine system, with a very well protected lagoon behind a sand dune cordon. This coastal configuration creates a particular suite of abiotic conditions that in turn support a rich diversity of fauna and flora. The site is thus especially important for supporting different life-

history stages as well as threatened and declining species and habitats, most notably featuring as the site with the highest nest density for Vulnerable olive ridley turtles. Local insights indicate that the lagoon is an important feature that warrants research to understand its biodiversity patterns, processes, and ecological role, which could benefit from traditional knowledge held by members of the local communities. Many of the biodiversity features comprising the EBSA are sensitive to disturbance, slow growing and/or late maturing (including sea turtles, birds and some species of mangroves). The area is thus highly relevant in terms of the EBSA criteria: "Importance for threatened, endangered or declining species and/or habitats" and "Vulnerability, fragility, sensibility or slow recovery".

Introduction

The coastal portion of the Longa River is characterized by an 8-km long dune-backed sandy shore that shelters a narrow estuarine lagoon in the northern half of the central Angolan coast. The estuary mouth itself breaks through the dunes at various locations along this sandy shore; sometimes in the northern portion of the lagoon, and sometimes in the southern portion. The Longa's waters are dark (almost black) due to leaching tannins. The plume of brackish and nutrient-rich water exiting the estuary mouth moves to the west and north (Morais et al., 2005). The distinct character of this estuarine system is one of the reasons why this area is proposed as an EBSA. However, there is a clear need for more research to better understand the biodiversity patterns, ecological processes and ecological role of the estuarine lagoon system; local knowledge suggests that it is an important feature, but very little is known about it.

What is known, though, is that the estuary is rarely subjected to sudden alterations from estuary-mouth closure, thus allowing mangroves and marginal banks with vegetation to establish within the system (Holísticos, 2014). The vegetation in the surrounds is predominantly made up of dry forest formations, bushy savannah (with *Adansonia*, *Sterculia*, *Acacia*), grassy savannah (of *Setaria welwitschii*), grassy steppe with shrubs and trees (*Hyphaene gossweileri*) and palustrine wetlands (Diniz, 2006). The proposed EBSA extends beyond the estuary system itself, and includes approximately 470 km^2 (44 km alongshore) of sandy, mixed and rocky shores, and adjacent inshore and estuarine habitats. Most importantly, these beaches support the highest nest densities in Angola for Vulnerable olive ridley turtles. Another species that this site has supported historically is the Vulnerable African manatee. There are no known recent records of this species in Longa River, and so contemporary presence of this species in the Longa Coastline EBSA is not known. Research is required to determine if manatees still exists in the area of if it has been extirpated (and if the latter, why).

The mangroves were fundamental in choosing this site as a proposed EBSA; although not globally significant, these mangroves are of key local significance because they are the southernmost mangroves in Angola. Consequently, the reason this EBSA was not included in the original set of EBSAs at the South Eastern Atlantic Workshop in 2013 (UNEP/CBD/RW/EBSA/SEA/1/4) is because this information was not available at that meeting and local knowledge is better than the information included in international datasets (e.g., WCMC and the World Mangrove Atlas). Further, results from the turtle monitoring programme in the area had not yet been published and thus were not available at the meeting; it was not known at the time how important this site is for these threatened species. Because this is a discrete site that is centred around the mangroves, lagoon and the associated

threatened species, it is presented as a Type 1 EBSA (sensu Johnson et al., 2018). It is coastal, and thus does not extend far offshore.

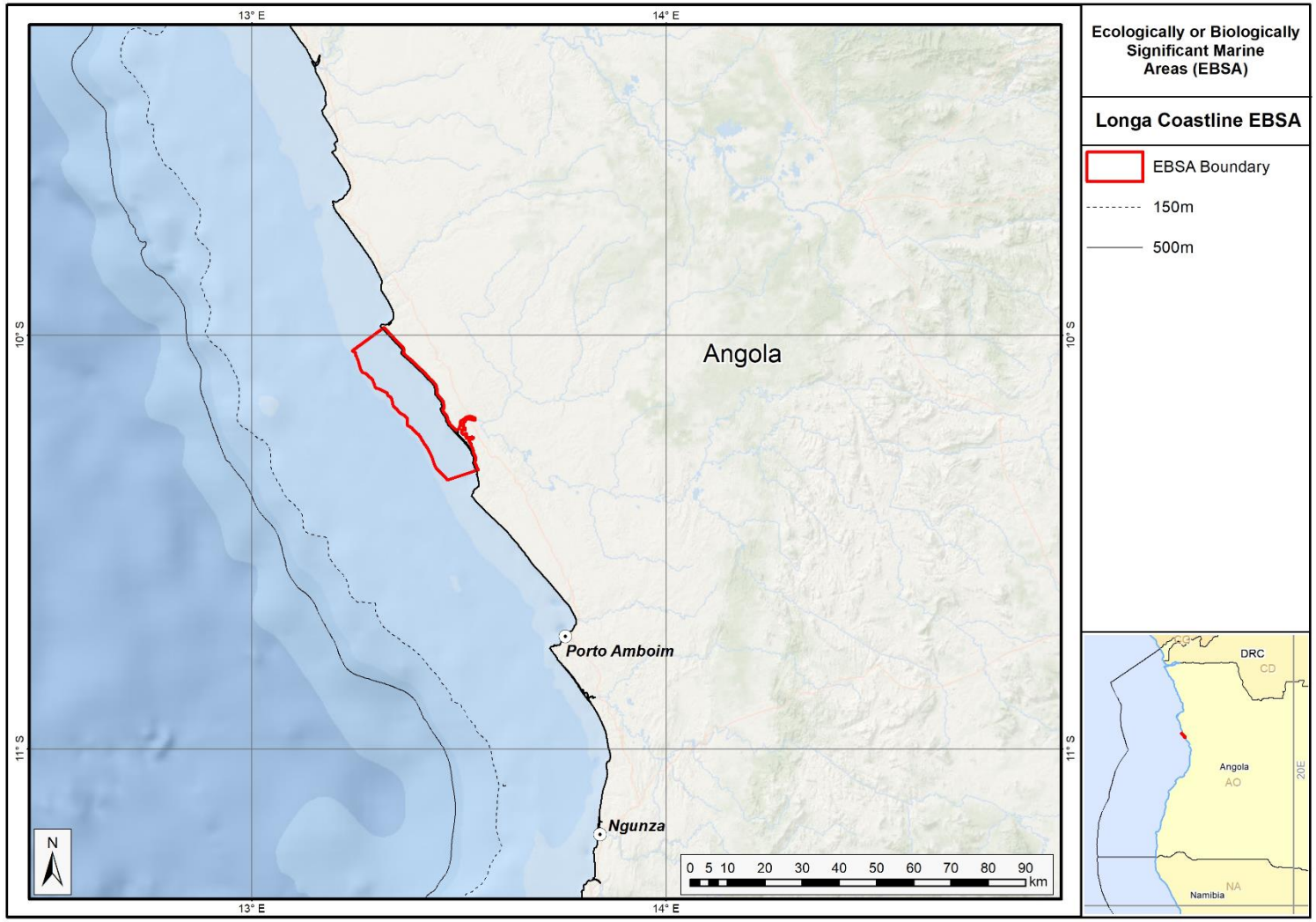
Description of the location

EBSA Region

South-Eastern Atlantic

Location

The proposed area for the Longa Coastline EBSA is located in the province of Cuanza-Sul in central Angola, near the South border of the Quiçama National Park. It includes the Longa River estuary, lagoon and mouth and 44 km of adjacent coastline, covering an approximate area of 470 km^2. The whole of the proposed area lies entirely within Angola's national jurisdiction.



Proposed delineation of the Longa Coastline EBSA.

Feature description of the proposed area

Longa Coastline is a coastal EBSA is in the province of Cuanza-Sul, Angola, and is thus described primarily for its benthic features, although the overlying water column in the estuary and nearshore is very tightly coupled to the ecology of the site. This proposed EBSA spans the confluence of estuarine and marine systems with specific characteristics. Local knowledge indicates that this estuarine lagoon is an important feature because of the uniqueness of the conditions. However, future research on the lagoon component is required to understand the broader significance of this coastal feature. For example, what other species are present; what is the importance/role of the crocodiles, birds and mangrove species; what are the dynamics of the estuary and the effects during mouth breaching or mouth closure and back flooding? Given the local (human) communities in the surrounding area, traditional knowledge could play an important role in future research projects. For example, as noted below, it is said that local fish catches have declined in recent years: research is necessary to establish why, and how this could potentially be mitigated or reversed, and local fishers' knowledge could be important in reconstructing past information.

The mangroves, comprising trees and shrubs, are the characteristic vegetation of the area, represented by families of *Rhizophoraceae* and *Avicenniaceae*. They provide feeding, breeding, nursery and resting areas for an important component of the local biodiversity. The main indicators of this include a high number of crustaceans (lobsters on the marine side; shrimps and crabs on the estuarine side) as well as many species of fish, among which are representatives of families such as *Megalopidae*, *Carangidae*, *Lutjanidae*, *Sciaenidae*, *Polynemidae*, *Mugilidae* and *Clariidae* (Holísticos, 2014).

Many bird species use the various ecosystems within the proposed EBSA. Birds rest along the sandy shoreline, nest along the vegetation (mangroves and riparian forest) and move among the local habitats. The most dominant groups are sea swallows and seagulls, some waders, diving birds, aquatic birds and birds of prey (MINAMB et al., 2015). The presence of Asian woolly neck (*Ciconia episcopus*) was confirmed, which is classified as Vulnerable in accordance with the IUCN Threatened Species Red List (Bird Life International, 2017). This bird is mainly threatened due to hunting by humans and loss of habitat.

The area is seen as the most important site for marine turtles nesting along the Angolan coast. The Kitabanga Project has been ongoing since 2003 in this area and currently monitors around 10 km of beach around the Longa River mouth. It has particularly high nest densities for olive ridley turtles (*Lepidochelys olivacea*). According to Morais (2014), the Longa region is seen as extremely important for olive ridley turtles, a species classified in the IUCN Red List as Vulnerable, with an average density of 175 nests.km^{-1}. The leatherback turtle (*Dermochelys coriacea*), classified by the IUCN Red List as Vulnerable, is also present at much lower densities of 2 nests.km^{-1}. However, this region is under high pressure from the artisanal fisheries sector where, during the period of 2013/2014, 136 turtles were captured (Morais, 2014). There are also many other reptile species within the proposed EBSA. Crocodiles, for example, are commonly seen along the river banks and along the whole inner side of the sandy shoreline where they rest and nest (MINAMB et al., 2015).

Among the aquatic mammals, manatees use mostly or exclusively the inshore waters up to estuarine areas from the Longa River to the north, and are seen in some estuaries. However, recent records do not show the presence of manatees in the proposed EBSA. Major threats to this animal's survival are

human exploration (illegal hunting), degradation and/or loss of habitat and accidental capture in nets (Morais et al., 2005), and thus the species is classified as Vulnerable. Further research is required to confirm the presence or extirpation of manatees in this EBSA.

Feature condition and future outlook of the proposed area

The people living in the surrounding areas come to this site daily in order to carry out commercial activities. The most popular products sold along the road are already made (i.e. meat, fish, and cold beverages) to feed lorry and bus drivers. The residents state that the capture of fish has gone down significantly over the years in terms of volume and occurrence. The environmental conditions of the estuary mouth and the inner side of the estuary are mainly regulated by the river, especially the levels of flood and drought conditions. These are dependent on the rainy season and annual rainfall rate. Beyond the ongoing turtle monitoring, no research is planned for the area, however, it is highlighted here as a priority.

An assessment of ecological condition of the area based on cumulative pressures show that 14% of the EBSA is in good ecological condition, and the remainder is in fair (38%) or poor (48%) ecological condition. This suggests that, although there is widespread modification of the area, biodiversity and the ecological processes are still largely intact.

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Other relevant website address or attached documents

Summary of types of habitats and status of threats for the Longa Coastline. Data from Holness et al. (2014).

Threat Status	Ecosystem Type	Area (km^2)	Area (%)
Endangered	Kwanza Exposed Rocky Shore	1.9	0
	Kwanza Inshore	383.6	82
	Kwanza Intermediate Sandy Beach	3.0	1
	Kwanza Mixed Shore	45.0	10
Vulnerable	Kwanza Estuarine Shore	7.0	1
Least Threatened	Kwanza Reflective Sandy Beach	11.4	2
	Kwanza Sheltered Rocky Shore	17.7	4
Least Threatened Total		**29.1**	**6**
Grand Total		**469.5**	**100**

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**
Uniqueness or rarity	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	Medium

	(iii) unique or unusual geomorphological or oceanographic features.	

Explanation for ranking

The Longa River mouth is a regionally unique site where there is the combination of a high-energy marine system and a very sheltered estuarine system that jointly created a distinct set of abiotic conditions that support a rich diversity of flora and fauna. It is also one of the most important rookeries in Angola for nesting olive ridley turtles, and the southernmost mangrove community in Angola. Further research is required to fully understand the biodiversity patterns, ecological processes and role of this regionally unique estuarine lagoon system, which may be understated here.

Special importance for life-history stages of species	Areas that is required for a population to survive and thrive.	High

Explanation for ranking

One of the most important attributes of this EBSA is that it is one of the most important turtle rookeries along the Angolan coast. The average nest densities recorded between 2011 and 2015 are as follows: 175 nests.km^{-1} for the olive ridley turtle (classified as Vulnerable) and 2 nests.km^{-1} for leatherback turtles (classified as Vulnerable) (Morais, 2016).

The mangroves also offer feeding, breeding, nursery and/or resting sites for many species, including crustaceans, fish and birds. For example, species that use the estuary for breeding and nursery areas include lobsters on the marine side, shrimps and crabs on the estuarine side, and fish from many different families (Holísticos, 2014). The most dominant birds present in the EBSA are sea swallows and seagulls, some waders, diving birds, aquatic birds and birds of prey (MINAMB et al., 2015) that use the site mainly for feeding and resting.

Importance for threatened, endangered or declining species and/or habitats	Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.	High

Explanation for ranking

This EBSA is highly important for threatened species, particularly for Vulnerable turtles and manatees. Turtle nesting occurs along the whole strip of sand mainly between September and December, with hatching between October and January. Turtle nesting and hatching in this area is monitored by the Kitabanga Project – Conservation of Marine Turtles. Currently, the project monitors around 10 km of beaches of the Longa River mouth. The average nest density recorded between 2011 and 2015 was 175 nests.km^{-1} for olive ridley turtles and 2 nests.km^{-1} for leatherback turtles (Morais, 2016), both of which species are listed as Vulnerable. For this reason, Longa Coastline is of extreme importance for olive ridley turtles because it is the area in Angola that contains the highest nest densities. This is one of the main motivations for this EBSA, and for requiring coastal conservation measures.

The African manatee (*Trichechus senegalensis*) was, in the recent past, found in this area. However, there are no recent records of manatees in the area. The manatee is a Vulnerable species that is showing declines across its range, and extirpations at some sites due to hunting and habitat destruction (Keith Diagne, 2015). Research is required to determine whether this site still supports manatees, or if it has been extirpated (and if so, why). There are also several threatened bird species in the area, e.g., the Asian woolly neck (*Ciconia episcopus*), which is classified as Vulnerable. Finally, the proposed EBSA includes various threatened habitats, including four Endangered sandy, rocky and mixed shore types, and one inshore type, and one Vulnerable estuarine shore type.

Vulnerability, fragility, sensitivity, or slow recovery	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

Explanation for ranking

The proposed EBSA comprises several features that are fragile, sensitive to disturbance and that will take a long time to recover. Sensitive species with slow recovery following impacts to populations include the turtles (around 30 years to sexual maturity), manatees (30-year generation time) and some of the birds. The mangroves are the most sensitive ecosystem in the proposed EBSA because the trees are slow growing. Research is required to determine the vulnerability and sensitivity of the estuarine lagoon system.

Biological productivity	Area containing species, populations or communities with comparatively higher natural biological productivity.	Medium

Explanation for ranking

No data exist for this particular system; however it is known that mangroves are among the most productive ecosystems (FAO 1994), in turn supporting highly productive coastal lagoons and estuaries that contain essential organic nutrients. Mangroves are also important fish spawning sites and nursery areas for larvae and juvenile stages of important species (Shumway, 1999), with lobsters and shrimps of importance in the Longa River.

Biological diversity	Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.	High

Explanation for ranking

All habitats in this site present a set of favorable conditions for a rich diversity of species, from plants to iconic vertebrates. The high diversity of plant species at this site comes from the combination of dune, mangrove and forest areas in the proposed EBSA that each support different floral communities. Similarly, habitat diversity contributes to diverse animal species assemblages, with a high number of crustaceans (i.e., lobsters in the marine shore and shrimps and crabs in the estuarine shore) and many species of fish (namely Megalopidae, Carangidae, Lutjanidae, Sciaenidae,

Polynemidae, Mugilidae and Clariidae families) (Holísticos, 2014). The most dominant groups of birds include sea swallows and seagulls, some waders, diving birds, aquatic birds and birds of prey (MINAMB et al., 2015). Crocodiles are frequently observed resting and nesting along the riverside and on the inner side of the sandy riverbank (MINAMB et al., 2015), with other repties including several species of turtles, some of which nest on the site's beaches. Manatees were historically present at this site too, but it is not clear if this is still the case.

Naturalness	Area with a comparatively higher degree of naturalness as a result of the lack of or low level of human-induced disturbance or degradation.	Medium

Explanation for ranking

An assessment of ecological condition of the area based on cumulative pressures show that 14% of the EBSA is in good ecological condition, and the remainder is in fair (38%) or poor (48%) ecological condition. This suggests that, although there is widespread modification of the area, biodiversity and the ecological processes are still largely intact.

Some important areas of mangrove and the riparian vegetation around the River Mouth are in pristine condition with little signs of human intervention or global degradation. It is estimated that the size of this area is 30 ha (MINAMB et al., 2015). However, outside of this area some impact result from activities of the community along this road who moves daily to this area to carry out commercial activities. The residents state that the capture of fish has gone down significantly over the years in terms of volume and occurrence. The environmental conditions of the river mouth and the inner side of the estuary are mainly regulated by associated riverside factors, especially the levels of flooding and drought conditions.

Status of submission

The description of Longa Coastline has been submitted to the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) for consideration by the Conference of the Parties to the Convention on Biological Diversity.

COP Decision

Not yet submitted.

End of proposed EBSA description

Ombaca Canyon and Seamount Complex

Proposed EBSA Description

Abstract

The proposed Ombaca Canyon and Seamount Complex EBSA focuses on offshore canyons, seamounts and key oceanographic features that relate to elevated productivity in the area. It is situated 120 km offshore of Porto Amboim, extends to the boundary of the Angolan EEZ, and covers an area of approximately 37 321 km^2. Although biodiversity has not yet been comprehensively surveyed, the area is known to support various turtle and cetacean species. The seasonal upwelling also creates periods of intense primary productivity, that in turn promotes productivity of many fish species that are commercially important throughout the BCLME, including supporting very early life history stages of these and other key species. It is also likely that the canyons and seamounts support diverse communities, highly likely to support fragile habitat-forming species, such as corals and sponges. Currently, the entire area is considered to be in Good ecological condition, with virtually pristine biodiversity patterns and processes intact: this site is thus recognized highly for its Naturalness in both benthic and pelagic features.

Introduction

The site comprises a rugged benthic topography of canyons and seamounts, situated within the semi-permanent Angola-Benguela Front. A key characteristic of the oceanography on the Angolan continental shelf is the upwelling phenomenon that starts in May-June, reaches its peak in August-September and probably ends near the end of the year. This upwelling results in intense primary production that in turn influences the production and distribution of fish, thereby playing a critical ecological role for ecosystems in the area. It is known that fish species often adapt their reproductive strategies to ocean currents and productivity cycles, so spawning times and the distribution of the main Angolan species tend to coincide with the observed seasonal oceanographic patterns (Sætersdal et al., 1999). The interactions of the main currents in the region generate areas of divergence along the continental margin (such as the coastal upwelling) as well as along the equator. The intensity of these processes varies with each season.

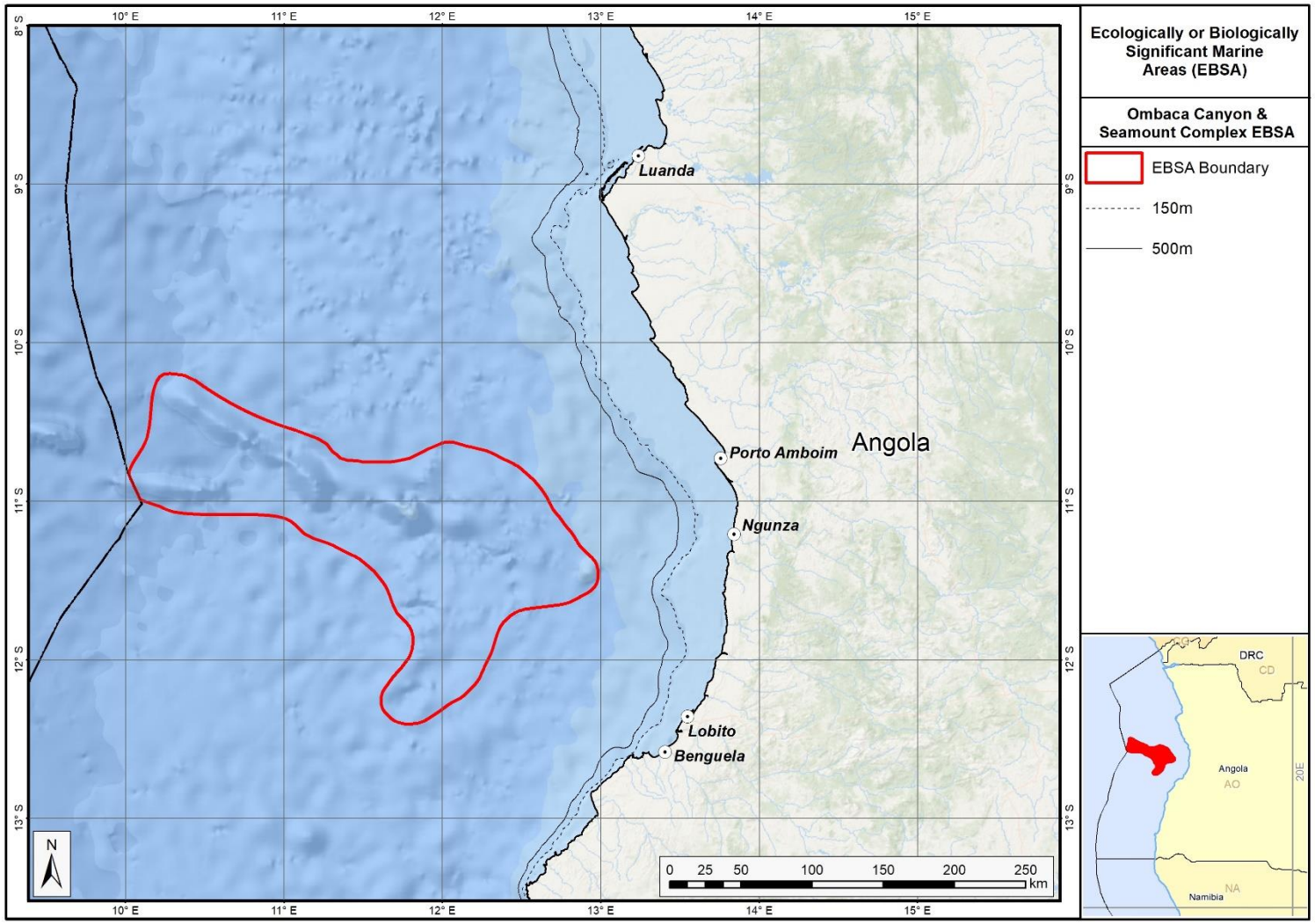
Description of the location

EBSA Region

South-Eastern Atlantic

Location

The proposed EBSA is approximately 120 km offshore of Porto Amboim, between Luanda and Benguela, and extends to the outer boundary of the Angolan Exclusive Economic Zone. It has an approximate area of 37 321 km^2. The proposed EBSA lies entirely within Angola's national jurisdiction.



Proposed delineation of the Ombaca Canyon and Seamount Complex EBSA.

Feature description of the proposed area

The outer portion of the continental shelf and slope is mostly regular with a smooth, gentle gradient of approximately 20 $m.km^{-1}$ within the depth range of -200 to -1000 m, and of approximately 12 $m.km^{-1}$ between depth ranges of -1000 to -2000 m. At approximately 50 km from the Benguela coastline, the seabed maintains these characteristics but, immediately to the north (towards Sumbe), the seabed rises sharply to depths of shallower than -1000m.

Ocean currents and circulation patterns in the region include a complex set of flows that are linked to a larger system of currents in the tropical east Atlantic. The dominant circulation patterns of the Angolan central and southern continental shelf are driven by the warm Angola Current that moves southwards, and where this current meets the cold Benguela Current at the Angola-Benguela Front (Moroshkin et al., 1970; Meeuwis and Lutjeharms, 1990; Shannon and O'Toole, 1998; and Lass et al., 2000). The Angola Current is fast and stable and penetrates up to depths of 250-300 m, covering both the continental shelf and slope. The typical current speed is 50 $cm.s^{-1}$ but it can reach or even exceed speeds of 70 $cm.s^{-1}$ (Moroshkin et al., 1970). The origin of this current, at least on the surface, is the southeastern arm of the South Equatorial Counter-Current.

The Angola-Benguela Front forms where the warm Angola Current, moving south, meets with the cold Benguela Current, moving north. This phenomenon occurs typically in the south of the Bay of Lobito at 14°S – 16°S and is a semi-permanent oceanographic feature. The gradients of temperatures at the surface reach 4°C.°$latitude^{-1}$, but on average are 1.5°C.°$latitude^{-1}$. This Front varies by season, reaching maximum levels in the summer when it is wider and is located further south, compared to winter when the front retracts towards the north and has a lower temperature gradient. These variations are related to the seasonality of the Angola Current (Meeuw and Lutjeharms, 1990). Episodic inflows of warm, saline water towards the south may displace the Angola-Benguela Front up to 23°S (Shannon et al, 1986), with effects associated with the general level of biological productivity in the north of the system. Shannon et al. (1986) classified these events as 'Niños de Benguela' because they are comparable to the 'El Niño' of the tropical east Pacific Ocean. However, a northward shift of the Angola-Benguela Front has never been observed on this same scale. High concentrations of phytoplankton biomass occur below the surface where the water column is highly stratified, a phenomenon that also occurs offshore of central Angola (Holligan et al., 1984, Joint et al., 1986, In: ARC, 2013).

Data presented by the INIP (2013) show that phytoplankton is dominated by diatoms and dinoflagellates throughout most of the year in almost all years that were studied (2004, 2008, 2009 and 2010), but that dinoflagellates and cyanobacteria (blue algae) may have dominance over diatoms (2011) and that cyanobacteria may completely dominate the composition of phytoplankton (2012).

There is a lack of detailed knowledge regarding the concentrations and distributions of ichthyoplankton (fish eggs and larvae) in Angolan waters, but eggs and larvae of South African pilchard (sardines; *Sardinops sagax*), Round Sardinella (*Sardinella aurita*), European anchovy (*Engraulis encrasicolus*), cape horse mackerel (*Trachurus trachurus capensis)* and hakes (*Merluccius* sp.) occur in the Angola-Benguela Front area as well as the mesopelagic zone. Round Sardinella and Madeiran Sardinella (*Sardinella aurita* and *S. eba* (*maderensis*)) juveniles are vastly distributed over the Angolan Continental Shelf (Wysokinski, 1986, INIP, 2013), thus it is likely that these species, together with

Cunene horse mackerel *(Trachurus trecae),* are important components of the region's ichthyoplankton (ARC, 2013). The area coincides with the distribution of two species of Sardinella (*S. maderensis* and *S. aurita*), Cunene horse mackerel (*Trachurus trecae*), other demersal fish (mainly *Dentex*) and deep-water king prawns (ARC, 2013). Other species occurring in deeper areas of the continental shelf and slope include squid, shrimps, crabs and Smallscale Splitfin (*Synagrops microlepis*) (ARC, 2013).

Five turtle species have been recorded in Angolan waters, namely: leatherbacks (*Dermochelys coriacea*)**,** olive ridleys (*Lepidochelys olivacea*), green turtles (*Chelonia mydas*), loggerheads, (*Caretta caretta*) and hawksbills (*Eretmochelys imbricata*) (Carr and Carr 1991; Fretey 2001, Weir et al., 2007). Of these species, only the green turtles, leatherbacks and olive ridleys nest in Angola (Carr and Carr 1991; Fretey 2001). Leatherbacks are known to forage in productive waters and around seamounts, and likely use this area as a foraging ground.

Whales and dolphins are commonly observed in Angolan waters with confirmation of 11 dolphin and 14 whale species in the region. Among these, four species are classified as threatened *as per* the IUCN criteria (IUCN, 2013) namely, Sei whale, blue whale and common whale being classified as Endangered, while the Sperm Whale is classified as Vulnerable.

Broadly, therefore, the EBSA is a particularly productive area, with productivity likely also enhanced by the rugged undersea topography. However, more research is required to better establish the linkages between the benthic and pelagic systems, that might ultimately require splitting this EBSA into a benthic and dynamic pelagic EBSA. Also, the link between the seamounts within and beyond Angola's EEZ needs to be investigated, as well as the dynamics of the Angola-Benguela Front in Angola and in the adjacent ABNJ; this new information, subject to international processes, may require an extension of this EBSA into ABNJ. In the interim, however, it is presented here as a Type 2/4 EBSA (sensu Johnson et al., 2018) as a collection of features that are connected by the same ecological processes, and as a dynamic feature viz. the Angola-Benguela Front.

Feature condition and future outlook of the proposed area

An assessment of ecological condition based on cumulative pressures within the EBSA showed that 100% of the benthic and pelagic area is in good ecological condition, suggesting that the whole EBSA area is (near) pristine, and has virtually all natural biodiversity patterns and processes still intact.

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Summary of types of habitats and status of threats for Ombaca Canyon and Seamount Complex. Data from Holness et al. (2014).

Threat Status	Ecosystem Type	Area (km^2)	Area (%)
Least Threatened	Cunene Abyss	8 916.1	24
	Kwanza Lower Slope	18 078.1	48
	Kwanza Seamount	5 864.9	16
	Kwanza Upper Slope	243.9	1
	Lobito Upper Slope	7.5	0
	Sumbe Upper Slope	4 210.8	11
Grand Total		**37 321.2**	**100**

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**
Uniqueness or rarity	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.	High
Explanation for ranking Regional delineation of seamounts and canyons in the Benguela Current Large Marine Ecosystem revealed that these are rare features (Holness et al., 2014) that likely also support rare and/or unique biological communities.		
Special importance for life-history stages of species	Areas that is required for a population to survive and thrive.	Medium
Explanation for ranking Seamounts are known to be associated with relatively high productivity from upwelling, and that they consequently serve as foraging and aggregation areas for many top predators, and other threatened vertebrates, such as turtles – and particularly, leatherbacks. They may also provide important "stepping stones" that allow species to expand their ranges.		

Importance for threatened, endangered or declining species and/or habitats	Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.	Medium
Explanation for ranking Although none of the ecosystem types represented in the EBSA are threatened, there are several threatened species that frequent the area. These include five turtle species: leatherbacks (*Dermochelys coriacea*, Vulnerable), olive ridleys (*Lepidochelys olivacea*, Vulnerable), green turtles (*Chelonia mydas*, Endangered), and hawksbills (*Eretmochelys imbricata*, Critically Endangered) (Carr and Carr 1991; Fretey 2001, Weir et al., 2007). Seamounts are generally associated with higher productivity where turtles, particularly leatherbacks, spend time foraging. Four species of cetaceans are classified as threatened, including three Endangered whales (Sei whale, blue whale and common whale) and the Vulnerable Sperm Whale. Other threatened species include the fish *Sardinella maderensis* that is listed as Vulnerable.		
Vulnerability, fragility, sensitivity, or slow recovery	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.	Medium
Explanation for ranking The biological communities associated with the Ombaca Canyon and Seamount Complex have not been comprehensively sampled. However, it is well established that seamounts serve as an important habitat for many fragile, habitat-forming species, including corals and sponges. The turtles and cetaceans associated with this site are also slow growing, and are vulnerable to and slow to recover from declines in their populations. Conservatively, this area is ranked as Medium, but may very well be High.		
Biological productivity	Area containing species, populations or communities with comparatively higher natural biological productivity.	High
Explanation for ranking Biological productivity is elevated in the region as a result of the seasonal upwelling. This results in intense primary production (by diatoms, dinoflagellates and cyanobateria) that in turn influences the production and distribution of fish, thereby playing a critical ecological role for ecosystems in the area. Seamounts are also recognized as sites of relatively higher productivity compared to surrounding areas.		
Biological diversity	Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.	Medium
Explanation for ranking		

The proposed EBSA has not yet been comprehensively sampled for biodiversity, however, there is likely a rich diversity associated with the complex bottom topography, as has been found on other seamounts and in other canyons, including both benthic and pelagic assemblages. Of the diversity that is known, there are many crustacean, fish, turtle, and cetacean species that are resident in or migratory through the area. Studies in a proposed area of this EBSA recorded 195 sampled species (of 8 phyla). However, the juvenile stage was not taken into account when quantifying benthic diversity statistics (except for biomass), resulting in a total of 191 species (excluding the juvenile stage).		
Naturalness	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
Explanation for ranking An assessment of ecological condition based on cumulative pressures within the EBSA showed that 100% of the benthic and pelagic area is in good ecological condition, suggesting that the whole EBSA area is (near) pristine (Holness et al., 2014).		

Status of submission

The description of Ombaca Canyon and Seamount Complex has been submitted to the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) for consideration by the Conference of the Parties to the Convention on Biological Diversity.

COP Decision

Not yet submitted.

End of proposed EBSA description

Bentiaba

Proposed EBSA Description

Abstract

The proposed Bentiaba EBSA includes 190 km of coastline, extends about 50 km offshore in the north and 300 km offshore in the south, and spans a total area of 35 631 km^2. It is located along the Bentiaba coast in the south of Lucira (Namibe province). The morphology of the seabed in this area suggests that the underlying geology comprises sandy, muddy and rocky substrates. In the southern portion, the continental shelf drops steeply, reaching deep depths very near to the coast. This contributes to a key influence of coastal upwelling in driving high productivity in the area. The EBSA includes 24 different ecosystem types, ranging from intertidal to abyssal types, and including seamounts and canyons. In turn, the diversity of species within this area is particularly high compared to the surrounding areas. The proposed area is currently subjected to very few pressures, and thus most of

the site is in a highly natural condition. It is also recognized as a priority area for marine biodiversity in the Benguela Current Large Marine Ecosystem.

Introduction

A key characteristic of the oceanography on the Angolan continental shelf is the upwelling process that starts in May-June, reaches its peak in August-September and probably ends near the end of the year. This upwelling results in intense primary production that in turn influences the production and distribution of fish, thereby playing a critical ecological role for ecosystems in the area. It is known that fish species often adapt their reproductive strategies to ocean currents and productivity cycles, so spawning times and the distribution of the main Angolan species tend to coincide with the observed seasonal oceanographic patterns (Sætersdal et al., 1999).

The offshore ecosystems in the area have not been sufficiently surveyed to allow for a full understanding of their ecological and biological importance. However, it can be said that many seamounts support endemic species and poorly known biodiversity (Sink, 2004). The coastal ecosystems are better researched in Angola, with these ecosystems characterized by diverse communities. Invertebrate animal diversity is represented by Echinodermata, Ctenophora, Sipunculida, Polychaeta, Bryozoa, Brachiopoda, Tunicata and Pycnogonida groups. The Crustaceans and Molluscs, which are of commercial importance, also constitute very important groups in the area (Migoto and Marques, 2003 In: Silva, 2015). Vertebrate communities are similarly diverse, with turtles, marine and coastal birds, seals, dolphins and whales (e.g., the humpback whale (*Megaptera novaeangliae*) and the Blue whale (*Balaenoptera musculus*)) all being of great importance. The small pelagic fish found in Angolan waters are made up of sardinellas (*Sardinella aurita* and *Sardinella madeirensis*) and mackerel (Cunene Horse Mackerel and Cape Horse Mackerel), with the latter being the major fisheries resource species in the area. Other important pelagic species include the *Engraulis encrasicolus* and the *Sardinops ocellata* (Silva, 2015) that originate from the temperate waters of Namibia, limited in the north by the *Baía dos Tigres* Bank (Bianchi 1986 In: Silva 2015). The yellowfin tuna (*Thunnus albacares*) and the bigeye tuna (*Thunnus obesus*) are the most important species of large pelagic fish.

In the EBSA specifically, there are 24 ecosystem types. Although the area has not been well sampled, it is presumed to be diverse based on the different types of communities associated with those 24 habitats. The shore types include boulder and rocky shores, mixed and sandy shores, with islands shelf, seamount, slope and abyss types represented offshore. Because this site comprises a collection of features and ecosystems that are connected by the same ecological processes, it is proposed as a Type 2 EBSA (sensu Johnson et al., 2018).

Description of the location

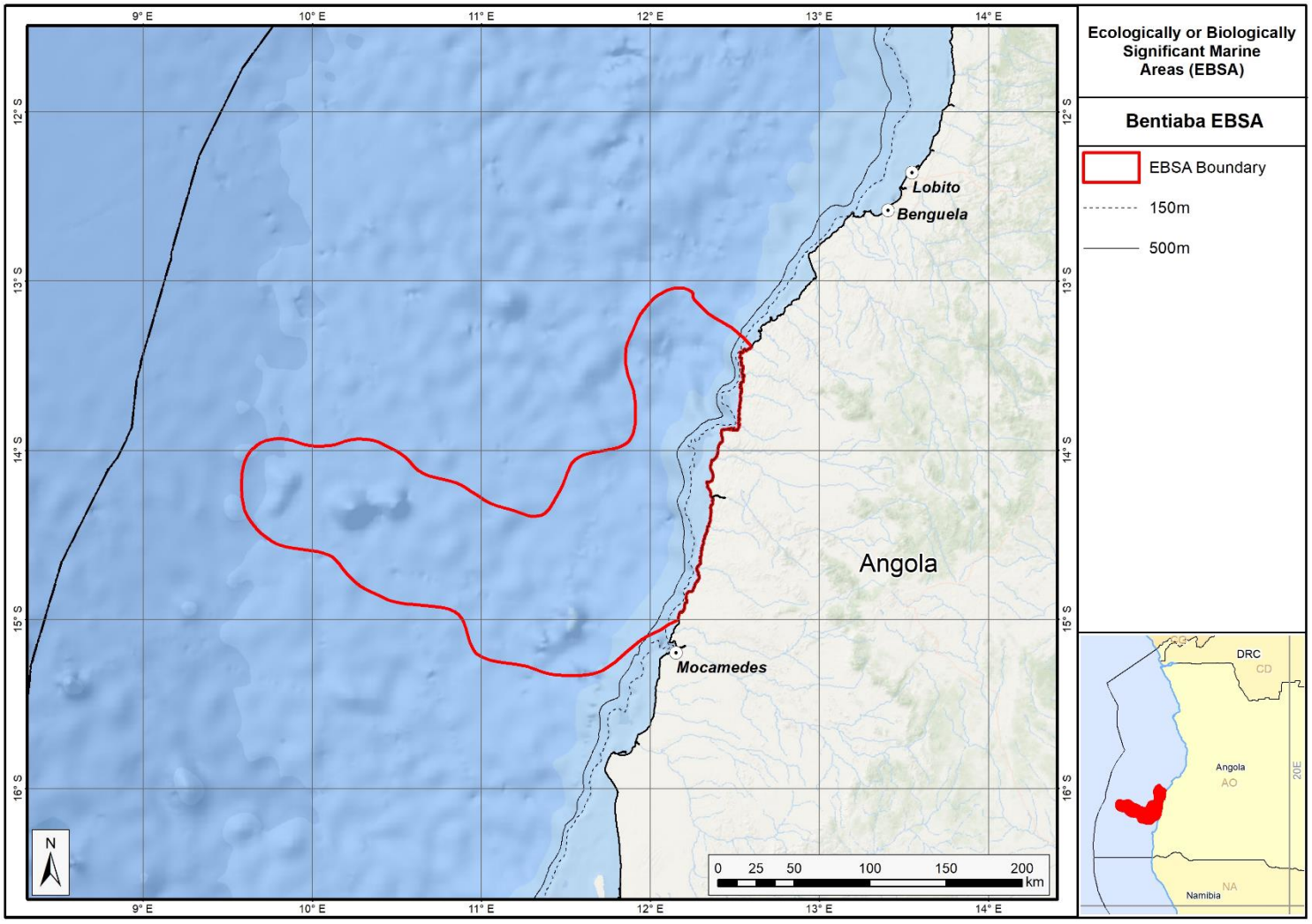
EBSA Region

South-Eastern Atlantic

Location

The area includes 190 km of coastline and extends about 50 km offshore in the north and 300 km offshore in the south. The area totals approximately 35 631 km^2. It is located along the Bentiaba coast,

south of Lucira in the province of Namibe. The proposed EBSA lies entirely within Angola's national jurisdiction.



Proposed delineation of the Bentiaba EBSA.

Feature description of the proposed area

The morphology of the seabed in this area suggests that the underlying geology comprises sandy, muddy and rocky substrates. (ARC, 2013). The proposed EBSA spans the section of the Namibe coast where the continental shelf is very narrow because it drops steeply, reaching deep depths very near to the shore. Beyond the 200 m isobath, the continental shelf slopes down to a -3000-m deep abyss with a very smooth and regular gradient. Based on available information for northern Angola, deep-water sediments seem to be dominated by silts and clays with a very high organic carbon content. There are many offshore geomorphic features in this area that are not described in the maritime charts, but that were mapped for the BCLME (Holness et al., 2014), including canyons and seamounts, around which the proposed EBSA is delineated. Even though the EBSA is in an "L shape", the features in both of these "arms" are similar.

Ocean currents and circulation patterns in the region include a complex set of flows that are linked to a larger system of currents in the tropical east Atlantic. The dominant circulation patterns of the Angolan central and southern continental shelf are driven by the warm Angola Current that moves southwards, and where this current meets the cold Benguela Current at the Angola-Benguela Front (Moroshkin et al., 1970; Meeuwis and Lutjeharms, 1990; Shannon and O'Toole, 1998; and Lass et al., 2000). The Angola Current is fast and stable and penetrates up to depths of 250-300 m, covering both the continental shelf and slope. The typical current speed is 50 $cm.s^{-1}$ but it can reach or even exceed speeds of 70 $cm.s^{-1}$ (Moroshkin et al., 1970). The origin of this current, at least on the surface, is the southeastern arm of the South Equatorial Counter-Current.

The Angola-Benguela Front forms where the warm Angola Current, moving south, meets with the cold Benguela Current, moving north. This phenomenon occurs typically in the south of the Bay of Lobito at 14°S – 16°S and is a semi-permanent oceanographic feature. The gradients of temperatures at the surface reach $4°C.°latitude^{-1}$, but on average are $1.5°C.°latitude^{-1}$. This Front varies by season, reaching maximum levels in the summer when it is wider and is located further south, compared to winter when the front retracts towards the north and has a lower temperature gradient. These variations are related to the seasonality of the Angola Current (Meeuw and Lutjeharms, 1990). Episodic inflows of warm, saline water towards the south may displace the Angola-Benguela Front up to 23°S (Shannon et al, 1986), with effects associated with the general level of biological productivity in the north of the system. Shannon et al. (1986) classified these events as 'Niños de Benguela' because they are comparable to the 'El Niño' of the tropical east Pacific Ocean. However, a northward shift of the Angola-Benguela Front has never been observed on this same scale.

The thermoclines are well developed on the Angolan continental shelf, with depths above 10 - 20m of mixed strata (Van Bennekom & Berger, 1984). Temperature gradients may reach 0.32 $°C.m^{-1}$ at depths of 25 - 50m, with corresponding firm salinity gradients (Lass et al., 2000). The thermoclines are interrupted by the coastal upwelling along the entire Angolan coast. This coastal upwelling is the most significant oceanographic characteristic of the region and starts in May-June, reaches its peak in August-September and probably ends near the end of the year. Upwelling results from interactions between the main currents of the region and generates areas of divergence both in the continental margin and along the equator. The intensity of these processes depends on season and latitude (ARC, 2013). This is largely due to seasonality in the Benguela Current that flows towards the north, bringing

cold water to the Angola-Benguela Front region, and the coastal upwelling driven by the southerly winds that are characteristic of the region (Hardman-Mountford et al., 2003).

Upwelling plays a crucial ecological role as it results in a substantial increase in primary production that is of great importance for supporting fish stocks and influencing their distribution. It is known that fish species often adapt their reproductive strategies to ocean currents and productivity cycles, so spawning times and the distribution of the main Angolan species tend to coincide with the observed seasonal oceanographic patterns (Sætersdal et al., 1999). Phytoplankton production rates in the area near the Angola-Benguela Front (>400 $gC.m^{-2}.yr^{-1}$) are higher compared to that in northern Angolan (<250 $gC.m^{-2}.yr^{-1}$) but much lower than the estimated production rate of >1 000 $gC.m^{-2}.yr^{-1}$ further South in the Benguela Current system (ARC, 2013).

The zooplankton consists of crustaceans and other animals that feed on phytoplankton and protists such as Telonemia, and also includes some eggs and larvae of bigger animals. The zooplankton of the region is not well known. However, data from the Angola-Benguela Front show that the species in the Front and immediately north of it (i.e., in the southern Angola Current) are similar to those species in the northern Benguela Current, which are dominated by calanoid copepods (*Calanoides* and *Calanus* spp.) (ARC, 2013).

Distributions of ichthyoplankton (fish eggs and larvae) are also poorly known in Angolan waters. However, eggs of the South American pilchard *Sardinops sagax* and larvae of the Round Sardinella (*Sardinella aurita),* European Anchovy (*Engraulis encrasicolus),* Cape horse mackerel *(Trachurus Trachurus capensis)* and hake *(Merluccius* sp.) as well as some other mesopelagic species have been recorded within the southern portion of the Angola–Benguela Front.

In general, the benthic fauna of tropical West Africa is relatively poor in comparison with other tropical regions, showing levels of benthic diversity similar to that in the Mediterranean. This low diversity has been attributed to a lack of coral reefs and seagrass meadows along the West African coast; the lack of hard benthic substrates; localised upwelling of colder water in some sites; and the high turbidity from estuarine plumes (ARC, 2013). Nevertheless, invertebrate animal diversity is represented by Echinodermata, Ctenophora, Sipunculida, Polychaeta, Bryozoa, Brachiopoda, Tunicata and Pycnogonida groups. The Crustaceans and Molluscs, which are of commercial importance, also constitute very important groups in the area (Migoto and Marques, 2003 In: Silva, 2015). Furthermore, even though these systems are yet to be sampled, seamounts are known to support diverse assemblages, and are habitat for species that are fragile, sensitive, vulnerable and slow growing, e.g., habitat-forming corals and sponges.

Whales and dolphins are commonly seen along the Angolan coast with 11 species of dolphins and 14 species of whales confirmed in the wider south-west Africa (ARC, 2011). Among these, three *Balaeonoptera* whale species are classified as Endangered (IUCN, 2011), namely: the Sei whale (*B. borealis*), Blue whale (*B. musculus*), and Fin whale (*B. physalus*). Among the dolphins, only the Atlantic humpback dolphin (*Sousa teuszii*) is Critically Endangered (but this species was not observed in the study area by Weir, 2010).

The other main species of marine mammals that may be found in the study area include the pinnipeds, such as the Cape Fur Seal (*Arctocephalus pusillus*). *A. pusillus* are much more commonly found in high seas in the South of Angola, where there is a big colony in Baía dos Tigres, near the southern boundary with Namibia (Morais et al., 2006).

Importantly, the collection of 24 diverse habitats, and thus presumably communities, in such close proximity resulted in this area being selected in a systematic conservation plan for the region that sought to identify areas of ecological priority (Holness et al., 2014). The combination of upwelling, seamount and canyon features all contribute to the increased productivity of this area. Although the EBSA spans a broad depth range, there are species in this EBSA that similarly have a broad depth range, e.g., the Sipunculid, *Onchnesoma steenstrupi* found from the subtidal shallow (<10m) to deep sea (1500m; ARC, 2013). Notwithstanding, biodiversity information is very limited for this site, and future research and surveys are highly recommended.

Feature condition and future outlook of the proposed area

An assessment of ecological condition based on cumulative pressures within the EBSA showed that 84% of the benthic area is in good ecological condition, 14% is in fair ecological condition, and <1% is in poor ecological condition. This suggests that most of the EBSA area is highly natural.

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Summary of types of habitats and status of threats for Bentiaba. Namibe. Data from Holness et al. (2014).

Threat Status	Ecosystem Type	Area (km^2)	Area (%)
Endangered	Namibe Exposed Rocky Shore	2 9	0
	Benguela Boulder Beach Rocky Shore	0 0	0
	Benguela Estuarine Shore	0 0	0
	Benguela Exposed Rocky Shore	0 6	0
	Benguela Inshore	18 6	0
	Benguela Intermediate Sandy Beach	0 3	0
	Benguela Island	180 3	1
	Benguela Mixed Shore	0 5	0
	Benguela Reflective Sandy Beach	1 3	0
	Benguela Sheltered Rocky Shore	31 6	0
	Cunene Abyss	6 821 1	19
Least Threatened	Namibe Boulder Beach Rocky Shore	0 2	0
	Namibe Dissipative-Intermediate Sandy Beach	0 6	0
	Namibe Estuarine Shore	5 0	0
	Namibe Inshore	145 2	0
	Namibe Intermediate Sandy Beach	14 3	0
	Namibe Lower Slope	19 409 9	54
	Namibe Mixed Shore	23 6	0
	Namibe Reflective Sandy Beach	15 4	0
	Namibe Seamount	2 119 9	6
	Namibe Shelf	1 233 5	3
	Namibe Shelf Edge	1 079 3	3

	Namibe Sheltered Rocky Shore	32 9	0
	Namibe Upper Slope	4 494 1	13
Grand Total		**35 631 2**	**100**

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**
Uniqueness or rarity	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.	High
Explanation for ranking Regional delineation of seamounts and canyons in the Benguela Current Large Marine Ecosystem revealed that these are rare features that likely also support rare and/or unique biological communities. The canyons and seamounts in this particular EBSA are especially rare in the region given their close proximity to the coast, whereas most other features like these are located much further offshore (Holness et al., 2014).		
Special importance for life-history stages of species	Areas that is required for a population to survive and thrive.	Medium
Explanation for ranking Seamounts are known to be associated with relatively high productivity from upwelling, and that they consequently serve as foraging and aggregation areas for many top predators, and other threatened vertebrates, such as turtles. They may also provide important "stepping stones" that allow species to expand their ranges. The benthic ecosystem types support dead organic matter originating from the ocean surface and is a habitat for some species of shrimp, crabs and lobsters. Available data suggests that benthic organisms are abundant with a uniform distribution in regions shallower than -400 m, but are rare and irregularly distributed in deeper waters. A common species is the Sipunculid, *Onchnesoma steenstrupi*. This species is found largely distributed in water depths ranging from subtidal shallow (<10m) to deep sea (1500m) and occurs in the Northeast Atlantic, Mediterranean Sea, and Gulf of Florida and has also been seen at depths of 1200m along the coast of Nigeria (ARC, 2013).		
Importance for threatened, endangered or declining species and/or habitats	Area containing habitat for the survival and recovery of endangered, threatened, declining species or area with significant assemblages of such species.	Low

Explanation for ranking

Of the 24 ecosystem types in the proposed EBSA, only one is threatened: the Endangered Namibe Exposed Rocky Shore. The species diversity is not well known for the area. Although the site is likely to provide habitat that supports threatened species, e.g., turtles, cetaceans, birds and some fish (e.g., Vulnerable *Sardinella maderensis*), this criterion is conservatively ranked Low until more information is available.

Vulnerability, fragility, sensitivity, or slow recovery	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.	Medium

Explanation for ranking

The biological communities in Bentiaba have not been comprehensively sampled. However, it is well established that seamounts serve as an important habitat for fragile species that are sensitive to disturbance and take long to recover, including corals and sponges. Conservatively, therefore, this area is ranked as Medium, but may very well be High.

Biological productivity	Area containing species, populations or communities with comparatively higher natural biological productivity.	High

Explanation for ranking

Seasonal upwelling plays a crucial ecological role in the area as it results in a substantial increase in primary production that is of great importance for supporting fish stocks and influencing their distribution. Phytoplankton production rates in the area near the Angola-Benguela Front (>400 $gC.m^{-2}.yr^{-1}$) are higher compared to that in northern Angola (<250 $gC.m^{-2}.yr^{-1}$) but much lower than the estimated production rate of >1 000 $gC.m^{-2}.yr^{-1}$ further South in the Benguela Current system (ARC, 2013).

Biological diversity	Area contains comparatively higher diversity of ecosystems, habitats, communities, or species, or has higher genetic diversity.	High

Explanation for ranking

The proposed EBSA comprises a particularly diverse collection of 24 habitats that range from intertidal to abyssal types (Holness et al., 2014). In turn, these are expected to support a rich diversity of species within this discrete geographic area, with known representation of numerous invertebrate phyla, as well as vertebrates such as whales, dolphins, seals, birds, turtles, and diverse assemblages of commercially important fish species including both large and small pelagics.

Naturalness	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
Explanation for ranking An assessment of ecological condition based on cumulative pressures within the EBSA showed that 84% of the benthic area is in good ecological condition, 15% is in fair ecological condition, and 1% is in poor ecological condition (Holness et al., 2014). This suggests that most of the EBSA area is highly natural.		

Status of submission

The description of Bentiaba has been submitted to the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) for consideration by the Conference of the Parties to the Convention on Biological Diversity.

COP Decision

Not yet submitted.

End of proposed EBSA description

Transboundary EBSAs

Revised EBSAs

Namibe (Formerly Kunene-Tigres)

Revised EBSA Description

General Information

Summary

Namibe is a trans-boundary area shared by Namibia and Angola. The EBSA is a modification, and extension of the original Kunene-Tigres EBSA. The Kunene River, its mouth and associated wetland influence the salinity, sediment and productivity within the Tigres Island-Bay complex about 50 km north of the river mouth. This link, underpinning elevated local productivity, is a regionally unique feature. However, the original EBSA delineation also included but overlooked the presence of shelf-incising canyons and seamounts in EBSA footprint, which also contribute to elevated productivity and foraging habitat. New information since the initial description has facilitated a northward extension of the EBSA to include adjacent canyons and seamounts, as well as the full extent of the coastline of Iona National Park. In short, Namibe comprises a highly diverse collection of species and habitats in very close proximity, many of which are also threatened, with unique and other features that promote high productivity. In turn this drives importance of the area for supporting the life-histories of key species, such as providing foraging, breeding and resting habitats for seals, fish, turtles, and migratory and resident birds.

Introduction of the area

Adjacent to the arid, mostly uninhabited, and remote 100 km of the southern Angolan coastline is an area of limited geographic but notable ecological prominence. Tigres Island and adjacent bay are a remnant of the pre-1970s peninsula formed by sediment discharged from the Kunene River. These features form a rare coastal wetland that plays an important role in the life cycles of many marine and terrestrial fauna (Simmons et al., 2006, Paterson 2007). The predominantly sandy island, measuring ~6 km at its widest point and ~22 km in length, has withstood the weathering effects of the Atlantic since the breaching of the isthmus in 1973, and has become an important site for a number of migratory and resident aquatic fauna (Morant 1996b, Simmons et al., 2006, Dyer 2007, Meÿer 2007). Approximately 50 km south of Tigres Island is an ecologically significant natural marine-freshwater feature: the Kunene River mouth. Although discharge volumes are erratic, this sub-tropical, perennial river may discharge up to 30 million m^3 of fresh water per day into the sea. This has pronounced physicochemical influences on the adjacent marine habitat (sublittoral to littoral coastal region) to an extent of ~100 km from the river mouth, mostly northwards, but also southwards during certain times of the year and during abnormal climatic events, such as Benguela Niños (Simmons et al., 1993, Shillington 2003). A lagoon extends 2 km south from the river mouth (Simmons et al., 1993). These features provide foraging, roosting and breeding habitat for a range of fauna, including sea- and shorebirds (Braine 1990, Simmons et al., 1993, Anderson et al., 2001, Dyer 2007, Simmons 2010), marine and freshwater reptiles (Griffin & Channing 1991, Simmons et al., 1993, Griffin 1994, Carter & Bickerton 1996, Griffin 2002), crustaceans (Carter & Bickerton 1996), marine and freshwater fish species (Simmons et al., 1993, Hay et al., 1997, Fishpool & Evans 2001, Holtzhausen 2003), as well as resident (Meÿer 2007) and transient marine mammals (Paterson 2007). In this region the presence of the Cape Fur Seal (*Arctocephalus pusillus*) is verified. This species is strongly associated with the cooler waters of the Benguela Current ecosystem and, therefore, its distribution extends to the western coast of southern Africa to the south of Angola. *A. pusillus* are most common in southern Angola, where there is a large colony in Tigres Bay (Morais et al., 2006). Weir (2013) found that this was the most common marine mammal species in the Benguela region but rarely seen in the northern-most regions. This confirms the link between the northern Angolan section of the EBSA and the Namibian sections.

The revised boundary for this EBSA now includes the full extent of the coastline of the adjacent Iona National Park, which is an Important Bird and Biodiversity Area that similarly supports migratory and resident birds in this area. Further, since the original description, a regional map of marine ecosystems has become available for Namibia and Angola (Holness et al., 2014). It was then noted that the original Kunene-Tigres EBSA contained seamounts and canyons that were also likely contributing to the elevated productivity that underpins the key foraging areas for the species noted above. Therefore, the EBSA was extended northward to include adjacent seamounts and canyons that were in close proximity to Tigres Island and adjacent to the Iona National Park IBA. The southern boundary was also refined to improve precision based on the new habitat map. The habitats that are influenced by the Kunene River, i.e., those formed from terrigenous sediments flowing out of the river, are now included in their full extent. Furthermore, the real extent of the Kunene Estuary, on which this whole EBSA depends, is now included to improve precision over the much smaller representation of the estuary in the original boundary. Namibe is thus proposed as a Type 2 EBSA (sensu Johnson et al., 2018) because it comprises a collection of features and ecosystems that are connected by the same ecological processes.

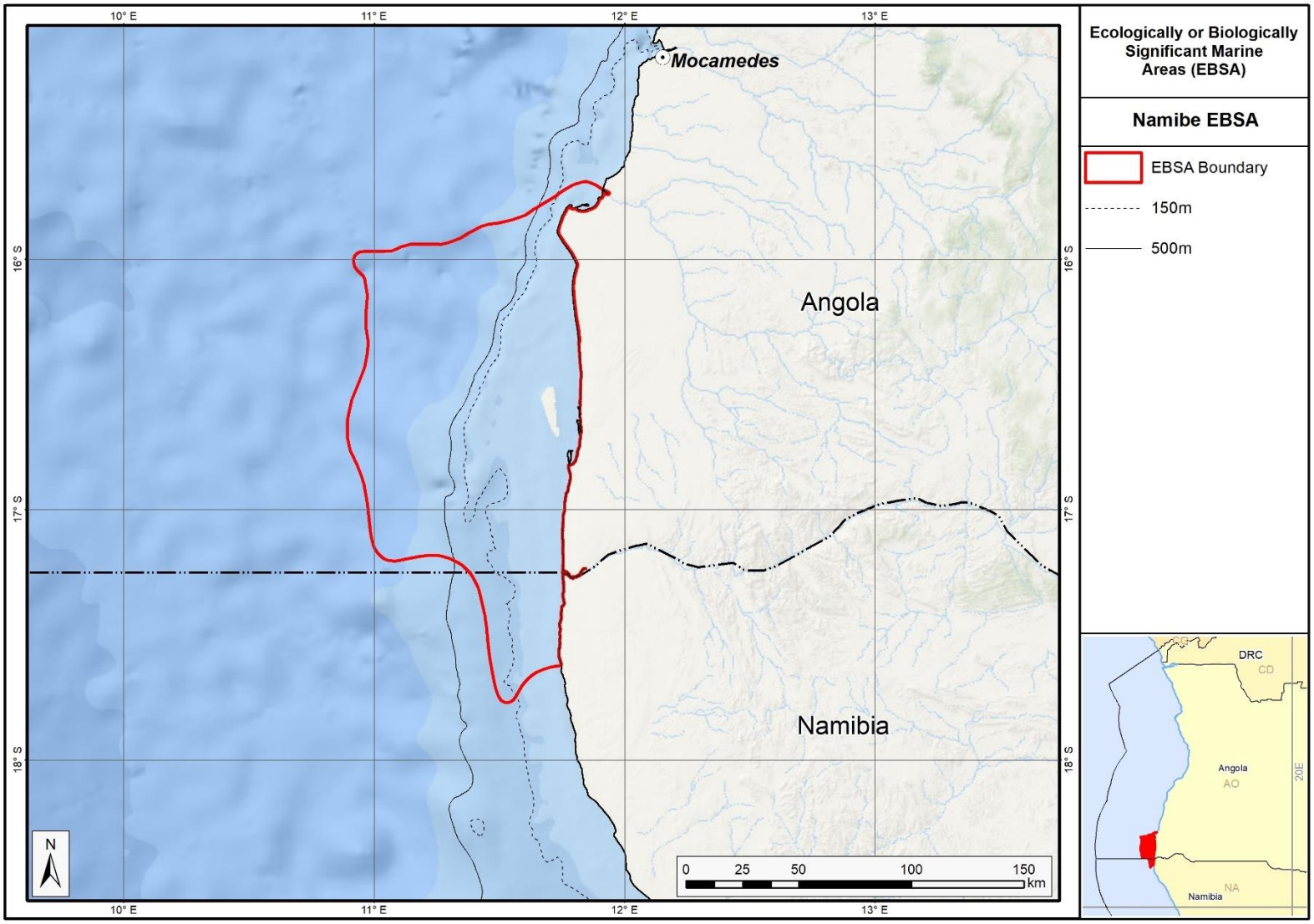
Description of the location

EBSA Region

South-Eastern Atlantic

Description of location

The delineated area extends along the shore approximately 170 km north of the Kunene mouth into southern Angola (to the northern boundary of Iona National Park at Curoca River), and 40 km south of the Kunene mouth into northern Namibia. The maximum offshore extent is approximately 100 km, although the Namibian section extends only 40 km offshore. The EBSA includes the Tigres Bay lagoon and approximately 12 km of the Kunene estuary. Namibe is well within the national jurisdictions of the two neighbouring countries it straddles (i.e., Angola and Namibia), with >80% of the area falling within Angolan jurisdiction. In Namibia, this EBSA borders the Skeleton Coast National Park; and in Angola it borders the Iona National Park. It has a total area of approximately 15,000km^2.



Revised boundary of the Namibe EBSA.

Feature description of the area

Namibe comprises a rich diversity of features, species and habitats. The southern portion includes the Kunene estuary and surrounding river-influenced ecosystems, with the bulk of the influence from the river (freshwater, sediment and nutrients) transported north, connecting to Tigres Island and Tigres Bay in Angola. The surrounding ecosystems also include canyons and seamounts that contribute to the productivity and diversity in the EBSA. Tigres Bay is approximately 11 km at its widest point (northern region of Tigres Bay) and ~8.5 km at its narrowest point (southern limit of Tigres Island from the mainland), with a longitudinal extent of ~60 km.

Surveys of the area have recorded 26 bird species with abundances of around 13000 individuals (Simmons et al., 1993, Simmons et al., 2006, Simmons 2010). Several bird species breed on Tigres Island or along the bay (including globally threatened Cape Cormorants and Damara Terns, and locally threatened Great White Pelicans and Caspian Terns; Simmons et al., 2006; Dyer 2007; Simmons 2010) and Cape fur seals breed on the island (Meÿer 2007). The Kunene River mouth and adjacent marine habitat supports a lower bird density (~4000 individuals) than does Tigres Bay, but a higher species richness, and serves as a refuelling and resting area for Palearctic migrant bird species (Simmons et al., 1993). At least 119 bird species have been recorded at the Kunene River mouth (Paterson 2007), and there are records of 381 species in the EBSA area, of which 2 are Critically Endangered, 3 are Endangered, and 9 are Vulnerable (OBIS, 2017). Iona National Park in Angola is an Important Bird and Biodiversity Area. Furthermore, the Kunene-Namib area is known to support the largest density of green turtles in Namibia (Griffin & Channing 1991; Simmons et al., 2006), with olive ridleys also present. In addition, there are many species of fish, sharks and cetaceans in the area, some of which are threatened, that breed and/or forage in this EBSA (Hay et al., 1997, Holtzhausen 2003, Paterson 2007).

Habitat heterogeneity is high, with 15 habitats present in the EBSA. These include representation of two threatened ecosystem types: the Endangered Kunene Outer Shelf, and Vulnerable Kunene Shelf Edge. These threat statuses were determined by assessing the weighted cumulative impacts of various pressures (e.g., extractive resource use, pollution, development and others) on each ecosystem type for Namibia and Angola (Table in the Other relevant website address or attached documents section; Holness et al., 2014).

Feature conditions and future outlook of the proposed area

Due to the remoteness of the Namibe focus area, limited human impacts (apart from current mining/prospecting) on the marine and coastal areas have resulted in this area being relatively pristine. However, threats to the pristine nature of this ecologically important area include industrial interests upstream of the Kunene River mouth (including proposals to dam the river for power generation) and recent increases in fishing, mining and tourism interests on both sides of the Kunene River mouth (Simmons et al., 1993, Paterson 2007). The Namibian portions of the area are generally in good condition, although most of the Angolan area is in fair ecological condition, primarily due to the high intensity of artisanal and commercial fishing taking place there (Holness et al., 2014). Consequently, 63% of the overall area has been identified as being in fair ecological condition, and 25% in good condition.

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Assessment of the area against CBD EBSA criteria

C1: Uniqueness or rarity High

Justification

The Namibe area is unique in the sense that it is the only sheltered, predominantly marine, sandy bay with a link to a perennial river for a 1500 km stretch along the Namibian coast and a 200 km stretch along the Angolan coast (Simmons et al., 2006). Being both geographically and biologically isolated, this area is ranked amongst the most threatened in Namibia (Simmons et al., 1993, Carter and Bickerton 1996, Barnard and Curtis 1998, Bethune 1998, De Moor et al., 2000) and supports reptilian fauna unique to Southern Africa (Kolberg & Simmons 1998). Furthermore, the Kunene wetland is globally unique as it is the only freshwater input area that is located adjacent to an upwelling cell, viz. the Kunene upwelling cell, and wedged within the longitudinal range of a warm-cold water frontal system, i.e., the Angola-Benguela frontal system (Lutjeharms & Meeuwis 1987, Paterson 2007).

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

Justification

The Namibe wetlands serve as resting grounds for Palearctic migratory birds that use the area to build up energy reserves during their seasonal migrations (Simmons et al., 1993). The area (particularly Tigres Island) also serves as the breeding site for several bird species (Simmons et al., 2006, Simmons 2010). In addition to a colony of Cape fur seals, a number of other marine mammals (in particular Heaviside's dolphins, long-finned pilot whales, bottlenose dolphins, beaked whales and Atlantic humpback dolphins) have also been recorded in the general area (Dyer 2007, Paterson 2007). However, little research has been done on cetaceans there, and they are currently considered to be only transient visitors to the area (Paterson 2007). Namibe is very important for green turtles, with high densities of these animals known to occur in the area, which also represents the southern-most distribution of the species along the African west coast (Carr & Carr 1991, Griffin and Channing 1991, Carter & Bickerton 1996, Branch 1998, Griffin 2002, Fretey 2001, Paterson 2007). Furthermore, Namibe is an important spawning area for many marine fish species found along the northern and central Namibian coast (Hay et al., 1997, Holtzhausen 2003).

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

Justification

The EBSA contains portions of two threatened habitats, assessed by determining the weighted cumulative impacts of various pressures (e.g., extractive resource use, pollution, development and others) on each ecosystem type for Namibia and Angola (Table in the Other relevant website address or attached documents section; Holness et al., 2014): the Endangered Kunene Outer Shelf, and Vulnerable Kunene Shelf Edge. Further, the Kunene-Tigres area (including the island, the bay, the river mouth and adjacent marine environment) supports threatened and/or regionally endemic bird species – in particular the Great White Pelican: *Pelecanus onocrotalus*, Cape Cormorant: *Phalacrocorax capensis*, Lesser Flamingo: *Phoeniconaias minor*, African Black Oystercatcher: *Haematopus moquini*, Hartlaub's Gull: *Chroicocephalus hartlaubii*, Caspian Tern: *Hydroprogne caspia* and Damara Tern: *Sternula balaenarum* (Barnard & Curtis 1998, Anderson et al., 2001, Simmons et al., 2006, Simmons et al., 2015). Cetaceans that are endemic to the region (e.g., Heaviside's dolphin: *Cephalorhynchus heavisidii*), or are threatened (e.g., the Vulnerable sperm whale, *Physeter microcephalus*; OBIS 2017) also make use of this area during their life cycles (Paterson 2007). Other threatened species in the area include the fish and condricthian species: *Squatina oculata* and *Squatina aculeate* (Critically Endangered); *Argyrosomus hololepidotus, Rostroraja alba,* and *Sphyrna lewini* (Endangered); and *Thunnus obesus, Mustelus mustelus, Rhinobatos albomaculatus, Oxynotus centrina, Oreochromis macrochir,* and *Centrophorus squamosus* (Vulnerable; OBIS, 2017). The resident

edible freshwater prawn: *Macrobrachium vollenhovenii* is also believed to be geographically, ecophysiologically and morphologically distinct here due to the physical characteristics of the Kunene River mouth (Carter and Bickerton 1996, Patterson 2007). Large aggregations of green turtles, *Chelonia mydas*, found in the area further support the significance of the area in relation to this EBSA criterion; Vulnerable olive ridley turtles, *Lepidochelys olivacea*, are also present. This criterion is ranked as medium because the cetaceans listed are probably non-resident here, and there are other areas along the Namibian coast that are considered more important in terms of supporting threatened and endemic bird species.

C4: Vulnerability, fragility, sensitivity, or slow recovery Medium
Justification
The EBSA is largely underpinned by the influence of the Kunene River. Consequently, there is a moderate level of vulnerability and sensitivity to disturbance because changes to the freshwater outflow could result in significant changes to the ecosystems it influences by altering sediment delivery, salinity and nutrient concentrations. The vulnerability of the site to changes in productivity is, in part, buffered by the numerous other features that also contribute to productivity in the area, including the upwelling cell and the seamounts and canyons. The Kunene wetlands are believed to be vulnerable to environmental change mainly as a result of anthropogenic stress from activities such as fishing, mining and industrial development (Schneider & Miller 1992; Simmons et al., 1993; De Moor et al., 2000; Paterson 2007). The species at the site include turtles, cetaceans, sharks, seals and birds that are sensitive to delines in population abundance, and would be slow to recover from impacts.

Historically, dams constructed along the upper reaches of the Kunene River (six in total) have not had significant negative impacts on the flow characteristics of the river and naturalness of the adjacent wetland (Paterson 2007). This may be linked to the fact that the six dams have never been in operation at the same time due to structural damages sustained during the historic civil unrest in the region. This, however, may change as there is a proposal for a new hydroelectric dam to be built in the vicinity of the Epupa Falls (Dentlinger 2005), and potential still exists for the renovation of the existing six dams (Paterson 2007). Limited fishing occurs in the area that poses threats to vulnerable species such green turtles (which are often targeted by small military contingents near the Kunene River mouth) and marine mammals, which can get entangled in gillnets used by the fishers on the Angolan side of the border (Paterson 2007). On the Namibian side, diamond mining poses a threat to the area; prospecting taking place some 10 km south of the Kunene River mouth (Schneider & Miller 1992; Paterson 2007). There has also been a proposal for a deepwater harbour at one of two locations (viz. Cape Fria or Angra Fria), which are located roughly 160 and 130 km south of the Kunene River mouth, respectively (Paterson 2007). There have also been calls for the investigation of aquaculture viability at the Kunene River mouth, focusing on the edible freshwater prawn that is resident to the area (Paterson 2007). Furthermore, limited tourism interests are already established on the Namibian side and with tourism gaining momentum on the Angolan side, this industry could also pose a threat to the naturalness of the area if not properly regulated (Simmons et al., 2006, Paterson 2007).

C5: Biological productivity High
Justification
The Namibe area is considered to be productive due to its unique geographical location. It is situated within the moderately strong Kunene Upwelling Cell, within the longitudinal range of the Angola-

Benguela frontal system (Lutjeharms & Meeuwis 1987, Paterson 2007), and at the mouth of one of only two perennial rivers in Namibia. The nutrients carried by the Benguela Current are supplemented by nutrient inputs from the Kunene River, providing a rich food supply that supports a diverse fish community in the area (Paterson 2007). In addition, the EBSA contains ecosystems that are characteristically associated with relatively higher productivity, including wetlands, seamounts and canyons. Jointly, this collection of productive features results in a site of high productivity that in turn provides foraging areas for several species, including seals, birds and turtles that breed or rest in the coastal areas (e.g., Simmons et al., 2006; Dyer 2007; Simmons 2010), as well as supporting many fish species that spawn in the area (Paterson 2007).

C6: Biological diversity High

Justification

Habitat heterogeneity in Namibe is high, with 15 distinct ecosystem types present in the EBSA (Holness et al., 2014). The Namibe wetlands also support a high diversity of species, including terrestrial, freshwater and marine fauna (Paterson 2007). Over and above freshwater and marine reptiles (e.g., Nile soft-shelled terrapin, Nile crocodile, green turtle and Nile monitor), and cetaceans, the area also supports a large colony of Cape fur seals (Griffin & Channing 1991, Simmons et al., 1993, Carter & Bickerton 1996, Patterson 2007). The Kunene river mouth is also one of Namibia's most diverse bird areas, with a total of at least 119 bird species (including 8 resident waders, 22 palearctic waders, 32 wetland-, 19 marine- and 38 non-wetland bird species; Ryan et al., 1984, Braine 1990, Simmons et al., 1993, Anderson et al., 2001, Paterson 2007). In terms of ichthyofauna, 65 freshwater fish species (five of which are endemic to the area) and 19 marine fish species have been recorded in Namibe (Hay et al., 1997, Holtzhausen 2003, Paterson 2007).

C7: Naturalness Medium

Justification

In Namibia, human impacts on the Namibe area have been limited due to its remoteness. However, historic and current fishing activities, combined with dam construction, mining and prospecting activities in and around the area have had some impacts on the local naturalness (Simmons et al., 1993, De Moor et al., 2000, Paterson 2007). Much of the Angolan area was identified as being in fair ecological condition by Holness et al. (2014) largely due to the high intensity of artisanal and commercial fishing. Consequently, overall 63% of the area is in fair ecological condition and 25% in good condition.

Other relevant website address or attached documents

Summary of ecosystem types and threat status for Namibe. Data from Holness et al. (2014).

Threat Status	Ecosystem Type	Area (km^2)	Area (%)
Endangered	Cunene Outer Shelf	919.6	6%
Vulnerable	Cunene Shelf Edge	601.9	4%
	Tombua Estuarine Shore	3.8	0%
	Tombua Inshore	56.6	0%
	Tombua Mixed Shore	0.5	0%
	Tombua Reflective Sandy Beach	22.1	0%
	Tombua Sheltered Rocky Shore	2.4	0%
Least Threatened	Cunene Dissipative-Intermediate Sandy Beach	11.6	0%
	Cunene Estuarine Shore	6.2	0%
	Cunene Inner Shelf	2,220.9	15%
	Cunene Inshore	655.8	4%
	Cunene Intermediate Sandy Beach	56.6	0%
	Cunene Island	860.6	6%
	Cunene Lagoon Coast	5.1	0%
	Cunene Low-energy Reflective Sandy Beach	14.3	0%
	Cunene Lower Slope	3,720.9	25%
	Cunene Mixed Shore	28.5	0%
	Cunene Reflective Sandy Beach	57.6	0%
	Cunene Shelf	2,443.9	16%
	Cunene Upper Slope	3,112.2	21%
	Namibe Shelf	148.4	1%
	Namibe Shelf Edge	61.4	0%
	Namibe Upper Slope	25.9	0%
	Tombua Intermediate Sandy Beach	5.7	0%
	Tombua Low-energy Reflective Sandy Beach	12.8	0%
Grand Total		**15,055.4**	**100%**

Status of submission

The Kunene – Tigres EBSA was recognized as an area meeting EBSA criteria that were considered by the Conference of the Parties. The revised name, description and boundaries have been submitted to the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) for consideration by the Conference of the Parties to the Convention on Biological Diversity

COP Decision

dec-COP-12-DEC-22

End of proposed EBSA revised description