

# ATLAS



of ecological and biological sensitivity in coastal and offshore areas of West Africa, especially Mauritania, Senegal, Guinea-Bissau, and Sierra Leone

With particular reference to the development of oil and gas in the region





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# ATLAS

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# Executive Summary

The Atlantic seaboard and marine waters of West Africa are vital assets for the region, supporting globally important fisheries and highly productive areas for wildlife. Coastal habitats include extensive tidal flats, offshore islands, a large archipelago, winding rivers, and long beaches, with tropical ecosystems in the south yielding to desertic landscapes in the north. Offshore, Atlantic currents and a major upwelling combine with a range of underwater features including seamounts, canyons, and cold-water corals to result in a diverse marinescape of great productivity.

The key coastal and marine ecosystems and habitats of the region are estuaries, sandy beaches, rocky coasts, archipelagos, mangroves, seagrass beds, seamounts, knolls, canyons, and cold-water corals. Mangroves extend from Sierra Leone to southern Senegal, with smaller pockets in northern Senegal and Mauritania. Western and Central Africa has about 11% of the world's mangrove area. Seagrass beds extend from Sierra Leone north to Mauritania. Both mangroves and seagrass play a vital role in coastal zone defence and carbon capture, as well as significantly contributing to local economies and to supporting fish and other wildlife, from manatees to crabs and seabirds. Coastal development, including that due to oil and gas developments, is the principal threat to the region's mangroves; some restoration initiatives have helped to counter mangrove loss. Seagrasses are susceptible to damage from contact with oil or oil-related chemicals, whilst they are also vulnerable to damage due to their location in shallow coastal seas, often close to areas of development.

Deep-water habitats also play a major role in supporting biodiversity in the West African Marine Ecoregion (WAME). Seamounts, knolls, and submarine canyons are seabed features that are particularly important, supporting rich biodiversity. They also provide habitat for deep-sea corals, which in turn provide food and refuge for numerous marine species. A key function of these habitats is nutrient regeneration and upwelling, essential for healthy fisheries. Very little protection is in place for these habitats, and all deep-water construction activity poses a direct physical threat, whilst issues such as increased turbidity and pollution impact deep-sea corals and other marine life.



The marine waters of West Africa are particularly rich in seabirds and waterbirds. The atlas presents an overview of the species richness and range rarity of 22 pelagic seabird species. These birds have a key – and often overlooked - role in oceanic ecosystems as top predators, and are important vectors of nutrients between marine and terrestrial ecosystems. Although a number of key areas for seabirds have been identified and designated as Marine Protected Areas (MPAs) or marine Important Bird & Biodiversity Areas (IBAs), active protection and management of such areas and of seabirds at sea present many challenges. Oil and gas developments represent a serious threat to pelagic seabirds, including through their attraction to well-lit infrastructures, pollution, shipping, and displacement from important feeding areas.

Many seabirds and waterbirds breed along the coastline, often on small islands. Senegal's Saloum Delta, Guinea-Bissau's Bantambour island, and Mauritania's Banc d'Arguin are particularly important for breeding gulls and terns, whilst there are important breeding areas for many waterbirds, such as the Senegal Delta, which supports colonial breeding sites for several species, notably Great White Pelican and Lesser Flamingo. Although efforts have been made to strengthen the conservation status of seabirds and waterbirds in the region, including the designation of protected areas, these birds still face an uncertain future, due largely to anthropogenic pressures. These include those linked to oil and gas development, the major threat being oil contamination. Scavenging birds such as Hooded Vulture (CR) are also vulnerable. Colonial breeding birds are particularly at risk as they depend heavily on specific breeding sites and areas close by for feeding. The coastal zone of West Africa is also of high international importance for migratory waterbirds, many of which breed in Europe and the Arctic. So, impacts in West Africa will have wider impacts along the birds' flyways.

The WAME supports a wide range of cetaceans, the most threatened of which is the Atlantic Humpback Dolphin (CR), which is endemic to the tropical Atlantic coastline of Africa. Cetaceans are vulnerable to impact by oil and gas developments, as different actions can impact them in various ways. Seismic surveys used in oil exploration may adversely affect them, especially Sperm Whales (VU) and baleen whales. Collision through increased marine traffic is another impact, whilst pollution damages cetaceans, including through increasing their susceptibility to infectious diseases. The Atlantic Humpback Dolphin occurs almost exclusively in coastal waters and is especially vulnerable to impacts affecting the coastal zone, such as higher levels of shipping, onshore and coastal developments, and pollution.

Other mammals in the coastal zone include the African Manatee (VU), which occurs from Sierra Leone to southern Mauritania, and the Mediterranean Monk Seal (EN), which has a population of over 300 animals in the Cap Blanc Peninsula at the northwest coast of Mauritania. The Bijagós Archipelago of Guinea-Bissau also supports a unique population of Common Hippopotamus (VU), which moves between islands, whilst two species of otter also live in the region. All aquatic mammals living in the coastal zone are vulnerable to impacts from the oil and gas sector, especially those affecting inshore waters, such as pollution. Like cetaceans, manatees are also prone to collision, so increasing levels of marine traffic in their key areas can be problematic.

Five species of sea turtles breed in West Africa. The island of Poilão in Guinea-Bissau's Bijagós Archipelago hosts the largest Green Turtle (EN) breeding site in Africa, with around 25,000 clutches laid every year. Sea turtles are widely subject to numerous threats, including bycatch, predation of adults and eggs, coastal erosion, pollution, and acoustic noise. The oil and gas industry adds cumulatively to these threats through the potential for pollution, underwater noise, and disturbance of the seabed (e.g. impacting water quality). The region also supports three species of crocodiles, including the Slender-snouted Crocodile (CR) and the African Dwarf



Crocodile (VU), both with small fragmented populations, and both highly prone to coastal development and disturbance.

The WAME is a key area for fish productivity, supporting a wide range of species, many of which are of high commercial value and essential for local people, although there is also high pressure from international fleets. Many cartilaginous fish occur, several of which are threatened with extinction, such as Smalltooth Sawfish (CR), Great Hammerhead (CR), and Guitar Ray (EN). As long-lived species, sharks and rays do not reach sexual maturity until several years old and also have low fecundity, rendering them very vulnerable to threats. Already impacted by fisheries and widely in decline, any additional impacts from oil and gas could push some species to local extinction; oil has already been found to impact the survival of Atlantic Stingrays, and may well impact other species as well.

Over 1,000 fish species occur in the coastal zone of West Africa, both pelagic and demersal fish, whilst the area also abounds in marine molluscs. The high fish productivity is due to both deepwater and coastal features, including the permanent upwelling at sea and coastal spawning grounds. All countries have important fisheries, with both artisanal and industrial fisheries operating. The annual catch in Mauritania is around 900,000 tonnes. However, the regional fishery is heavily over-exploited, and the prospect for productive fisheries and sustainable catches in the future is slim unless significant control measures are adopted and effectively implemented. Against this backdrop, the oil and gas sector brings additional threats to fish and fisheries, including the potential for oil spills/pollution, disturbance of the seabed and discharges from drilling, underwater noise, and waste.

There have been significant planning developments in the offshore oil and gas sector in the region since the 1990s, with the discovery of petrol and gas in 2001. By 2018, a wide range of activities of exploration, discovery, and exploitation was already underway. Whilst development remains at a relatively early stage, there is high potential for production into the future. All stages of the industry must adopt strict environmental controls, given the major importance of this region for fisheries, biodiversity, and traditional livelihoods. All six countries from Mauritania south to Sierra Leone have signed various international conventions relating to offshore oil and gas management and to biodiversity conservation. However, several of these have not been widely ratified, whilst implementation measures are broadly lacking. A key step, for instance, is the elaboration of national Emergency Response Plans to encourage efficient planning in the case of an emergency, such as a major oil spill. Some measures are currently underway to strengthen oil spill preparedness and response capabilities, which will need long-term support given the anticipated pace of development of the sector. For instance, a shoreline clean-up policy has only been developed for two out of six countries of the region.

In recognition of the high importance of the WAME for biodiversity and conservation, there is a strong network of coastal and marine sites with various national and international designations for protection and management. These include over 50 nationally protected sites in the coastal zone between Mauritania and Sierra Leone, as well as 24 Ramsar Sites, 3 World Heritage Sites, and 4 Biosphere Reserves. Some sites have both national and international designations. Mauritania's Banc d'Arguin, for instance, is a Ramsar Site, World Heritage Site, and National Park (NP). There is also a significant marine area designated within 10 EBSAs (Ecologically or Biologically Significant Marine Areas) under the Convention of Biological Diversity (CBD). Many of these marine and coastal protected areas and a few additional sites are also listed as IBAs.



Mauritania was the first country in the region to exploit its oil and gas reserves; the Grand Tortue Ahmeyim LNG well between Senegal and Mauritania is a substantial development expected to generate its first gas in 2023. The Timiris Canyon EBSA, cold-water coral reefs, and key upwelling features, as well as parts of the Senegal-Mauritania Transboundary Biosphere Reserve, all fall within areas dedicated to offshore oil and gas activity. The coastal protected areas of the Banc d'Arguin and of the Senegal River Delta in both Mauritania and Senegal are also in close proximity to concessions, especially Grande Tortue-Ahmeyim. In Senegal's marine waters, the Cayar MPA, the Cayar EBSA, and the Cayar Seamount EBSA are included within the Cayar Offshore Block. In addition, Iles de la Madeleine NP, Gorée MPA, Somone MPA, and some coastal sites are all included within the Rufisque offshore block, while the Joal-Fadiouth MPA, the Palmarin Community Reserve, the Sangomar MPA, the Saloum Delta NP, and the Saloum Delta EBSA are all within the Diffère Offshore block. Further south, the Senegal Offshore South Block encompasses the Abéné MPA, part of Kalissaye Ornithological Reserve and the Embouchure Casamance EBSA. Guinea-Bissau's coastal zone protected areas are either close to or within oil blocks, notably Rio Cacheu NP and the Bolama-Bijagós Biosphere Reserve and Ramsar Site. All areas are threatened by a potential gas or oil discovery, as is a part of Cantanhez and Cufada National Parks. Sierra Leone could become a major oil producer in the future and would need to put in place policy tools and strategies to protect the marine environment. The risk that oil exploration will result in a blowout or a major oil spill or cause catchment disturbance has been assessed as significant in a 5-year perspective and high in a 50-year perspective.

The principal risks to marine and coastal ecosystems from offshore oil and gas activities are from noise, damage to the seabed, spills of oil and other chemicals, gas flaring, infrastructure, waste, and transport. Mitigation measures are urgently required to minimise these risks throughout this region, which is of high global importance for biodiversity and of high value to all countries of the region and their populations.

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# 1

## Introduction

## The Atlas

This atlas presents an overview of the distribution and status of ecosystem, biodiversity and natural resource values of the West African Marine Ecoregion. It presents these values in the form of distribution maps alongside supporting and additional texts that together aim to show where the key sites are for different taxa and habitats and to highlight their conservation and management status and risks, notably from the emerging offshore oil and gas sector.

The atlas illustrates first the key coastal and marine ecosystems and habitats of the ecoregion, followed by an overview of some of the key vertebrate biodiversity values. It then provides summary information on regional fisheries, before a more detailed situation analysis of the offshore oil and gas sector. The atlas is completed by country overviews and individual accounts for each key site.

## The region

West Africa is a large and diverse part of Africa stretching from Mauritania and Senegal in the west to Chad and Cameroon in the east, encompassing biomes from the Sahara-Sindian biome in the north to the Guinea-Congo Forests biome in the south. The region also includes Cabo Verde, an island group due west of Senegal. The coastal zone from Mauritania to Cameroon changes from an arid area where the desert meets the sea to a lush tropical zone with rainforest-fringed beaches, whilst mangroves are prevalent across much of the region. The marine area is influenced heavily by the Canary Current Large Marine Ecosystem (CCLME) in the northwest to the Benguela Current Large Marine Ecosystem (BCLME) in the southeast. The area covered by this atlas is the coastal and marine zone of the western part of West Africa, from Mauritania to Sierra Leone, with a particular focus on four countries – Mauritania, Senegal, Guinea-Bissau and Sierra Leone.



**Figure 01.** Map showing the countries of the Atlantic coast of Africa influenced by the CCLME





Credit: Maegan Luckiesh/Unsplash

## Biodiversity importance of the coastal zone

West Africa is an area rich in biological diversity. On land, the Guinean Forests of West Africa form one of Africa's eight biodiversity hotspots, whilst the wide range of habitats from the Sahel to the tropics present a range of diverse ecoregions. Offshore, West Africa has one of the four main permanent upwelling areas of the world, and supports some of the most important estuarine areas for migratory waterbirds along the East Atlantic Flyway. The coastal zone is a very important non-breeding and breeding area for numerous species of seabirds, sea turtles and marine mammals, many of which spend different parts of their life cycle in different regions, habitats and ecosystems.

WWF (2010) identified the West African Marine Ecoregion as spanning from Mauritania to Sierra Leone and including Cabo Verde. This area comprises the marine ecoregions of Cabo Verde, Sahelian Upwelling and Gulf of Guinea West identified by Spalding et al. (2007) on the list of Marine Ecoregions of the World (MEOW). The region's marine and coastal ecosystems and the services they provide are under pressure from a range of factors, especially overfishing by international and national industrial and artisanal fisheries, as well as coastal development, maritime traffic and climate change. More recently, oil and gas exploitation activities exert additional pressures to an area that is already heavily compromised.

## Oil & Gas development in the region

The countries of the West African Marine Ecoregion have actively engaged in identifying and exploiting oil and gas reserves in almost the entire coastal and marine area (Kloff et al. 2010). These include areas important for tourism, key fishing areas and biodiversity hotspots, with the coastal and marine zone split into blocks for oil and gas exploration. In 2006, a consortium began oil extraction along the Mauritanian coast and many test wells have been drilled throughout the region.

Since the series of new discoveries of offshore oil and gas deposits, particularly in Senegal and Mauritania, oil and gas companies have assailed the West African Marine Ecoregion. The various offshore oil and gas activities will, depending on the life cycles of the projects and operational safeguards in place, constitute threats to the habitats, ecosystems and species of the region due largely to the potential risks of accidents and pollution that could impact the health and integrity of the marine and coastal ecosystems.

[Refer to chapter 4—Oil and Gas Developments for a detailed account of oil and gas development in the region.]



Credit: Chris Leboutillier/Unsplash

# 2

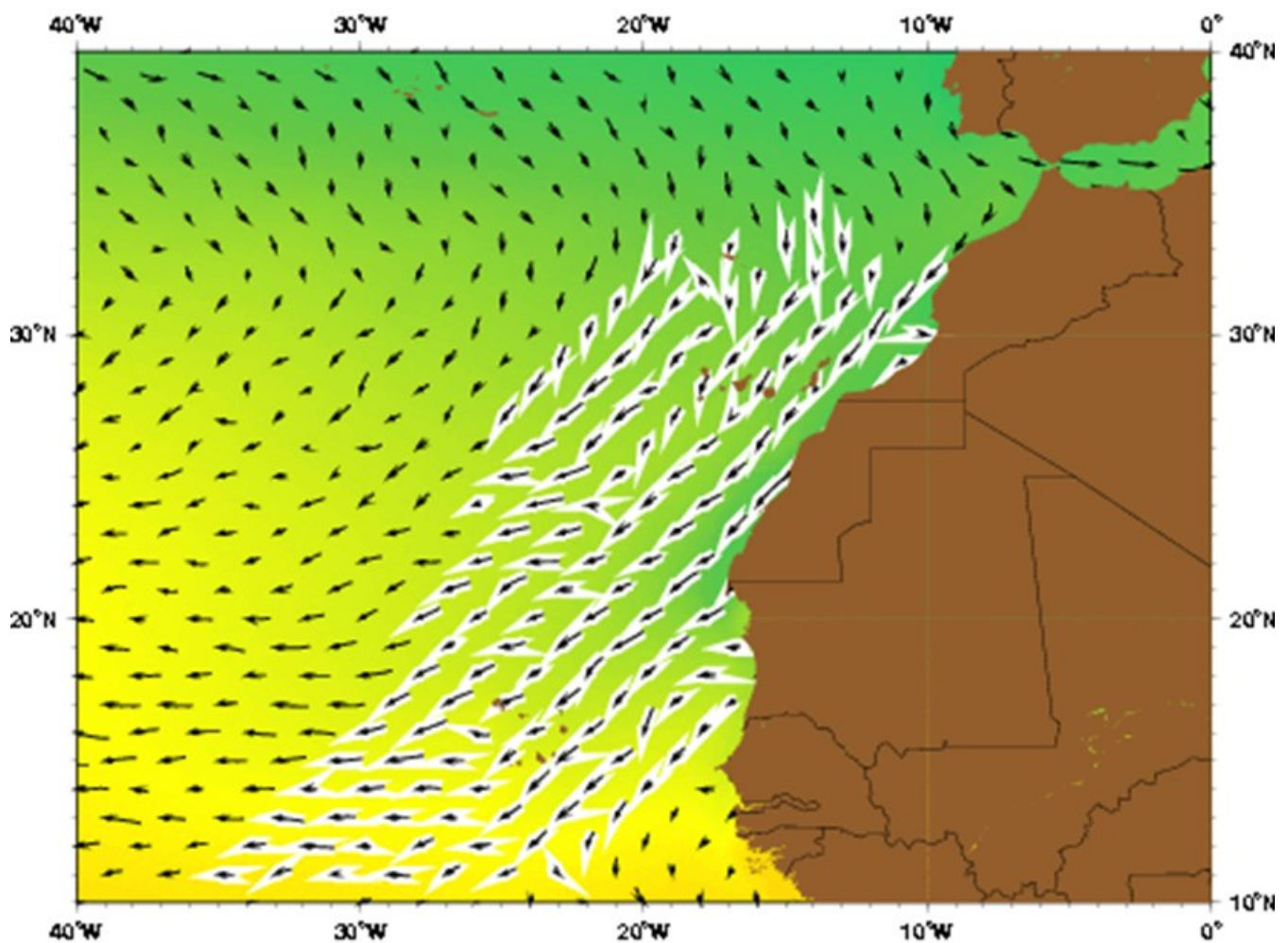
## Coastal and Marine Ecosystems of the region



The West Africa Marine Ecoregion is known for its rich biodiversity and high natural productivity, yet its key habitats are fragile and a number of species are globally threatened with extinction. As in other parts of the world, healthy wildlife populations depend on healthy habitats. In this section the key coastal and marine ecosystems and habitats of the region are presented, notably:

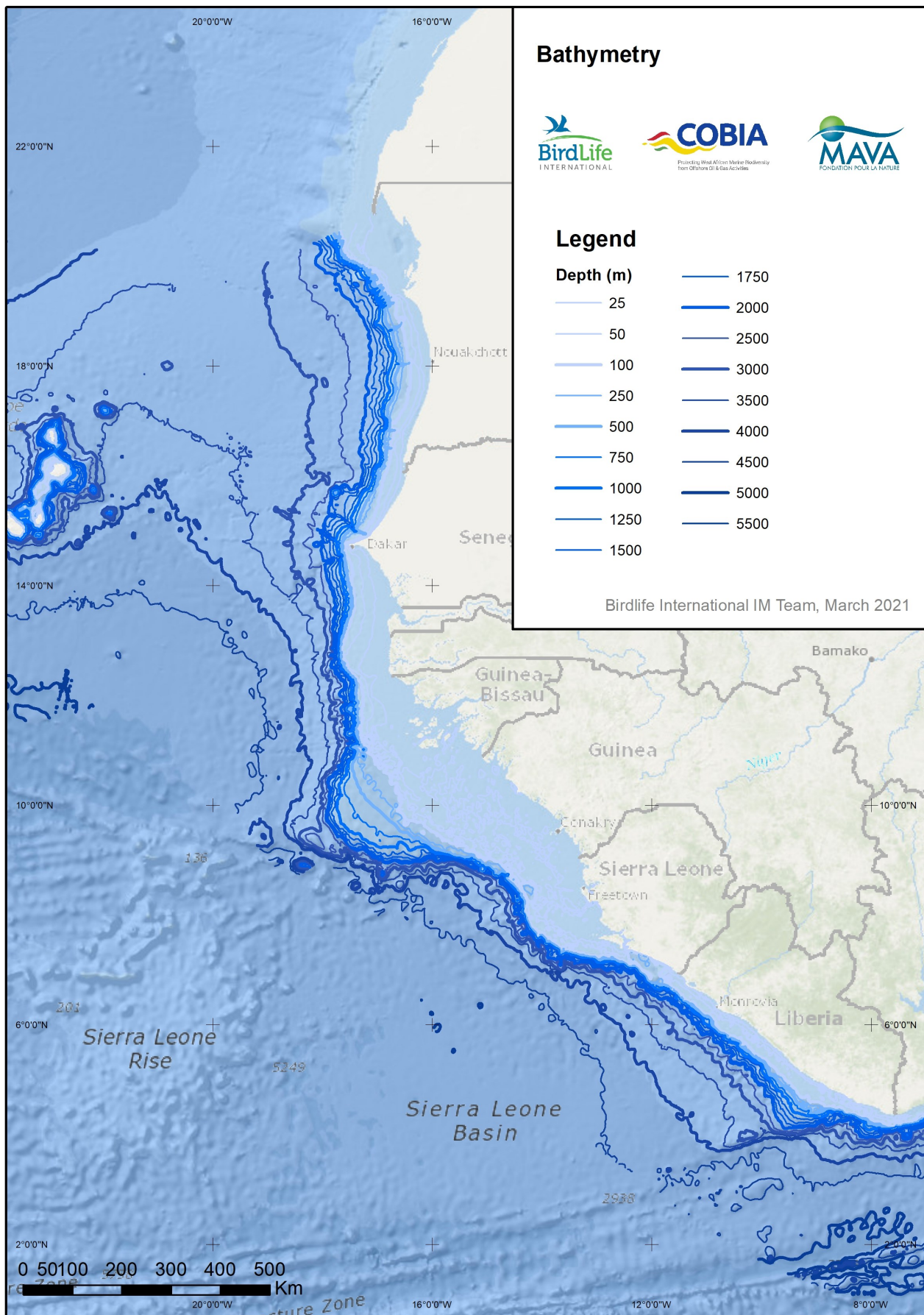
- Estuaries, sandy beaches, rocky coasts and archipelagos
- Mangroves
- Seagrass beds
- Seamounts, knolls, canyons and cold-water corals

Offshore currents, notably the CCLME, heavily influence all coastal and marine habitats of the West African Marine Ecoregion. The Canary Current flows in a southerly direction along the West African coast between 30°N and 10°N and offshore to 20°W (Fedoseev 1970). It is 1000 km wide and flows slowly (10-30 cm/s) year-round towards the equator (Wooster et al. 1976, Batten et al. 2000). As it travels south it entrains upwelled water from the coast, cooling its surface waters (Figure 02, Mittelstaedt 1991).



**Figure 02.** Circulation of currents off the coast of West Africa (Mittelstaedt 1991).

The bathymetry of the marine zone also bears great influence on the dynamics and ecology of the region (Map 01). The continental shelf is much further from shore off Guinea-Bissau and Guinea, whilst the Cap Vert peninsular of Senegal lies close to the shelf, with shorter access to deep water fishing grounds.



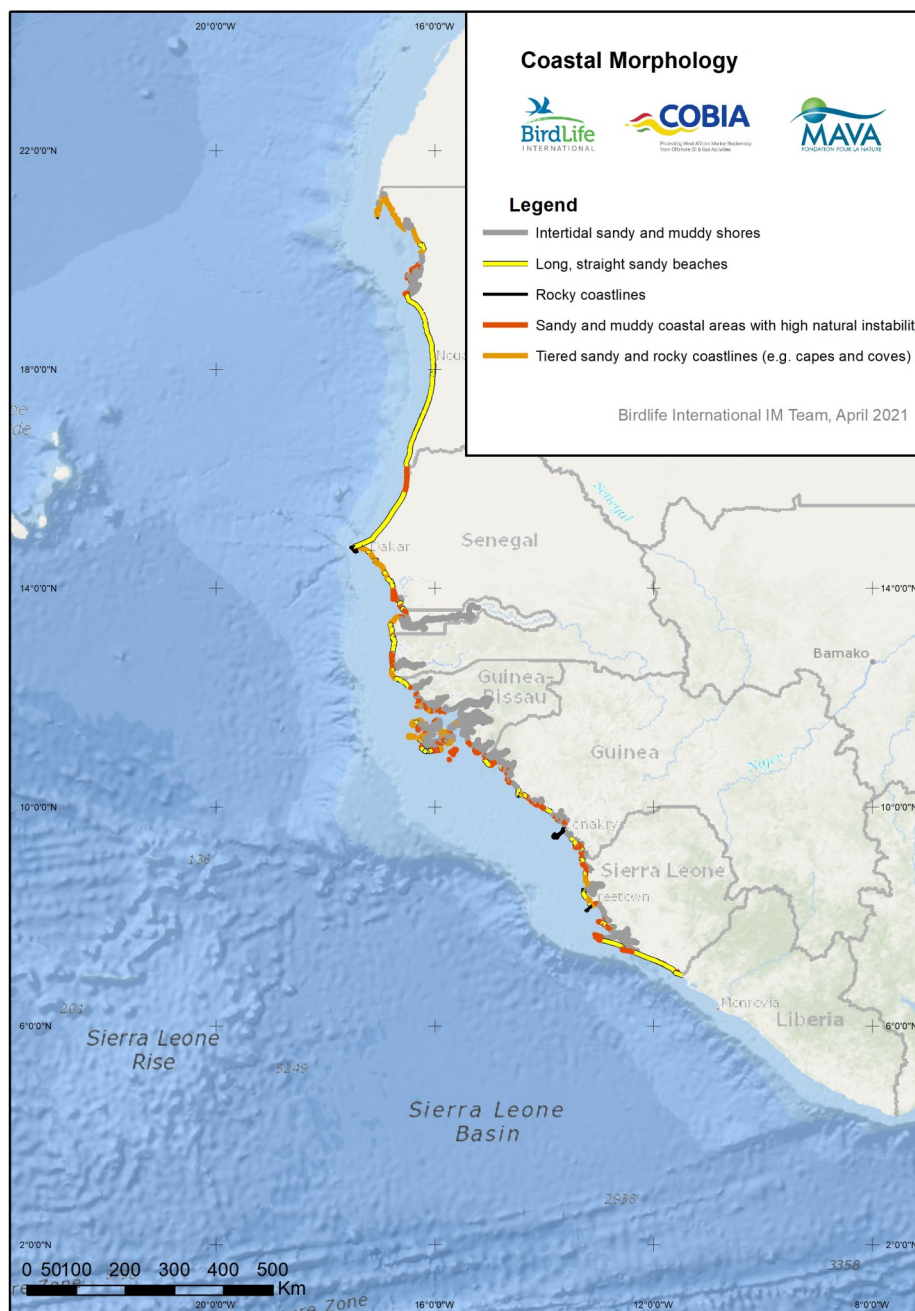


## 2a. Coastal zone morphology

The northern coastline of the West Africa Marine Ecoregion in Mauritania is characterised by the vast Golfe d'Arguin – a mostly shallow marine area sheltered by a substantial offshore sedimentary formation, providing ideal conditions for aquatic vegetation and the formation of sandflats and mudflats. To the northwest there is a rocky coastline with low cliffs around Cap Blanc; other rocky areas occur in the region, especially around Senegal's Cap Vert and other promontories as well as some small rocky islands. Extensive mudflats are found at the mouths of most of the

region's rivers, such as the Saloum Delta in Senegal and in the extensive Bijagós Archipelago of Guinea-Bissau.

Mangroves dominate lower reaches of rivers and adjacent areas, such as the Bijagós. Large parts of the coastline are given over to sandy beaches, fringed by desert and semi-arid scrub in the north and by tropical forest in the south, from the Casamance of Senegal to Sierra Leone. Coastal lagoons sometimes form behind coastal strips. Seagrasses occur throughout the region in shallow coastal waters.



**Map 02.** Morphology of the coastal zone between Mauritania and Sierra Leone





## Estuaries

Estuaries are formed at the coastal mouths of rivers, where seawater advances upriver. They characterise the West African coastline between the Saloum Delta in Senegal and the Sherbro River in Sierra Leone, giving rise to the name for this region of 'Rivers of the South'.

During the dry season saltwater reaches far inland up the estuaries, a situation that is reversed during the rainy season, when freshwater extends its influence to the mouth and beyond into the sea (PRCM 2011). There are significant tidal influences in the region's estuaries, with often extensive areas of mudflats revealed at low tide.

## Archipelagos

Archipelagos are groups of islands in the open sea, represented in the West Africa Marine Ecoregion by the Bijagós Archipelago in Guinea-Bissau. Mangroves and mudflats surround the 88 low islands and islets that make up the Bijagós. The islands are relicts of the former delta of the Rio Gêba, which extended up to 100 km offshore at a time when the sea level was lower (PRCM 2011). Extralimetary, the Cabo Verde archipelago, which lies 460-830 km west of Senegal, comprises 10 islands and several islets of volcanic origin (Hazevoet 1995).





Credit: Djibril Diallo/Unsplash

## Sandy beaches and rocky coasts

Coastal mapping from Mauritania to Guinea-Bissau based on satellite images shows largely sandy coastlines with varied landscapes, from beaches backed by rocky cliffs, beaches associated with continental dunes and barrier beaches or semi-fixed coastal dunes (Faye 2010). From the Presque Ile du Cap Blanc peninsula to Cap Timiris in Mauritania (901 km) *sebkhas* salt flats dominate the coastline alongside rocky cliffs, sandy coastlines and bays. A rocky coastline zone of >70 km length of volcanic origin dominates the Cap Vert Peninsula in Senegal, which also contains artificial shores of the port of Dakar.

The coastline stretching south of Cap Vert from Bel Air to Joal (133 km) combines various types of sandy shores, including barrier beaches with small wetlands formed behind them, the sandstone cliffs of the Ndiass massif, beaches

with continental dunes in the Mbour region, and semi-fixed coastal and sandy spits. This area is one of the main centres of tourism development in Senegal. The coastline from Joal to Rio Cacine in south Guinea-Bissau (2400 km) is characterised by numerous estuaries dominated by mangroves, though there are also beaches associated with dune strands, mudflats and sandy spits at the mouths of rivers or tidal channels (Faye 2010).

There are two main landscape types in coastal Sierra Leone: (a) estuaries, shallow waters, mangroves and mudflats dotted with rocky shores and (b) sandy beaches, which occur between the northern border to the Sherbro River, and in the south, where there is a wide 125 km long sandy beach to the border with Liberia (van der Winden *et al.* 2007).



# Mangroves

An aerial photograph of a mangrove forest. A dark, narrow waterway or canal runs vertically through the center of the image, flanked on both sides by dense, lush green mangrove vegetation. The trees appear as a thick canopy of bright green. In the upper left corner, there is a patch of dead, greyish-brown mangrove branches and roots, contrasting with the living forest. The overall scene is a top-down view of a coastal wetland ecosystem.

Credit: Mohmed Nazeeh/Unsplash



# Mangroves

## What is presented?

Mangroves are coastal forests that grow where ocean, freshwater and land meet and are among the most productive and complex ecosystems on the planet, thriving in salty and brackish conditions that would kill most other plants (CILSS 2016). They have evolved mechanisms to enable them to cope with high concentrations of salt and the regular inundation of their root systems by incoming tides (UNEP 2007).

Mangroves are found in all coastal countries of the Atlantic coastline of Africa between Mauritania and Angola. They can be found as far as 100 km inland, due to strong tidal influences on major rivers. They also grow offshore where there are strong riverine influences into the ocean, and in the Bijagós Archipelago in Guinea-Bissau, which presents a myriad of islands.

Seven species of mangroves occur between Mauritania and Sierra Leone - the Red Mangroves *Rhizophora racemosa*, *R. mangle* and *R. harrisonii*, the Black Mangrove *Avicennia germinans*, Golden Leather Fern *Acrostichum aureum*, Buttonwood Mangrove *Conocarpus erectus* and White Mangrove *Laguncularia racemosa* (UNEP 2007).

## Why is this important?

Coastal livelihoods depend heavily on access to natural resources such as fuelwood and fish stocks. As highly productive ecosystems, mangroves provide many of these needs including wood and non-wood forest products, protection from storm surges, spawning grounds and nutrients for a variety of commercially important fish and shellfish, and salt production<sup>1</sup>.

Mangroves play an essential role in West Africa's coastal fisheries, which contribute at least \$400 million annually<sup>2</sup> to the regional economy. Despite some declines, mangroves between Mauritania and Sierra Leone are still relatively extant, and this ecoregion has the potential to support sustainable mangrove forests, which could contribute to the long-term security, climate change mitigation, biodiversity support and economy of the region.

Mangroves are important habitats for numerous species, including the threatened African Manatee *Trichechus senegalensis* (VU), the African Softshell Turtle *Trionyx triunguis* (VU) and many pelagic fish species of conservation and economic importance. They also function as vital roosting and breeding areas for birds.

## What protection and management is in place?

Between Mauritania and Angola, about 18% of mangrove areas fall within protected areas, although relatively few of these areas are actively managed for mangrove protection (UNEP 2007). Since the 2000s, a number of mangrove reforestation campaigns have been initiated, often operated by NGOs.

Although some results have been encouraging, e.g. with 140km<sup>2</sup> of mangrove planted between 2009 and 2013 in the lower Casamance and Saloum Delta, these efforts are sometimes poor in terms of biological and cultural diversities (Cormier-Salem & Panfili 2016).

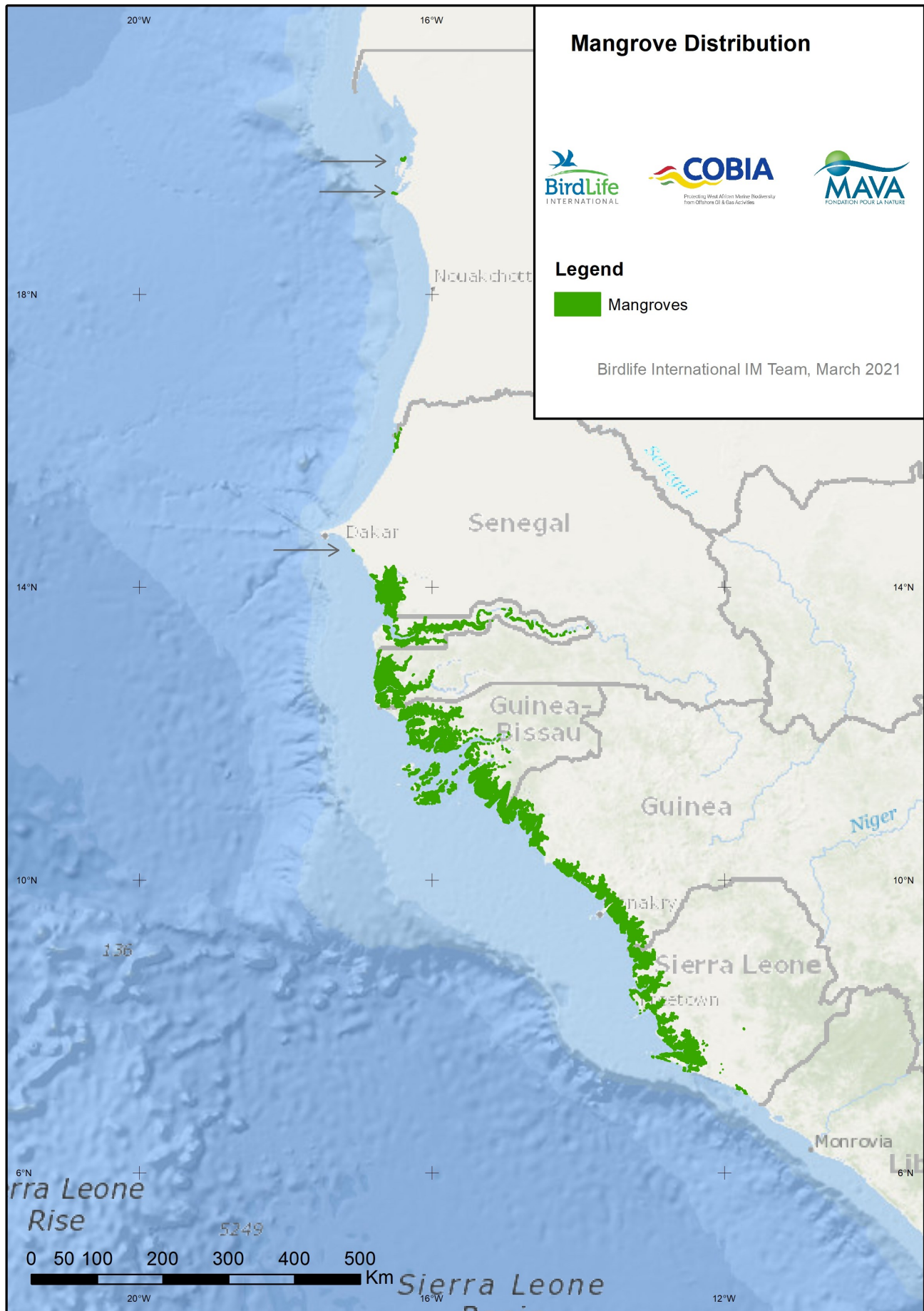
The Ecological Mangrove Restoration (EMR) approach, which supports the wider system of water and sediment flows in which mangroves flourish, is now underway in parts of Senegal and Guinea-Bissau. This approach encourages natural restoration and results in better survival rates, faster growth, and a more diverse, resilient forest (Hillsdon 2020).

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1. <https://www.worldwildlife.org/ecoregions/at1401>

2. <https://2012-2017.usaid.gov/west-africa-regional/news-information/press-releases/west-africa-mangroves-key-addressing-climate>





**Map 03:** Mangrove extent between Mauritania and Sierra Leone

## What are the risks from oil & gas development?

Coastal development is the main threat to mangroves in the ecoregion, an impact that may increase due to oil and gas developments, which are likely to draw more people into less populated coastal areas and result in new infrastructure. Along with indiscriminate logging and urbanization, the development of oil and gas activities has contributed to the decline in mangroves in the Niger Delta of Nigeria (Emerhi & Ekeke 2010). As well as impacts from oil pollution, the development of oilfield infrastructure requires extensive land clearance, dredging and sand filling in the mangrove areas, with former mangrove areas converted to other habitats (UNEP 2007). Dredging in mangrove areas has far-reaching impacts, affecting many components of the ecosystem as well as water quality and therefore the wellbeing of local communities who depend directly on the mangrove ecosystem for their livelihoods.

There are also indirect and ‘induced’<sup>3</sup> impacts to mangroves driven by oil and gas development caused by increasing human populations in their vicinity, driven by better economic opportunities, accelerating destruction of mangrove through cutting for fuelwood, clearing for farmlands and human settlements. In some areas, the introduction of foreign and invasive species also occurs, such as Nipa Palm *Nypa fruticans* in Nigeria, where it prevents the recolonisation of some areas by mangroves, which are outcompeted (Numbere 2018).

In terms of direct impacts, destruction of seabed and coastal areas by dredging and the construction of infrastructure such as breakwaters remove mangroves and often permanently convert potential mangrove habitats. Water and substrate pollution from ship ballast and refinery waste products can negatively impact mangrove health, as can air pollution from gas and oil processing, evaporation and flaring, and heat production.

Other global impacts from oil and gas exploitation include coastal subsidence that may aggravate the effects of sea-level rise, and oil spills that cause mortalities of birds, mammals, reptiles, invertebrates and fishes. Oil spills can alter succession, productivity and nutrient cycling, which in turn make mangrove habitat more susceptible to colonisation by invasive species such as Nipa Palm (Numbere 2018).

## What other conservation issues are significant?

Western and Central Africa has about 11% of the world’s mangrove area, which witnessed some 25% of coverage loss between 1980 and 2006 (UNEP 2007), also representing a loss of blue carbon stocks due to the significant carbon storage capacity of mangroves (Bryan et al. 2020). West Africa’s coastlines are under high pressure from rapidly growing human populations. Many communities rely on mangrove wood as a primary fuel source for curing fish and other purposes, and urban expansion and intensifying demands for charcoal, fuelwood, and land for agriculture are growing drivers of mangrove deforestation and degradation. These factors combined with climate change impacts - rising sea levels, erosion from extreme weather, and more intense storm surges - represent significant and growing threats to mangroves.

The overall regional trend from 1975 to 2013 identified by CILSS (2016) indicated a decline in mangrove area between Senegal and Nigeria of 4.8% with a net loss of 984 km<sup>2</sup>, including losses of 288 km<sup>2</sup> in Senegal and 220 km<sup>2</sup> in Guinea-Bissau, whilst Sierra Leone appears to have either no change or an overall increase in mangrove area over the 38-year period. However, UNEP (2007) reported somewhat different trends between 1980 and 2006, with a slight increase in Guinea-Bissau and moderate declines in Senegal and Sierra Leone. Encouragingly, CILSS (2016) report measurable gains in mangrove cover from 2000 to 2013 in Senegal, Guinea and The Gambia, partly due to restoration efforts.

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3. IFC GN 15: Indirect impacts might include project-induced access by third parties, in-migration and associated impacts on resource use, including land conversion, hunting and wildlife trade, and spread of invasive alien species.





Credit: Curioso / Unsplash

### Further important information

Coastal vegetated ecosystems, such as mangrove forests, seagrass meadows and salt marshes, have long provided benefits to human communities and fisheries. More recently they have also been recognized for the significant amounts of carbon that they store, with mangroves of Africa's Atlantic seaboard storing 854 million metric tons of carbon, and hence their contributions to mitigating climate change, central to 'blue carbon' sequestration projects (Bryan et al. 2020).

Although threats to mangroves remain, steps have been taken to save them from further

destruction in Western Africa, and many national governments have passed legislation to protect them, whilst they are further bound to this through international conventions, such as the Convention on Wetlands.

Mangrove restoration efforts have been conducted in all countries of the West African Marine Ecoregion and further afield. Although success of restoration ventures has been mixed, there is nevertheless a growing realisation in the key roles that mangroves play in coastal zone defence and supporting other resources.





Credit: Quimbaya/Flickr





## Seagrass

### What is presented?

Seagrasses are a functional group of about 60 underwater species of marine flowering plants upon which thousands more associated plant and animal species depend. They have a range of phenotypes ranging from eelgrass strap-like blades of up to 4 m long to the 2-3 cm long sea bines. Seagrass beds provide habitat for fish and shellfish and nursery areas for the larger ocean, and are usually found close to other marine habitats such as coral reefs, mangroves and saltmarshes. They are the primary food source for manatees and Green Sea Turtle *Chelonia mydas* (Green & Short 2003).

Seagrasses depend on light for photosynthesis and, as rooted plants, also require sediments for both attachment and nutrition. Therefore, seagrasses are primarily found in shallow coastal waters. Because of their sediment stabilization and high productivity functions, seagrasses tend to link the coastal and offshore ecosystems. The most widespread seagrass in the West African Marine Ecoregion is *Halodule wrightii*, with a known distribution from Mauritania to Sierra Leone as well as in Cabo Verde, followed by *Cymodocea nodosa* from Mauritania to Casamance and *Zostera noltii* from Mauritania to Senegal's Saloum Delta (ResilienSEA 2020a).

Seagrass beds provide valuable ecosystem services, dissipating wave energy and storing significant amounts of ocean carbon. Their principal values are for biodiversity, fish and nursery habitat, sediment stabilization, climate change mitigation through carbon storage, and water quality regulation (Vegh & Potouroglou 2020).



## What protection and management is in place?

Although West Africa is one of the least known areas in the world for seagrasses (Duarte *et al.* 2008), new insights are currently being made, including the recent confirmation of seagrasses in Sierra Leone, by virtue of the Resilient Seagrasses project<sup>4</sup>. This project aims to enhance the management of seagrasses in West Africa, including mapping seagrasses and improving knowledge and awareness about them, and to enhance stewardship. These actions will hopefully improve protection measures, which are currently only at a low level.

## What are the risks from oil & gas development?

The greatest threats to seagrasses worldwide are from coastal zone development and human induced pollution (Short & Wyllie-Echeverria 2000). The potential for damage to seagrass ecosystems from oil can be broken down into two broad categories: susceptibility and vulnerability (Region IV Regional Response Team, undated):

- Susceptibility: The potential for damage to plants and associated communities due to contact with oil or oil-related chemicals, either breakdown products or clean-up chemicals. In particular, certain components of both crude and refined products have high toxicity to marine organisms in small concentrations.
- Vulnerability is largely a positional effect, reflecting the proximity of a particular seagrass bed to a potential hazard. Seagrass beds are especially vulnerable to damage and degradation by human activities because of their location in the shallow coastal seas where human activities are greatest. The potential for damage is highest in seagrass beds within harbours, estuaries, and lagoons, and in areas in close proximity to shipping lanes.

Petroleum products can act to damage seagrass ecosystems in various ways, including:

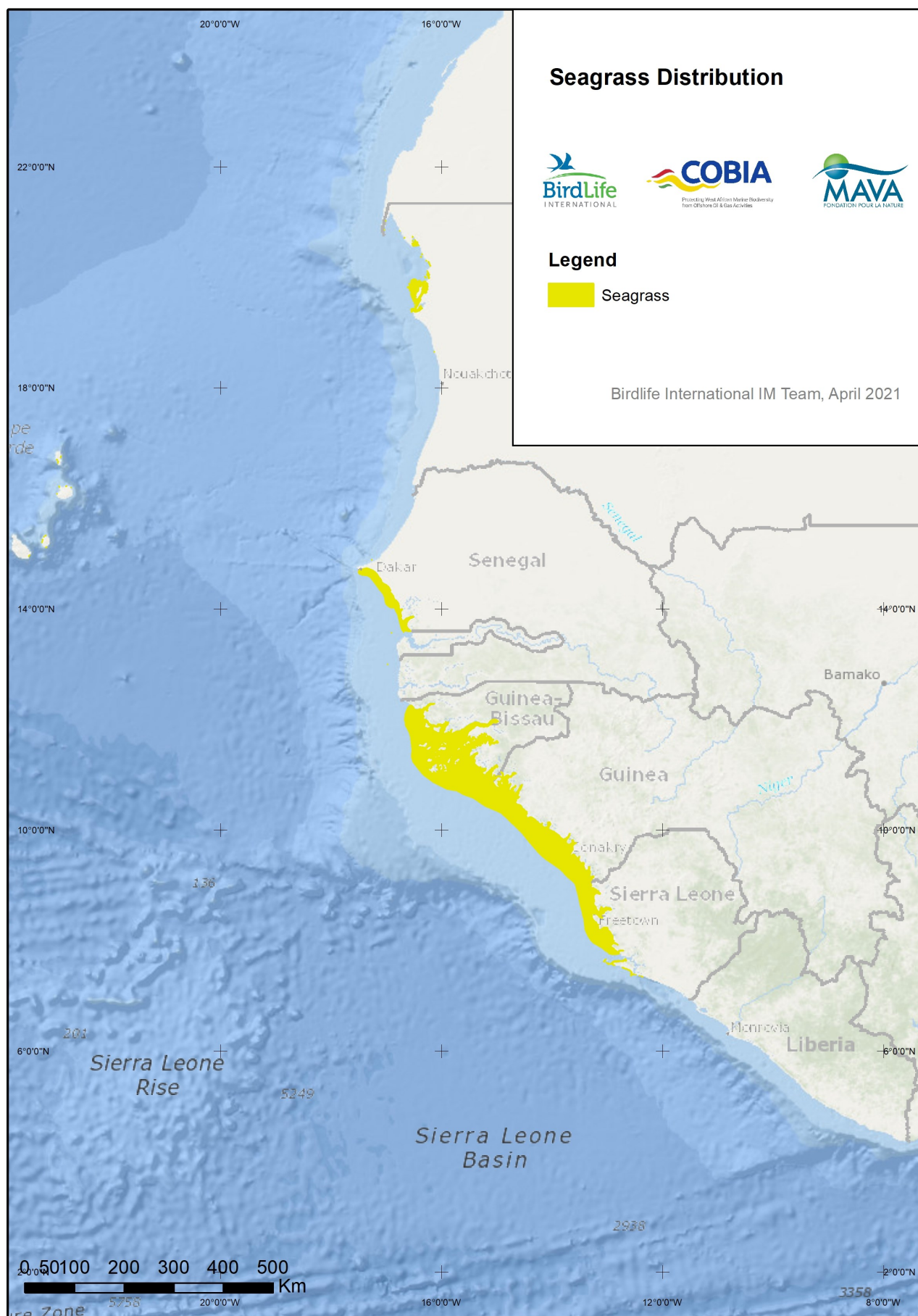
- Direct mortality of organisms due to smothering, fouling, asphyxiation or poisoning.
- Indirect mortality due to the death of food sources or the destruction or removal of habitat.
- Destruction of juvenile fish and other taxa using seagrass beds as a nursery ground.
- Incorporation of sub-lethal amounts of petroleum fractions into body tissues, potentially lowering tolerance to other stresses.
- Reduction or destruction of the food or market value of fisheries due to absorption of hydrocarbons.
- Incorporation of potentially carcinogenic or mutagenic substances into the food chain.

## What other conservation issues are significant?

Short & Wyllie-Echeverria (2009) estimated the loss of seagrass habitat from direct and indirect human impacts to be 33,000 km<sup>2</sup> globally over two decades. The primary cause of degradation and loss of seagrasses in Australia has been from direct habitat disturbance or removal, and from a reduction in water clarity, both through increased turbidity and increased nutrient loading (Walker & McComb 1992). In West Africa, boat anchoring and coastal net fishing are significant threats to seagrasses; gaps in seagrass bed extent is caused by damage from anchoring of boats in the bays around Dakar.

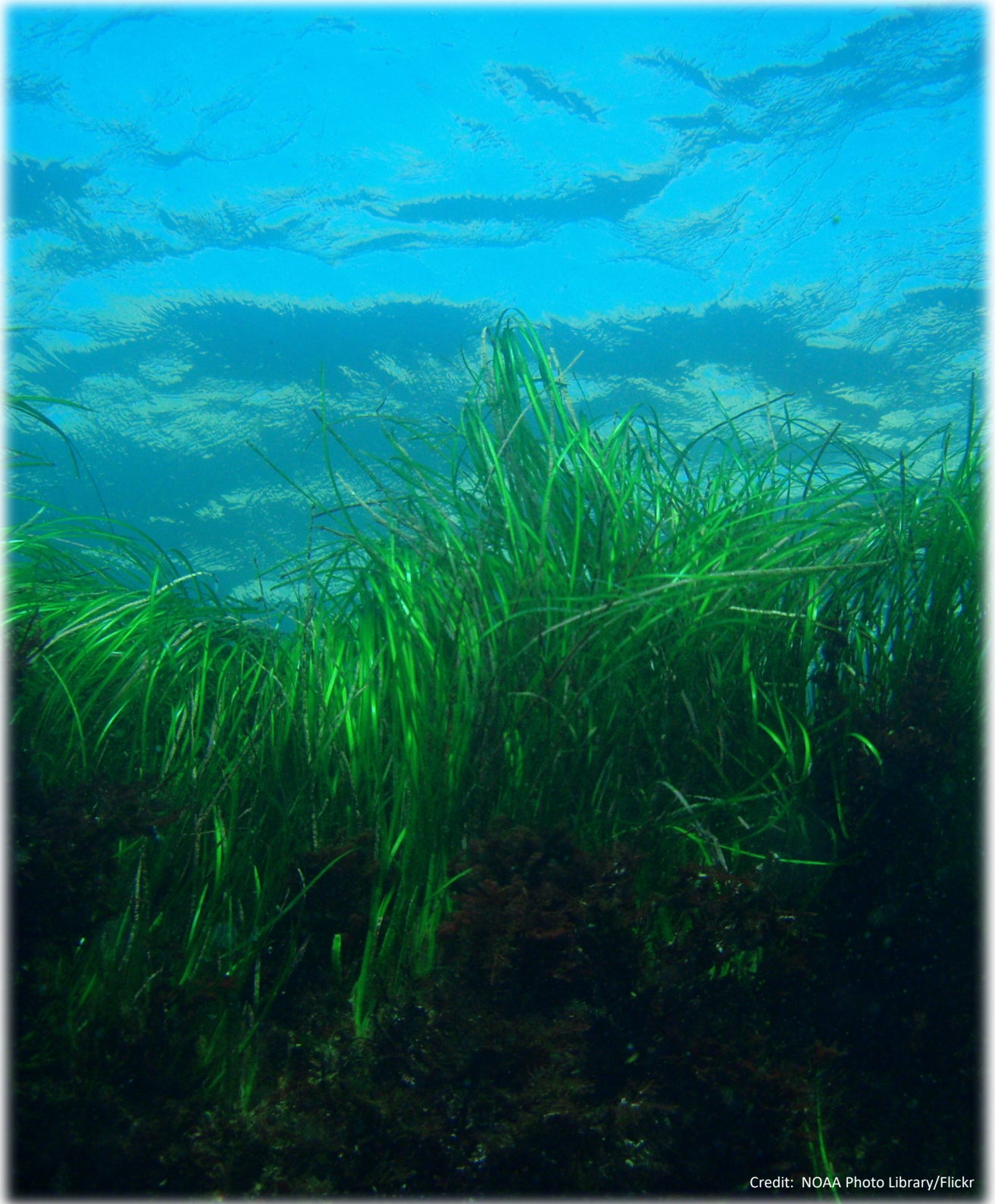
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4. <https://resiliensea.org/>



**Map 04:** Distribution of seagrass beds from Mauritania to Sierra Leone. Seagrass is predicted to also occur between Cap Vert in Senegal and the Banc d'Arguin, and west and south of Cap Blanc in Mauritania (ResilienSEA 2020b).





Credit: NOAA Photo Library/Flickr

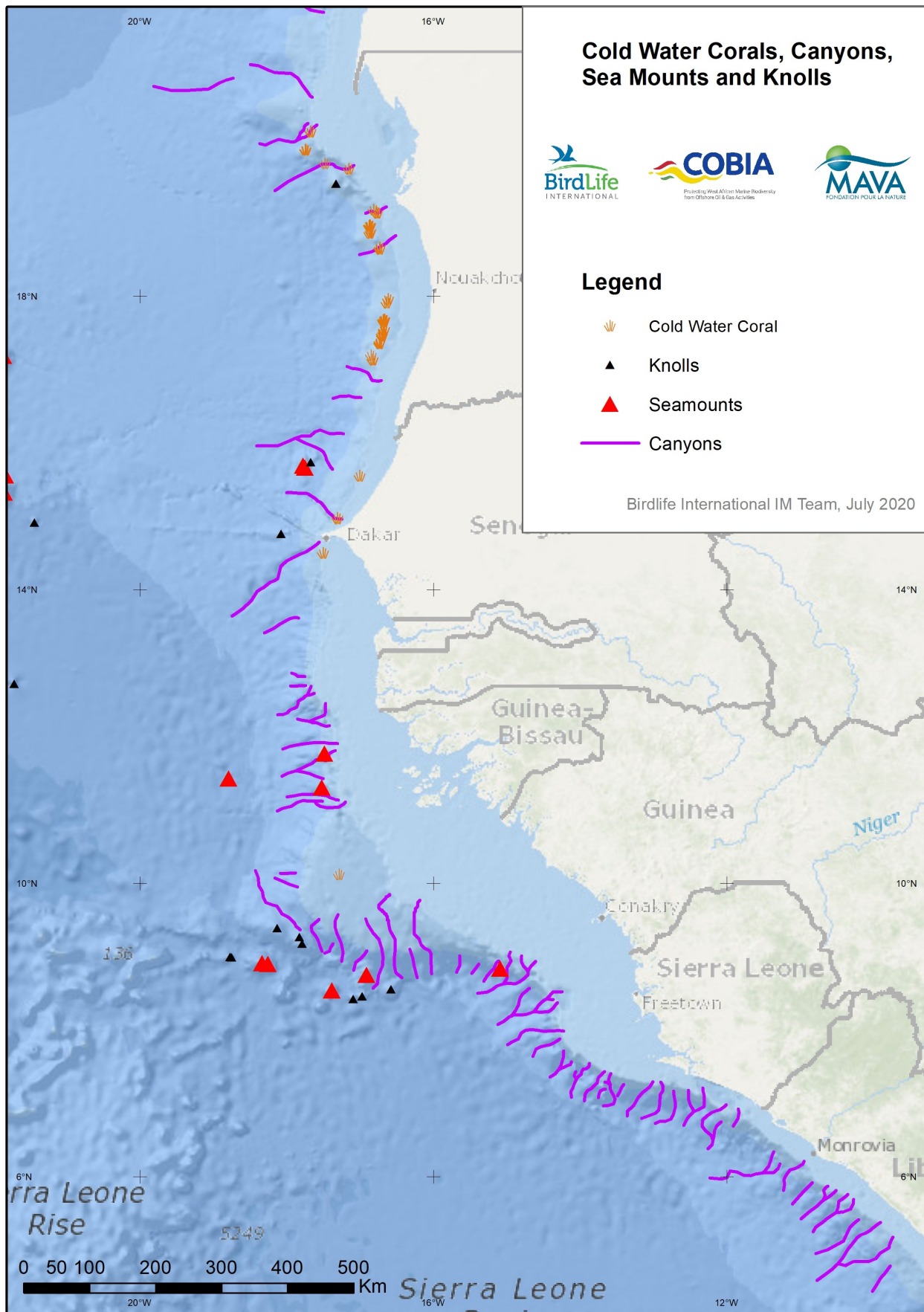
### **Further important information**

The taxonomic groups of seagrass beds that are mainly distributed along tropical Atlantic coasts are *Thalassia*, *Halophila*, *Syringodium* and *Halodule*. The genus *Cymodocea* is typically restricted to the Indo-Pacific waters, however, the species *Cymodocea nodosa* has a more warm-temperate distribution in the Mediterranean, and fans out into the Atlantic down to the north-western coast of Africa. A number of seagrass species occur in the Atlantic that have not been recorded in West Africa; further research may reveal their presence.



## 2 b. Deep-water habitats

### Seamounts, knolls, canyons and cold-water corals



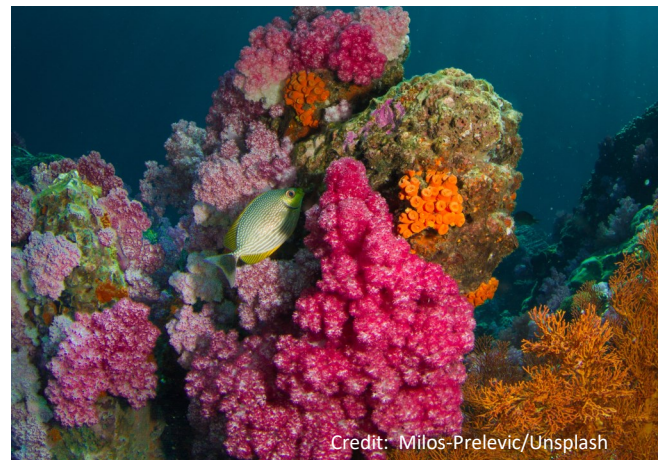


## What is presented?



**Seamounts** are underwater mountains rising to at least 1000 m above the surrounding sea floor, and are generally extinct volcanoes, whilst **knolls** are smaller mountains <1000 m. These geological features are associated with cold-water corals, which favour areas with accelerated oceanic current flows.

**Deep-sea or cold-water corals** are solitary and colonial suspension-feeding cnidarians<sup>5</sup> commonly associated with seamounts. Unlike tropical corals, deep-sea corals lack symbiotic algae living in their polyps so they do not need sunlight to survive. They feed solely by capturing food particles from the surrounding water. Their polyps tend to be much larger than in tropical corals. Deep-sea corals grow slowly - about 5-25 mm a year - but over time they form extensive coral gardens or coral forests. Cold-water corals are typically found in water depths of 200 to >2000 m.



Scleractinian corals *Scleractinia* (including *Dendrophylliidae* and *Parazoanthidae*) and gorgonian corals *Alcyonacea* (possibly including corals from the families *Isididae*, *Primnoidae*, *Plexauridae* and *Gorgoniidae*) were reported to occur in the Sangomar Deep Offshore Block of Senegal by Woodside (2020).



**Submarine canyons** known as *gouf* in French are valleys including underwater extensions of rivers that cut into the continental slope, sometimes to the edge of the coast. They enable sediment movement from the continental margin to deep abyssal plains. Several canyons exist in the CCLME area, the most productive and biodiverse being the Timiris Canyon in Mauritania and the Kayar Trench in Senegal (Abdellah *et al.* 2014). A series of small canyons - Serere, Diola, Mandingo and Oualo canyons - cut into the southern part of the Golfe d'Arguin and merge to form Timiris Canyon. They shelter a rich

biodiversity and breeding grounds for several species of fish (Abdellah *et al.* 2014). The canyons incised into the continental margin of Sierra Leone serve as sediment traps. The outer shelf lies below 60–70 m depth and is smaller in width with greater angles of inclination of the bottom; in some parts bedrock is common. The state of these canyons is stable (Environment Protection Agency 2015).

5. Cnidaria is a phylum of the Animalia Kingdom containing over 11,000 predominantly marine species. They have specialised cells (cnidocytes) that they use mainly for capturing prey.

## **Why is this important?**

Deep-sea corals are important components of seamount ecology, providing food and refuge for numerous species of fish, crabs, shrimp, sponges and sea stars at depths 50–6000 m where few other habitat formers live (Etnoyer 2015). They are rich assemblages, and >3300 species of a zooxanthellate stony corals and soft corals have been recorded (Cairns 2007). Methane-derived authigenic carbonate (MDAC) also provides a hard substrate for refuge and supports a faunal assemblage similar to that of stony reef, different to surrounding soft sediment.

Due to cold-water corals, the number of invertebrate species on reefs in the Northeast Atlantic Ocean can be as high as that found in shallow-water tropical reefs. Although the number of fish species is relatively low at 20-40 species compared to 3000 species on some tropical reefs, cold-water coral reefs attract large masses of fish and, like their tropical cousins, serve as important spawning and nursery grounds.

A deep-sea function that supports fisheries is nutrient regeneration, which occurs mainly in regions of strong upwelling, but also in areas where local upwelling can occur e.g. mesoscale eddies, seamounts. Upwelled nutrients fuel photosynthesis, which in turn supports major fisheries.

There is only limited data on the marine life of West Africa's canyons, but cold-water corals and other vulnerable benthic species have been recorded (Westphal et al. 2013). In Mauritania, fishermen's testimonies and recent observations show that canyons are home to a rich biodiversity of deep corals, fish and other species protected from upwelling currents. Canyons could represent marine sanctuaries for cetaceans (Hooker et al. 2001). At least 206 megabenthic species belonging to 29 higher taxa have been recorded in northern Mauritanian canyons, including hydrozoans, sponges and decapods (most numerous), as well as bivalves, polychaetes and prosobranchs, although crinoids appeared to be absent, at least at the edges of the canyons (Diop 2014).

## **What protection and management is in place?**

Very little, if any, legal protection is currently afforded to seamounts, canyons and cold-water coral systems in the region, whilst information about their extent is limited. Several cold-water coral species are listed by CITES and on EC Habitats Directive Annex I, and their trade is illegal. In Senegal, a part of the Cayar Canyon is included in a Marine Protected Area (MPA). Further north, coral gardens have been included on the OSPAR List of threatened and/or declining species and habitats, due to concern about the status of vulnerable cold-water coral reefs in the North-East Atlantic, many of which are threatened with destruction (OSPAR Commission 2008).

## **What are the risks from oil & gas development?**

All deep-water construction activity poses direct physical destruction/ damage and indirect pollution, increased turbidity and sediment deposition risks to deep-sea coral. There is potential for seabed disturbance associated with the installation of subsea facilities, anchors for FPSOs<sup>6</sup>, rock protection and concrete mattresses to cause direct disturbance to sediment habitats and communities.

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6. An FPSO (Floating Production Storage and Offloading) unit is a floating vessel that receives fluids crude oil, water etc. from a subsea reservoir and then separates fluids into products such as natural gas.

## What other conservation issues are significant?

Cold-water corals are often damaged by industrial fishing activity, with physical destruction by trawl lines and nets, and increased intensity of fisheries is a significant risk in the region. However the biggest, existential, issue is increasing atmospheric CO<sub>2</sub> levels, which directly leads to ocean acidification and a shallowing of both the aragonite and calcite saturation horizons (Feely et al. 2004).

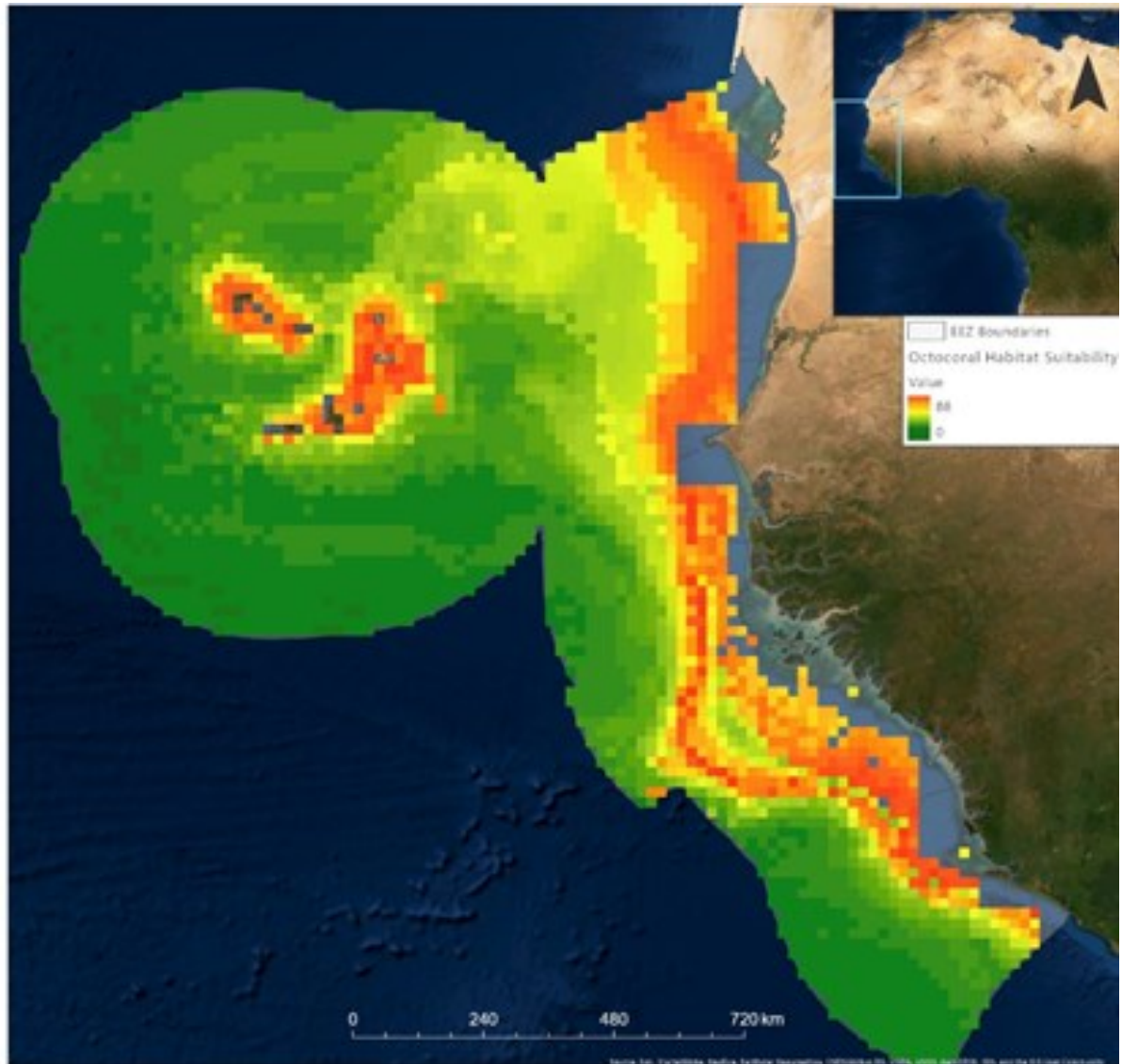


Figure 03: Modelled habitat suitability for cold-water coral

## Further important information

Global habitat suitability modelling shows the region has relatively high habitat suitability for octocorals<sup>7</sup> (Yesson *et al.* 2012) indicating suitability for all forms of cold-water corals (Figure 03).

7. Octocorals are soft corals which, although not reef-forming, are often found in coral gardens/ forests i.e. single- or multi-species assemblages where the density of colonies on the seabed is very high.

# 3

## Vertebrate Species of the coastal and marine zone



## Vertebrate Species of the coastal and marine zone

The West African Marine Ecoregion occupies an important place in the life cycle of numerous animal species, some of which congregate here in large numbers, indicating the high productivity of West Africa's offshore waters. The region supports key migration routes for numerous species of fish, birds, marine turtles and cetaceans. Several threatened aquatic species also occur, such as the African Manatee *Trichechus senegalensis* (VU) and the Mediterranean Monk Seal *Monachus monachus* (EN).





# 3 a. Birds

Marine and coastal birds play a key role in oceanic and estuarine ecosystems as top predators and important vectors of nutrients between aquatic and terrestrial ecosystems (Brooke 2004, Doughty et al. 2016). However, seabirds are highly threatened, and many shorebirds are in severe decline worldwide (e.g. Catry et al. 2011, Howe et al. 1989, Studds et al. 2017), with about 15% of species classified as Near Threatened. In light of this, any additional threats to these fragile populations are detrimental. For this atlas, separate texts and maps are provided for pelagic seabirds and coastal seabirds.

## Pelagic seabirds



Credit: NOAA/Unsplash

Pelagic seabirds are those birds that essentially make their living from the ocean, usually only coming ashore to breed, and rarely found in inshore coastal waters outside of the breeding season. They feed exclusively at sea, including during the breeding season. In the West African Marine Ecoregion, pelagic seabirds include petrels (Procellariidae), storm-petrels (Hydrobatidae and Oceanitidae), tropicbirds (Phaethonidae) and gannets and boobies (Sulidae). Some gulls and terns (Laridae) are also pelagic in nature, such as Sabine's Gull *Xema sabini* and Sooty Tern *Onychoprion fuscatus*, although all gulls and terns are grouped together here as 'coastal seabirds'.

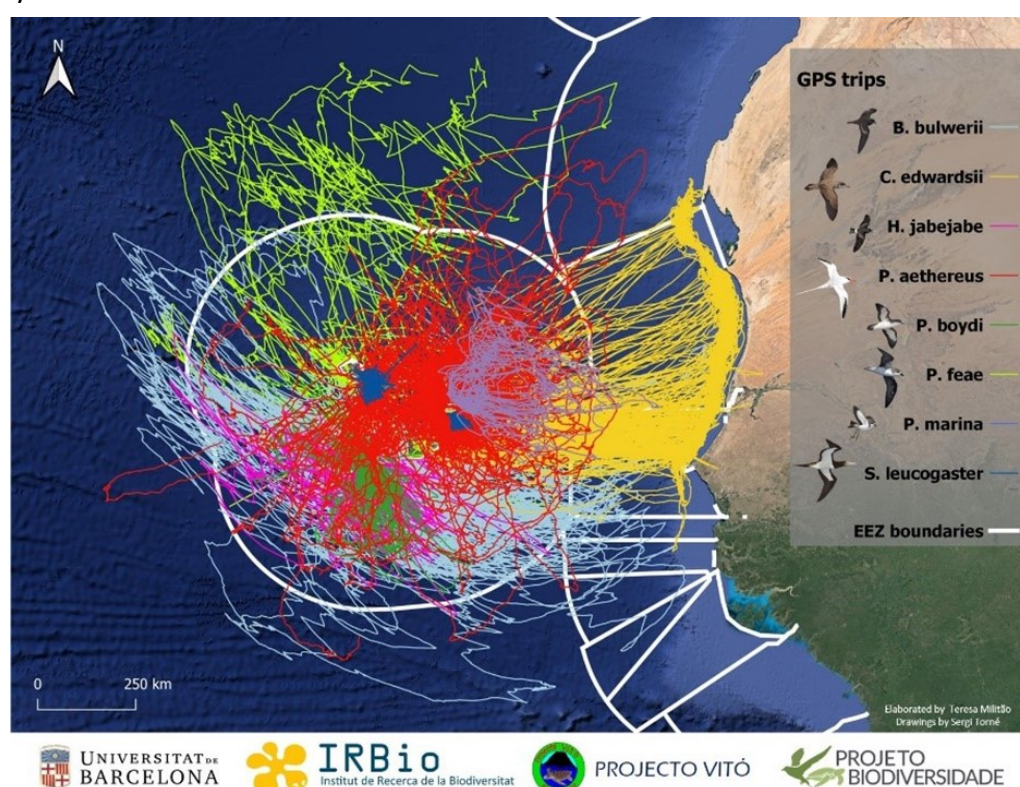
Most of the pelagic and coastal seabirds that occur in the area are migratory species (Tables 01 & 02), often originating from colonies located thousands of kilometres away (Grecian *et al.* 2016, Egevang *et al.* 2010, Stenhouse *et al.* 2012). Therefore, the conditions that seabirds find here can have repercussions on the status of populations in distant regions, revealing the importance to take marine migratory connectivity into account (Dunn *et al.* 2019) when assessing the scope of the impact of oil and gas development.



## What is presented?

Maps 06 and 07 illustrates richness and range-rarity of pelagic seabirds occurring in the West African Marine Ecoregion, including Cabo Verde. “Pelagic” seabirds are those that typically forage in deep water >200 m in depth or neritic, continental shelf water (Croxall et al. 2012, Dias et al. 2019), although these species also occur in shallower waters, particularly around their colonies. Range-rarity shows the occurrence of species weighted by the relative contribution of each cell to the global distribution of the species, so species with a smaller distribution (e.g. restricted to the region) have a higher contribution for the range-rarity map.

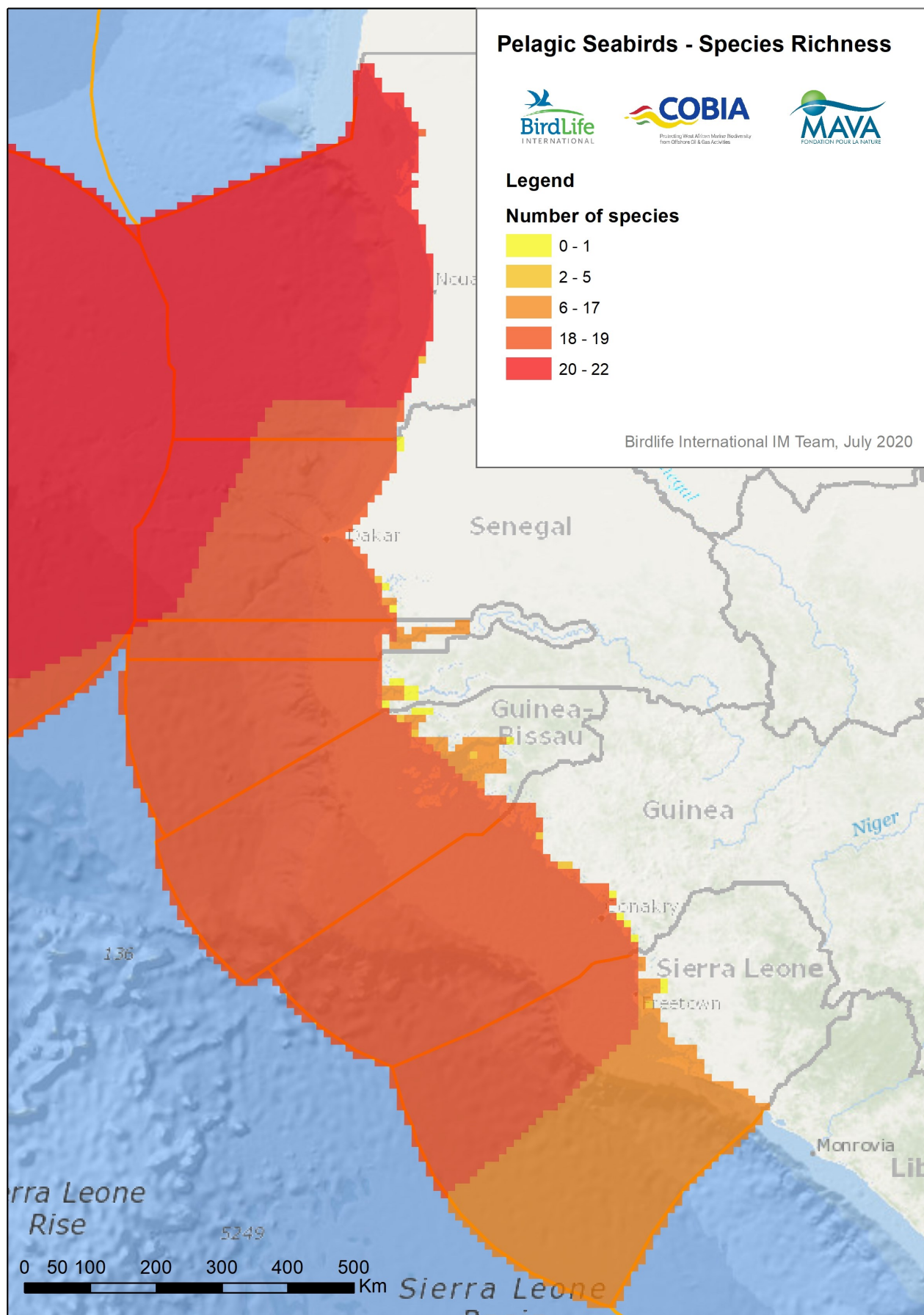
The West African Marine Ecoregion is of high importance for a large number of pelagic seabirds, both for species that breed locally such as Cape Verde Shearwater *Calonectris edwardsii*, Cape Verde Petrel *Pterodroma feae* and Cape Verde Storm-petrel *Hydrobates jabejabe* and for migratory species originating from colonies located in the south and in the north Atlantic e.g. Scopoli's Shearwater *Calonectris diomedea*, Pomarine Jaeger *Stercorarius pomarinus* and European Storm-petrel *Hydrobates pelagicus* (Table 01). The importance of the West African coastline for Cape Verde Shearwater is illustrated by Figure 04, which shows the movements of seabirds tracked from their breeding sites in Cabo Verde. All tracked species feed at sea around Cabo Verde and further afield, but the Cape Verde Shearwater clearly makes significant foraging trips to the coastal waters off Mauritania and Senegal. Many other seabirds also feed in this area in high numbers, including Northern Gannet *Morus bassanus* and Great Shearwater *Ardenna gravis*. But the intense usage of this area by Cape Verde Shearwater shown in Figure 04 is a clear indication of the importance and productivity of the West African coastal waters.



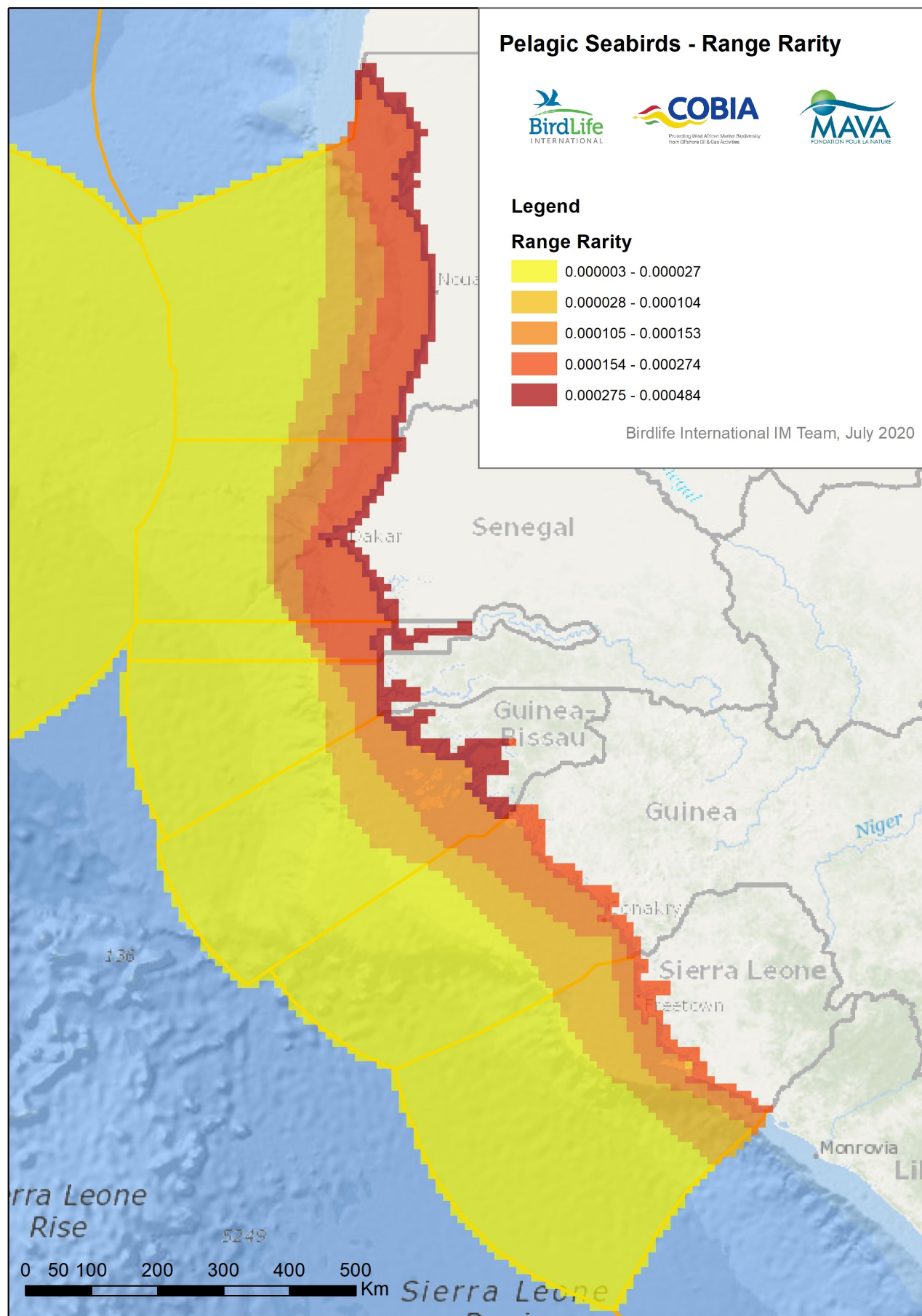
**Figure 04.** GPS tracking results of breeding seabirds of Cabo Verde. The trips made by Cape Verde Shearwater *Calonectris edwardsii* (shown in yellow) illustrate their numerous movements from Cabo Verde to the coastal waters of Mauritania and Senegal, a key foraging area for this seabird. Source: Teresa Militão (UB), Sarah Saldanha (UB), Mariona Sardà (UB), Marcos Hernández-Montero (APB), Herculano Andrade Dinis (PV), Ngone Diop (UCAD), and Jacob González-Solís (UB). UB: Universitat de Barcelona, Spain; APB: Associação Projeto Biodiversidade, Cabo Verde; UCAD: Université Cheikh Anta Diop de Dakar, Sénégal; PV: Projecto Vito, Cabo Verde.

The range maps of 22 pelagic seabird species from four families overlap with the region and were included in the analyses (Table 01). The waters of Cabo Verde and Mauritania are particularly important due to the higher number of pelagic species breeding in nearby colonies, mostly located in Cabo Verde (e.g. Paiva et al. 2015) or migrating from northern latitudes (e.g. Grecian et al. 2016)





**Map 06:** Pelagic seabirds - Species Richness.



**Map 07:** Pelagic seabirds - Range Rarity. The occurrence of species weighted by the relative contribution of each cell to the global distribution of the species, based on range maps available in BirdLife International databases. Species with a smaller distribution (e.g. restricted to the region) have a higher contribution for the range-rarity map.



### **Why is this important?**

Pelagic seabirds have a key role in oceanic ecosystems as marine top predators and are important vectors of nutrients between pelagic waters and terrestrial ecosystems (Brooke, 2004, Doughty et al. 2016). Pelagic seabirds are also the most threatened group of birds, with more than 50% of species classified as Threatened (T) or Near-Threatened (NT) in the IUCN Red List (Dias et al. 2019). The severe decline of seabird populations in the last decades, still occurring currently, has significant impacts on both marine and terrestrial habitats (Doughty et al. 2016, Graham et al. 2018). Pelagic seabirds, along with coastal seabirds, are regarded as good indicators of the health of marine ecosystems, given their high position in marine trophic webs, and because they are easier to study compared to other marine species (Parsons et al. 2008, Piatt & Sydeman 2007).

### **What protection and management is in place?**

The active protection and management measures for vast marine areas are not easy, especially when it comes to surveillance. However, a number of important measures are underway that could have a positive impact on the status of seabirds in the region. These include:

- Identification and designation of MPAs
- Identification of marine IBAs
- Identification of EBSAs
- Ratification of relevant international conventions and agreements, including the Abidjan Convention, UNEP/CMS, UNEP/AEWA and MARPOL and related agreements
- Regional fisheries agreements and protocols, with efforts underway to address bycatch of seabirds
- Regional collaboration through initiatives such as RAMPAO

Probably the most significant developments relate to the establishment of MPAs and other designations, although there are no doubt obstacles in achieving implementation of management actions. Although some seabird species are listed on Table 1 of the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA), to which Mauritania, Senegal, The Gambia, Guinea-Bissau and Guinea are Contracting Parties, this does not necessarily confer that implementation measures are in place. Further details of conventions are provided in Annex 03.



## What are the risks from oil & gas development?

**Infrastructure:** Oil and gas development represents a very serious threat to pelagic seabird species (Rodríguez et al. 2019, Ronconi et al. 2015). Oil and gas platforms have an “attraction” effect on many pelagic seabirds due to light pollution and/or enhanced foraging and roosting opportunities. This attraction can result in collision and mortality associated with flame from gas flares. Some episodic events around the world have caused the mortality of hundreds or even thousands of birds (Montevecchi 2006, Ronconi et al. 2015). The global magnitude of this problem is potentially very high and likely causing the decline of many seabird populations, but it remains only poorly understood (Burke et al. 2012, Wiese et al. 2001), especially in West Africa.

Small pelagic seabirds, such as gadfly petrels and storm-petrels, are particularly sensitive to this attraction threat (Rodríguez et al. 2019). West Africa is one of the most important hotspots in the Atlantic for these species (Camphuysen & van der Meer 2005, Camphuysen et al. 2015, Pollet et al., 2014, Ramos et al. 2017), with several endemic and/or threatened species breeding in the Atlantic island groups, such as Cape Verde Storm-petrel *Hydrobates jabejabe*, Cape Verde Petrel *Pterodroma feae*, Desertas Petrel *Pterodroma deserta*, Zino's Petrel *Pterodroma madeira*, and with thousands of individual birds congregating here during the non-breeding season (Camphuysen & van der Meer 2005, Camphuysen et al. 2015). Due to the large distances that these species are able to cover in a single trip, associated with the attraction effect, any oil and gas platform in the region, regardless of the location, has the potential to represent a very high risk for these species.

**Pollution:** Another major cause of concern from oil and gas development is the risk of oil pollution. Oil spills from wells and ships present a major risk (e.g. Kerr et al. 2010) whilst day to day operations at offshore platforms can also cause problems (e.g. Fraser et al. 2006).

**Shipping:** The increase in ship traffic from support vessels is a further cause of concern (Ronconi et al. 2015), due to increased level of light pollution - considered one of the potentially major threats to small pelagic seabirds - but still poorly understood (Dias et al. 2019).

**Displacement:** The displacement of seabirds from important foraging areas due to the presence of industrial activity, along with an increased exposure to hazardous environments, can also pose a significant threat (Ronconi et al. 2015). Oil and gas platforms often result in changes to the local marine community both in terms of prey availability and attraction of potential avian predators, which can indirectly affect seabirds (Fabi et al. 2002, Ronconi et al. 2015).

## What other conservation issues are significant?

Pelagic seabirds are highly impacted by several threats occurring both at-sea and at their colonies. On average, each seabird species is affected by three different threats (Dias *et al.* 2019), and the impact of these threats is often cumulative, explaining the very poor conservation status of most pelagic seabirds currently. Therefore, and considering that several threatened species occur in the area (Table 01), the impacts of oil and gas development should be evaluated taking into account: (A) the already fragile status of this community due to other ongoing threats including fisheries bycatch, climate change, overfishing, pollution, invasive alien species, direct harvesting and disturbance (Dias *et al.* 2019), and (B) the wide scope of the impact due to the presence of several highly migratory species.

Species	Red List Category	Local <sup>1</sup> / Migratory	Region of Origin
<b>Procellariidae (shearwater &amp; petrel) family</b>			
Cape Verde Shearwater <i>Calonectris edwardsii</i>	NT	Local	Cabo Verde endemic
Cory's Shearwater <i>Calonectris borealis</i>	LC	Migratory	North Atlantic
Scopoli's Shearwater <i>Calonectris diomedea</i>	LC	Migratory	Mediterranean Sea
Audubon's Shearwater <i>Puffinus lherminieri</i>	LC	Both <sup>2</sup>	North Atlantic
Manx Shearwater <i>Puffinus puffinus</i>	LC	Migratory	North Atlantic
Great Shearwater <i>Ardenna gravis</i>	LC	Migratory	South Atlantic
Sooty Shearwater <i>Ardenna grisea</i>	NT	Migratory	South Atlantic
Cape Verde Petrel <i>Pterodroma feae</i>	NT	Local	Cabo Verde endemic
Desertas Petrel <i>Pterodroma deserta</i>	VU	Migratory	Madeira endemic
Zino's Petrel <i>Pterodroma madeira</i>	EN	Migratory	Madeira endemic
Bulwer's Petrel <i>Bulweria bulwerii</i>	LC	Both <sup>2</sup>	North Atlantic
Cape Verde Storm-petrel <i>Hydrobates jabejabe</i>	LC	Local	Cabo Verde endemic
White-faced Storm-petrel <i>Pelagodroma marina</i>	LC	Both <sup>2</sup>	North Atlantic
Band-rumped Storm-petrel <i>Hydrobates castro</i>	LC	Migratory	North Atlantic
Leach's Storm-petrel <i>Hydrobates leucorhous</i>	VU	Migratory	North Atlantic
European Storm-petrel <i>Hydrobates pelagicus</i>	LC	Migratory	North Atlantic
Wilson's Storm-petrel <i>Oceanites oceanicus</i>	LC	Migratory	South Atlantic
<b>Stercorariidae (skua) family</b>			
Great Skua <i>Catharacta skua</i>	LC	Migratory	North Atlantic
Pomarine Jaeger <i>Stercorarius pomarinus</i>	LC	Migratory	North Atlantic
<b>Sulidae (gannet &amp; booby) family</b>			
Northern Gannet <i>Morus bassanus</i>	LC	Migratory	North Atlantic
Brown Booby <i>Sula leucogaster</i>	LC	Migratory	Cabo Verde/ Guinea
Red-footed Booby <i>Sula sula</i> <sup>3</sup>	LC	Both	Cabo Verde
<b>Phaethontidae (tropicbird) family</b>			
Red-billed Tropicbird <i>Phaethon aethereus</i>	LC	Local	Cabo Verde/ Senegal
White-tailed Tropicbird <i>Phaethon lepturus</i> <sup>3</sup>	LC	Both	Cabo Verde

**Table 01:** List of pelagic seabirds with range maps overlapping the West African Marine Ecoregion, including Cabo Verde. Note that other pelagic species occur in the area especially during migration but were not included in the analyses due to lack of data.

<sup>1</sup> Local breeders: note that these species can migrate outside the West African Marine Ecoregion/ Cabo Verde in the non-breeding season;

<sup>2</sup> Both local and migratory populations occur in the area.

<sup>3</sup> These species breed in Cabo Verde in very small numbers, and were not included in the analysis.



## Coastal seabirds

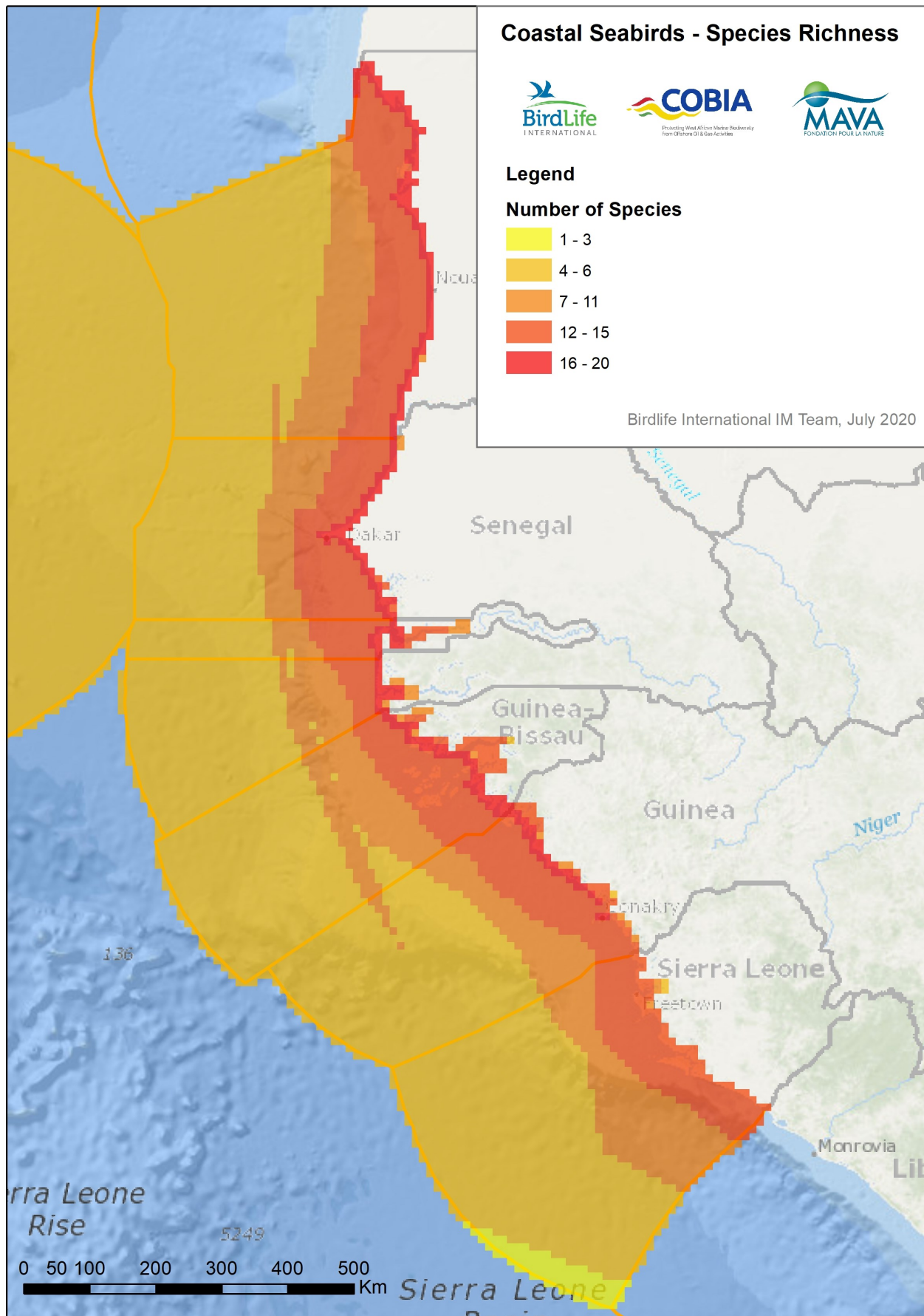


Credit: Pavel Storchilov/Unsplash

### What is presented?

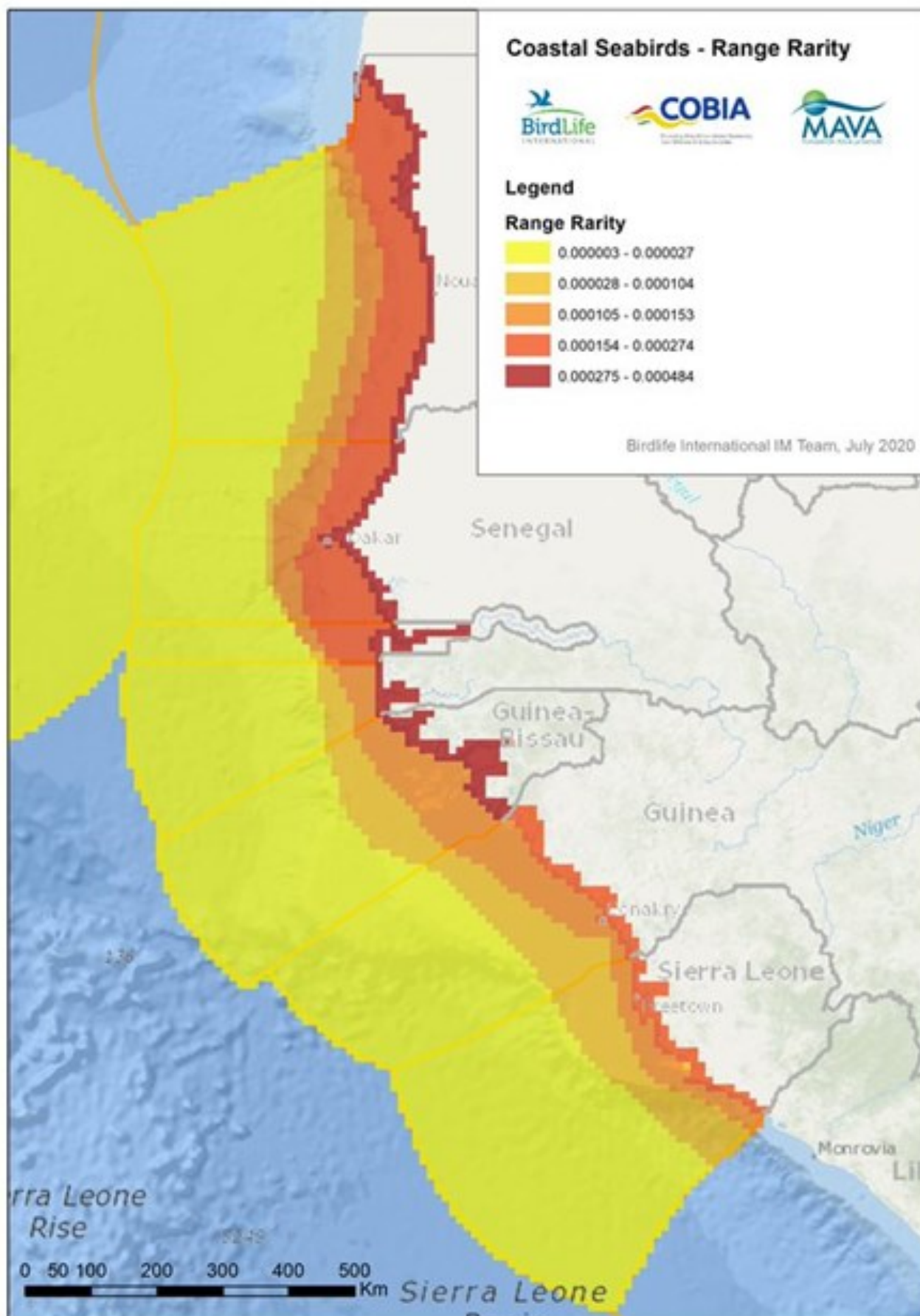
Maps 8 and 9 (page 35, 36) illustrates richness and range-rarity of coastal seabirds occurring in the region. 'Coastal' seabirds are species that primarily use inshore waters, typically <8 km from the shoreline, largely comprising gulls and terns (Croxall et al. 2012, Dias et al. 2019). Range-rarity shows the occurrence of species weighted by the relative contribution of each cell to the global distribution of the species, so species with a smaller distribution (e.g. restricted to the region) have a higher contribution for the range-rarity map.

The range maps of 20 coastal seabird species of gulls and terns Laridae from two families were included in the analyses (Table 02), along with three other species that occur in the coastal zone or offshore waters. As expected, both maps show that coastal areas are considerably more important for coastal seabirds than offshore waters; the range-rarity map also reveals the importance of the northern part of the area for species with a more restricted distribution.



**Map 08:** Coastal seabird maps - Species Richness.





**Map 09:** Coastal seabirds - Range Rarity. The occurrence of species weighted by the relative contribution of each cell to the global distribution of the species, based on range maps available in BirdLife International databases. Species with a smaller distribution (e.g. restricted to the region) have a higher contribution for the range-rarity map.

Species	Red List Category	Local <sup>1</sup> / Migratory	Region of Origin
<b>Laridae (Gulls, Terns, Skimmers) family</b>			
Black Tern <i>Chlidonias niger</i>	LC	Migratory	North Atlantic
Common Gull-billed Tern <i>Gelochelidon nilotica</i>	LC	Both <sup>2</sup>	North Atlantic
Caspian Tern <i>Hydroprogne caspia</i>	LC	Local	Local colonies
Bridled Tern <i>Onychoprion anaethetus</i>	LC	Both	North Atlantic
Sooty Tern <i>Onychoprion fuscatus</i>	LC	Both	North Atlantic
Roseate Tern <i>Sterna dougallii</i>	LC	Migratory	North Atlantic
Arctic Tern <i>Sterna paradisaea</i>	LC	Migratory	North Atlantic
Common Tern <i>Sterna hirundo</i>	LC	Both	North Atlantic
Little Tern <i>Sternula albifrons</i>	LC	Both	North Atlantic
Lesser Crested Tern <i>Thalasseus bengalensis</i>	LC	Migratory	North Atlantic
Royal Tern <i>Thalasseus maximus</i> <sup>3</sup>	LC	Local	Local colonies
Sandwich Tern <i>Thalasseus sandvicensis</i>	LC	Migratory	North Atlantic
Audouin's Gull <i>Larus audouinii</i>	LC	Migratory	North Atlantic
Grey-headed Gull <i>Larus cirrocephalus</i>	LC	Local	Local colonies
Kelp Gull <i>Larus dominicanus</i> <sup>4</sup>	LC	Local	Local breeder
Lesser Black-backed Gull <i>Larus fuscus</i>	LC	Migratory	North Atlantic
Slender-billed Gull <i>Larus genei</i>	LC	Local	Local colonies
Mediterranean Gull <i>Larus melanocephalus</i>	LC	Migratory	North Atlantic
Yellow-legged Gull <i>Larus michahellis</i>	LC	Migratory	North Atlantic
Black-headed Gull <i>Larus ridibundus</i>	LC	Migratory	North Atlantic
Sabine's Gull <i>Xema sabini</i>	LC	Migratory	North Atlantic
<b>Other families (Pelecanidae, Phalacrocoracidae &amp; Scolopacidae)</b>			
Great White Pelican <i>Pelecanus onocrotalus</i> <sup>5</sup>	LC	Local	Local colonies
Great Cormorant <i>Phalacrocorax carbo</i> <sup>6</sup>	LC	Local	Local colonies
Red Phalarope <i>Phalaropus fulicarius</i> <sup>7</sup>	LC	Migratory	North Atlantic

**Table 02:** List of coastal gulls and terns with range maps overlapping the study area, plus three other species also included in the analysis. Other migratory species also occur on occasion.

1 Local breeders: these species may also migrate outside the study area in the non-breeding season.

2 Both local and migratory populations occur in the area.

3 The African Royal Tern *Thalasseus maximus albidorsalis* is likely to be recognized as a distinct species from the nominate American Royal Tern *T. m. maximus* based on recent research.

4 Kelp Gull has a small apparently isolated breeding population in West Africa; it was not included in the analysis.

5 Pink-backed Pelican *Pelecanus rufescens* also breeds in the coastal zone of West Africa.

6 Long-tailed Cormorant *Phalacrocorax africanus* also breeds in the coastal belt of West Africa, although it is rarely found in marine habitats, unlike Great Cormorant, which occurs in freshwater and marine habitats.

7 This species is rarely seen from the coastline, but occurs in inshore waters.









### Why this is important?

Coastal seabirds, as pelagic seabirds, have a key role in marine and coastal ecosystems as top predators and important vectors of nutrients between the ocean and terrestrial ecosystems (Brooke 2004, Doughty et al. 2016). Coastal seabirds are also culturally important, as many species are very conspicuous and well known by coastal human communities, and often used by fisherman to locate fish schools (e.g. Le Bot et al. 2018).

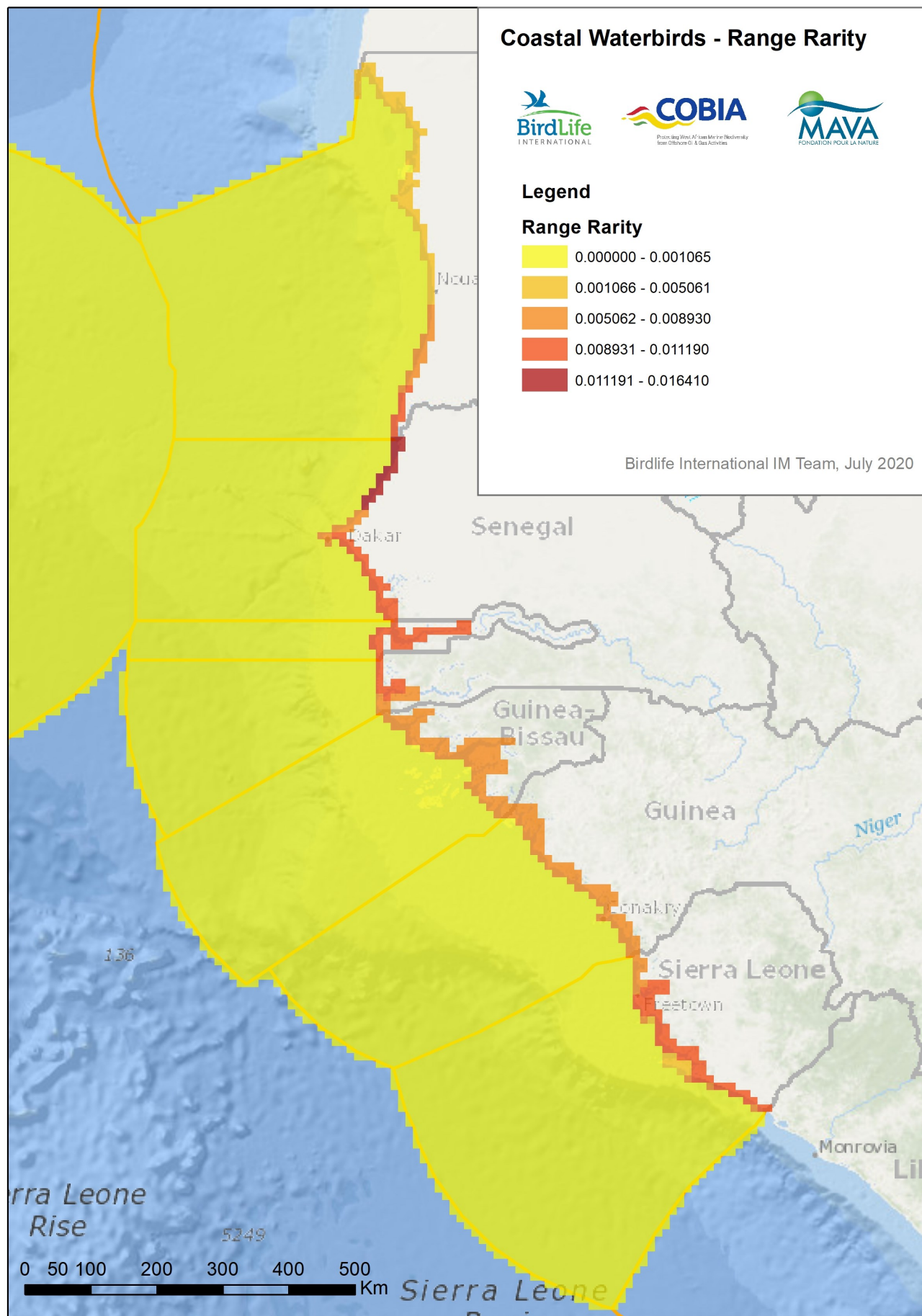
West Africa is a very important foraging hotspot for many species of coastal seabirds (Table 02), in particular terns that often forage in association with subsurface marine predators (Correia et al. 2019). The region supports several species breeding in nearby colonies e.g. Royal Tern *Thalasseus maximus* and Slender-billed Gull *Larus genei*, as well as migratory species that breed out with the area, congregating here during the non-breeding season e.g. Black Tern *Chlidonias niger*, or that occur during migration e.g. Arctic Tern *Sterna paradisaea* and Sabine's Gull *Xema sabini*. Some species e.g. Sooty Tern *Onychoprion fuscatus* and Little Tern *Sternula albifrons* have small breeding populations as well as non-breeding visitors.

### Breeding colonies of gulls and terns

Breeding colonies of most West African populations of coastal gulls and terns are spread along the coasts of Mauritania, Senegal, The Gambia, Guinea-Bissau and Guinea. Only a limited number of sites regularly hold significant numbers of breeding coastal seabirds. These sites are mainly found on sandy offshore islands, which represent a fragile dynamic habitat threatened by coastal erosion, most likely exacerbated by climate change impacts. The main sites from north to south are Parc National du Banc d'Arguin, Parc National de la Langue de Barbarie, Parc National du Delta du Saloum, Bijol Islands and Tanji Bird Reserve, Réserve Ornithologique de Kalissaye, Bijagós Archipelago, Bantambour off Ilheu de Jeta and Iles Alcatraz and Naufrage.

Royal Tern, Caspian Tern, Slender-billed Gull and Grey-headed Gull breed in the region in large numbers. The Royal Tern is the most numerous breeding species with around 95,000 breeding pairs (Wetlands International 2021). Their largest colonies currently occur on Point Nord and Ansoukala in the Saloum Delta and on Bantambour north of the Bijagós Archipelago, whilst smaller but still significant colonies occur on the islands of Arel and Ilot aux Pelicans in the Banc d'Arguin (Folmer et al. 2019). Caspian Tern has around 17,500 pairs (Wetlands International 2021); censuses conducted between 3 and 17 May 2019 by Folmer et al. (2019) revealed 1,350 nests on Point Nord in the Saloum Delta and 2,885 nests on Grand Kiaone in the Banc d'Arguin. There are also around 9,000 pairs each of Grey-headed Gull and Slender-billed Gull in the region (Wetlands International 2021).





Site	Island	Royal Tern	Caspian Tern	Slender-billed Gull
Banc d'Arguin	Kiaone	0	2,885	
	Zira	0	0	1,425
	Arel	5,832	215	0
	Nair	0	0	190
	Ile aux Pelicans	4,309	855	0
Langue de Barbarie	Langue de Barbarie	300		0
Saloum Delta	Point Nord	19,773	1,350	
	Ile aux Oiseaux	230	43	
	Ansoukala	14,282	263	
	Jakonsa			10
Kalissaye	Kalissaye 1	50	250	
	Kalissaye 2	733	673	
Bijagós Archipelago	Imbone 1	475	259	
	Imbone 2	0	0	
	Naufrage	31	0	
	Jeta	27,837	400	

**Table 03.** Estimated number of nesting pairs of Royal Tern, Caspian Tern and Slender-billed Gull at selected sites along the West African coast conducted in May 2019 (Folmer *et al.* 2019). Counts were conducted using three different methods, and numbers for Royal Tern show averages between methods.

### What protection and management is in place?

As for pelagic seabirds, active protection and management at sea is not easy, although actions are more achievable for coastal areas. Important measures underway include:

- Identification and designation of protected areas, MPAs and IBAs
- Protection measures in place for a number of key sites, including seabird breeding islands
- Ratification of relevant international conventions and agreements, including the Abidjan Convention, UNEP/CMS, UNEP/AEWA, the World Heritage Convention and the Convention on Wetlands
- Regular monitoring of coastal seabirds
- Regional fisheries agreements and protocols
- Regional collaboration through initiatives such as RAMP AO and PRCM

The continuing identification and designation of coastal sites under different levels of protection is very encouraging, including those under community management arrangements. Most of the coastal seabird species occurring in the area are listed in Table 1 of AEWA, an intergovernmental treaty dedicated to the conservation of migratory waterbirds and their habitats, developed under the framework of the Convention on Migratory Species of Wild Animals (CMS). However, governments generally require different levels of support in order to implement this and other international agreements. Further details of conventions are provided in Annex 03.





### **What are the risks from oil & gas development?**

Oil and gas developments represent a serious threat to coastal seabird species (Ronconi et al. 2015). Although not as severe as with the pelagic species, oil and gas platforms can have an “attraction” effect due to enhanced foraging and roosting opportunities, which can also result in collision and mortality associated with flame from gas flares. The expansion of energy production is considered one of the major threats to coastal seabirds globally, with more than 25% of the species affected (Dias et al. 2019).

Oil pollution constitutes a major risk, especially from oil spills (e.g. Kerr et al. 2010) but also from day to day operations at offshore platforms (e.g. Fraser).

The displacement of seabirds from important foraging areas due to the presence of industrial activity, along with an increased exposure to hazardous environments, can also pose a significant threat to coastal seabirds (Ronconi et al. 2015). Oil and gas platforms often result in changes to the local marine community, both in terms of prey availability and attraction of potential avian predators, which can indirectly affect seabirds (Fabi et al. 2002, Ronconi et al. 2015). This effect can be particularly severe to coastal seabirds, given that they are usually more spatially restricted than pelagic seabirds. The impact on important foraging habitats of terns and gulls in the region can be particularly difficult to mitigate.

### **What other conservation issues are significant?**

Coastal seabirds are highly impacted by several threats occurring both at-sea and at their colonies (Dias *et al.* 2019). The impact of these threats are often cumulative; therefore, the impacts of oil and gas development should be evaluated taking into account: (A) the already fragile status of this community due to other ongoing threats, notably habitat loss due to coastal erosion, fisheries bycatch, climate change, overfishing, pollution, invasive alien species, direct harvesting and disturbance (Dias *et al.* 2019), and (B) the wide scope of the impact due to the presence of several highly migratory species.



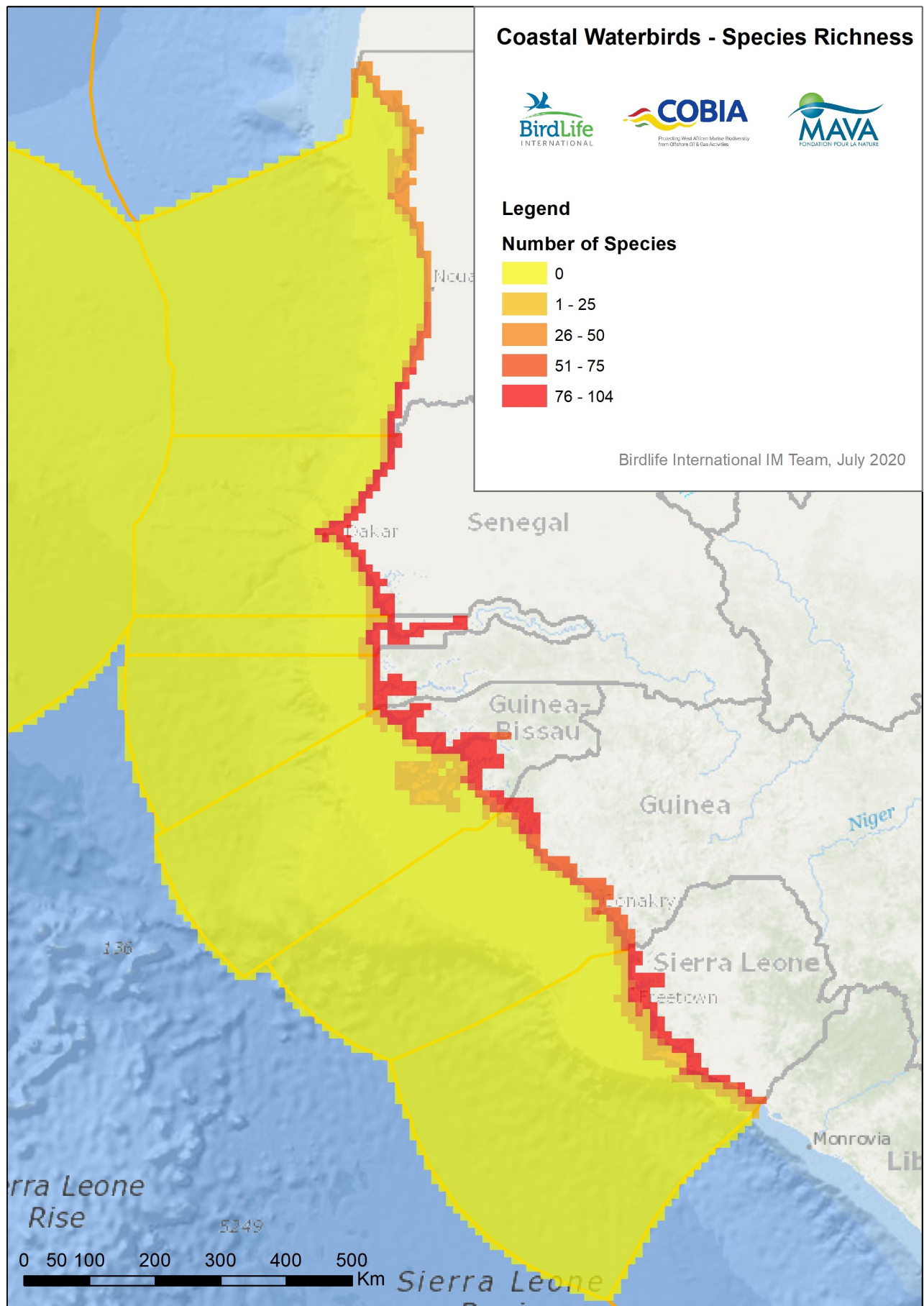
## Coastal waterbirds



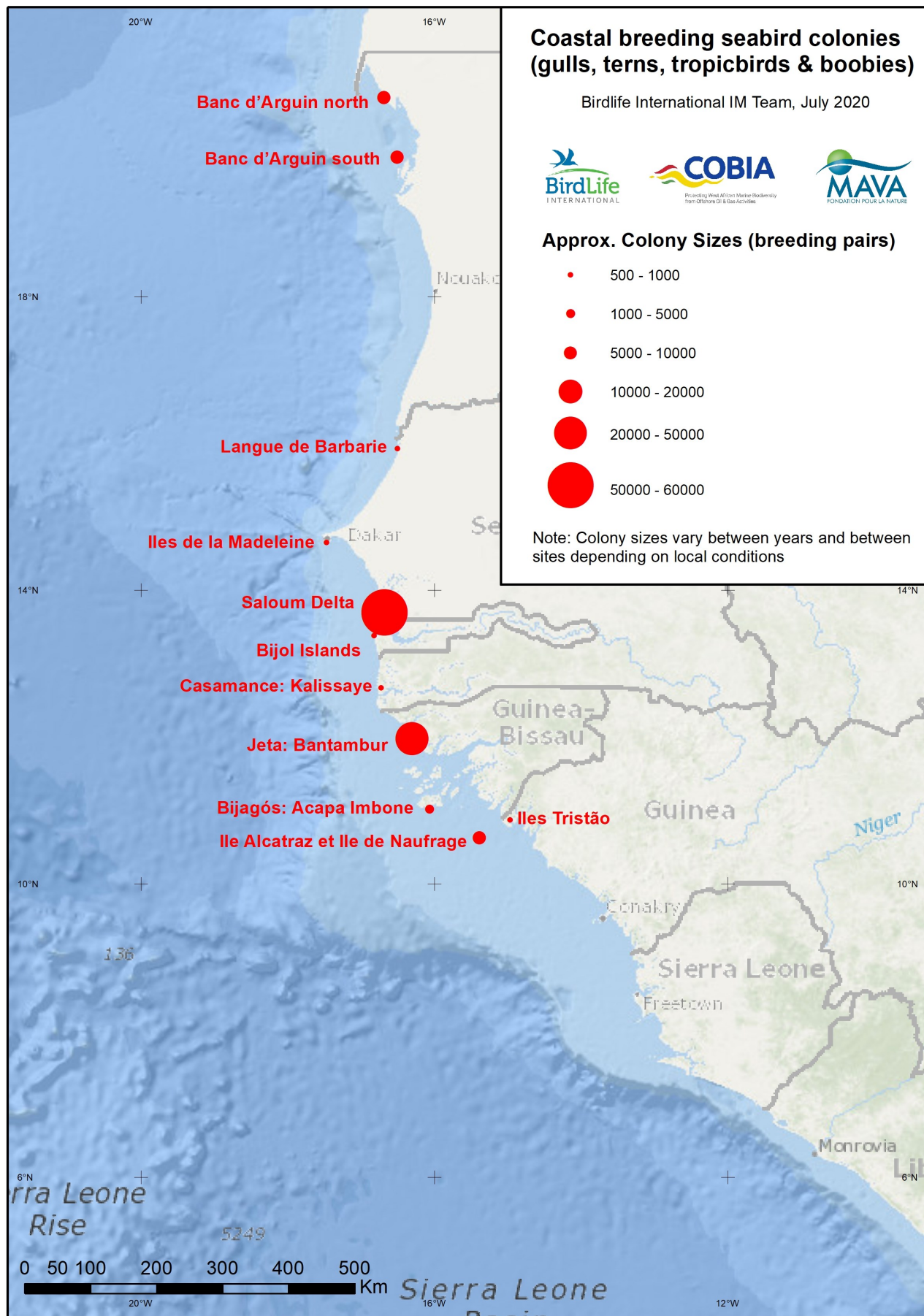
### What is presented?

Maps 10 and 11 illustrate richness and range-rarity of coastal waterbirds occurring in the region. Range-rarity shows the occurrence of species weighted by the relative contribution of each cell to the global distribution of the species, so species with a smaller distribution (e.g., restricted to the region) have a higher contribution for the range-rarity map. As expected, both maps show that coastal areas are considerably more important for coastal waterbirds than offshore waters; the species richness map indicates that more species occur south of the Senegal River, with occurrence of a higher number of Afrotropical species not found in more arid regions to the north.





**Map 11:** Coastal waterbirds - Range Rarity. The occurrence of species weighted by the relative contribution of each cell to the global distribution of the species, based on range maps available in BirdLife International databases. Species with a smaller distribution (e.g. restricted to the region) have a higher contribution for the range-rarity map.



**Map 12:** Coastal breeding seabird colonies - distribution and size.



The coastal zone of West Africa is one of the most important regions for waterbirds, especially for migratory populations that breed in the Palearctic. At least 151 waterbird species of 23 families occur in the coastal zone of the West African Marine Ecoregion. The main waterbird families present in the coastal zone are:

**Ducks & Geese (Anatidae, 20 species):** Mostly occur in freshwater and brackish wetlands along the coast, with major concentrations in the Lower Senegal Delta, which supports around 240,000 Palearctic ducks, as well as Afrotropical species, especially whistling-ducks.

**Grebes (Podicipedidae, 2 species):** Grebes are mainly found in freshwater wetlands.

**Flamingos (Phoenicopteridae, 2 species):** Both Lesser Phoeniconaias minor (NT) and Greater Flamingo Phoenicopterus roseus breed in coastal Mauritania, whilst Greater Flamingos from Europe also visit. Large concentrations occur in the Lower Senegal Delta, but travel along the coastline south to Guinea, favouring large coastal wetlands.

**Finfoot (Heliornithidae, 1 species):** African Finfoot *Podica senegalensis* occurs in tree-lined rivers, lakes and lagoons, from Sierra Leone to Senegal.

**Rails & Allies (Rallidae, 11 species):** They mostly occur in wetlands and marshes, the most ubiquitous being the Black Crake *Zapornia flavirostra*.

**Cranes (Gruidae, 1 species):** The coastal zone of West Africa supports a key population of Black Crowned-crane *Balearica pavonina* (VU), especially in the Lower Senegal Delta and in the mosaic of rice fields and wetlands between Casamance and northern Guinea.

**Storks (Ciconiidae, 8 species):** Several coastal sites are of international importance for the southwest Europe breeding population of Black Stork *Ciconia nigra*.

**Ibises & Spoonbills (Threskiornithidae, 7 species):** African Spoonbill *Platalea alba* and African Sacred Ibis *Threskiornis aethiopicus* breed in coastal areas, such as in mangroves. There is a unique subspecies of Eurasian Spoonbill *Platalea leucorodia balsaci* in Mauritania, which only breeds in the Banc d'Arguin.

**Hérons, Egrets & Bitterns (Ardeidae, 18 species):** Many herons and egrets depend heavily on coastal wetlands and most also breed in the region. There is a unique subspecies of Grey Heron *Ardea cinerea monicae*, which only breeds in the Banc d'Arguin. The White-crested Tiger-heron *Tigriornis leucolopha* is a mangrove specialist.

**Hamerkop (Scopidae, 1 species):** Occurs in wetlands near woodlands.

**Pelicans (Pelecanidae, 2 species):** Pink-backed Pelican *Pelecanus rufescens* occurs widely, breeding in small colonies. There are substantial breeding colonies of Great White Pelican *Pelecanus onocrotalus* in the Lower Senegal Delta.

**Cormorants (Phalacrocoracidae, 2 species):** White-breasted Cormorant *Phalacrocorax lucidus* is particularly found in the coastal zone.

Credit: FredR/Flickr



**Darter (Anhingidae, 1 species):** African Darter *Anhinga rufa* occurs in freshwater wetlands and coastal lagoons.

**Thick-knees (Burhinidae, 3 species):** The Senegal Thick-knee *Burhinus senegalensis* is common in mangroves.

**Egyptian Plover (Pluvianidae, 1 species):** Favours wide rivers with sandy banks, reaching estuarine stretches of some rivers.

**Oystercatchers (Haematopodidae, 1 species):** Eurasian Oystercatcher *Haematopus ostralegus* (NT) is a Palearctic migrant along the coast.

**Stilts & Avocets (Recurvirostridae, 2 species):** Pied Avocet *Recurvirostra avosetta* is a denizen of coastal lagoons; Black-winged Stilt *Himantopus himantopus* has resident and migratory populations.

**Plovers & Lapwings (Charadriidae, 13 species):** There are 5 Palearctic migrants, which depend heavily on coastal wetlands of this region, especially the intertidal flats.

**Painted-snipe (Rostratulidae, 1 species):** The Greater Painted-snipe *Rostratula benghalensis* occurs in wetlands with good cover, including mangrove areas.

**Jacanas (Jacanidae, 2 species):** Adapted to walking across floating vegetation.

**Sandpipers & allies (Scolopacidae, 24 species):** All are Palearctic migrants and depend heavily on the coastal wetlands, especially the intertidal flats. Six species are of global conservation concern: Eurasian Curlew *Numenius arquata* (NT), Bar-tailed Godwit *Limosa lapponica* (NT), Black-tailed Godwit *Limosa limosa* (NT), Red Knot *Calidris canutus* (NT), Curlew Sandpiper *Calidris ferruginea* (NT) and Great Snipe *Gallinago media* (NT).

**Couriers & Pratincoles (Glareolidae, 5 species):** Collared Pratincole *Glareola pratincola* occurs in floodplains, grasslands and rivers.

**Noddies, Skimmer, Gulls and Terns (Laridae, 26 species):** Most species may be considered equally as waterbirds or seabirds (see previous section). African Skimmer *Rynchops flavirostris* (NT) occurs in coastal lagoons and estuaries, though generally scarce.

Other bird families with members that frequent the coastal zone include:

**Owls (Strigidae, 4 species):** Rufous Fishing-owl *Scotopelia ussheri* (VU) occurs patchily in forests and mangroves in Sierra Leone.

**Osprey (Pandionidae, 1 species):** The Osprey *Pandion haliaetus* visits many coastal wetlands during the northern winter, where it hunts for fish, including in the open sea.

**Birds of Prey (Accipitridae):** Amongst those regularly found around coastal wetlands are Palm-nut Vulture *Gypohierax angolensis*, Hooded Vulture *Necrosyrtes monachus* (CR), Black Kite *Milvus migrans*, African Fish-eagle *Haliaeetus vociferus* and three species of harrier, including Pallid Harrier *Circus macrourus*.







### Why is this important?

The range and diversity of waterbirds along the coastal zone is very high, as is their number, especially during the northern winter, when the whole coastline welcomes several million Palearctic migratory waterbirds. Many waders breed in high Arctic latitudes, migrating between there and West Africa via a chain of critical sites along the East Atlantic Flyway (Figure 05). These include important stopover sites in Europe and North Africa, such as the Wadden Sea of Denmark, Germany and The Netherlands, the Wash of the UK, the Tagus Estuary of Portugal, the Doñana wetlands of southern Spain, the Baie Dakhla of southern Morocco. Some birds continue their southwards journeys as far as South Africa.

Many of the coastal wetlands of the West African Marine Ecoregion are critical stopover and nonbreeding sites for Palearctic migrants, which depend on highly productivity and undisturbed sites to enable them to recover from or prepare for major migratory flights. The coastline thus plays a crucial role in the annual life cycle of these birds, which serve as direct connections and shared resources between continents.

The diversity of Afrotropical waterbirds is also impressive, with large concentrations found in some of the major coastal wetlands. Unlike most seabirds, many waterbirds, especially larger ones like flamingos, pelicans and egrets, are visible and familiar inhabitants of the coastal zone, and thus have important roles as 'wetland ambassadors'.

## **What protection and management is in place?**

Significant local, national and regional efforts have been made in the region to strengthen the conservation status of waterbirds in the coastal zone. Important measures underway include:

- Identification and designation of protected areas, coastal zone MPAs and IBAs.
- Protection measures in place for a number of critical sites, especially national parks, with protection of some key breeding sites and important non-breeding areas for migratory waterbirds
- Ratification of relevant international conventions and agreements, including the Abidjan Convention, UNEP/CMS, UNEP/AEWA, the World Heritage Convention and the Convention on Wetlands
- Regular monitoring of waterbirds in the coastal zone, with waterbird monitoring structures in place and analysis of results through the International Waterbird Census
- The active engagement of international, national and local NGOs, with several initiatives underway, especially for migratory waterbirds
- A range of projects at different levels, aiming to build capacity and awareness within the region, and address conservation and management issues
- International and national action plans for some species
- Regional collaboration through initiatives such as RAMPAO and PRCM

The designation of coastal sites under different levels of protection is encouraging, including those under community management arrangements. Most of the coastal waterbird species occurring in the area are listed in Table 1 of AEWA.

Further details of conventions are provided in Annex 03.

## **What are the risks from oil & gas development?**

Most waterbirds do not travel beyond inshore waters, so the main risks are associated with oil and gas sector impacts at the coast. For most species the greatest risk is a major pollution incident, especially a prolonged one that affects inshore waters and which can also suffocate and clog benthic communities of the intertidal flats. Oil contamination may kill large numbers of waterbirds by:

- Damaging the waterproofing of their feathers.
- Poisoning through ingestion when preening.
- Affecting their food resources.

Colonial breeding waterbirds are particularly at risk from local incidents, as their options for alternative feeding areas may be limited. Scavenging birds, such as Hooded Vultures also risk ingestion or poisoning, for instance if feeding on oil-killed fish or birds. Most birds cannot survive oiling. The rehabilitation of individual oiled birds is difficult and costly, and often has poor results, and even if successful, the impact on population levels is usually minimal (UNEP/AEWA 2005). Pollution from oil pipelines can also affect wetlands away some distance from the coast; such impacts have been widespread within the Niger Delta in Nigeria. Waterbirds may also be impacted by infrastructural developments, including disturbance, heavy traffic and attraction to bright lights or gas flares. Most colonial breeding birds will abandon their colonies if there is sudden significant or prolonged lower level disturbance.





Credit: DVIDSHUB/Flickr

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## What other conservation issues are significant?

Threats to migratory waterbirds include (Dodman & Boere 2010):

- Impacts on habitat and food availability (including climate change and conversion of wetlands to agriculture)
- Hunting, harvesting, trade
- Physical barriers
- Oil pollution
- Parasites and disease
- Disturbance
- Predation
- Poisoning and lead shot
- Conditions in non-breeding and staging areas

Arctic-breeding birds are at particular risk from climate change, especially when their arrival times in Arctic areas are out of synch with changed Arctic productivity cycles.

Overall, the loss of wetlands, which has been ongoing for decades and which has plunged many waterbird populations into decline, remains a key threat, and additional threats may 'push some populations over the edge'. Fortunately, countries in West Africa have designated a good number of wetlands for protection and/or wise use, although implementation of such measures is lacking in some sites. However, a number of critical wetlands remain without any form of national designation.

Vultures have been targeted in West Africa for trade in their body parts; several hundred Hooded Vultures were killed in Guinea-Bissau in 2020 for this reason, which must have had a major impact on the local population of this Critically Endangered species.

Colonial breeding and congregatory birds are most at threat from disease and poisoning incidents, as disease can spread rapidly through the colony, whilst a poisoned water source can impact whole flocks. Over 1,000 Great White Pelicans died from avian influenza in Djoudj and Diawling in the Lower Senegal Delta in early 2021.







**Figure 05.** The East Atlantic Flyway

# 3

## b. Aquatic / marine Mammals



Due to the richness of its biodiversity, the West African Marine Ecoregion is home to several marine mammals including whales, dolphins, monk seals and manatees. The majority of these species are listed in various threat categories in the IUCN Red List and are classified in the appendices of the CITES.

### Whales and Dolphins

#### What is presented? Why this is important?

Marine mammals are major consumers at most trophic levels from primary production, such as manatees, to predatory fish and even to other marine mammals, as in the case of Killer Whales *Orcinus orca*. Due to their large body size they are thought to have a major influence on the structure and function of marine communities (Bowen 1997).

Marine mammals play an important role as ecosystem engineers, supporting healthy ecosystems in ways that extend well beyond simple predator-prey relationships. Manatees may cultivate the seagrass communities they feed on through nutrient recycling and grazing-stimulated growth. Iron and nitrogen are essential for plant and animal life but are limited near the ocean surface, where they stimulate primary productivity through photosynthesis. Many whales feed at depth, but defecate and urinate at the surface, thus playing a crucial role in transporting these limiting nutrients (Roman et al. 2010, Lavery et al. 2014).

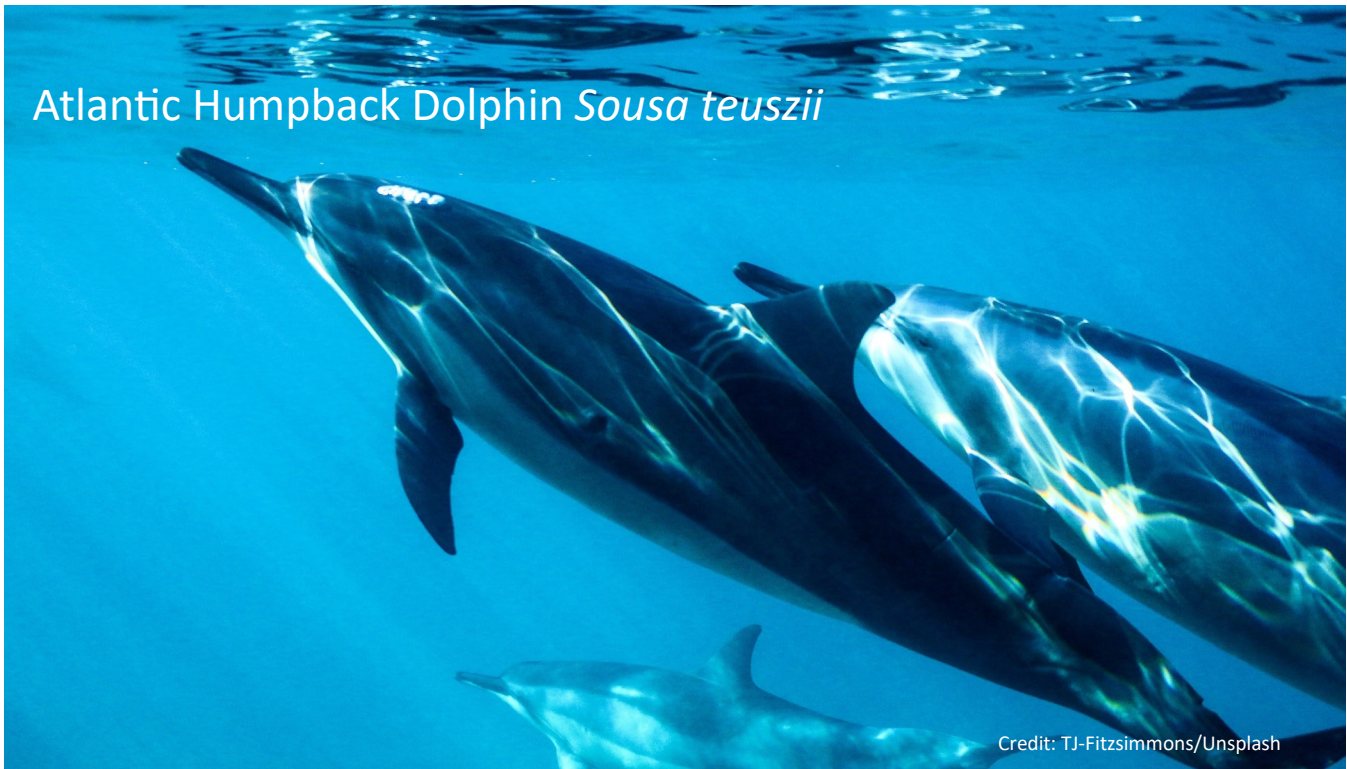
Spatial data on marine mammals for the region are limited and of varying quality, due to the large ranges of these species and paucity of records. However, a relatively high number of cetacean species occur in the region's waters, including Atlantic Humpback Dolphin *Sousa teuszii* (CR), Blue Whale *Balaenoptera musculus*, Fin Whale *Balaenoptera physalus* and Sei Whale *Balaenoptera borealis* (all EN) and Sperm Whale *Physeter macrocephalus* (VU). Blainville's Beaked Whale *Mesoplodon densirostris*, Cuvier's Beaked Whale *Ziphius cavirostris* and Rough-toothed Dolphin *Steno bredanensis* are probably present in the region throughout the year. The species confirmed to exist in the region by sightings or stranding incidences, along with their IUCN Red List status, are presented in Table 04.



**Table 04:** Whales and dolphins recorded in Mauritania (MRT), Senegal (SEN), Guinea-Bissau (GNB) and Sierra Leone (SLE) (IUCN 2021).

Species	Red List Category	MRT	SEN	GNB	SLE
Humpback Whale <i>Megaptera novaeangliae</i>	LC				
Blue Whale <i>Balaenoptera musculus</i>	EN				
Sei Whale <i>Balaenoptera borealis</i>	EN				
Common Minke Whale <i>Balaenoptera acutorostrata</i>	LC				
Bottle-nosed Dolphin <i>Tursiops truncatus</i>	LC				
Atlantic Spotted Dolphin <i>Stenella frontalis</i>	LC				
Atlantic Humpback Dolphin <i>Sousa teuszii</i>	CR				
Risso's Dolphin <i>Grampus griseus</i>	LC				
Short-finned Pilot Whale <i>Globicephala macrorhynchus</i>	LC				
Killer Whale <i>Orcinus orca</i>	DD				
Pygmy Killer Whale <i>Feresa attenuata</i>	LC				
Blainville's Beaked Whale <i>Mesoplodon densirostris</i>	DD				
Melon-headed Whale <i>Peponocephala electra</i>	LC				
Bryde's Whale <i>Balaenoptera edeni</i>	LC				
Pantropical Spotted Dolphin <i>Stenella attenuate</i>	LC				
Clymene Dolphin <i>Stenella clymene</i>	LC				
Spinner Dolphin <i>Stenella longirostris</i>	LC				
Rough-toothed Dolphin <i>Steno bredanensis</i>	LC				
Sperm Whale <i>Physeter macrocephalous</i>	VU				
Long-finned Pilot Whale <i>Globicephala melas</i>	DD				
Pygmy Sperm Whale <i>Kogia breviceps</i>	DD				
Cuvier's Beaked Whale <i>Ziphius cavirostris</i>	LC				
Long-beaked Common Dolphin <i>Delphinus capensis</i>	DD				
Short-beaked Common Dolphin <i>Delphinus delphis</i>	LC				
Striped Dolphin <i>Stenella coeruleoalba</i>	LC				
False Killer Whale <i>Pseudorca crassidens</i>	NT				
Fraser's Dolphin <i>Lagenodelphis hosei</i>	LC				
Gervais' Beaked Whale <i>Mesoplodon europaeus</i>	DD				
Dwarf Sperm Whale <i>Kogia sima</i>	DD				
Harbour Porpoise <i>Phocoena phocoena</i>	LC				

## Atlantic Humpback Dolphin *Sousa teuszii*



Credit: TJ-Fitzsimmons/Unsplash

Of all cetaceans occurring in the region, the Atlantic Humpback Dolphin (CR) is perhaps the most significant, given its conservation status and its dependence on the coastal zone. It is widespread in suitable habitat in near shore waters along the Atlantic coast of Africa from Morocco to Angola, but the population appears to be fragmented and in decline. This species prefers coastal wetland and tidal sites, such as river deltas and archipelagos, as opposed to long stretches of open coastline. Areas of regular occurrence in West Africa include the Banc d'Arguin (Mauritania), the river deltas of the Saloum-Niumi region (Senegal and The Gambia), the estuaries and islands of Guinea-Bissau and the estuaries of northern Guinea (Collins et al. 2017).

### **What protection and management is in place?**

Probably the most significant measures taken in recent years have been the identification and designation of MPAs, as well as the identification of EBSAs. Much needs to be done in strengthening these arrangements and in implementation, but the process is ongoing. It is hoped that momentum can continue, because surveillance and protection of these marine areas is vital for the future survival of cetaceans in the region, as well as for fisheries.

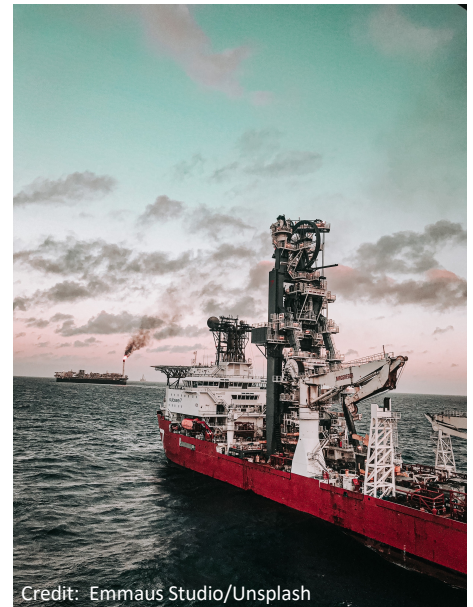
All countries besides Sierra Leone are signatories to the Convention on Migratory Species of Wild Animals (CMS), which negotiated an MOU on 'Western African Aquatic Mammals': Memorandum of Understanding concerning the Conservation of the Manatee and Small Cetaceans of Western Africa and Macaronesia. The MOU outlines a series of commitments to improve the conservation status of small cetaceans and manatees in the region. However, there are significant gaps in implementation.

However, positive steps have been taken recently to focus on conservation of the Atlantic Hump-backed Dolphin through endorsement of a Concerted Action for this species, which was renewed at CMS COP13 in 2020. The collective aim is 'Work towards the long-term sustainability of Atlantic humpback dolphin *Sousa teuszii* populations and their habitats through research, awareness, capacity-building and action.' A key tool for achieving this aim is the newly launched website <https://sousateuszii.org/>.



## What are the risks from oil & gas development?

**Sonar:** Marine mammals rely on sound for fundamental biological and ecological aspects of their lives including navigation, prey location and capture, predator avoidance, and communication, including during migration and reproduction. There is increasing concern regarding the potential effects of the airgun sound produced during geophysical seismic surveys on marine mammals. Airgun arrays typically produce high amplitude sound with source levels of around 220–248 dB (Green & Richardson 1988, Richardson & Würsig 1997, Gulland & Walker 2001). The acoustic output has highest energy at relatively low frequencies of 10–200 Hz, which overlaps extensively with the low frequency sound produced by baleen whales in the 12–500 Hz bandwidth (Thompson et al. 1979, Richardson et al. 1995). Airgun arrays may also produce significant high frequency sound energy, dominating frequencies up to 22 kHz within a few kilometres of the source (Goold & Fish 1998). Toothed cetaceans such as Sperm Whale, dolphins and porpoises utilise and are sensitive to sound in the 0.5–20 kHz range (Arthur et al. 1980); both they and baleen whales may be adversely affected by airgun sound.



There are several potential levels of impact on marine mammals from seismic airgun sound, including physical injury such as tissue damage, temporary and permanent hearing loss, indirect physical damage (e.g. “the bends”), physiological effects such as stress, masking of echolocation signals, behavioural impacts including displacement from migratory, feeding and breeding habitat, and indirect effects from displacement of prey species (Jonathon et al. 1998). Behavioural responses vary from changing vocal behaviour to habitat avoidance, and physiological responses may include higher stress hormone levels. Beaked whales display particular sensitivity to anthropogenic sounds, with responses that have led to stranding and/or death (Cholewiak 2017).

**Collision** with ships is another key risk for marine mammals and turtles. Maritime traffic and vessel speed has increased globally, creating a higher likelihood of cetacean collisions, which can occur with all types of vessels, and are often undetected or underreported by crew. Generally, collisions occur in coastal areas where many cetaceans concentrate for feeding or breeding purposes, and most frequently involve baleen whales. High potential for shipping-caused injury or death exists in West African waters due to expanding trade and oil and gas activities and heavy shipping traffic linked to ports (Félix & Van Waerebeek 2005).

**Pollution** of the marine environment is another key threat to cetaceans. Elevated levels of organochlorines can cause immunosuppression, resulting in increased susceptibility to infectious diseases, reproductive failure, physical deformities and death. This is especially true for cetaceans in coastal waters, which are exposed to a variety of bacterial, fungal and viral pathogens from untreated sewage and ballast water discharged from ships. These pathogens can be transferred via prey or through wounds (Minton et al. 2017).

Oil can also clog the filtering device of baleen whales, in extreme cases leading to starvation and death. Top predators can become vulnerable to an increased concentration of toxins found at a higher level of the food chain (Ober 2010). Oil and related contaminants can also impact food sources for marine mammals; for example benthic amphipods (crustaceans), a major source of food for certain whale species are very sensitive to spilled oil (Geraci & St. Aubin 1990).

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8. Rapid decompression from surfacing too quickly causing dissolved gases mainly nitrogen to come out of solution in bubbles, which can affect joints, lung, heart, skin and the brain.

### **What other conservation issues are significant?**

Small cetaceans suffer from capture in fisheries bycatch and direct targeting. Dolphin meat (or marine bushmeat) has been widely recorded from African Atlantic countries. Bycatch in small-scale fisheries with some suspected deliberate captures, mostly related to increasing consumption of aquatic/ marine bushmeat, as well as fast coastal development, are considered the principal threats to the long-term survival of the Atlantic Humpback Dolphin (Collins et al. 2017).



Credit: FWC Fish and Wildlife Research Institute/Flickr



## African Manatee



Credit: NOAA/Unsplash

The African Manatee *Trichechus senegalensis* (VU) occurs in coastal marine waters, brackish estuaries and adjacent rivers along the Atlantic coast of Africa from southern Mauritania to the Cuanza and Longa Rivers in Angola, also far inland up major river systems (Dodman et al. 2007). It is of important cultural significance in parts of Western Africa and widely respected in many local customs. However, the species is also highly valued for traditional medicine and consumed as bushmeat. Traditional hunters have various specialised methods to hunt them, although such hunters are reduced in number. However, manatees are caught in fishing nets, often accidentally, although in most cases they would not be spared. Manatees are protected in most national legislations.

Manatees favour seagrass habitats in the Saloum Delta, Senegal and the Bijagós Archipelago of Guinea-Bissau, and are most frequently sighted at freshwater springs. Manatees occur in major river systems in the region, such as the Senegal, Saloum, Gambia and Casamance rivers and in most estuarine waters of Guinea-Bissau, Guinea and Sierra Leone. (In Guinea, they even occur in the upper

reaches of the Nile). Further north, manatees in the Senegal River are permanently isolated from the coast by the Diama Dam located east of St. Louis and are no longer resident in coastal waters there.

The level of threats, particularly hunting and incidental catches, appear to be increasing throughout range with locally high rates and near extirpation in some regions (Keith Diagne 2016). A number of local, national and regional conservation and research actions have been taken in relation to the African Manatee.

Wetlands International and the Abidjan Convention produced a regional Conservation Strategy for the species in 2007 (Dodman et al. 2007). Based on a stakeholder workshop, UNEP/CMS developed a 'Conservation Action Plan for the West African Manatee' as part of the MOU Concerning the Conservation of the Manatee and Small Cetaceans of Western Africa and Macaronesia (UNEP/CMS 2008). The African Aquatic Conservation Fund has coordinated more recent research and conservation activities.

## Mediterranean Monk Seal



Credit: Robyn Budlender/Unsplash

The Mediterranean Monk Seal *Monachus monachus* (EN) is one of the most threatened marine mammals in the world, with a global population of around 350-450 mature individuals (IUCN 2021). The seals prefer warm coastal waters and forage for food in shallower waters, eating a variety of fish, cephalopods and macroinvertebrates. They occur in the Mediterranean Sea and the eastern Atlantic, including the Cap Blanc Peninsula in Mauritania, where the population is increasing (100 seals in 1998 to 330 in 2020), holding about half of the global population (Monk Seal Conservation Program 2020).

Monk seals use marine caves with sea entrances for hauling out, resting and pupping throughout their range but may also haul out on open beaches. Humans have long exploited them for subsistence and commercial harvest. Along the coast of northwest Africa, they

became the target of a commercial harvest for skins and oil by the Portuguese as early as the 15<sup>th</sup> century (Israëls 1992). Population declines in recent times have been driven by habitat destruction due to property development displacing seals, continued persecution (targeted and accidental) by fishermen and a past mass die-off at the Cap Blanc colony (Johnson & Lavigne 1999a).

There has been action to protect breeding caves and to restrict fishing gear and relocate the most adverse fishing practices. An action plan for their recovery is being implemented and the population has begun to increase (EDGE 2020). There is also a Mediterranean Monk Seal MOU (Memorandum of Understanding concerning Conservation Measures for the Eastern Atlantic Populations of the Mediterranean Monk Seal *Monachus monachus*) under UNEP/CMS.



The Common Hippopotamus *Hippopotamus amphibius* or Hippo (VU) is a large amphibious mammal with a widespread but fragmented distribution across sub-Saharan Africa. Hippos usually spend much of the day in water, especially rivers, lakes and other freshwater wetlands, emerging at night to graze on nearby vegetation. Common Hippos are gregarious and social, and often gather together by day when resting in water.

The West African Common Hippo population is estimated at about 7,500 spread over 19 countries, in generally rather low densities, being most abundant in estuarine habitats and on the lower reaches of rivers. The main risks are due to the fragmented nature of their distribution and the high frequency of Hippo-human conflicts (Lewison & Pluháček 2021).

Hippos no longer occur in Mauritania. In Senegal hippos are largely restricted to the Niokolo-Koba National Park, with a population of some 500 animals; there are widespread reports of crop raiding in surrounding areas.

Low density and isolated populations occur in The Gambia, notably in the Gambia River National Park, home to about 40 animals. In Guinea-Bissau there may be some 200-250 hippos, with a population of about 100 in the Bijagós centred around the Orango complex, whilst they are also resident in the Rio Corubal and Rio Cacheu. They are found in many of Guinea's rivers, with a population in the order of 500. Sierra Leone has an estimated 150 Hippos across several protected areas (Lewison & Pluháček 2021).

The only coastal population between Senegal and Sierra Leone is in Orango. These hippos are unique in their adaptation of traversing stretches of sea to move between islands. They are also of high cultural significance. The much smaller Pygmy Hippopotamus *Choeropsis liberiensis* (EN) also occurs in extreme southeast Guinea and in northern and eastern Sierra Leone, although no populations occur in the coastal zone.

## Common Hippopotamus



Credit: Getinspo Co Bibhash/Unsplash



## Otters



Credit: Andreas Schantl/Unsplash

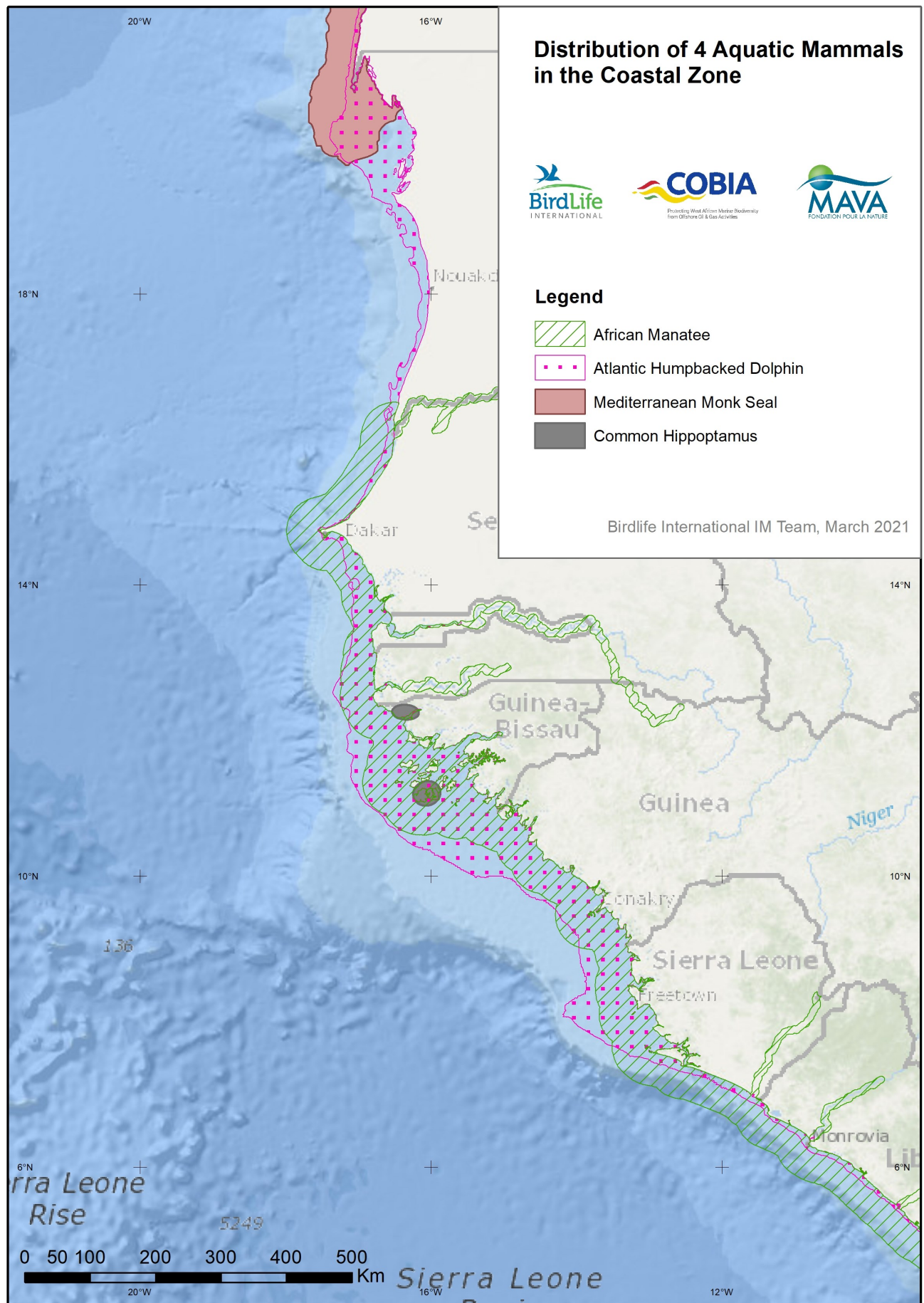
There are two species of otter found in the coastal zone of West Africa, the African Clawless Otter *Aonyx capensis* and the Spotted-necked Otter *Hydrictis maculicollis*. The African Clawless Otter (NT) is widely distributed in sub-Saharan Africa, found always in association with freshwater. These otters can occur in coastal areas so long as there is reliable access to freshwater, and may be found from the Senegal Delta south to Sierra Leone (and beyond).

Their main threat is the loss of freshwater habitats (Jacques *et al.* 2001). In West Africa, the Spotted-necked Otter (NT) appears to have a more restricted distribution than African Clawless Otter. It occurs from Guinea-Bissau south to Sierra Leone and beyond. It also depends on freshwater habitats, and its main threat is the decline in its habitat quality (Reed-Smith *et al.* 2015).

### What are the risks from oil & gas development?

As for cetaceans, all aquatic mammals are vulnerable to impacts from the oil and gas sector. However, these species are less pelagic than many whales and dolphins, so the impacts are greater when they affect inshore waters. The most significant risk is most likely pollution, especially for manatees and seals, both from major spills and localised events, such as occurs in cleaning tanks or discharge of products. Infrastructural developments pose a threat if installations are in sensitive areas. Manatees are also generally vulnerable to collision, which may increase through increased shipping relating to the oil and gas sector.





**Map 13:** Map depicting selected aquatic mammal's distribution ranges



# 3 c. Reptiles

## Sea Turtles



Credit: Geoff Trodd/Unsplash

The most important reptiles in the marine environment in West Africa are marine turtles, for which the region plays a key role, both in provision of breeding and feeding areas. Other reptiles are found in the coastal zone, including three species of crocodile and one monitor.

### **What is presented?**

Sea turtles (or marine turtles) range widely across the planet and occur from the tropics to subarctic waters. Five species occur in West Africa, summarised in Table 05. The seaward facing coastlines from Mauritania to Sierra Leone consist predominantly of sandy beaches, and turtle nesting occurs throughout the region. For example much of the coastline of Senegal is critical habitat for Green and Hawksbill Turtles. Sea turtles once used to exist in huge numbers, many times their current populations, but have widely been depleted by humans through bycatch, consumption, habitat loss and degradation (Lutz *et al.* 2002).



Species & subpopulation	Red List Category	Nesting Season	Trend	Global key threats in order of current impact: high to low
Loggerhead Turtle <i>Caretta caretta</i> North-east Atlantic	VU (EN)	Mauritania: July-Oct	ê	Bycatch, coastal development, direct take including egg collection
Green Turtle <i>Chelonia mydas</i> South Atlantic	EN (LC)	Mauritania, Senegal, Guinea-Bissau, Guinea: June-Dec	ê (é)	Egg collection, direct take, coastal development, marine habitat degradation and associated disease
Leatherback Turtle <i>Dermochelys coriacea</i> Southeast Atlantic	VU (DD)	Guinea-Bissau: Dec-May	ê	Bycatch, egg collection and direct take, coastal development, climate change
Hawksbill Turtle <i>Eretmochelys imbricata</i> East Atlantic	CR	Senegal, Guinea-Bissau, Guinea: Apr-Dec	ê	Tortoiseshell trade, egg collection, oil pollution, hybridisation, climate change
Olive Ridley <i>Lepidochelys olivacea</i> East Atlantic	VU	Guinea-Bissau: Dec-May	ê	Bycatch, egg collection, loss of nesting habitat, climate change

**Table 05:** Sea turtle species present between Mauritania and Sierra Leone, their population trends, threats, and countries with confirmed nesting data (SWOT 2020). Red List category in brackets = subpopulation status; trend in brackets = subpopulation trend if different to global trend.

The productive coastal and marine waters of the West African Marine Ecoregion provide important feeding areas for sea turtles.

Green Turtles are vegetarian and occur primarily in areas with seagrass beds. They nest particularly in the Bijagós and along the sandy coastlines of Senegal, Mauritania, Guinea-Bissau and Sierra Leone. In the extreme south of the Bijagós, the small island of Poilão, with its beach of only 2 km long, hosts the third largest Green Turtle breeding site of the Atlantic, and the largest in Africa, with a mean of 25,000 clutches laid annually (Nô Okinka di Mar 2020).

Less is known about the frequency of Olive Ridley and Hawksbill Turtles in the subregion, although both species nest in the Bijagós Archipelago of Guinea-Bissau and on Katrack Island in Guinea. The carnivorous Hawksbill Turtles are most often observed in littoral areas, with high numbers to the south of Mbour, Senegal, but also in the Bijagós and in Mauritania and Sierra Leone, frequenting shallow waters and mangroves. The omnivorous Olive Ridley Turtles are most often observed in shallow coastal waters and estuaries remaining close to the seabed. Loggerhead Turtles are also carnivorous but are much more pelagic than coastal. The pelagic Leatherback Turtle is the largest turtle species and feeds on jellyfish, only occurring in coastal waters when nesting (Nô Okinka di Mar 2020, Dupuy 1986).

### Why is this important?

Sea turtles are important components of the marine ecosystem. As with other larger marine animals, they can connect ecosystems by vectoring organic matter and nutrients between them (Bouchard & Bjørndal 2000). Removing key consumers such as sea turtles from marine ecosystems have well-documented and far-reaching consequences (Pitcher 2001). Sea turtles are an important component of local culture and practices for many African coastal communities, and have provided food and other traditional uses for millennia. They increasingly have additional economic value through ecotourism.

## **What protection and management is in place?**

All countries besides Sierra Leone are signatories to the Convention on Migratory Species, which has a specific Atlantic Turtles MOU, which outlines conservation measures for turtles along the Atlantic coastline of Africa (UNEP/CMS 2020). The MOU outlines a series of commitments to improve the conservation status of small cetaceans and dugongs in the region, although there are significant gaps in implementation, especially at a formal policy level. However, a number of initiatives are or have been underway that either focus on sea turtle conservation or cater for them within a wider programme. These include regional projects supported by the MAVA Foundation, efforts to reduce turtle bycatch and research projects to determine migratory movements and other parameters.

The West African Marine Ecoregion supports a number of internationally important sea turtle nesting sites, and fortunately a good number of these are under some form of protection. At some of these sites, protection measures are effective and well managed. There have also been a number of local projects that can often have marked positive effects, especially through education and public awareness, for instance in reducing the collection of sea turtle eggs or capture of adults for meat.

## **What are the risks from oil & gas development?**

Coastal development related to oil and gas infrastructure and marine habitat degradation including oil pollution are inherent threats to sea turtles, which are cumulative in relation to other threats, such as bycatch, egg harvesting and climate change impacts. Threats from chronic or sudden catastrophic oil spills pose significant risks to all species of sea turtles, including the potential for direct ingestion, ingestion through prey and coating of adults, hatchlings and nesting beaches in oil.

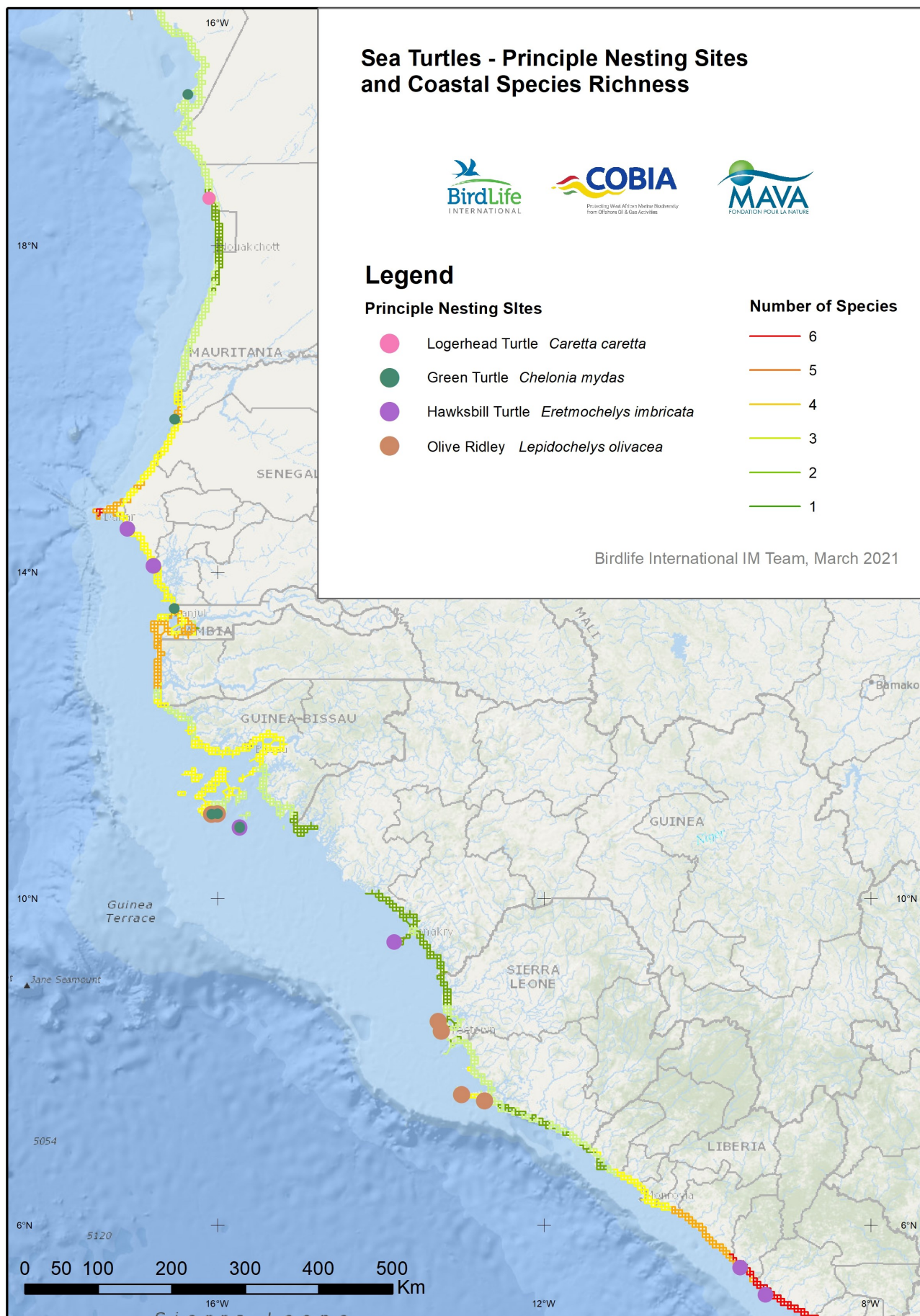
Marine turtles and fish present in the offshore development area (including commercially important species) could also be affected by underwater noise generated by drilling, vessel use and potential hammer piling, as well as by the physical presence of vessels, including navigational lighting and light from flaring. They would also be at risk in the case of any significant deterioration in marine water quality and disturbance of the seabed.

Acoustic disturbance from seismic survey activities may lead to the interruption of normal behaviours such as feeding or breeding and avoidance, leading to displacement from the area and exclusion from critical habitats. In addition to the noise-induced issues, the firing of airguns during seismic surveys may cause rapid changes in pressure, an occurrence that is known to cause barotrauma in fish, whereby tissues and organs are damaged. Another potential risk to turtles is entanglement in seismic equipment, such as tail buoys and their associated attachment materials, towed behind the survey vessel, possibly leading to injuries or mortality (Nelms *et al.* 2016).

## **What other conservation issues are significant?**

Sea turtles in Africa face threats from fisheries, consumption of adults and eggs, boat strikes, pollution, climate change and egg-laying beach losses caused by coastal erosion. The Mauritanian Institute for Oceanographic Research and Fisheries (IMROP) discovered hundreds of stranded juvenile and adult Loggerheads in 2014, presumably killed in fishing nets while foraging in the rich near shore waters. The African Chelonian Institute in Senegal has also reported similar mass mortality events, believed to be a result of bycatch impacts from the very intensive offshore fishing in the region (SWOT 2017). Coastal development along breeding beaches is a perennial issue for sea turtles, especially well-lit developments such as larger tourist hotels, whose lights attract turtle hatchlings towards them instead of to the sea.





**Map 14:** Map depicting the principle nesting sites of Sea Turtles as well as coastal species richness



## Crocodiles



Credit: Martin Pettitt/Unsplash

Three species of crocodiles occur in the region: West African Crocodile *Crocodylus suchus*, Slender-snouted Crocodile *Mecistops cataphractus* (CR) and African Dwarf Crocodile *Osteolaemus tetraspis* (VU). All may be found in the coastal zone. The West African Crocodile (confirmed only recently as a separate species to the Nile Crocodile *Crocodylus niloticus*) has a fragmented distribution from the Lower Senegal River to Sierra Leone, also occurring at various inland locations, including in Mauritania.

The Slender-snouted Crocodile occurs from the Casamance of southern Senegal to Sierra Leone, although it has disappeared from much of its range. It is still known to occur in the Bijagós Archipelago of Guinea-Bissau and in Sierra Leone. It has a fragmented distribution, and the West African population is likely to be a separate taxon from the population in Central Africa. Threats include commercial skin hunting, local fisheries (reduced prey base and incidental mortality in fishing nets), habitat modification and the bushmeat trade. In West Africa it is anticipated to go completely extinct without significant revisions in protected area policy and management, as well as assisted efforts such as reintroductions (Shirley 2014).

The African Dwarf Crocodile occurs mainly in freshwater habitats from The Gambia to Sierra Leone (and beyond). It also has a fragmented distribution, with a few records from coastal areas.



## Cartilaginous fish



Credit: Hans Hillewaert/Flickr

The West African Marine Ecoregion supports a wide diversity of fish in its coastal and pelagic waters, but many species are in decline, and the once highly productive fishery is being diminished. There is not enough scope in this publication to detail the conservation status of the many fish species found in these waters. Instead, a brief picture is provided for cartilaginous fish, which are widespread in the region, but almost without exception subject to serious declines and in some cases national and even regional extinction.

### What is presented?

Cartilaginous fish or elasmobranchs are large predators at or near the top of the food chain and as such play a key role in regulating marine ecosystems and maintaining balance. Many species have a wide range of distribution. Those most often encountered in the West African Marine Ecoregion are Guitar Ray *Rhinobatos rhinobatos* (EN), Common Smoothhound *Mustelus mustelus* (VU), African Brown Skate *Raja parva* and Atlantic Weasel Shark *Paragaleus pectoralis* (DD).

Yet sharks, rays and allies are some of the most threatened species on earth, especially from directed fisheries and fisheries bycatch. Some of the most threatened species are:

- CR: Smalltooth Sawfish *Pristis pectinata*, Largetooth Sawfish *P. pristis*, African Wedgefish *Rhynchobatus luebberti*, Great Hammerhead *Sphyrna mokarran*, Sawback Angelshark *Squatina aculeata*, Smoothback Angelshark *S. oculata* and Angelshark *S. squatina*, Blackchin Guitarfish *Glaucoctegus cemiculus*, Scalloped Hammerhead *Sphyrna lewini*.
- EN: Guitar Ray *Rhinobatos rhinobatos*, Whale Shark *Rhincodon typus*.
- VU: Spiny Butterfly Ray *Gymnura altavela*, Spineback Guitarfish *Rhinobatos irvinei*, Smooth Hammerhead *Sphyrna zygaena*.

## Why this is important?

Although sharks include more than 1,000 different species with very different life histories, most species share some common characteristics: they do not reach sexual maturity until several years old, gestation is very long (often >9 months) with the intervention of organs similar to a placenta, and breeding cycles are annual or biennial. In addition, fecundity is very low, and most species produce no more than eight young per litter. Some cartilaginous species are already reported to be extinct across much of the region. For instance, possibly only Guinea-Bissau could still harbour a few remaining Pristidae (sawfish) in the Bijagós Archipelago, which is extinct elsewhere.

Rhynchobatidae (guitar rays) have also virtually disappeared throughout the sub-region, except in the Banc d'Arguin in Mauritania.



Credit: Neil DeMaster/Flickr

Diop & Dossa (2011) provide a brief overview of shark, skate and rays in West African countries and fisheries, with numbers of species per country based on national action plans and a Subregional Action Plan for Sharks (PSRA-Sharks):

In Mauritania, of 30 coastal species (16 sharks and 14 skates and rays), artisanal fishing has mainly targeted three species, with significant landings: Common Smoothhound, Milk Shark *Rhizoprionodon acutus* (VU) and Blackchin Guitarfish *Glaucostegus cemiculus* (CR). This included heavy targeting within the Banc d'Arguin prior to implementation of a ban on directly targeted elasmobranch fishing in 2003 (Diop & Dossa 2011). However, Belhabib et al. (2012) found artisanal and illegal fishing effort was still significant and ongoing in the park. Spiny Dogfish *Squalus acanthias* (VU) is caught by industrial fisheries; Mauritania intensified Spiny Dogfish fishing to supply demand from the European market (Dell'Apa et al. 2013).

In Senegal, some 40 species of shark and 30 species of skate and ray have been recorded in fishing landings. Fishing mainly targets guitar rays (Rhinoobatidae) and coastal sharks, especially Carcharhinidae. Skates and rays are significant in bycatch. The Bramble Shark *Echinorhinus brucus* (EN) is a large deep water shark with a widespread but patchy, global distribution, including Senegal, and targeted across the world for its liver oil. Common Thresher *Alopias vulpinus* (EN) also occurs in Senegal, but is increasingly rare.



Credit: Kris-Mikael Krister/Flickr

In The Gambia, 29 species (14 sharks and 15 skates and rays) have been identified. Landings consist mainly of Daisy Stingray *Fontitrygon margarita* (EN), Common Stingray *Dasyatis pastinaca* (DD), Smooth Butterfly Ray *Gymnura micrura* (DD), Lusitanian Cownose Ray *Rhinoptera marginata* (NT), Spinner Shark *Carcharhinus brevipinna* (VU), Milk Shark and Scalloped Hammerhead *Sphyrna lewini* (CR).

In Guinea-Bissau, 29 species of shark and 21 species of skate and ray were identified during experimental fisheries conducted in 1989 by IPIMAR. The most landed species are Milk Shark, Bull Shark, Scalloped Hammerhead, Blackchin Guitarfish, Lusitanian Cownose Ray, Daisy Stingray and Duckbill Eagle Ray *Aetomylaeus bovinus* (DD).

In Guinea, of 40 species (20 sharks and 20 skates and rays), the most significant landings concern Blacktip Shark *Carcharhinus limbatus* (NT), Bull Shark *C. leucas* (NT), Blackchin Guitarfish,



Lusitanian Cownose Ray and various Dasyatidae stingray species from estuarine and coastal areas and Carcharhinidae sharks from the high seas.

In Sierra Leone, 20 species of elasmobranchs (14 sharks and 6 skates and rays) are exploited. The dominant sharks in landings, by weight, are hammerheads *Sphyrna* spp. (27%) and Carcharhinus shark spp. (52%). However, in terms of numbers, Nurse Shark *Ginglymostoma cirratum* (DD, 31%) is the most common species in landings. The most commonly caught skates and rays are Rhinobatos guitarfish species and Dasyatidae stingray species.

### **What protection and management is in place?**

Many sharks in the region are threatened species; the IUCN Red List is a valuable information tool in this respect. It was updated in 2006 for West Africa, partly thanks to the results of the PSRA-Sharks project (which also contributed to listing Pristidae sawfish in the CITES Appendices), with other subsequent updates, noting that many species have wide distributions.

Globally, there is much higher awareness now of the threatened status of sharks and the high demand to supply markets, especially in Asia. There have been various developments in West Africa, including the development of national shark action plans and the Subregional Action Plan for Sharks (PSRA-Sharks). Although the fishing of several shark species is banned in some countries, effective policing is not widespread. There was a sawfish project in the Bijagós Archipelago, where sawfishes have an important cultural role, but the status of sawfishes even here is far from certain.

Overall, the reality is that shark fishing continues quite widely in the region in the face of high international demand, and most species are most likely in decline. Effective implementation of the PSRA-Sharks and related national plans requires strong government direction, with support at all levels as well as formal protection measures, widespread awareness and community-based actions.

### **What are the risks from oil & gas development?**

Given the severe declines of sharks worldwide and also in West Africa, and the threatened status of so many species, it is clear that any additional pressure to the conservation status of sharks in the West African Marine Ecoregion could have severe consequences. Elasmobranchs that favour shallow coastal waters are particularly at threat, including many skates, rays and the few remaining sawfishes. Inshore oil pollution incidents would likely pose the highest threat. It has been found that Atlantic Stingrays *Hypanus sabinus* exposed to crude oil lost their ability to smell prey underwater, whilst oil can also dull the rays' electrosensory abilities - both critical senses for survival (Cave & Kajiura 2018).



Credit:Gerald Schombs/Unsplash

### **What other conservation issues are significant?**

Specialised artisanal shark fisheries are found from Sierra Leone to Senegal, as well as in seasonal settlements in Mauritania, where a specialised fishery in the Banc d'Arguin was banned in 2003, after consultation between the Imraguen fishermen, the administration of the PNBA and the Ministry of Fisheries, based on research results, which showed that it was unsustainable.

In Mauritania, the main landing sites are located in Nouadhibou (Boutiya) and Nouakchott, whilst there are temporary camps between the PNBA and Nouakchott. In Senegal, sharks are caught in all coastal fishing centres, either as target species or as bycatch. However, it is on the Grande Côte (Saint-Louis), Petite Côte (Mbour and Joal) and in the Casamance (Kafountine and Elinkine) that sharks are landed the most. In The Gambia, the main fishing areas are Gunjur, Tanji, Bakau, Burufut, Kartung, Sanyang and Banjul; they are linked to areas in Senegal, due to their contiguity and exploitation by the same communities.

In Guinea-Bissau, the Bijagós Archipelago and the island of Melo, in the south of the country, are areas specialised in shark fishing. In Guinea, waters around the Loos islands, Koba, Boké area (Katckeck, Alcatraz and Kamsar port) and Kassa, are reputed to be sites where sharks are fished. Some Senegalese and Ghanaian fishermen, who stay temporarily or permanently, exploit sharks and rays in Guinea-Bissau. In Sierra Leone, shark fishing is concentrated in Bonthe, Shenge and around the island of Moyamba.





Credit: Vix Mørá/Flickr



## Fish and commercially important fisheries



### What is presented?

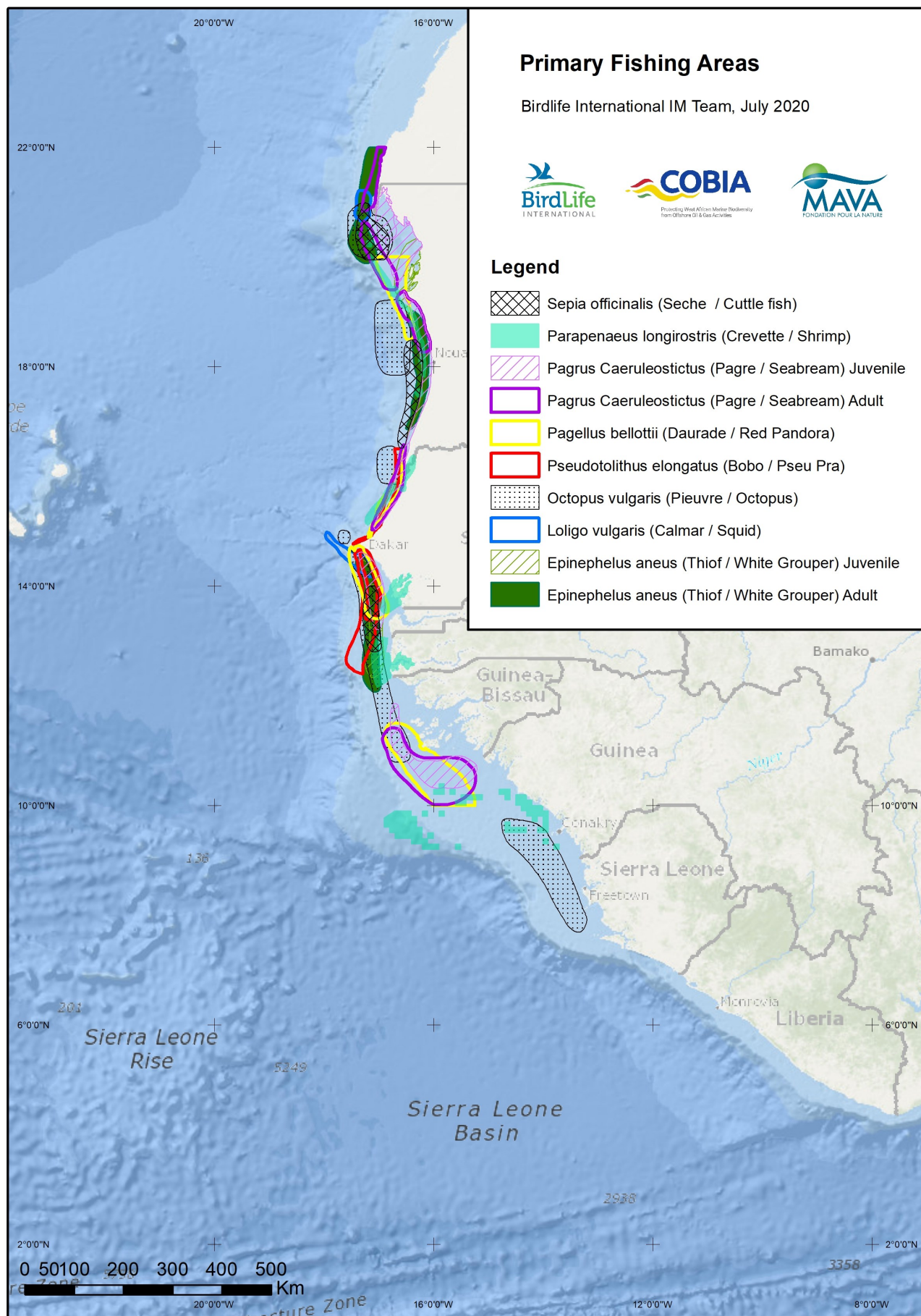
Fishing is essential for the economic and social development of West African countries and contributes significantly to the national GDPs. Annual catches are on average around 450,000 tonnes in Senegal, 900,000 tonnes in Mauritania, between 20,000 and 30,000 tonnes in Guinea-Bissau and 150,000 tonnes in Sierra Leone. Artisanal and industrial fisheries are the two main types of fishing, practiced in the different fishing zones known to be rich in fish.

Artisanal fishing largely dominates industrial fishing in terms of workforce, fleet and quantity of fish caught. Artisanal fisheries have a strong capacity to adapt, particularly in the face of the very marked seasonal and migratory behaviour of the different fish species.

Figure 15 shows primary fishing areas between Mauritania and Sierra Leone for different fisheries. Fishing is most diverse and intensive in Senegal and Mauritania. Of note is the low level of fishing around the Banc d'Arguin in Mauritania, where fisheries regulations are in place and motorised boats largely banned.

However, fishing pressure is high in the upwelling area south of Cap Blanc, where productivity is high. The fisheries for molluscs and shrimps are important and widespread in the region.





**Map 15:** Fishing areas in coastal West Africa between Mauritania and Sierra Leone

### **Why is this important?**

Over 1,000 species of fish have been identified in the coastal zone of West Africa, with two major groups: pelagic and demersal. Some pelagic fish live close to coasts and estuaries such as sardinella, *Sardinella spp.*, Bonga-fish *Ethmalosa fimbriata* and mullets *Mugilidae*, while others prefer the open sea, such as tuna. Many pelagic fish in West Africa carry out large seasonal migrations throughout the area and beyond. Demersal fish are less gregarious and more territorial, living close to the coast, often near the sea floor, and include groupers, captains, sole and sea bream.

In addition to fish, the area abounds in marine molluscs, notably Common Octopus *Octopus vulgaris*, cuttlefish *Sepia spp.*, squid *Teuthida spp.* and shellfish that are abundant in estuaries and along the coast, including ark clams, Algarve Volute *Cymbium olla* and Spiny Dye Murex *Bolinus brandaris*.

The high fish productivity is due to the presence of both deepwater and coastal features. Deepwater features include seamounts, canyons, cold-water corals and the permanent upwelling, which together contribute very significantly to the high marine diversity and productivity of the region. At the coast, mangroves, seagrasses and algae in the various estuaries and shallow waters provide shelter, spawning grounds and food for many species of fish.

### **What protection and management is in place?**

Various national, regional and international policies and regional arrangements such as the Sub-regional Fisheries Commission (CSRP) are in place, which are trying to manage the complex West African fishery at different levels. A wide range of research and management programmes and projects are underway. National management procedures are led by the Ministries in charge of fisheries management, the Directorates that manage artisanal and industrial fisheries in waters under the sovereignty and jurisdiction of the country, the applied fisheries research centres, which are public scientific establishments responsible for stock assessment and fisheries monitoring at the national level, and the Fisheries Surveillance Services, which aim to control compliance with regulations.

### **What are the risks from oil & gas development?**

Risks related to the fisheries sector from oil and gas can include, among others:

- Risk of accidental events and release of contaminants into the marine environment, e.g. oil spills.
- Disturbance of the seabed and benthic habitat by drilling activities.
- Discharges at sea from drilling activities and ships, with impacts on water quality and seabed ecology.
- The physical presence of drilling rigs and ships, which increases the risk of collision and the exclusion of maritime areas from use by others, including fishermen.
- The production of underwater noise from ships, drilling and seismic operations.
- Generation of waste during drilling.

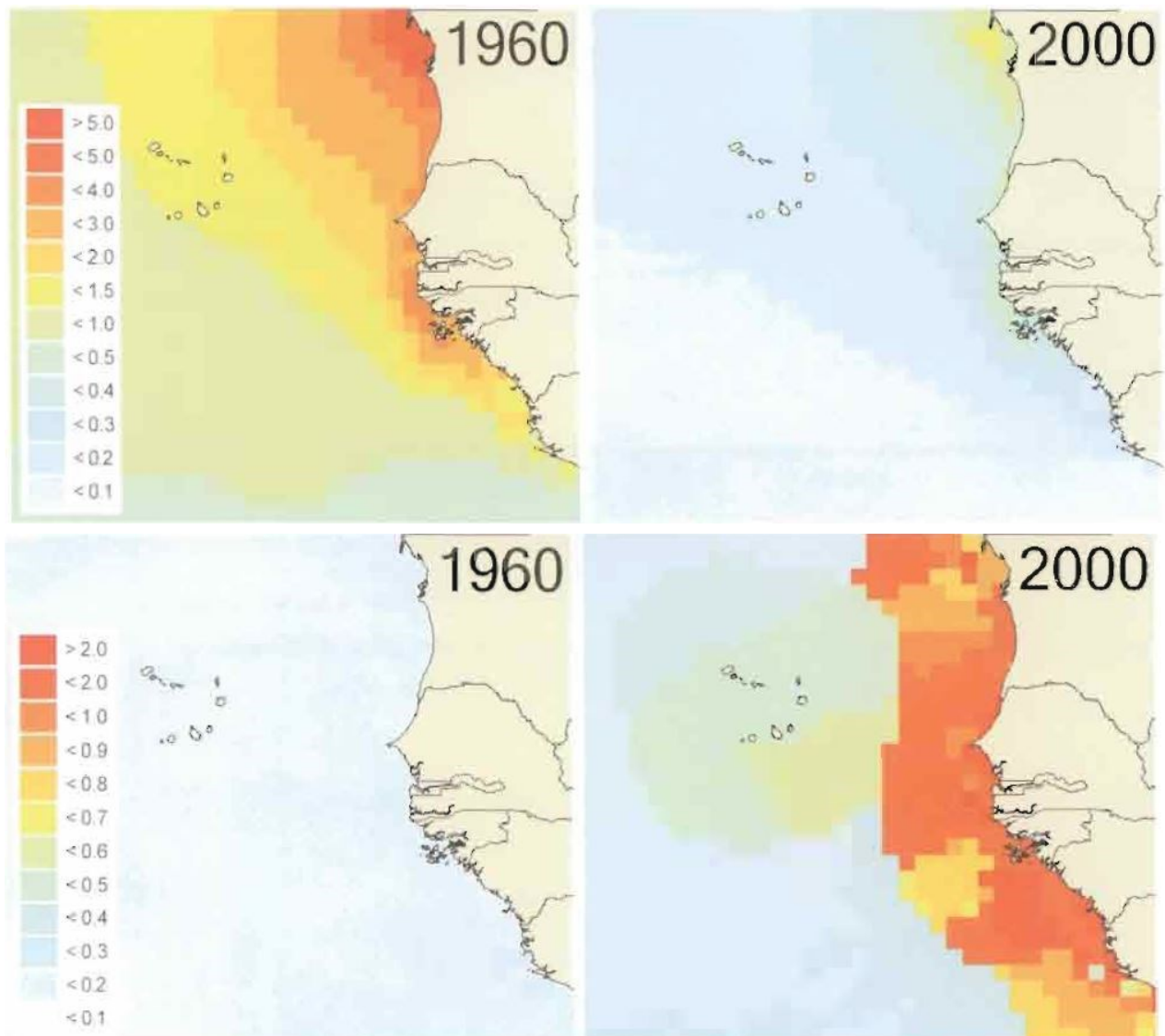


### What other conservation issues are significant?

Fisheries management is in a precarious situation in West African waters, where fish stocks have significantly reduced in recent decades due almost exclusively to overfishing. The intense fisheries pressure comes from both the industrial fleet, which mostly operates in deeper waters, and artisanal fisheries, which mostly targets the inshore waters.

Fish resources in West Africa have been the subject of intense exploitation by small-scale and industrial fishing operators, driven by an increase in demand and by technological advances at all levels of fishing activity. The emergence of access rights to regulate fishing also led to the strong development of national and foreign fishing fleets. This quantitative growth in fleets combined with technological progress and the diversification and spatial growth of fishing grounds were the main reasons for resource overexploitation (Christensen *et al.* (2005).

Figure 06 compares the fish biomass in 1960 and 2000 (top maps) and the fishing intensity in the same period (bottom maps): The high coastal concentrations of fish seen in 1960 have nearly completely disappeared by 2000, whilst, conversely, the fishing intensity in the coastal zone has dramatically increased (Christensen *et al.* 2005). As fishing pressure remains intense, the prospect for productive fisheries and sustainable catches in the future is slim unless effective long-term management measures are implemented.



**Figure 06.** Top maps: Biomass distribution for fishes (excluding small pelagics) off west Africa in 1960 and 2000. Bottom maps: Fishing intensity (catch/biomass ratio) for fishes (excluding small pelagics) off West Africa in 1960 and 2000. Units in the legend are in tonnes per km<sup>2</sup> (Christensen *et al.* 2005).

# 4

## Oil and Gas Developments





Credit: Emmaus Studio/Unsplash

## Oil and gas developments in the region

There has been significant planning development in the offshore oil and gas sector since the 1990s, and Mauritania, Senegal, Guinea-Bissau and Sierra Leone have all identified oil and gas concessions (Map 16). Petrol and gas were discovered in the West African Marine Ecoregion in 2001. In 2002, the Australian oil company Woodside discovered the first commercially exploitable deposit off the Mauritanian coast, the Chinguetti oil field, whilst the British company Premier later discovered the offshore Sinape oil field in Guinea-Bissau (Kloff & Wicks 2005).

By 2018, a range of activities of exploration, discovery and some exploitation were underway across these four countries (Table 06).

At a regional level, development is at an early stage, though some concessions have seen oil and gas production, especially in Mauritania. The largest offshore gas field is Grand Tortue-Ahmeyim of Mauritania-Senegal. Uncovered in 2016, this natural gas deposit has a potential of 1,400 billion m<sup>3</sup> of natural gas for production of LNG (liquefied natural gas).

**Table 06.** Offshore oil blocks of Mauritania, Senegal, Guinea-Bissau and Sierra Leone in active phases of discovery, exploration and exploitation.

Offshore oil block	Operators, 2018	Status	Type	Protected Areas nearby
<b>Mauritania</b>				
C-19	Shell	Exploration		PNBA et Cap Blanc
C-7	TOTAL	Exploration		PNBA et Cap Blanc
C-12	BP	Exploration		
C-13	BP	Exploration		
C-08	BP	Discovery: Ahmeyim 2/ Tortue-1 (Grande Tortue)	Gas	PNBA et Cap Blanc
		Discovery: Marsouin	Gas	PNBA et Cap Blanc
C-9	TOTAL	Exploration		
C-18	TOTAL	Exploration		
C-6	BP	Exploration		
C-10	Shell	Exploration		
C-3	Tullow oil	Exploration		Diawling
C-14	Exxon Mobil	Exploration		PNBA, Cap Blanc
C-22	Exxon Mobil	Exploration		PNBA
C-17	Exxon Mobil	Exploration		
<b>Senegal</b>				
Saint-Louis offshore profond	BP Senegal Invest Ltd/ Kosmos Energy/ PETROSEN	Discovery: Guembeul 1 (Grand Tortue)	Gas	Saint-Louis MPA; PNLB
Saint-Louis off-shore	Oranto petroleum LTD/ PETROSEN			Saint-Louis MPA; PNLB
Cayar offshore profond	BP Senegal Invest Ltd/ Kosmos Energy/ PETROSEN	Discovery: Teranga-1	Gas	Cayar MPA; EBSAs: Canyon Cayar & Mont sous marins Cayar
	BP Senegal Invest Ltd/ Kosmos Energy/ PETROSEN	Discovery: Yakaar-1	Gas	Cayar MPA; EBSAs: Canyon Cayar & Mont sous marins Cayar
Cayar offshore	Oranto Petroleum Ltd/ PETROSEN	Exploration		Cayar MPA; EBSAs: Canyon Cayar & Mont sous marins Cayar
Rufisque offshore profond	TOTAL/ PETROSEN	Exploration		PNIM, Somone MPA, Popenguine, Joal Fadhiout MPA
Rufisque offshore	CAIN Energy/ Woodside/ FAR limited/ PETROSEN	Exploration		PNIM, Somone MPA, Popenguine, Joal Fadhiout MPA
Sangomar offshore, offshore profond	CAIN Energy/ Woodside/ FAR limited/ PETROSEN	Discovery: FAN1 / SEN1	Oil & gas	Delta du Saloum, MPAs: Joal Fadiouth, Sangomar, Palmarin & Gandoul
Djieffere offshore	TRACE Atlantic Ltd/ PETROSEN	Exploration		Delta du Saloum, MPAs: Joal Fadiouth, Sangomar, Palmarin & Gandoul
North UDO	TOTAL/ PETROSEN	Exploration		



Offshore oil block	Operators, 2018	Status	Type	Protected Areas nearby
<b>Guinea-Bissau/Senegal</b>				
AGC Central	Oryx Petroleum Corporation Ltd	Exploration		PN Rio Cacheu
AGC ultra PROFOND4	Rhino Resources	Exploration		
AGC ultra PROFOND3	Rhino Resources	Exploration		
AGC ultra DEEP UP1	Tender Oil & Gas SRL	Exploration		
AGC profond	IMPACT Oil & Gas/ CNOOC West Africa Petroleum E&P	Exploration		
AGC shallow	Oryx Petroleum Corporation Ltd	Discovery: Dome Flore / Dome Géa.	Oil	Casamance sites, PN Rio Cacheu
<b>Guinea-Bissau</b>				
Block 1	Cap Energy Limited	Exploration		PN de Cacheu
Block 2	CNOOC/ Australian FAR/ Svenska (Sweden)	Exploration; Discovery: Sinapa	HC resource potential	Bijagós
Block 3	Terralliance	Exploration		Bijagós
Block 4A	Svenska FAR	Exploration		Bijagós
Block 4B	Bissau Exploration	Exploration		
Block 5 A	CNOOC/ Australian FAR/ Svenska (Sweden)	Exploration; Discovery: Esparanca	HC resource potential	Bijagós
Block 5 B	Cap Energy Limited	Exploration		
Block 6 A	Larsen oil and gas	Exploration		
Block 6 B	Larsen oil and gas	Exploration		
Block 7B	Sanangol	Exploration		
Block 7A	Supernova Energy			
Block 5C	ATIP	Exploration		
Block 6C	ATIP	Exploration		
Block 7C	DEXOIL	Exploration		

Offshore oil block	Operators, 2018	Status	Type	Protected Areas nearby
<b>Sierra Leone</b>				
SL8 A & B	Chevron Sahara/ Noble Energy/ ODYE	Exploration		SLRE / Yawri Bay
SL1	Young	Exploration		SLRE / Yawri Bay
SL2	Young	Exploration		Yawri Bay /Scarcies River Estuary / SLRE
SL 9A	GNBH Exploration	Exploration		Scarcies River Estuary
SL 3	African Petroleum	Exploration		Scarcies River Estuary
SL4A-9	African Petroleum	Exploration		Scarcies River Estuary
SL4A-10	African Petroleum/ Kosmos Energy	Exploration		Scarcies River Estuary
SL9B	GNBH Exploration	Exploration		
SL 5-11	Lukoil/ Oranto Petroleum / Panatlantic	Exploration		Scarcies River Estuary
SL7C-10	Masters Energy	Exploration		Scarcies River Estuary
SL7B-11	Anadarko	Exploration; Discovery: Mercury 2	Oil & gas	Scarcies River Estuary
		Discovery: Mercury 1	Oil & gas	Scarcies River Estuary
		Discovery: Venus	Gas condensate	Scarcies River Estuary
		Discovery: Jupiter 1	Gas condensate	Scarcies River Estuary
SL7A-10	Elinilto Ltd/ Signet Petroleum/ Miexco	Exploration		
SL 10B	Varada Petroleum & Hydrocarbons	Exploration		

**Abbreviations:**

CNOOC	China National Offshore Oil Corp
EBSA	Ecologically or Biodiverse Sensitive Area
HC	Hydrocarbon
MPA	Marine Protected Area
PNBA	Parc National du Banc d'Arguin
PNIM	Parc National des Iles de la Madeleine
PNLB	Parc National de la Langue de Barbarie
SLRE	Sierra Leone River Estuary

As well as oil and gas being exploited in the region, every year some 400-500 tonnes of crude oil and refined products transit along the West African coast coming in particular from Nigeria, Gabon and Angola (UNEP 2002).



## Why is this important?

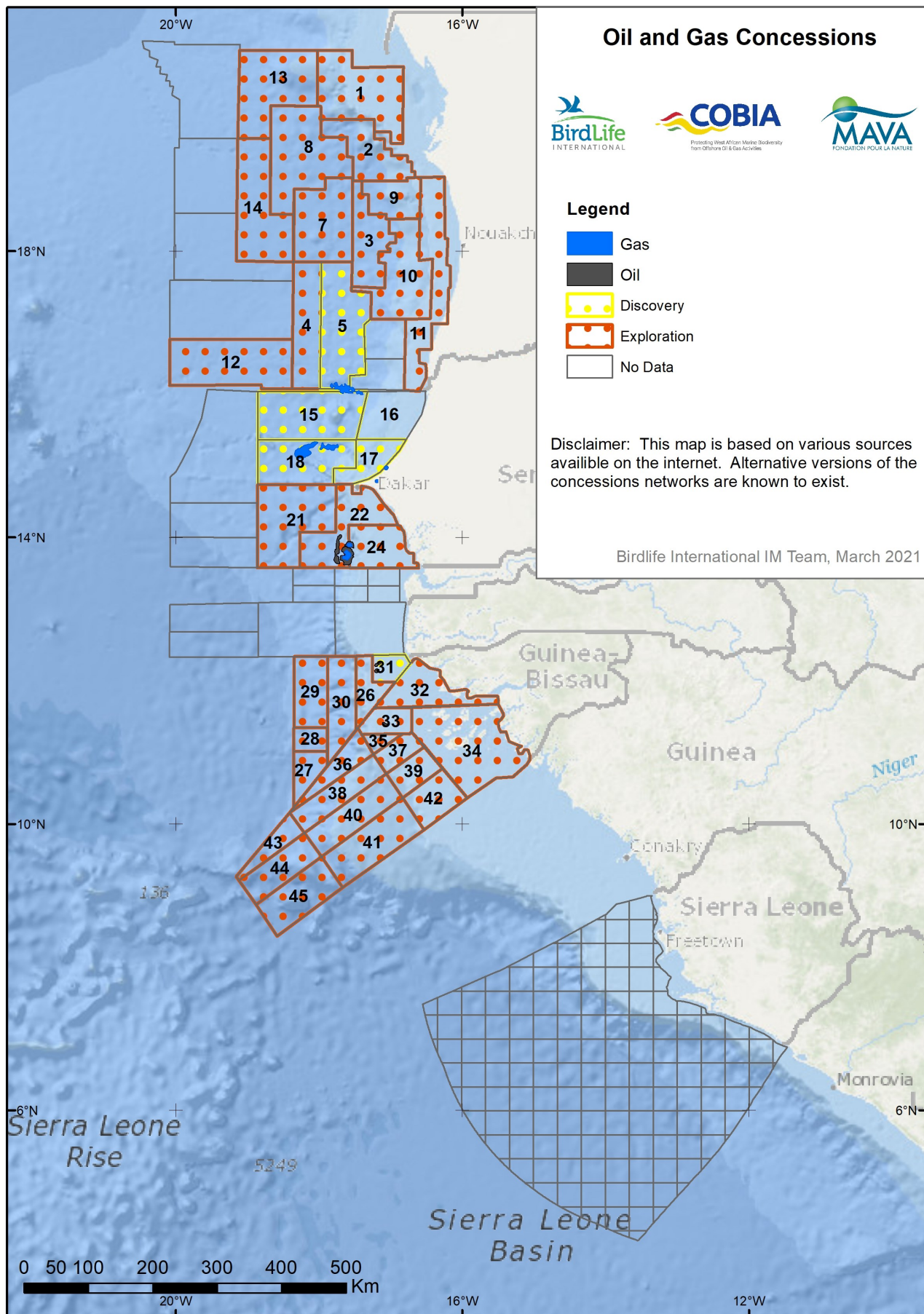
The development of offshore oil and gas exploration and exploitation activities poses a direct threat to the conservation of biodiversity and marine and coastal ecosystems. The growing number of discoveries and exploration draw attention to the potential environmental impacts of offshore oil extraction in the region. Public debate has focused on marine pollution and particularly on the compatibility of this new economic activity with the existing economy, based on fishing and partly on tourism (Kloff & Wicks 2005). The enormous damage to biodiversity and related activities caused by the explosion of the Deepwater Horizon platform in the Gulf of Mexico, where various precautions were taken to avoid this kind of disaster, serves as a reminder of the potential dangers of oil pollution that know no borders (Abdellah et al. 2014).

The risks relating to present and future maritime traffic emanating from outside the ecoregion are also significant. An accident in the region involving just one of these oil tankers would cause a very large oil spill. With the development of offshore oil exploitation in the region itself, the number of oil tankers stopping in the maritime and coastal zone to load oil from future platforms will increase further. Shipping is also a source of ballast water discharge, which is a source for the transfer of marine invasive species, whilst ship-generated and hazardous wastes require adequate collection and treatment facilities in ports, to avert soil, air and water pollution and consequent negative public health (Barnes-Dabban & Karlsson-Vinkhuyzen 2018).

The West African Marine Ecoregion supports a high biodiversity and productivity, in both offshore waters and in the coastal zone. The area is particularly important for fish, turtles, cetaceans and birds, and the fisheries sector is vital to communities and to national economies. Oil and gas exploitation in or near areas rich in marine and coastal biodiversity can cause serious damage at the ecosystem level through the accumulation of residues from regular or accidental discharges of waste products (Kloff et al. 2010).

The coastline between Mauritania and Sierra Leone supports several protected areas, many of which extend into the countries' territorial waters, although very few extend into Exclusive Economic Zones (EEZs). Most protected areas are close to oil and gas concessions or have part of their area included within them. In recent decades, the countries have also identified and designated MPAs, although the practical implementation of protection measures remains largely problematic.





**Map 16:** Oil and gas concessions between Mauritania and Sierra Leone



## What protection and management is in place?

Mauritania, Senegal, Guinea-Bissau and Mauritania have national laws that govern offshore oil and gas activity, including environmental, mining and petroleum codes, whilst protected areas are afforded varying levels of protection. However, implementation of protection measures varies between sites, whilst active management of MPAs presents significant logistical and financial challenges. At an international level, the coastal and marine zone of West Africa is subject to a range of international conventions, regional agreements and management protocols. In relation to offshore oil and gas, key international tools include:

### The Abidjan Convention

The Convention for Cooperation in the Protection, Management and Development of the Marine and Coastal Environment of the Atlantic Coast of the West, Central and Southern Africa Region (or Abidjan Convention) came into effect in 1984. It is a political, legal and technical tool that serves to protect the Atlantic coastline of Africa, and has been ratified by 19 of the 22 countries within its range (from Mauritania to South Africa). Parties to the Convention adopted the Protocol concerning Cooperation in Combating Pollution in Cases of Emergency, including the related Action Plan for the Protection and Development of the Marine Environment and Coastal Areas of the West and Central African Region. The Malabo Protocol of this Convention, ratified in 2019, establishes minimum standards to combat the risks associated with pollution caused by oil and gas activities. Further information is provided in Annex 03.

### OPRC: International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990 (OPRC 90)

This is a legal framework under the **International Maritime Organization (IMO)**, which aims to reduce the impacts of major oil spills, to encourage states to develop appropriate means to tackle such events and to facilitate international cooperation and mutual assistance. It requires States to plan and prepare by developing national systems for pollution response in their respective countries, and by maintaining adequate capacity and resources to address oil pollution emergencies. It applies to vessels, installations and ports. The OPRC 90 Convention is part of a wider regulatory system composed of IMO international and regional conventions. IMO has a three-tiered approach towards maritime pollution conventions:

- Level 1. Preventive legislation: deals with safety, seafarers' training and operational pollution (MARPOL 73/78, Annex 1);
- Level 2. Mitigation (preparedness and response) legislation: deals with accidental pollution (OPRC 90, OPRC-HNS Protocol);
- Level 3. Compensatory legislation: deals with liability and compensation to those affected by pollution (CLC/FUND 92, BUNKER 2001, LLMC 96, HNS 2010).

## The International Convention for the Prevention of Pollution from Ships (MARPOL)

MARPOL is the main international convention covering prevention of pollution of the marine environment by ships from operational or accidental causes. It includes regulations aimed at preventing and minimising pollution from ships - both accidental pollution and that from routine operations - and currently includes six technical Annexes. Special Areas with strict controls on operational discharges are included in most Annexes. Annex I (Regulations for the Prevention of Pollution by Oil) covers prevention of pollution by oil from operational measures as well as from accidental discharges.

The 1992 Civil Liability Convention was adopted to ensure that adequate compensation is available to persons who suffer oil pollution damage resulting from maritime casualties involving oil-carrying ships. The Convention places the liability for such damage on the owner of the ship from which the polluting oil escaped or was discharged<sup>9</sup>.

Table 07 illustrates the regional status of adoption of international conventions in relation to offshore oil and gas production. Although most countries have ratified the MARPOL Convention, overall there is still a long way to go in adoption and in particular implementation of the various conventions and related mechanisms relevant to the production, loading and transport of offshore oil and gas products.

International Conventions	Mauritania	Senegal	The Gambia	Guinea-Bissau	Guinea	Sierra Leone
Abidjan Convention	R	R	R	R	R	R
MARPOL 73-78 & Annex 1	R	R&I	R	R	R	R
OPRC 1990	NR	R&I	R	NR	R	R
OPRC HNS Protocol 2000	R	NR	NR	NR	NR	NR
CLC 1992	R	R	R	NR	R	R
FUND 1992	R	R	R	NR	R	R
Supp FUND 2003	NR	NR	NR	NR	NR	NR
Bunker 2001	NR	R	NR	NR	NR	R
LLMC 1996	NR	NR	NR	NR	NR	NR
HNS 2010	NR	NR	NR	NR	NR	NR

Not ratified	NR
Ratified	R
Ratified & Implemented	R&I

**Table 07** Status of international conventions and related mechanisms in relation to offshore oil and gas from Mauritania to Sierra Leone (GI WACAF 2021).

9. <https://www.giwacaf.net> consulted 25/11/2020.



- **OPRC HNS Protocol 2000:** Like the OPRC Convention, the OPRC-HNS Protocol aims to establish national systems for preparedness and response and to provide a global framework for international co-operation in combating major incidents or threats of marine pollution.
- **CLC 1992:** The Civil Liability Convention was adopted to ensure that adequate compensation is available to persons who suffer oil pollution damage resulting from maritime casualties involving oil-carrying ships. The Convention places the liability for such damage on the owner of the ship from which the polluting oil escaped or was discharged.
- **FUND 1992:** The 1992 Fund Convention, which is supplementary to the 1992 CLC, establishes a regime for compensating victims when compensation under the 1992 CLC is not available or is inadequate. The International Oil Pollution Compensation Fund, 1992 (1992 Fund) was set up under the 1992 Fund Convention.
- **Bunker 2001:** The Convention was adopted to ensure that adequate, prompt and effective compensation is available to persons who suffer damage caused by spills of oil, when carried as fuel in ships' bunkers. The convention is modelled on the International Convention on Civil Liability for Oil Pollution Damage, 1969.
- **HNS 2010:** The Hazardous and Noxious Substances (HNS) Convention was adopted in 1996 to ensure adequate and efficient compensation to victims of accidents involving HNS, such as chemicals. The Convention is based on the two-tier system established under the CLC and Fund Conventions.

### Implementation of agreements

A key step required by all coastal countries is the elaboration of national Emergency Response Plans to encourage efficient planning in the case of an emergency, and which provide a framework for cooperation between government and the petroleum industry. All operations also require specific Oil Pollution Emergency Plans. Globally, there are gaps in emergency response planning at local, national and sub-regional levels, whilst legislation under the conventions needs to be harmonised. Sub-regional cooperation needs to be very strong for effective action, whilst cooperation for combating pollution is also needed between oil companies and governments. Comprehensive maps of the coastal zone that clearly indicate the most sensitive coastal areas to the effects of oil pollution, as well as ocean currents and other features, are important tools for implementation. Another issue is that international and national laws are not always respected, whilst training is also required in relation to environmental impacts and their assessments.

In the framework of its integration vision, the Association of African Oil Producing Countries (APPA) should contribute to the set-up of networks for the circulation of environmental information, establish a network of national environmental focal points for APPA in order to facilitate the use and transfer of technical information, and contribute to implementing an alert system (Dodman *et al.* 2006).

In addition to these management tools, international conventions relating to biodiversity and natural resources also provide guidance in relation to oil and gas. These include the Convention on Biological Diversity, the Convention on Wetlands (Ramsar) and the Convention on the Conservation of Migratory Species of Wild Animals (CMS, Bonn) and its agreements and MOUs. An overview of international conventions and agreements is provided in Annex 03.

## Cooperation:

GI WACAF (Global Initiative for West, Central and Southern Africa) is a cooperation project between the International Maritime Organization (IMO) and IPIECA, the global oil and gas industry association for advancing environmental and social performance. It was launched in a shared desire to improve the level of preparedness and response to oil spills in the West, Central and Southern Africa region. GI WACAF works in close cooperation with relevant national authorities in 22 African countries, supporting them in strengthening their oil spill preparedness and response capabilities. By doing so, GI WACAF is contributing to a better protection of the marine and shoreline environment in the region. The project works in the spirit of IMO's OPRC 1990, which promotes industry-government cooperation and encourages them to work together to address core elements of effective preparedness and response to an oil spill.

GI WACAF focuses on six of these core elements:

1. Designation of authorities in charge
2. Ratification of relevant international conventions
3. Development of a National Oil Spill Contingency Plan
4. Structuring of regional agreements
5. Implementation of training and exercises
6. Procurement of national resources and equipment

The GI WACAF Project sets up and delivers activities in close liaison with its network of dedicated government and industry focal points. Constantly adapting to reflect the various needs of the participating countries, the project organises activities of various forms, from workshops to trainings, technical advice missions or exercises. Activities are based on the latest technical development achieved in the field of oil spill preparedness and response. GI WACAF is supported and funded by IMO with financial support from oil and gas industry members through an annual contribution.



Credit: DVIDSHUB/Flickr



## Policies:

Table 08 shows the current status of policies relating to offshore oil and gas production in countries from Mauritania to Sierra Leone. This indicates that the region, overall, is not well prepared for dealing with a major oil and gas incident, and significant progress needs to be made, especially noting the great importance of this zone for fisheries and biodiversity.

**Table 08.** Status of policies in relation to the offshore oil and gas industry (GI WACAF 2021).

Policies	Mauritania	Senegal	The Gambia	Guinea-Bissau	Guinea	Sierra Leone
National Oil Spill Contingency Plan (NOSCP)	D&A	D&A	IP	IP	IP	D&A
Sensitivity Maps	ND	IP	ND	ND	IP	D&A
Dispersant Policy	IP	D&A	ND	ND	IP	ND
Shoreline Clean-up Plan	ND	ND	ND	ND	D	D
Waste Management Policy	IP	ND	ND	ND	IP	ND
Incident Management System	NI	PiN	NI	NI	NI	FlIN
Trans-boundary Cooperation	NA	NA	NA	NA	NA	NA

Not Developed

ND

In progress

IP

Developed

D

Developed & Approved

D&A

Not included

NI

Principles included in the NOSCP

PiN

Fully implemented in the NOSCP

FlIN

No agreement in place

NA

## With particular reference to the development of oil and gas in the region

- **A National Oil Spill Contingency Plan (NOSCP)** is a key document that provides guidance on how to respond to an oil spill in the case of an incident.
- **Sensitivity mapping** of the various types of environments and resources potentially exposed to oil spills enables the identification of the most sensitive sites or resources and provide a basis for the definition of priorities for protection and clean-up, and information to plan the best-suited response strategy.
- **Dispersant policy:** Policies on the use of dispersant ensure oil spill dispersants as a response option can be made available in a timely manner, and that suitable products are available for use if required.
- **Shoreline Clean-up Plan:** When oil reaches the shoreline, considerable effort may be required to clean affected areas. It is therefore essential that comprehensive and well-rehearsed arrangements for shoreline clean-up are included in contingency plans.
- The **waste management policy** is a vital component of any oil spill contingency plan. A well-developed policy addresses components like waste recovery and recycling opportunities or a logistics chain comprising temporary storage sites and transportation that has the ability to interface with the existing available waste infrastructure.
- An **Incident Management System (IMS)** facilitates command and control of an oil spill by organizing leaders, functions, response teams and other resources through a scalable structure with pre-identified roles, responsibilities, reporting relationships and authorities necessary to manage an incident.
- **Transboundary Cooperation:** Where there is the potential for transboundary movement of spilled oil, or if personnel and equipment may need to be transported across borders, regional and bilateral agreements can provide response actions and sharing of resources. Prearranged procedures are vital for rapid resolution of issues such as liability concerns, emergency immigration and import provisions, and financial compensation processes.

## Responsible authorities

In **Mauritania**, from an institutional and legal point of view, the Merchant Marine Directorate of the Ministry of Fisheries and Maritime Economy is the competent national authority in charge of oil spill preparedness and response. It is also the Authority in charge of the implementation of the IMO conventions.

In **Senegal**, the competent national authority in charge of preparedness and response to an oil spill at sea is the High Authority in charge of the coordination of maritime safety, maritime security and protection of the marine environment (HASSMAR). Response in the coastal environment is entrusted to the Civil Protection Directorate, whilst the implementation of IMO conventions is entrusted to several state entities, with the focal point being the National Maritime Affairs Agency (Maritime Authority, ANAM).

In **Guinea-Bissau**, the competent national authority in charge of preparedness and response to oil spills at sea is the Directorate General for the Environment. It is also in charge of land-based response.

In **Sierra Leone**, the competent national authorities responsible for oil spill preparedness and response at sea and at the shoreline is the Sierra Leone Maritime Administration, which is also responsible for implementation of IMO conventions.





# Risks from Oil and Gas

## What are the risks from oil & gas development?

Offshore oil and gas activities generate multiple risks of pollution that can have a negative impact on the different components and functions of marine and coastal ecosystems with potential consequences on associated ecosystem services, as detailed by Thiao *et al.* (2019):

**Noise:** During exploration, seismic campaigns to identify possible drilling sites generate very powerful underwater noise, with sound levels much higher than normal ambient levels. This noise has harmful effects on most marine mammals, especially whales, as well as on small organisms in the vicinity of the sound source. These effects include the disorientation of marine mammals, the destruction of larvae and the stunning of small organisms at the bottom of the food chain.

**Damage to seabed:** During exploration and extraction, drilling and production work destroys the seabed and generates much solid and liquid waste (e.g. pieces of rock, mud, cuttings, chemicals, drainage water, waste water from the platform). Such waste, which may also contain hydrocarbons, is asphyxiating and toxic for fauna and flora.



Credit: Deepwater Horizon Response/Flickr



Credit: Deepwater Horizon Response/Flickr

**Pollution:** Accidental spills of hydrocarbons and other chemical products used during drilling and extraction can occur. Gas flaring (the process of burning natural gas) contributes to the emission of toxic substances that pollute the atmosphere as well as the water where the particles fall.

**Infrastructure:** The construction of exploitation and storage infrastructures, generally located along the coastline, can damage coastal habitats. There are also potential consequences of asphyxiation and poisoning of fauna and flora.

**Transport:** Transport incidents may occur and lead to oil spills with direct consequences on flora and fauna (including birds) living in shallow or shallow waters. Vessels transporting oil and gas may on occasion also have direct collisions with animals such as marine mammals and turtles.

The potential risks to habitats, species and ecosystems, especially in protected areas, are shown in Table 09, indicating a range of risks associated with different aspects and operations of the oil and gas industry.

Whilst risks at shore are often easier to anticipate, offshore risks may often go undetected. Upwelling areas are home to abundant marine fauna and many seabirds, and there are rich benthic ecosystems such as deep-water coral reefs and shellfish beds. Small oil spills frequently generated by unloading operations generally disintegrate before reaching the coast but can affect large numbers of seabirds found in areas of intense upwelling. Rich benthic ecosystems such as shellfish beds on the continental shelf and deep water coral reefs can also be smothered by drilling operations (Kloff & Wicks 2010).

**Table 09:** Potential risks of aspects of oil and gas operations on habitats, species and ecosystems, especially in protected areas (after Thiao et al. 2019)

Operation/ concern	Potential risks of oil and gas activities on habitats, species and ecosystems
Seismic operations and use of sonar	Use of low and high frequency acoustic energy can have negative impacts in critical periods for fish reproduction and marine mammal occurrence.
Drilling	Low frequency sound, introduction of exotic invasive marine species via hull fouling/ ballast water, physical impact on seabed, displacement of marine wildlife.
Discharges of cuttings and drilling fluids	Discharges of drill cutting directly on the sea floor and not in the water column. Accumulation of contaminated material leading to smothering of benthos; increased turbidity; toxicity of drilling fluids
Discharges of produced water	Contamination with produced water products, such as polycyclic aromatic hydrocarbons (PAHs), trace metals, and radionuclides related to the non-reinjection of produced water and its discharge into the ocean.
Physical operations such as anchors and pipelines, control and flow lines, umbilical risers and other seabed infrastructure	The physical operation in environmentally sensitive areas may have a direct physical impact on the seabed; impact though tidally induced motion, increased sedimentation, mortality and burial of benthic fauna. Provision of hard substrate for new colonisations of sessile species, also of exotic invasive marine species.
Ancillary operations, helicopters, support vessels tankers	Introduction of exotic invasive marine species via hull fouling/ ballast water, vessel and tanker collisions with cetaceans.
Artificial light at installations	Light attracts birds and fish, and may repel other organisms.
Waste management	The dumping of food waste into the ocean attracts fish and other marine organisms.
Discharges to air flaring, emissions without flaring, tank venting	Flaring can attract and damage birds, all emissions contribute to climate change.
Accidental releases: mass release of chemicals or hydrocarbons to atmosphere, sea surface, water column or seafloor; mass release of dispersants	Increased toxicity, altered benthic, pelagic and faunal communities. Mortality of corals, marine mammals and birds. Dispersants increase toxicity of hydrocarbons on benthic communities and mortality of corals. MOSSFA (marine oil snow sedimentation & flocculent accumulation) induces massive mortality of pelagic and benthic communities lasting many years.
Presence of offshore structures	Exclusion zones around installations restrict access.



**Table 10:** Specific risks to biodiversity from different activities of the oil and gas sector

Activity	Potential impact on biodiversity
<b>Vessels</b>	
Sea vessel presence and movement	Disturbance to migration, feeding and breeding patterns through noise and light from, or the mere presence of a vessel. Behavioural changes or displacement of marine fauna, including injury and potential mortality of seabirds and mammals through collision with vessels.
Ship and boat wash	Wash from vessels may cause changes to the hydrodynamic regime, which can result in erosion of intertidal and shallow subtidal habitats and disturbance to shallow water communities.
Anchoring	Disturbs sensitive benthic communities. Disturbance of feeding/ breeding grounds for fish/shellfish.
<b>Waste</b>	
Hazardous waste	A wide variety of stresses and potential mortality of marine life will occur, depending on the material and amounts discharged.
Inorganic waste	Ingestion of plastic waste can cause individuals to die of starvation or malnutrition. Diving birds can become entangled in plastic waste, leading to infection, loss of limbs or death.
<b>Infrastructure</b>	
Port infrastructure	Damage or disturbance to estuarine habitat, e.g. saltmarsh and mangrove communities including dependent fauna, such as migratory waders.
Drill rig	Disturbance to migration, feeding and breeding patterns through noise and light from vessel, e.g. where rig is adjacent to intertidal areas used by migratory birds. Decline or extinction of native species through invasive alien species competition.
Pipe laying and decommission	Disturbed seabed and damage to associated fauna. Damage of feeding and nursery grounds of fish and shellfish affects livelihoods.
Dredging removal of sediment for field development	Removal of benthic habitat; increased turbidity and local sedimentation. Destruction of sensitive marine habitats such as seagrasses and increase in coral disease through stress from elevated turbidity.
Lighting	Marine species can be attracted to light sources and become disorientated. For example, petrels fledging are known to be attracted to light sources and are subsequently grounded leaving them vulnerable to other threats. Additionally, light sources can lead to mortality through strike if seabirds become exhausted circling light sources, especially in bad weather.
<b>Noise</b>	
Airguns and acoustic receivers streamers	Behavioural changes, such as displacement on foraging trips.
Explosives	Direct injury and mortality of marine species, particularly benthic species, but also fish and marine mammals and reptiles.
Machinery propellers and thrusters	Physical damage to hearing tissues and organs. Altered behaviour of fish and mammals.
Transport	Noise from helicopters and vessels can cause serious disturbance to migration, feeding and breeding patterns in terrestrial and marine mammals and birds.
<b>Production</b>	
Flaring	Natural gas produced during the course of routine oil and gas production operations is a potential attractant to birds. Injury and potential mortality of marine birds nesting on flare stacks.
<b>Accidents</b>	
Oil Spills	Destruction of sensitive habitats such as seagrasses and mangroves. Long-term damage to bird and turtle nesting and breeding grounds. Toxicological effects across the entire food chain. High levels of species mortality, including birds, mammals, fish and reptiles.

Various mitigation measures can be applied to minimise these risks. For example, in relation to sonar noise, measures can include setting of maximum sound levels, compulsory use of Marine Mammal Observers (MMOs) and day and night use of hydrophones.

All risks to the biotope and biocenosis (ecological community) are likely to have a negative impact on the provisioning, regulating, cultivating and supporting socio-economic services provided by coastal zone ecosystems, as illustrated in Table 12

### Oil spills

The most common causes of major oil spills are accidents with ships, illegal emissions from ships, and accidents or leakages at oil plants or pipelines. Prevention of spills from ships is difficult, and legal measures include restrictions on the use of inshore shipping lanes by oil tankers, mandatory safety procedures and bans on dumping. In the case of coastal spills, the use of detergents is often presented as a solution, but the side effects on marine food webs may be as serious as the effects of the oil spill (UNEP/AEWA 2005). Mechanical removal of oil is preferable, but requires significant human resources, is costly, and often depends ultimately on volunteers. Removal of oil involves:

- cleaning coastlines manually (e.g. with shovels)
- using high-pressure water hoses (especially on rocky shores)
- containing inshore floating oil in inflatable devices
- sucking up floating oil from ships (in combination with floaters).

The livelihoods of coastal communities face a variety of risks with different potential consequences related to offshore oil and gas activities. The risks to local fishing communities are more numerous and more likely with potentially very serious socio-economic consequences; (further information available in Thiao 2019).



Credit: Deepwater Horizon Response/Flickr





Credit: Marko Janković/Flickr

**Table 12:** Risks and Impacts on Coastal Ecosystem Services (after Thiao 2019)

Harmful effects of activities	Nature of risks on ecosystem components		
	Biotope	Vegetable Biocenosis	Animals Biocenosis
Sound and light pollution	Water turbidity	Destruction of phytoplankton	Disruption of travel/ migration Destruction of zooplankton/ larvae Stunting of small organisms Destabilization of food chain
Drill cuttings, hydrocarbon extraction sediment	Seabed destruction Water turbidity	Disturbance of underwater flora development	Habitat destruction Fatal or disabling injuries Destruction of zooplankton/ larvae Destabilization of the food chain
Discharge of hydrocarbons and other toxic liquids	Seabed destruction Water turbidity Water and beach pollution	Algae, phyto-plankton, seagrass & mangrove mortality	Habitat destruction Mortality of zooplankton Asphyxiates and intoxication Destruction of spawning grounds Destruction of reproduction sites, including for turtles and birds Destabilization of the food chain
Dispersion of gas flaring particles	Water pollution Beach pollution	Algae, phyto-plankton, seagrass & mangrove mortality	Habitat destruction Zooplankton mortality Asphyxiation and poisoning Destruction of spawning grounds Destruction of breeding sites, including turtle and bird nesting Destabilization of the food chain
Movement and pollution of oil vessels	Water turbidity Water pollution Beach pollution	Disturb under-water flora development Algae, phyto-plankton, seagrass & mangrove mortality	Fatal or disabling collisions with large species Habitat destruction Zooplankton mortality Asphyxiation and poisoning Destruction of spawning grounds Destruction of breeding sites, including turtle and bird nesting Destabilization of the food chain
Operating and Storage Infrastructure	Seabed destruction Water turbidity Water & beach pollution	Disturb under-water flora Algae, phyto-plankton, seagrass & mangrove mortality	Habitat destruction Asphyxiation and poisoning Destruction of spawning grounds Destruction of breeding sites, including for turtles and birds Destabilization of the food chain



## Potential effects on ecosystem services

Procurement	Regulation	Culture	Support
Reduced fisheries catch	Reduced O <sub>2</sub> production by phytoplankton	Decline in emblematic species of tourist and educational value	Decline in primary ocean production
Decrease in catches of species of fisheries interest	Reduced O <sub>2</sub> production by underwater flora	Damage to areas suitable for scuba diving	Decline in primary ocean production
Reduced fisheries catch Reduced collection of marine molluscs Decline in wood and other mangrove products Lower agricultural outputs	Reduced O <sub>2</sub> production by flora	Damage to water sports areas Lower beach use Disruption of cultural or religious practices	Decline in primary ocean production
Reduced fisheries catch Reduced collection of marine molluscs Lower product quality Decline in wood and other mangrove products Declining crop yields	Reduced O <sub>2</sub> production by flora Decrease in air quality Increase in greenhouse gases	Damage to water sports areas Decrease in beach use Decreased use of tourist venues Disruption of cultural practices	Decrease in primary ocean production Contribution to climate change
Reduced fisheries catch Reduced collection of marine molluscs Decrease in product quality Decline in wood and other mangrove products	Reduced O <sub>2</sub> production by flora Decrease in air quality Increase in greenhouse gases	Damage to water sports areas Decrease in beach use Reduced use of tourism venues Disruption of cultural practices	Decrease in primary ocean production Contribution to climate change
Reduced fisheries catch Reduced collection of marine molluscs Lower product quality Decline in wood and other mangrove products	Decrease in air quality Increase in greenhouse gases	Decrease in beach use Decreased use of tourism venues Disruption of cultural practices	Decrease in primary ocean production Contribution to climate change

# 5

Coastal and marine  
sites of the region



# 5

## Network of coastal and marine sites at a. the regional level

The West African Marine Ecoregion represents a unique part of the world, characterised in particular by its high productivity and varied coastline, from desertic to tropical moist environments. Along this coastline, a number of key sites stand out as being of particular importance for biodiversity and natural systems – jewels along the coastal belt from Mauritania to Sierra Leone. Although each site has key stand-alone attributes, most are connected in one way or another, especially when it comes to their shared role in supporting the many populations of migratory species that depend upon them. These include migratory fish, cetaceans, turtles and birds.

Many of these sites have been recognised for their importance and designated at the national level as protected areas of various kinds, including national parks, Marine Protected Areas, biosphere reserves and community reserves. Some sites are also recognised at the international level, notably as Ramsar Sites and World Heritage Sites. Table 13 provides a list of all coastal zone sites and MPAs under some form of international and/or national designation.

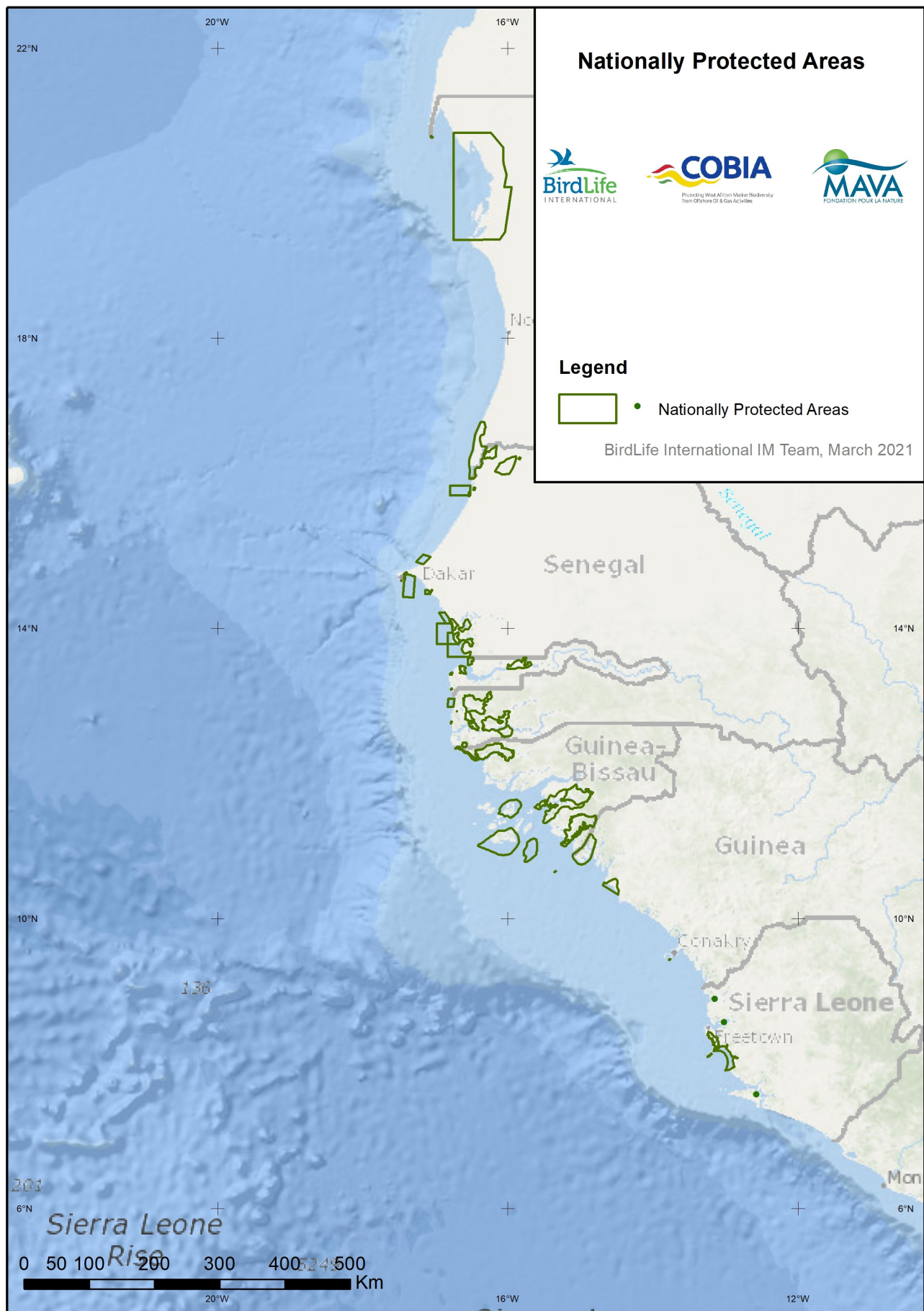
### Network of nationally Protected Areas

All countries of the region have national networks of protected areas, including a number of sites along the coastal belt and in the marine zone, as illustrated in Map 17 and Table 13. Mauritania has two key national parks in the coastal zone, including the largest site of the region, the Banc d'Arguin, which also has a small satellite reserve. Senegal has five national parks in the coastal zone, but also has quite a wide range of protected areas of different designations, including areas of local community heritage (APACs). There are five

BirdLife International (2001) has also recognised and described Important Bird and Biodiversity Areas (IBAs). Many IBAs, but not all, are also under some form of national protection.

The sites in this network invariably contain endangered species, fragile habitats and vital ecosystems, whilst most are also of high value for local communities. Most sites are further of high economic value for the natural functions that they support, such as the role of mangroves in coastal zone protection and provision of breeding areas for fish, as well as for direct income generation from natural resource use and tourism. However, there are numerous pressures along this productive coastline, largely due to the actions of people. These may take place at the local level to national and regional levels, and many actions are related to policies and decisions of governments. International pressures are particularly relevant, especially in relation to fisheries. Undoubtedly, these sites will face increasing pressures from the development of the oil and gas sector in the region.

national parks or reserves in the coastal zone of The Gambia, which extends up the Gambia River. Guinea-Bissau also has five coastal zone national or natural parks, including two within the Bijagós Archipelago. There is one wildlife sanctuary in Guinea's coastal zone; other sites are reserves that are principally Ramsar Sites. Sierra Leone has four new MPAs, but there is only one national park in the coastal zone, which is essentially protected for its forest biodiversity. Further details for all sites are provided in the Site Accounts.



**Map 17:** Protected area map





Credit: Kees Streefkerk/Unsplash



	Ramsar/UNESCO Map	
Site name	Ramsar site	UNESCO site
<b>Mauritania</b>		
Cap Blanc		
Banc d'Arguin	Ramsar	WHS
Chat Tboul	Ramsar	
Diawling	Ramsar	
Senegal Delta		MAB
<b>Senegal</b>		
Djoudj	Ramsar	WHS
Saint-Louis		
Gueumbeul	Ramsar	
Tocc Tocc	Ramsar	
Ndiaël	Ramsar	
Langue de Barbarie		
Kayar		
Grande Niaye de Pikine/ Technopôle		
Îles de la Madeleine		
Gorée		
Popenguine		
Somone	Ramsar	
Joal-Fadiouth		
Samba Dia		MAB
Palmarin	Ramsar	
Sangomar		
Delta du Saloum	Ramsar	MAB & WHS
Bamboung		
Gandoul		
Abéné		
Kassa-Balantacounda		
Niamone-Kalounayes		
Kaalolaal Blouf-Fogny		
Kalissaye	Ramsar	
Kawawana		
Kapac Olal de Mlomp		
Basse Casamance		
<b>The Gambia</b>		
Niumi	Ramsar	
Baobolon	Ramsar	
Tanbi	Ramsar	
Tanji/Bijol		
Abuko		
Gunjur/Bolonfenyo		
<b>Guinea-Bissau</b>		
Rio Cacheu	Ramsar	
Rio Grande de Buba		
Lagoa de Cufada	Ramsar	
Bolama-Bijagós Archipelago	Ramsar	MAB
Orango		
João Vieira & Poilão		
Urok (Ilhas Formosa, Nago & Tchediã)		
Cantanhez		
<b>Guinea</b>		
Iles Tristao	Ramsar	
Ile Alcatraz	Ramsar	
Rio Kapatchez	Ramsar	
Rio Pongo	Ramsar	
Konkouré	Ramsar	
Ile Blanche/Iles de Loos	Ramsar	
<b>Sierra Leone</b>		
Scarcies River Estuary		
Sierra Leone River Estuary	Ramsar	
Western Area Peninsula Forest		
Yawri Bay		
Sherbro River Estuary		

**Table 13.** Protected Areas of the coastal zone from Mauritania to Sierra Leone (RAMPAO 2021, UNEP-WCMS 2021)



Protected Area Map					
Park / national reserve	MPA	Community Reserve	Year created	Area (ha)	IUCN Category
Réserve satellite			1986	210	I
National Park			1976	1,207,500	I & VI
			2000	15,500	
National Park			1991	13,000	II & VI
National Park			1971	16,000	II
	MPA		2004	49,562	IV
Special Reserve			1983	720	IV
		Community Reserve	2013	273	
Wildlife Reserve			1977	48,898	IV
National Park			1976	2,000	II
	MPA		2004	17,029	IV
Urban Natural Reserve			2020		
National Park			1976	45	II
	MPA		2020		
Nature Reserve			1986	1,181	IV
	MPA	Community Reserve	2020	4,120	VI
	MPA		2004	17,362	IV
Classified Forest			1936	756	IV
		Community Reserve	2011	10,400	VI
	MPA		2013	87,437	VI
National Park			1976	76,000	II
		AMPC	2004	7,000	II
	MPA		2013 <sup>1</sup>	28,121	VI
	MPA		2004	11,844	V
	MPA		2016	23,300	VI
	MPA		2015	66,032	VI
		AMPC	2020		VI
Reserve Ornithologique			1978	16	IV
		APAC	2010	9,487	VI
		APAC	2013	22,280	VI
National Park			1970	5,000	II
National Park			1986	7,758	VI
Wetland Reserve			1996	22,000	VI
Wetland National Park			2003	6,034	VI
Bird Reserve			1993	612	II
Nature Reserve			1968	134	II
		Community Reserve	2007	320	II
Natural Park			1997	88,615	II
	Restricted fishing zone		2015	110,846	
National Park			2000	89,000	II
			2006	1,027,897	
National Park			2000	158,235	II
Marine National Park			2000	49,500	II
	MPA	Marine Community PA	2005	61,889	
National Park			2008	105,767	II
Faunal Reserve			1992	85,000	
Natural Reserve			1992	1	
Natural Reserve			1992	20,000	
			1992	30,000	
			1992	90,000	
Wildlife Sanctuary			1993	10	
	MPA		2012	63,394	
	MPA		2012	248,830	
National Park			2012	18,337	
	MPA		2012	31,605	
	MPA		2012	30,242	

WHS: World Heritage Site | MAB: Biosphere Reserve | AMPC: Aire Marine Protégée Communautaire (Community MPA)  
MPA: Marine Protected Area | APAC: Aire du Patrimoine Autochtone Communautaire (Local community heritage area)

<sup>1</sup> extended in 2020

# UNESCO: World Heritage Sites and Biosphere Reserves

The United Nations Educational, Scientific and Cultural Organisation (UNESCO) dates back to the 1940s, and seeks to build peace through international cooperation in Education, the Sciences and Culture. There are two key frameworks that recognise the global importance of sites – the World Heritage Convention (WHC) with the World Heritage List of sites, and the Man and Biosphere (MAB) Programme with the World Network of Biosphere Reserves.

The 1972 World Heritage Convention (WHC, Convention Concerning the Protection of the World Cultural and Natural Heritage) links together the concepts of nature conservation and the preservation of cultural properties, recognising the way in which people interact

with nature, and the fundamental need to preserve the balance between the two.

Through its World Heritage List of sites (or properties), the Convention reflects the world's cultural and natural diversity of outstanding universal value. The protection, management, authenticity and integrity of properties are important considerations, whilst significant interactions between people and the natural environment have been recognized as cultural landscapes. The Convention recognises cultural sites, natural sites and mixed sites.

Biosphere reserves promote solutions reconciling the conservation of biodiversity with sustainable use. They are learning areas for sustainable development under diverse ecological, social and economic contexts.

## World Heritage Sites (Mauritania to Sierra Leone)

Within the coastal belt of West Africa between Mauritania and Sierra Leone there are two natural World Heritage sites:

### Parc National du Banc d'Arguin

The contrast between the harsh desert environment and the rich marine zone has resulted in a land- and seascape of outstanding natural significance. A wide variety and large number of migratory and breeding waterbirds make use of the highly productive coastal zone, whilst the shallow waters are of great importance for fish, sea turtles and dolphins. Traditionally, local Imraguen people carry out cooperative fishing with dolphins – a unique cultural feature of the site.

### Parc National d'Oiseaux du Djoudj

In the Senegal River Delta, the Djoudj National Park is a 16,000 ha wetland ecosystem that supports large numbers of Afrotropical and Palearctic migratory birds, including one of the largest breeding sites for Great White Pelican. The site also supports populations of West African Crocodile and African Manatee.





Senegal has also listed a number of cultural World Heritage sites in the coastal zone. One of these is the Delta du Saloum, where the numerous shellfish beds are generally well preserved and sometimes have imposing dimensions. They bear direct witness to ancient and sustainable socioeconomic practices. Whilst listed for its cultural values and the synergy between a natural environment of great biodiversity and unique human development, the Saloum Delta is also of great environmental value in its own right, for instance supporting extensive mangroves and key islands for breeding birds.

The Gambia has also listed two cultural World Heritage sites in the coastal belt, including Kunta Kinteh Island in the Gambia River.

### **Biosphere Reserves (Mauritania to Sierra Leone)**

There are four biosphere reserves in the coastal zone between Mauritania and Sierra Leone:

#### **Delta du Fleuve Sénégal Transboundary Biosphere Reserve (Mauritania/Senegal)**

Situated in the Delta of the Senegal River, this transboundary reserve of 641,768 ha owes its diversity to its vast network of wetlands divided into several basins. The varied landscape includes floodplains, lakes and beaches, with continental and coastal dunes. The delta has a variety of protected areas that support large concentrations of migratory and breeding birds and other wildlife.

#### **Delta du Saloum**

The biosphere reserve comprises 72,000 ha of marine areas, 23,000 ha of flooded areas, and 85,000 ha of terrestrial islands. Mangroves are dominant, but sand dunes, open forest on sandy soils, coastal waters and sand islands also characterise the area.

#### **Samba Dia**

Samba Dia is a low-lying savanna woodland of 756 ha in the coastal belt of Senegal, especially important for stands of *Borassus* palm.

#### **Bolama Bijagós**

The 101,230 ha Bolama Bijagós Biosphere Reserve is an archipelago of 88 islands located on the coast of Guinea-Bissau formed from the ancient delta of the Rio Gêba and the Rio Grande. The archipelago is of great significance for sea turtles, waterbirds, fish, Atlantic Humpback Dolphin and African Manatee, and also supports a unique population of Common Hippo. The island group has a rich cultural heritage, with special customs and traditions, some unique to specific islands.



## Ramsar sites of the coastal zone

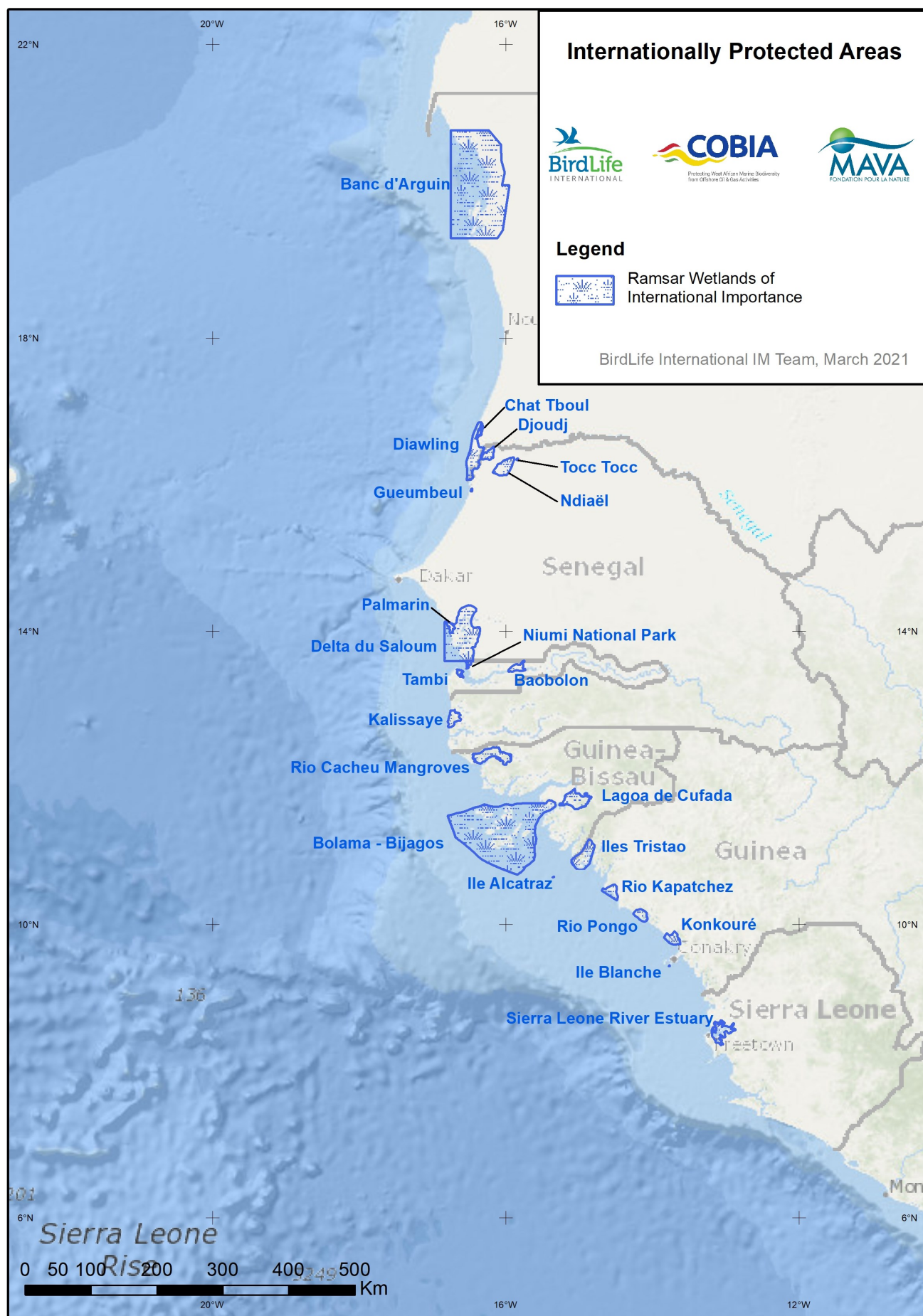
The Convention of Wetlands, adopted in 1971 in Ramsar, Iran, serves as a key intergovernmental framework for the conservation and wise use of wetlands and their resources around the world. A key commitment of the Convention's Contracting Parties is to identify and place suitable wetlands onto the List of Wetlands of International Importance, also known as the Ramsar List and to take the steps necessary to manage them effectively, maintaining their ecological character. Ramsar Sites need to meet the Convention's Criteria for identifying Wetlands of International Importance. The first criterion refers to Sites containing representative, rare or unique wetland types, and the other eight criteria relate to the importance of sites for conserving biodiversity.

There are 24 Ramsar Sites in the coastal zone between Mauritania and Sierra Leone: 3 in Mauritania, 8 in Senegal, 3 in The Gambia, 3 in Guinea-Bissau, 6 in Guinea and 1 in Sierra Leone. They vary significantly in size and character from the vast Banc d'Arguin of Mauritania to the tiny island of Alcatraz off the coast of Guinea. The different sites are shown in Map 18, whilst overviews of each site and provided in the Site Accounts.

**Table 14:** Ramsar sites in the coastal zone from Mauritania to Sierra Leone

Ramsar Site	Area (ha)	Coordinates	Link to site description
<b>Mauritania</b>			
Chat Tboul	15,500	16°33'N 16°24'W	<a href="https://rsis Ramsar.org/ris/1044">https://rsis Ramsar.org/ris/1044</a>
Parc National du Banc d'Arguin	1,200,000	20°50'N 016°45'W	<a href="https://rsis Ramsar.org/ris/250">https://rsis Ramsar.org/ris/250</a>
Parc National du Diawling	15,600	16°22'N 016°23'W	<a href="https://rsis Ramsar.org/ris/666">https://rsis Ramsar.org/ris/666</a>
<b>Senegal</b>			
Kalissaye	30,014	12°48'35"N 16°42'48"W	<a href="https://rsis Ramsar.org/ris/2326">https://rsis Ramsar.org/ris/2326</a>
Parc National des Oiseaux du Djoudj	16,000	16°24'17"N 16°14'27"W	<a href="https://rsis Ramsar.org/ris/138">https://rsis Ramsar.org/ris/138</a>
Parc National du Delta du Saloum	73,000	13°37'N 016°42'W	<a href="https://rsis Ramsar.org/ris/288">https://rsis Ramsar.org/ris/288</a>
Réserve Naturelle Communautaire de Palmarin	10,430	14°03'26"N 16°45'04"W	<a href="https://rsis Ramsar.org/ris/2328">https://rsis Ramsar.org/ris/2328</a>
Réserve Naturelle Communautaire de Tocc Tocc	273	16°20'38"N 15°50'12"W	<a href="https://rsis Ramsar.org/ris/2199">https://rsis Ramsar.org/ris/2199</a>
Réserve Naturelle d'Intérêt Communautaire de la Somone	700	14°30'26"N 17°04'11"W	<a href="https://rsis Ramsar.org/ris/2327">https://rsis Ramsar.org/ris/2327</a>
Réserve Spéciale de Faune de Gueumbeul	720	15°55'01"N 16°27'41"W	<a href="https://rsis Ramsar.org/ris/338">https://rsis Ramsar.org/ris/338</a>
Réserve Spéciale de Faune de Ndiaël	26,000	16°14'14"N 16°03'38"W	<a href="https://rsis Ramsar.org/ris/139">https://rsis Ramsar.org/ris/139</a>
<b>The Gambia</b>			
Baobolon Wetland Reserve	20,000	13°31'N 15°52'W	<a href="https://rsis Ramsar.org/ris/860">https://rsis Ramsar.org/ris/860</a>
Niumi National Park	4,940	13°34'N 16°31'W	<a href="https://rsis Ramsar.org/ris/1840">https://rsis Ramsar.org/ris/1840</a>
Tanbi Wetland Complex	6,304	13°25'59"N 16°37'59"W	<a href="https://rsis Ramsar.org/ris/1657">https://rsis Ramsar.org/ris/1657</a>
<b>Guinea-Bissau</b>			
Parc Naturel des Mangroves du Fleuve Cacheu (PNTC)	10,430	12°17'N 16°11'W	<a href="https://rsis Ramsar.org/ris/2229">https://rsis Ramsar.org/ris/2229</a>
Lagoa de Cufada	39,098	11°43'N 015°02'W	<a href="https://rsis Ramsar.org/ris/469">https://rsis Ramsar.org/ris/469</a>
Archipel Bolama-Bijagós	1,046,950	11°14'N 16°02'W	<a href="https://rsis Ramsar.org/ris/2198">https://rsis Ramsar.org/ris/2198</a>
<b>Guinea</b>			
Ile Alcatraz	1	10°37'59"N 15°22'59"W	<a href="https://rsis Ramsar.org/ris/571">https://rsis Ramsar.org/ris/571</a>
Ile Blanche	10	09°25'59"N 13°46'W	<a href="https://rsis Ramsar.org/ris/618">https://rsis Ramsar.org/ris/618</a>
Iles Tristao	85,000	10°55'N 15°00'W	<a href="https://rsis Ramsar.org/ris/572">https://rsis Ramsar.org/ris/572</a>
Konkouré	90,000	09°45'N 13°40'59"W	<a href="https://rsis Ramsar.org/ris/575">https://rsis Ramsar.org/ris/575</a>
Rio Kapatchez	679,280	10°45'27"N 14°15'21"W	<a href="https://rsis Ramsar.org/ris/573">https://rsis Ramsar.org/ris/573</a>
Rio Pongo	600,571	10°31'39"N 13°44'25"W	<a href="https://rsis Ramsar.org/ris/574">https://rsis Ramsar.org/ris/574</a>
<b>Sierra Leone</b>			
Sierra Leone River Estuary	295,000	08°37'N 13°03'W	<a href="https://rsis Ramsar.org/ris/1014">https://rsis Ramsar.org/ris/1014</a>





**Map 18:** Ramsar and UNESCO sites from Mauritania to Sierra Leone:

## Ecologically or Biologically Significant Marine Areas (EBSAs)

EBSAs are special areas in the ocean that serve important purposes to support the healthy functioning of oceans and the many services that they provide, designated under the Convention on Biological Diversity. The combined impacts of the numerous threats to the ocean as well as the potential impacts of climate change and ocean acidification have placed thousands of species at risk of extinction, and have impaired the structure, function, productivity and resilience of marine ecosystems. The most pressing threats relate to fishing, notably overfishing, destructive fishing practices and illegal, unreported and unregulated fishing activities, whilst other threats include marine debris, ship-based marine pollution, transfer of alien invasive species, illegal dumping and the legacy of historical dumping, seabed mineral extraction and noise pollution.

As the world's oceans are seriously under protected, measures are needed to increase protection and sustainable management. The designation of EBSAs can contribute to effective policy actions and to build a sound understanding of the most ecologically and biologically important ocean areas that support healthy marine ecosystems.

The criteria adopted for the designation of EBSAs relate to:

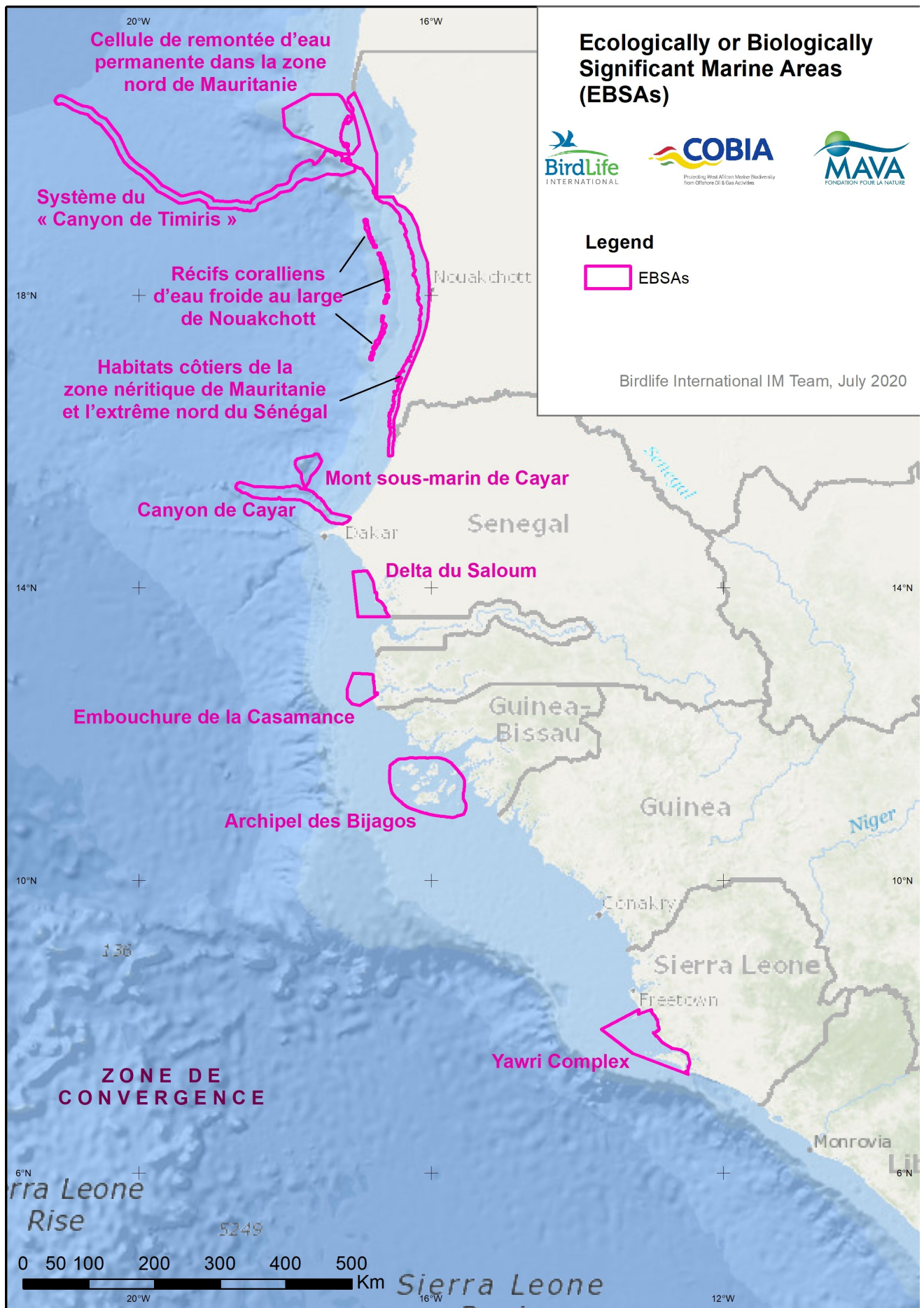
1. Uniqueness or Rarity
2. Special importance for life history stages of species
3. Importance for threatened, endangered or declining species and/or habitats
4. Vulnerability, Fragility, Sensitivity, or Slow recovery
5. Biological Productivity
6. Biological Diversity
7. Naturalness



Credit: Christophe André/Flickr



**Map 19:** The EBSAs of Mauritania, Senegal, Guinea-Bissau and Sierra Leone



## Important Bird and Biodiversity Areas (IBAs)

Important Bird and Biodiversity Areas (IBAs) are key sites for birds and biodiversity identified through a set of simple but robust criteria that can be applied worldwide. Initially, IBAs were identified only for terrestrial and freshwater environments, but the IBA process and method has since been adapted and applied in the marine realm. IBAs are:

- Places of international significance for the conservation of birds and other biodiversity
- Recognised worldwide as practical tools for conservation
- Distinct areas amenable to practical conservation action
- Identified using robust, standardised criteria
- Sites that together form part of a wider integrated approach to the conservation and sustainable use of the natural environment

Many IBAs in Africa were identified during a nine-year long continent-wide programme, which culminated in a regional directory (Fishpool & Evans 2001), followed by a number of national directories. In the West African Marine Ecoregion, individual directories have been developed for Guinea-Bissau (Dodman et al. 2004) and Sierra Leone (Okoni-Williams et al. 2005).

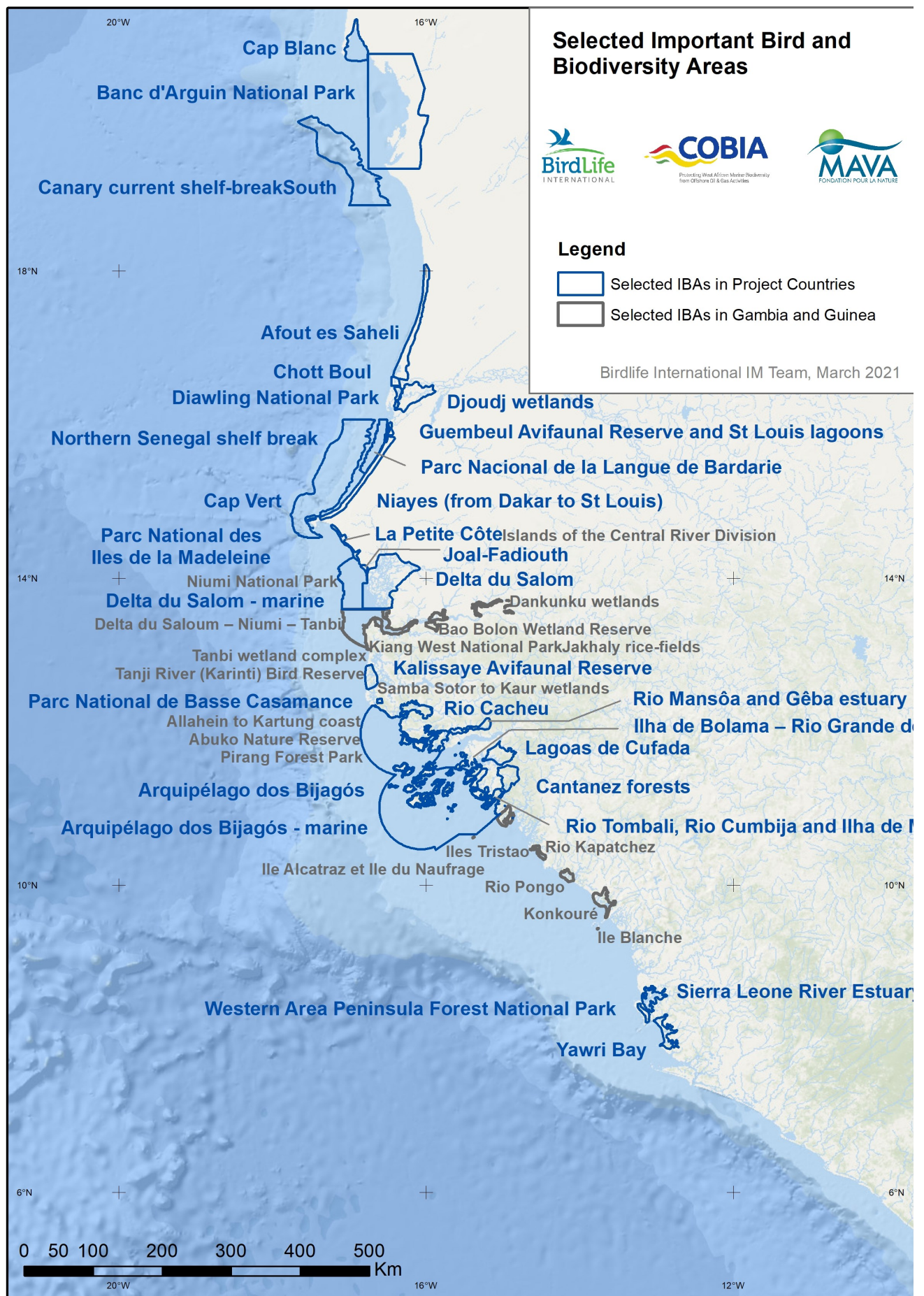
### What is presented?

Map 20 shows the marine and coastal sites in the region designated as IBAs, and which could be affected by offshore or coastal zone oil and gas activities. This network of IBAs includes some of the most important sites in West Africa for birds associated with marine ecosystems, notably pelagic and coastal seabirds and waterbirds. However, this network is far from exhaustive, and various projects aim to fill gaps in knowledge on the distribution of birds and their dependence on particular sites. Thus, some sites outwith the IBA network may be equally vulnerable to oil and gas developments. This is particularly true for the marine shelf break zone, where the continental shelf transitions to a slope down to the deeper ocean floor. The IBAs identified in this area so far result from direct and localized at sea surveys (e.g. Camphuysen & van der Meer 2005, Camphuysen *et al.* 2015), but such surveys are still lacking for most of the region. Furthermore, pelagic seabird species can travel very large distances (e.g. Ventura *et al.* 2020) and can also occur in large densities outside these marine IBAs.

Some of the most important areas in the Atlantic for marine and coastal species, particularly for migratory species using the East Atlantic Flyway (e.g. Delany *et al.* 2009) or offshore flyways (e.g. Dias *et al.* 2012) are listed IBAs, such as the Banc d'Arguin and the Canary current shelf break South in Mauritania; the Northern Senegal shelf break, Djoudj wetlands and two sites in the Delta du Saloum, Senegal; the Bijagós Archipelago, Guinea-Bissau; and the Sierra Leone River Estuary and Yawri Bay, Sierra Leone. Table 15 lists the IBAs between Mauritania and Sierra Leone of the coastal zone, and which could be impacted negatively by offshore oil and gas activities. Descriptions of each IBA are provided in the Site Accounts.







**Map 20:** The IBAs from Mauritania to Sierra Leone.

## Why is this important?

The IBAs of the West African Marine Ecoregion serve as a key network for the conservation of birds and their habitats, as well as for many other taxa. Many IBAs are already under some form of protection, but the IBA status is important in confirming their key role for birds, and in supporting improved monitoring. As most marine and coastal birds occurring in the West African Marine Ecoregion are migratory, it is important that they find good conditions to survive and prosper in order to fulfil their annual life cycles. Thus, it is vital that IBAs of the region are managed well, and present optimal conditions for birds. The conditions that these species find in this region can have repercussions in distant regions, highlighting the importance of migratory connectivity (Dunn *et al.* 2019, Iwamura *et al.* 2013) when assessing the scope and impact of oil and gas development.

## What protection and management is in place?

Despite being recognised worldwide as a practical tool for conservation, IBAs are not always protected. The protection of IBAs that are part of a country's Protected Area network falls under national legislation( Table 15). However, legal recognition and protection of IBAs that are not within existing Protected Areas varies within different countries; some countries around the world have developed a National IBA Conservation Strategy, whereas in others protection is completely lacking. Further details on the different designations and level of protection of each IBA are provided in the Site Accounts.

However, designation of sites as Protected Areas does not necessarily infer protection, and in reality many Protected Areas in the region receive insufficient resources to maintain adequate conservation measures.

## What are the risks of oil and gas development?

Most IBAs in the coastal and marine zone are at risk from current and potential risks of oil and gas development. Some impacts (such as pollution) may diminish the ecological integrity of the sites themselves, whilst birds utilising the IBAs may experience direct threats such as attraction to and collision with well-lit installations.

## What other conservation issues are significant?

As seabirds and shorebirds are highly impacted by several threats occurring in both their foraging areas and at their colonies, the impact of these threats is often cumulative, so it is especially important that the region's IBAs can continue to support them and remain naturally productive sites. Therefore, it is vital that the current and potential impact of oil and gas development on coastal zone and marine IBAs should be evaluated, taking into account already ongoing threats. Current threats to seabirds and shorebirds include fisheries bycatch, overfishing and shellfishing, destruction of intertidal and supratidal areas, climate change, pollution, invasive alien species, direct harvesting and disturbance (Dias *et al.* 2019, Iwamura *et al.* 2013). The importance of a network of IBAs cannot be underestimated for maintaining birds and biodiversity in the region in the face of these existing threats and the added future pressure from the expanding oil and gas sector.



Credit:Quimbaya/Flickr



**Table 15.** List of coastal zone and marine IBAs and their legal protection status between Mauritania and Sierra Leone.

Coastal IBAs with legal status	Coastal IBAs without legal status
<b>Mauritania</b>	
Banc d'Arguin National Park	Aftout es Sâheli
Cap Blanc	Canary current shelf-break South
Chott Boul	
<b>Senegal</b>	
Delta du Saloum	Cap Vert
Djoudj wetlands	Delta du Saloum - marine
Guembeul Avifaunal Reserve and St Louis lagoons (partial status)	Niayes (from Dakar to St Louis) (partial status)
Joal-Fadiouth	La Petite Côte (partial)
Kalissaye Avifaunal Reserve	Lac de Guiers
Ndiaël Basin (& Les Trois Marigots)	
Northern Senegal shelf break	
Parc National de Basse Casamance	
Parc National de la Langue de Barbarie	
Parc national des Iles de la Madeleine	
<b>The Gambia</b>	
Bao Bolon Wetland Reserve	Allahein to Kartung coast
Delta du Saloum - Niumi - Tanbi	
Niumi National Park	
Tanbi wetland complex	
Tanji River (Karinti) Bird Reserve	
<b>Guinea</b>	
Ile Alcatraz et Ile du Naufrage	
Ile Blanche	
Iles Tristao	
Konkouré	
Rio Kapatchez	
Rio Pongo	
<b>Guinea-Bissau</b>	
Arquipélago dos Bijagós	Rio Mansôa and Gêba estuary
Cantanhez forests	Rio Tombali, Rio Cumbija & Ilha de Melo
Ilha de Bolama – Rio Grande de Buba	
Lagoas de Cufada	
Rio Cacheu	
<b>Sierra Leone</b>	
Sierra Leone River Estuary	
Western Area Peninsula Forest National Park	
Yawri Bay	

# 5 Country overviews: key sites and oil & gas developments

## Mauritania



Credit: Ammar Hassan/Flickr



## **The coastal zone of Mauritania**

The Mauritanian coastline of 754 km from the Cap Blanc Peninsula to the Senegal River is generally sandy, flat and dotted with saltwater pools known as sebkhas (Ramos et al. 2017). The Senegal River (the boundary between Mauritania and Senegal) is the only permanent river in Mauritania; it fertilises the southern part of the country, providing an important amount of sediments to the sea. The most noticeable geographical feature of the Mauritanian coast is the Banc d'Arguin, a great bay stretching from Cap Blanc to Cap Timiris along the northern third of the coastline. Since 1976, about 12,000 km<sup>2</sup> of shallow water and adjacent desert have been included in the Parc National du Banc d'Arguin. This natural reserve, together with the Baie de l'Étoile, harbours an extensive seagrass community of >1,000 km<sup>2</sup>.

## **Network of protected areas in the coastal zone of Mauritania**

Mauritania has four coastal zone protected areas, which are relatively representative in terms of marine and coastal habitats, species and ecosystems. The Banc d'Arguin is foremost amongst sites, and plays an important role as a nursery area for fish, a breeding site for birds and turtles and in supporting significant numbers of waterbirds. Its satellite reserve, Cap Blanc, meanwhile, is the most important site in the world for Mediterranean Monk Seal. Protected areas in the Lower Senegal Delta complement these more northern sites.

In Mauritania, the legal status of protected areas is governed by several legal texts, notably the hunting and wildlife protection code, the framework law on the environment and the law relating to the Parc National du Banc d'Arguin <sup>10</sup>.

## **Ramsar and UNESCO sites in the coastal zone of Mauritania**

The Convention on Wetlands entered into force in Mauritania on 22 February 1983. Mauritania currently has four Ramsar Sites, three of which are in the coastal zone: the Banc d'Arguin, Chat Tboul and Diawling. The Banc d'Arguin is also a World Heritage Site, whilst the Senegal Delta is a transboundary Biosphere Reserve shared with Senegal.

## **EBSAs of Mauritania**

Mauritania has described four sites as EBSAs, namely the Timiris Canyon system, the permanent upwelling cell in the northern zone, the coastal habitats of the neritic zone (and the extreme north of Senegal), and the cold-water coral reefs off Nouakchott.

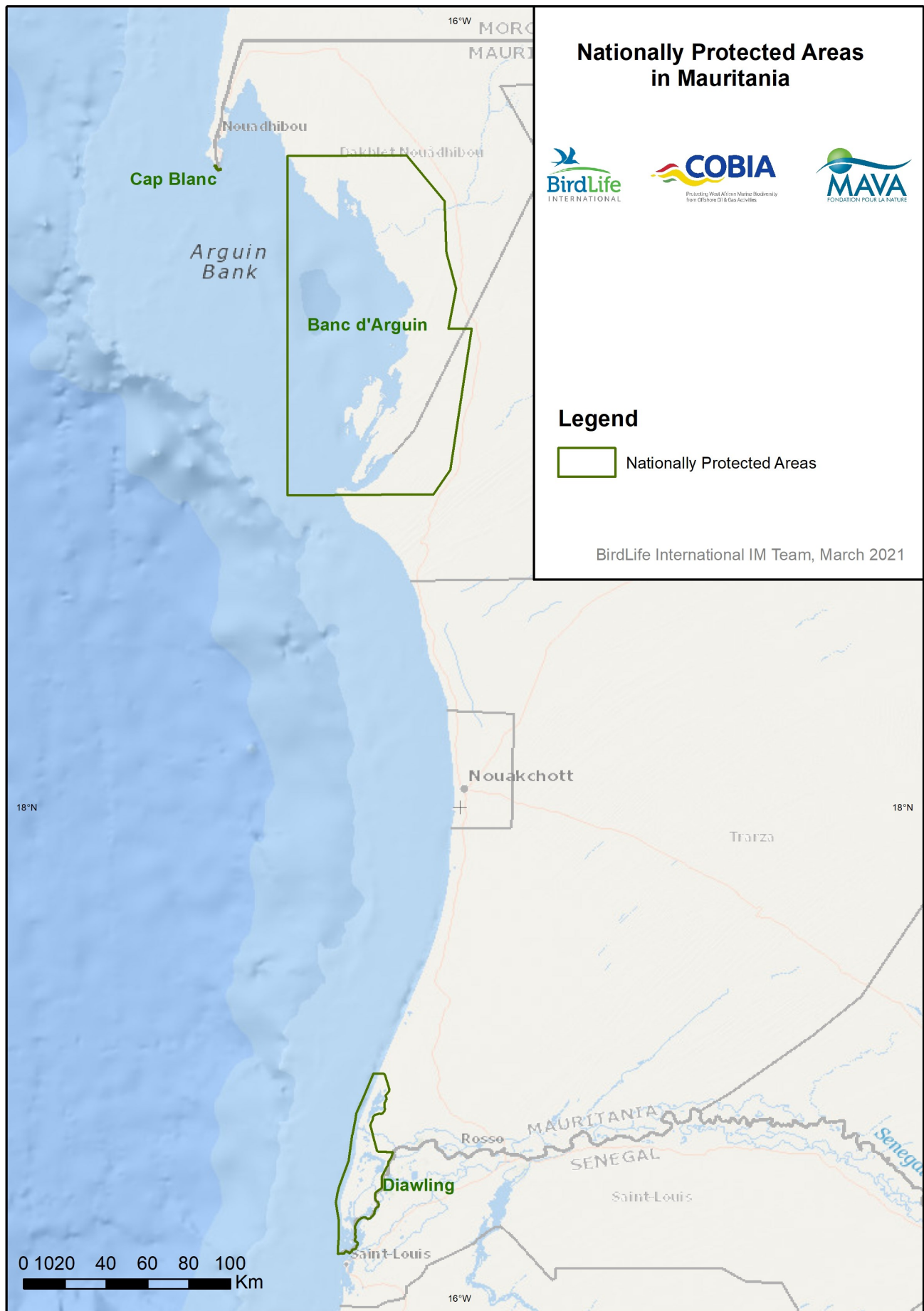
## **Oil & gas and protected areas in Mauritania**

Mauritania was the first country in the region to exploit its oil and gas reserves, and continues to develop this sector. The Grand Tortue Ahmeyim LNG well located between Senegal and Mauritania is a substantial new development, expected to generate its first gas in 2023. It is in close proximity to the coastal protected areas of Mauritania and Senegal from the Senegal Delta to Dakar.

Although Mauritania's protected areas of the Banc d'Arguin, Cap Blanc and Diawling are all located outside the oil and gas blocks, they are not immune to threats due to their close proximity to concessions. The Timiris Canyon EBSAs, cold-water coral reefs, key upwelling features and parts of the Senegal-Mauritania Transboundary Biosphere Reserve all fall within areas dedicated to offshore oil and gas activity.

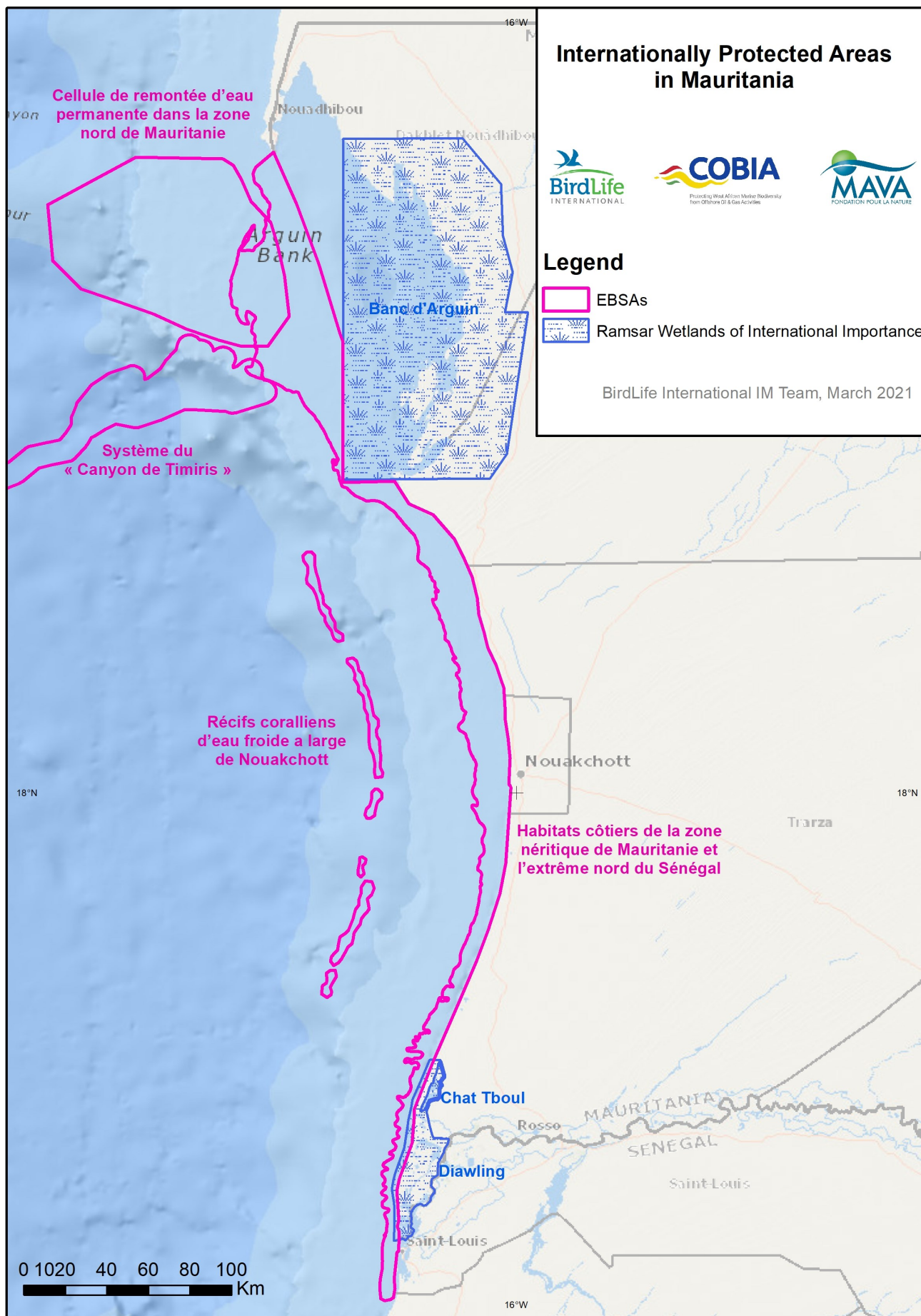
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10. Mauritanian law n° 97-006 of January 20, 1997 repealing and replacing law n° 75-003 of January 15, 1975 on the code of hunting and the protection of nature; Law n° 2000-045 of July 26, 2000 on the framework law on the environment and Law n° 2000/024 of January 19, 2000 relating to the Banc d'Arguin National Park..



**Map 21:** The Nationally Protected areas of Mauritania





**Map 22:** The Internationally Protected areas of Mauritania



# Senegal





## **The coastal zone of Senegal**

### **The coastline of Senegal can be divided into 3 main zones (Diaw *et al.* 1992):**

- La Grande Côte, from the mouth of the Senegal River to the Cap Vert Peninsula. The hydrology of the Lower Senegal River Delta is largely regulated by the Manantali and Diama hydroelectric dams built at the end of the 1980s. Along la Grand Côte, the Niayes region comprises coastal dune complexes with a number of flooded interdune depressions, which provide a setting for intense market gardening on the outskirts of Dakar. The niayes are true oases, 'ecological niches' to which the immediate vicinity of the ocean confers a unique climate; they also contain peat deposits.
- La Petite Côte, a large open and relatively sheltered gulf between Dakar and the Pointe de Sangomar, includes the Saloum Delta. To the south, the coastal belt is largely dominated by mangrove vegetation and salty tannin-rich soils, which mark a break with agricultural areas inland.
- The Lower Casamance is an extensive estuarine region defined by the internal limit of the upwelling of tides, extending from The Gambia to Guinea-Bissau, and enclosing the wide valleys of the Casamance River and its tributaries. The Lower (or Maritime) Casamance is also characterised by mudflats criss-crossed by deep meandering channels. Central Casamance mangrove mudflats are saline zones without vegetation reminiscent of the Saloum.

### **Network of protected areas in the coastal zone of Senegal**

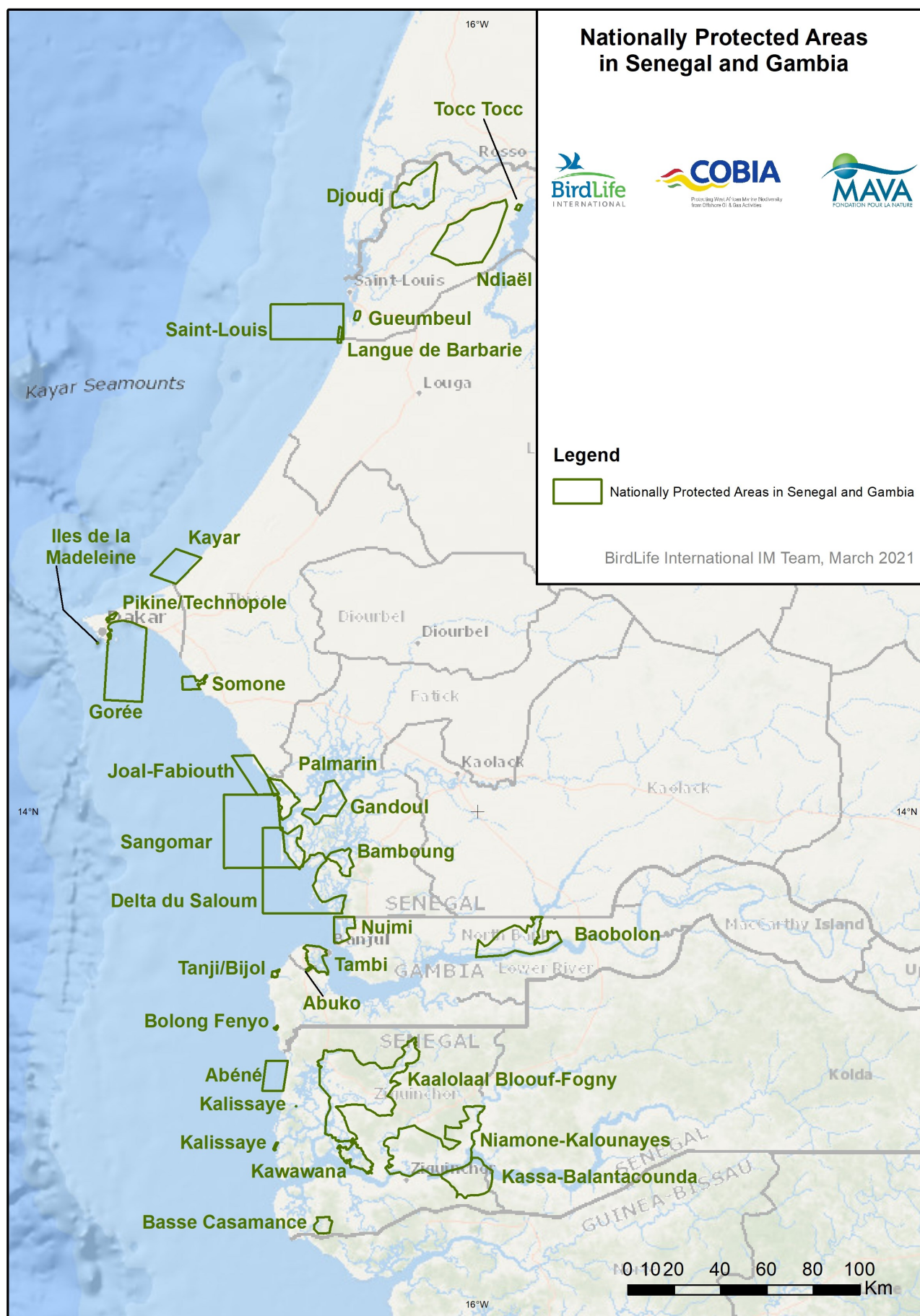
Senegal has a range of protected areas of different designations located along the coastline, and in the estuaries of the Senegal, Sine, Saloum and Casamance rivers. These sites comprise national parks, MPAs, biosphere reserves, natural reserves and local community heritage areas. Senegal's protected areas are largely governed by the Hunting and Wildlife Protection Code, the Forestry Code, the Fishing Code, the Environment Code, the Maritime Public Domain Code, the Mining Code and the Merchant Marine Code. The latter three are the main legal instruments for control of activities in coastal protected areas, as well as Law 64-46 of the National Domain Code and Law 2013-10 of the General Code of Local Authorities.

### **Ramsar and UNESCO Sites in the coastal zone of Senegal**

The Convention on Wetlands entered into force in Senegal on 11 November 1977. The country currently has eight sites listed as Ramsar Sites, with a total area of 157,137 ha, all of which are in the coastal zone (including the Lower Senegal River Delta). Senegal has one natural World Heritage Site (Parc National des Oiseaux du Djoudj) and two Biosphere Reserves, one of which is a transfrontier site, shared with Mauritania.

### **EBSAs of Senegal**

In Senegal, four EBSAs have been officially identified and described, namely Cayar Seamount, Cayar Canyon, the Saloum Delta and the Mouth of Casamance.



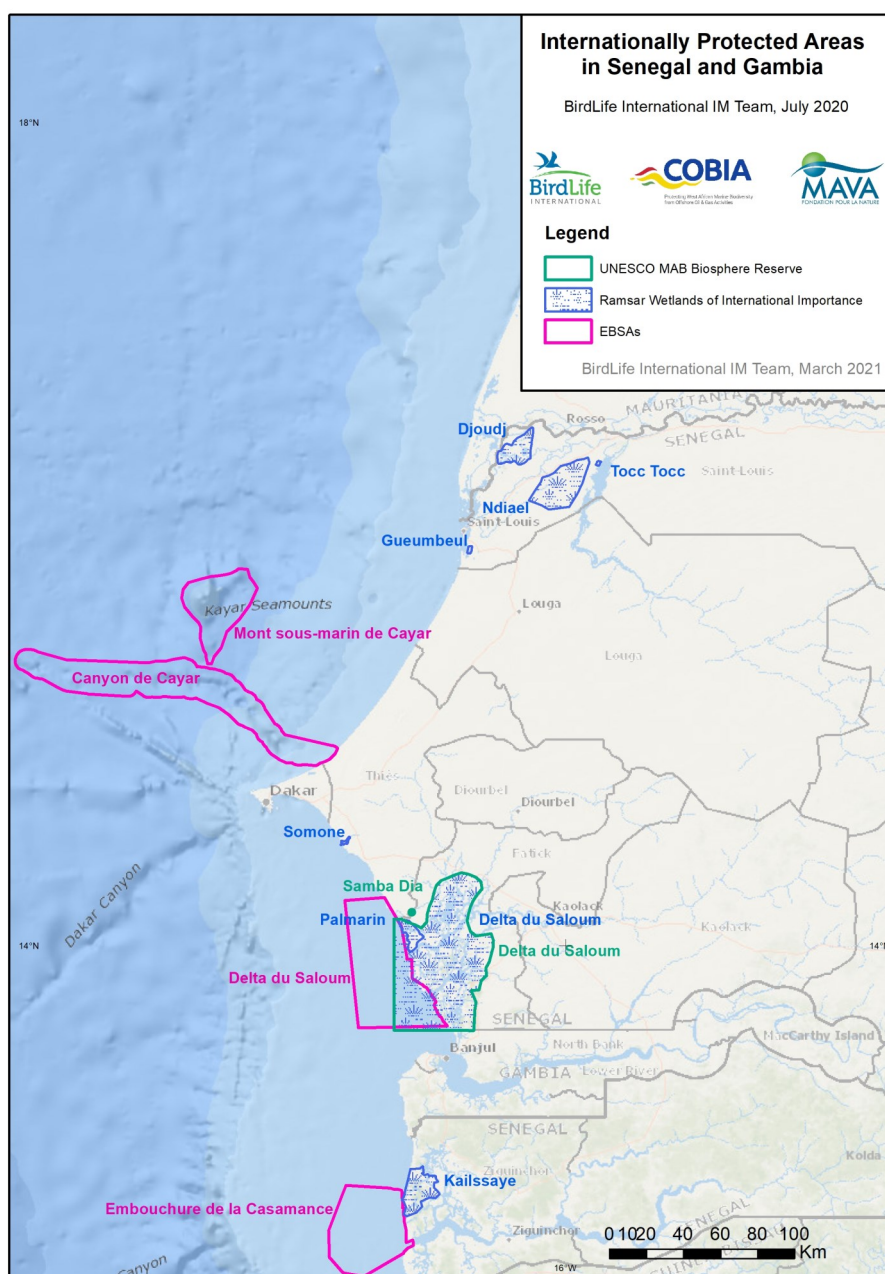
**Map 23:** Nationally Protected Areas in Senegal and Gambia



## Oil & Gas and protected areas in Senegal

The oil and gas discoveries in Senegal contribute a potential risk to the coastal protected areas, and the different blocks are close to or partially within protected areas. The Saint-Louis MPA and the Langue de Barbarie NP are in close proximity to the Grande Tortue-Ahmeyim LNG development, which is due to start production in 2023. It is located in the deep offshore Saint-Louis Block, reaching to just a few kilometres from the western limits of the Saint-Louis MPA. The deep Cayar Offshore Block constitutes a risk for the Cayar MPA, the Cayar EBSA and the Cayar Seamount EBSA, all of which are included within the Cayar Offshore Block.

From Dakar to the Petite Côte of Senegal, Iles de la Madeleine NP, Gorée MPA, Somone MPA and some coastal sites are all included within the Rufisque offshore block, while the Joal-Fadiouth MPA, the Palmarin Community Reserve, the Sangomar MPA, the Saloum Delta NP and the Saloum Delta EBSA are all within the Diffère Offshore block. The exploration around the Saloum Delta and the discovery of oil and gas in the Rufisque and Sangomar Deep Offshore Blocks represents a risk for all protected areas of the Petite Côte. Further south, the Senegal Offshore South Block encompasses the Abéné MPA, part of Kalissaye Ornithological Reserve and the Embouchure Casamance EBSA.



**Map 24:** Internationally Protected Areas in Senegal and Gambia



# Guinea-Bissau



Credit: Tim Oun/Unsplash



## **The coastline of Guinea-Bissau**

The coastline of Guinea-Bissau is 350 km in length, indented by seven river systems (from Sucujaque in the north to Cacine in the south), whilst offshore lies the Bijagós Archipelago, comprising 88 islands and islets (Dodman *et al.* 2004). Guinea-Bissau is central to 'the Rivers of the South' region, from The Gambia to Sierra Leone. The complex of estuaries and rivers is dotted with islands and islets, and the gently sloping coastal plain enables the tidal influence to extend up to 100 km inland along open channels with wide estuaries (Pennober 2003, Mendy 1991). This gradually changes eastwards from gently undulating relief to inland plateaus. A complex network of channels and marigots is largely colonised by extensive mangrove forests. The coastline comprises sandy beaches, extensive mangrove swamps and mudflats and sandbanks; the total surface area of intertidal flats extends to some 1,570 km<sup>2</sup> (Dodman *et al.* 2004).

## **Network of protected areas in the coastal zone of Guinea-Bissau**

Guinea-Bissau has several important protected areas along the coastline and in the estuaries and island area of the Bijagós. The representative habitats and ecosystems include vast expanses of mangroves and tidal flats. The largest protected areas in the continental coastal zone are Cantanhez and Cacheu.

## **Ramsar and UNESCO Sites in the coastal zone of Guinea-Bissau**

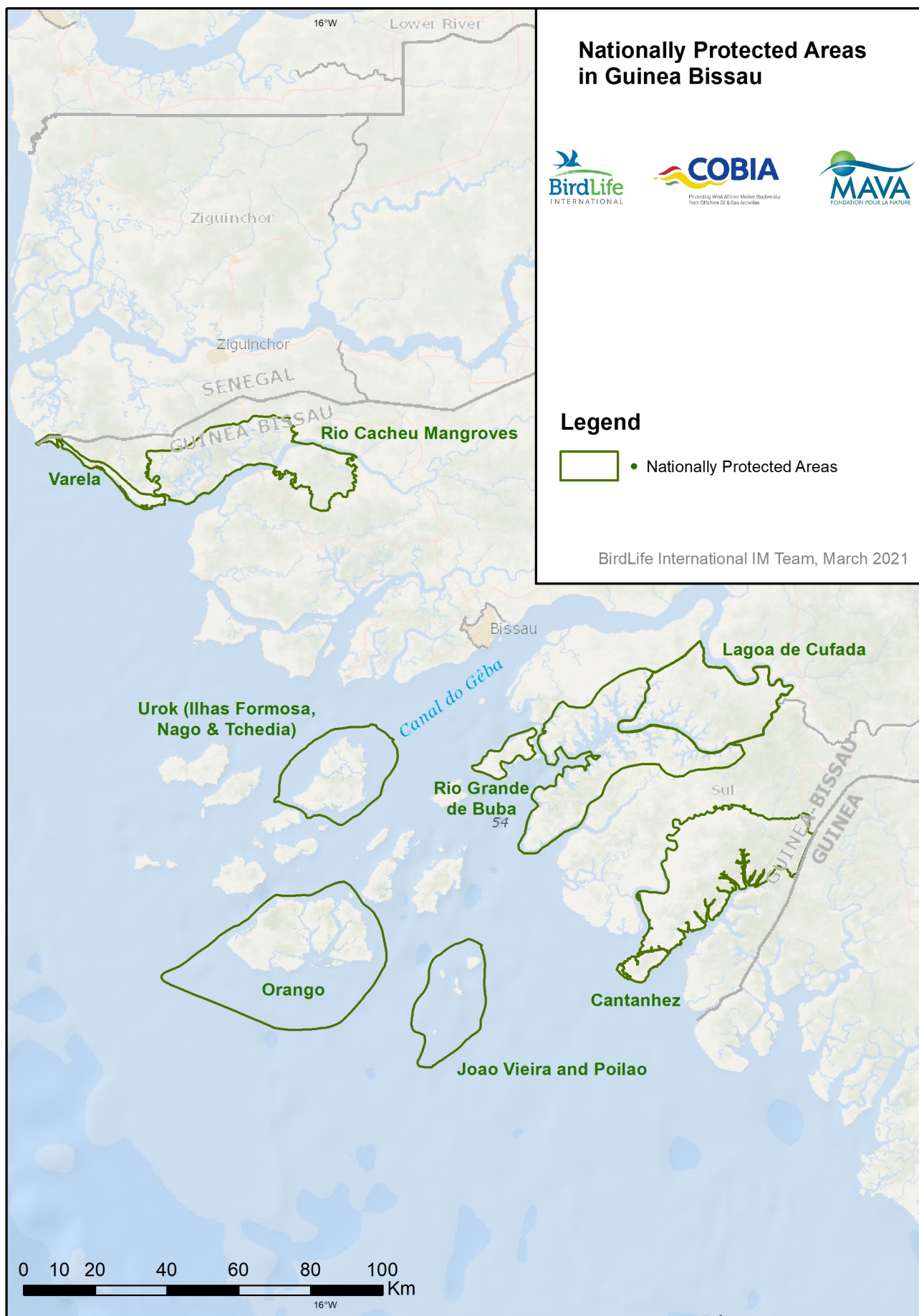
The Convention on Wetlands entered into force in Guinea-Bissau on 14 May 1990 and the country currently has four Ramsar Sites, with a total area of 1,189,633 hectares, of which three are in the coastal part of the country. These include the Bolama Bijagós Archipelago, which is also a UNESCO Biosphere Reserve.

## **Guinea-Bissau EBSAs**

Guinea-Bissau has a single EBSA – the Bolama Archipelago.

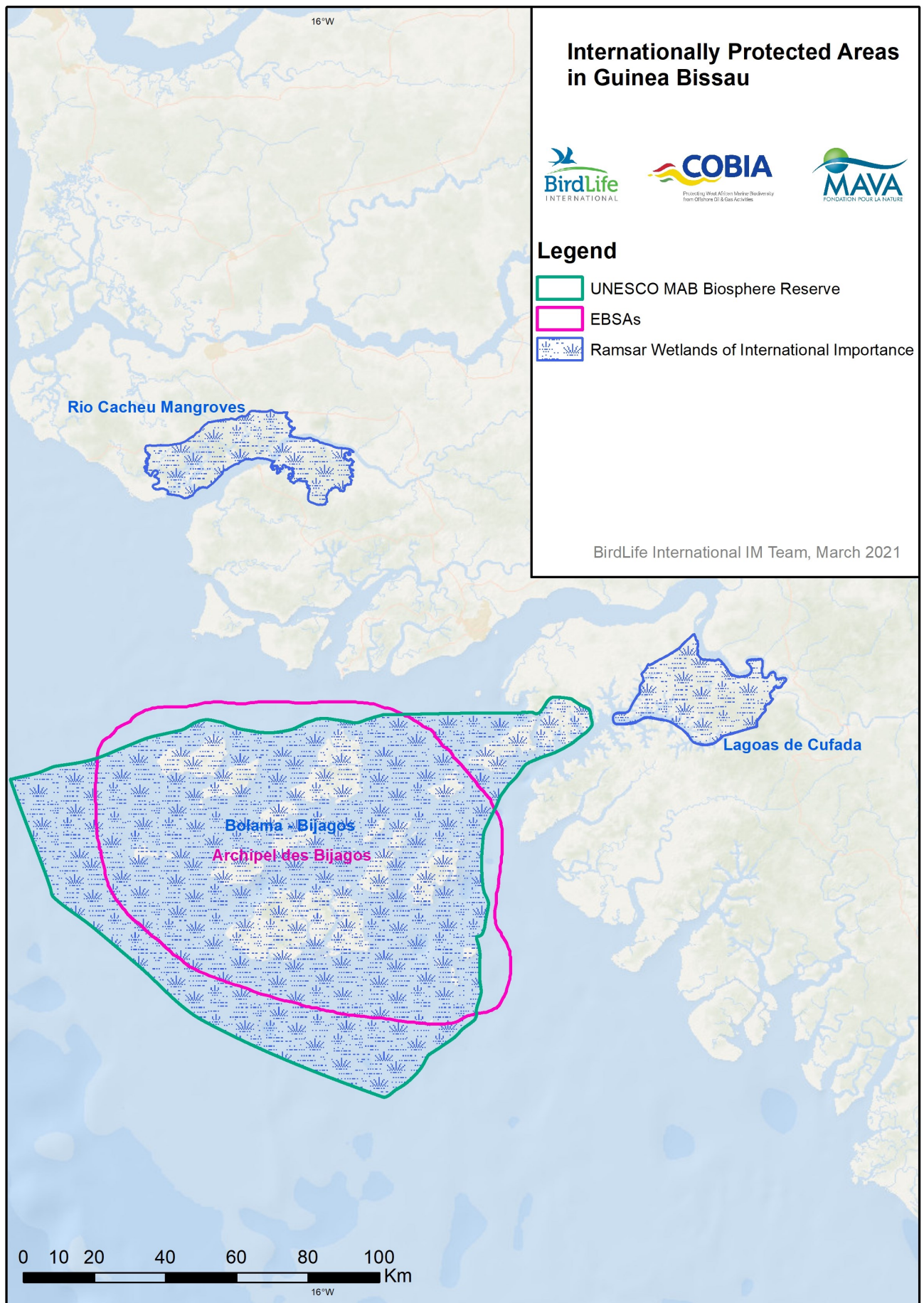
## **Oil & Gas and protected areas in Guinea-Bissau**

Guinea-Bissau's coastal zone protected areas are either close to or within the oil blocks, principally blocks 1 and 3. The boundaries of Block 1 are just at the mouth of the Rio Cacheu at the western boundary of the park. The Bolama-Bijagós Biosphere Reserve and Ramsar Site is included within Block 3, except for Orango and João Vieira e Poilão National Parks. However, even if these sites are excluded from the exploration areas they are all threatened by a potential gas or oil discovery in Block 3. Block 3 also poses a threat to part of Cantanhez National Park and also Cufada.



**Map 25:** Nationally Protected Areas in Guinea Bissau





**Map 26:** Internationally Protected Areas in Guinea Bissau

# Sierra Leone



Credit: Joëlle/Flickr



## **The coastal zone of Sierra Leone**

The coastline of Sierra Leone is endowed with around 350 km of sandy beaches, notably from the Freetown Peninsula to the south, interrupted by a few rocky headlands, bays and mangroves. The beaches comprise mainly fine-grained sand, which offers a suitable habitat for a variety of invertebrate fauna. Sierra Leone's sandy beaches are in generally good condition, although some show signs of erosion, such as Goderich, Lakka and Hamilton beaches, mainly due to sand extraction. The Lumley beach is probably undergoing erosion due to the changing regime of the sea accelerated by sea level rise. Most beaches outside the western area are used mainly as fish landing sites, e.g. Tombo, Shenge, Konakridi, Kambia, Pujehun, Port Loko, Moyamba and Bonthe. The most undisturbed beaches are along Turner's peninsular (Environment Protection Agency 2015).

The coastline north of Freetown is dominated by mangroves and is largely devoid of beaches. The bays and estuaries support diverse ecosystems, vital for local livelihoods. Extensive fringes of mangroves, tidal swamps and intertidal mud flats occur within the bays and estuaries. Due to their location near terrestrial sediment sources, the estuaries and bays contain large amounts of nutrients. The combination of this nutrient supply with generally shallow water gives rise to a diverse and rich flora and fauna.

### **Sierra Leone's Coastal Protected Areas Network**

Along the extensive coastal zone are many indentations and estuarine ecosystems, four of which constitute the most important coastal wetlands in the country: Scarcies River Estuary, Sierra Leone River Estuary, Yawri Bay and Sherbro River Estuary (RAMPAO 2017), all of which have been designated as MPAs, although their status and demarcation is not yet clear or readily available. Sierra Leone's only national park in the coastal zone is the Western Area Peninsula Forest, which is a tropical forest site, not directly impacted by offshore developments.

### **Ramsar site in the coastal zone of Sierra Leone**

The Convention on Wetlands entered into force in Sierra Leone on 13 April 2000. Sierra Leone currently has one Ramsar site, the Sierra Leone River Estuary, with a total area of 295,000 hectares. Sierra Leone has no World Heritage sites or Biosphere Reserves.

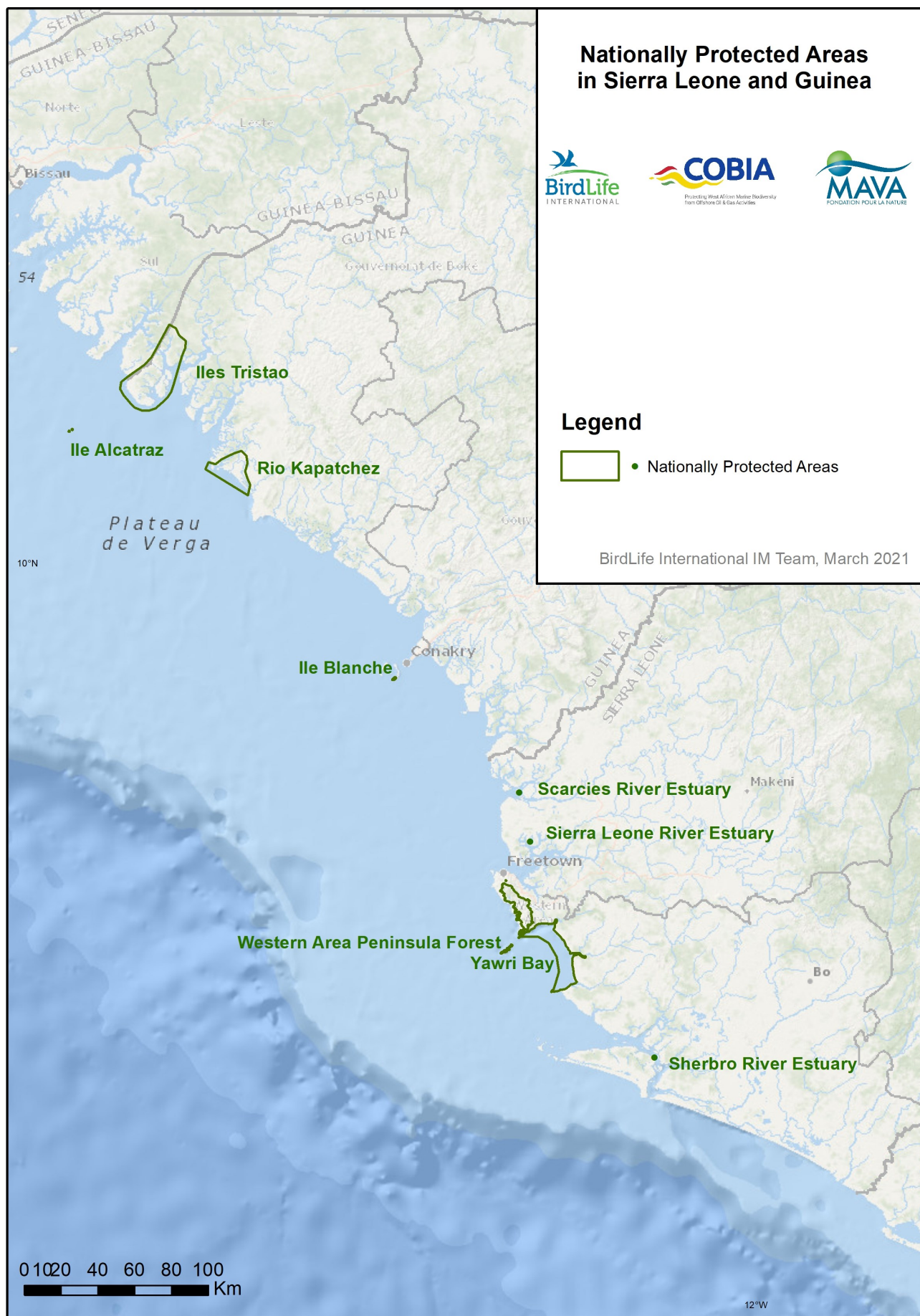
### **Sierra Leone EBSA**

Sierra Leone has a single EBSA, the Yawri Complex.

### **Oil & Gas and protected areas in Sierra Leone**

The outlook for the oil and gas sector in Sierra Leone over the coming decade is very likely to involve significant increases in exploration and exploitation of proven reserves by current producers (Environment Protection Agency 2015), and Sierra Leone could become a major oil producer in the future. Sierra Leone would need to put in place a wide variety of policy tools and strategies in order to protect the marine environment from unacceptable pollution derived from oil and gas activities. The risk that oil exploration will result in a blowout or a major oil spill is regarded as significant in a 5-year perspective and high in a 50-year perspective, whilst the risk that catchment disturbance due to mining activities causes siltation of the estuaries is high in a 5-year period and significant in a 50-year perspective (Environment Protection Agency 2015).

The Sierra Leone River Estuary and all MPAs would be under potential threat from oil and gas activities, as would other coastal habitats and ecosystems. There are many unprotected areas along the coastline and in territorial waters known to support key habitats and ecosystems for wildlife.



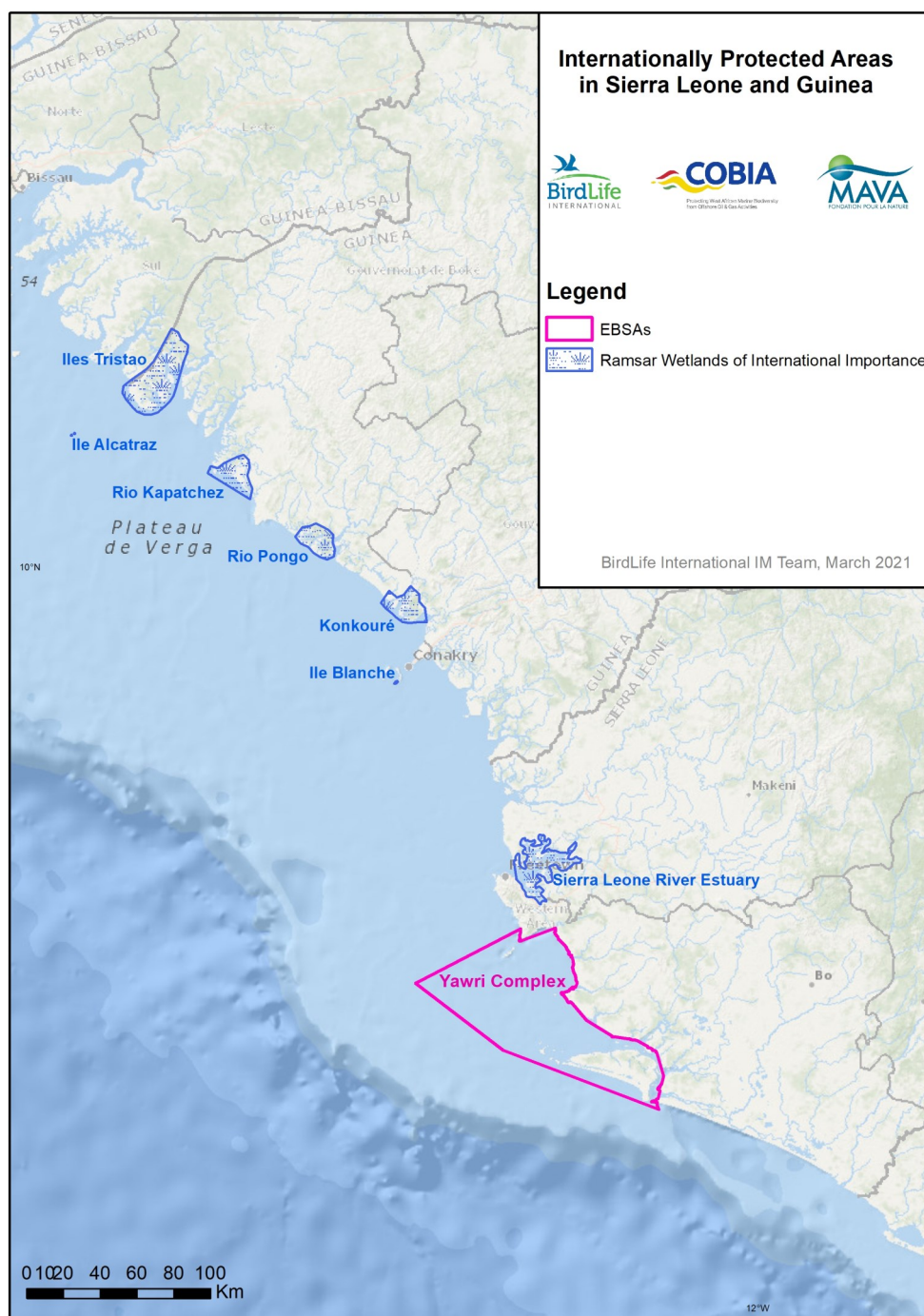
**Map 26:** Nationally Protected Areas in Sierra Leone Guinea



## Oil & Gas and protected areas in Sierra Leone

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The Sierra Leone River Estuary and all MPAs would be under potential threat from oil and gas activities, as would other coastal habitats and ecosystems. There are many unprotected areas along the coastline and in territorial waters known to support key habitats and ecosystems for wildlife.



**Mauritania**



# Aftout es Sâheli

Country: Mauritania

Admin region: Trarza

Coordinates: 17°22'N 16°08'W

Altitude -2–5 m

Designation Status: Partially included in the Réserve de Biosphère Transfrontière du Delta du fleuve Sénégal (RBTDS); IBA criteria A4, B1a, B3a, B3b - 120,000 ha

## Site description

Aftout es Sâheli is a long, narrow – 4 to 5 km wide - coastal lagoon that extends for nearly 200km, running from south of Nouakchott to the southern border. It is 10km wide and isolated from the sea by a line of dunes; it is connected by a tributary to the Senegal River Delta. When the Senegal River floods, fresh water flows into the lagoon, either along channels or via floodplains. Thus, the salinity of the lagoon varies depending on the rains, and it can dry out completely. Riverine floods and desiccation are frequent events, while inundation of seawater is relatively rare. As parts of the lagoon are about 1.5m below sea level some seawater seeps into the lagoon.

The dunes on the seaward side, which form a barrier 3km wide, are exposed to tides and strong winds and are highly mobile with restricted vegetation. In contrast, the dunes on the landward side are relatively stable and are mainly covered with shrubs. The interdune areas support well-developed vegetation including *Borassus aethiopum*. The edges of the lagoon are dominated by *Arthrocnemum glaucum* and *Tamarix sp.*, while dried out areas are unvegetated due to formation of *sebkhas* (saline mudflats). Rainfall varies from less than 100-150mm per year.

## Birds & Biodiversity

There is considerable annual variation in the numbers and diversity of waterbirds, dependent largely upon the amounts of seawater or fresh water coming into the lagoon. Along with neighbouring Chatt Boul, this is the only breeding site in West Africa for Greater Flamingo *Phoenicopterus roseus* and Lesser Flamingo *Phoeniconaias minor*. Northern Pintail *Anas acuta*, Northern Shoveler *Spatula clypeata*, Great Cormorant *Phalacrocorax carbo*, and Eurasian Spoonbill *Platalea leucorodia* may also occur in good numbers.

Species	Red List Category	Site estimates from counts (2014-2017)
<u>Northern Shoveler <i>Spatula clypeata</i></u>	LC	10,060-15,442
<u>Northern Pintail <i>Anas acuta</i></u>	LC	15,183-21,005
<u>Greater Flamingo <i>Phoenicopterus roseus</i></u>	LC	20,311-37,863
<u>Lesser Flamingo <i>Phoeniconaias minor</i></u>	NT	6,552-12,000
<u>Eurasian Spoonbill <i>Platalea leucorodia</i></u>	LC	722-1,202
<u>Great Cormorant <i>Phalacrocorax carbo</i></u>	LC	1,055-2,378
<u>Pied Avocet <i>Recurvirostra avosetta</i></u>	LC	664-749

**Table 16.** Site estimates of selected species

### Conservation issues

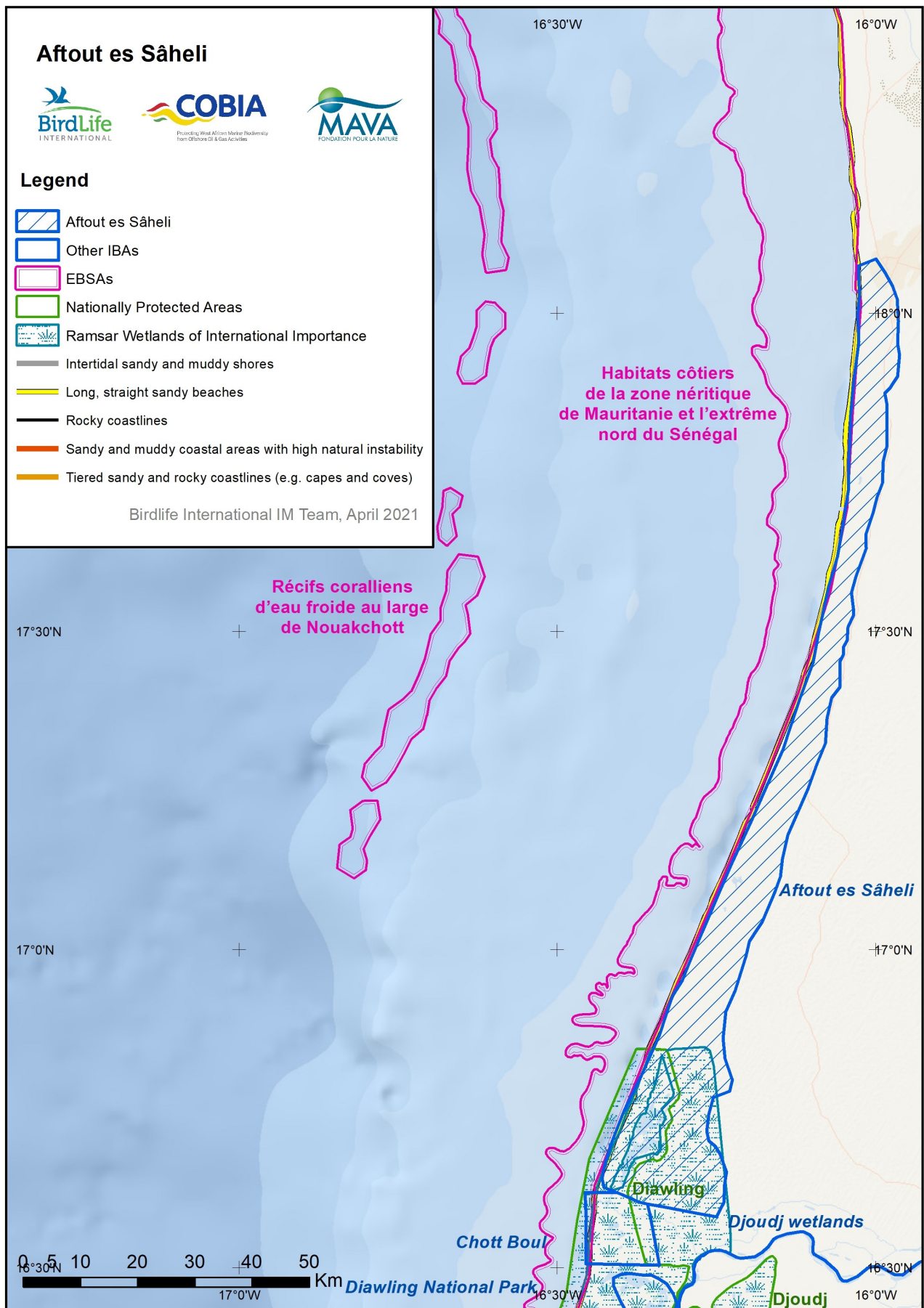
There is little economic activity in the area. The soils of the area are too saline for agriculture, and the human population is very sparse. However, nomads graze their livestock on the dunes and on the lagoon floodplain, and there are some temporary fishing camps on the beach. The site is an important nursery for commercial and other fish and shrimp species, though the Dama and Manantali dams have altered the normal hydrological cycle of the delta, impacting spawning grounds. Development projects have resulted in some pesticide and fertilizer run-off into the lagoon, which concentrates through evaporation. Some bird hunting occurs, whilst there is also predation by carnivores such as African Wolf *Canis lupaster*. Human disturbance at the site can disrupt breeding, feeding and roosting birds.

Conservation measures include set up of a monitoring team to identify violations and raise awareness among local populations. Additionally, the nesting sites of the Lesser Flamingo are protected from January to April.

### Risk from Oil and Gas

A potential risk from any onshore infrastructural developments is the partial destruction of the dunes, including extraction of sand for construction, which could lead to inundation of the lagoon by seawater.





**Map 29:** Aftout es Sâheli

# Parc National du Banc d'Arguin

Country: Mauritania

Admin region: Dakhlet Nouâdhibou, Inchiri

Coordinates: 20°07'N 16°16'W

Altitude 0–15 m

Designation Status:

IBA criteria A3, A4, B1a, B3a, B3b – 1,173,000 ha

Ramsar - 1,200,000 ha

World Heritage criteria ix, x – 1,200,000 ha

National Park – 1,207,500 ha

## Site description

The Parc National du Banc d'Arguin (PNBA) was established in 1976 and protects 40% of the Mauritanian coastline, between Nouakchott and Nouâdhibou. This vast coastal site includes shallow open sea <5m deep and seagrass beds of 60,000-80,000ha, intertidal flats of 55,000ha and channels and creeks, as well as coastal desert habitats. There are also numerous low-lying offshore islands. Cap Blanc (see Map 30) is a satellite reserve of the park.

Over 190 plant species have been recorded at the site. Coastal vegetation includes clumps of mangrove *Avicennia africana* as well as the grass *Spartina maritima* and species of *Chenopodiaceae*. The terrestrial part of the site includes areas of Saharan vegetation, including trees (e.g. *Acacia tortilis*, *Balanites aegyptiaca*) and herbaceous species (e.g. *Panicum turgidum*, *Cassia italica*). The dunes on the southern fringe are dominated by *Stipagrostis pungens*, *Cornulaca monacantha*, *Euphorbia balsamifera* and *Calligonum comosum*. Adjacent to the site lies one of the world's richest fishing grounds, resulting from upwellings off Râs Nouâdhibou, Cap Blanc and Cap Timiris and the prevalence of seagrass beds and other productive shallow-water benthic habitats.

## Birds & Biodiversity

The Banc d'Arguin holds the world's largest concentrations of non-breeding waders, and supports more migratory birds along the Atlantic coast of Africa than any other site. There are also substantial populations of breeding waterbirds, including endemic subspecies of the Eurasian Spoonbill *Platalea leucorodia balsaci* and Grey Heron *Ardea cinerea monicae*. It has been estimated that as many as 2,250,000 migrant waders winter at this site, some 30% of Palearctic waders using the East Atlantic Flyway. However, total bird numbers have been declining since the first complete census in 1980 (2,384,000 birds), with 1,725,000 birds counted in the 2017 census, and 1,459,000 birds counted in 2014 (Oudman *et al.* 2017). The average density of shorebirds on the mudflats of the PNBA is a very high 4,200 individuals per km<sup>2</sup>. The extensive desertic habitat of the park hosts a different bird fauna, including rare species such as the Nubian Bustard *Neotis nuba* (NT).



Species	Red List Category	Site estimate (2014-2017)
<u>Greater Flamingo <i>Phoenicopterus roseus</i></u>	LC	35,139-95,943
<u>Eurasian Spoonbill <i>Platalea leucorodia</i></u>	LC	6,431-8,890
<u>Little Egret <i>Egretta garzetta</i></u>	LC	1,344-2,152
<u>Western Reef-egret <i>Egretta gularis</i></u>	LC	1,173-1,638
<u>Great White Pelican <i>Pelecanus onocrotalus</i></u>	LC	4,327-7,775
<u>Long-tailed Cormorant <i>Microcarbo africanus</i></u>	LC	1,901-2,938
<u>Great Cormorant <i>Phalacrocorax carbo</i></u>	LC	7,879-14,589
<u>Eurasian Oystercatcher <i>Haematopus ostralegus</i></u>	NT	6,334-7,507
<u>Grey Plover <i>Pluvialis squatarola</i></u>	LC	26,070-30,202
<u>Common Ringed Plover <i>Charadrius hiaticula</i></u>	LC	48,047-75,137
<u>Kentish Plover <i>Charadrius alexandrinus</i></u>	LC	4,899-8,887
<u>Whimbrel <i>Numenius phaeopus</i></u>	LC	24,248-27,337
<u>Eurasian Curlew <i>Numenius arquata</i></u>	NT	5,170-5,723
<u>Bar-tailed Godwit <i>Limosa lapponica</i></u>	NT	172,154-247,894
<u>Ruddy Turnstone <i>Arenaria interpres</i></u>	LC	9,563-11,074
<u>Red Knot <i>Calidris canutus</i></u>	NT	167,320-200,565
<u>Curlew Sandpiper <i>Calidris ferruginea</i></u>	NT	52,721-76,069
<u>Sanderling <i>Calidris alba</i></u>	LC	45,820-49,437
<u>Dunlin <i>Calidris alpina</i></u>	LC	567,432-852,934
<u>Little Stint <i>Calidris minuta</i></u>	LC	25,042-38,808
<u>Common Greenshank <i>Tringa nebularia</i></u>	LC	5,581-6,063
<u>Common Redshank <i>Tringa totanus</i></u>	LC	65,139-85,538
<u>Slender-billed Gull <i>Larus genei</i></u>	LC	3,352-4,855
<u>Lesser Black-backed Gull <i>Larus fuscus</i></u>	LC	10,409-16,391
<u>Little Tern <i>Sternula albifrons</i></u>	LC	415-999
<u>Common Gull-billed Tern <i>Gelochelidon nilotica</i></u>	LC	331-620
<u>Caspian Tern <i>Hydroprogne caspia</i></u>	LC	2,865-4,631
<u>Waterbirds</u>	n/a	997,216-1,797,885

Table 17. Site estimates of selected species

The large and diverse marine fauna includes a number of taxa of conservation concern, including four species of turtles: Leatherback Turtle *Dermochelys coriacea* (VU), Green Turtle *Chelonia mydas* (EN), Loggerhead Turtle *Caretta caretta* (VU) and Hawksbill Turtle *Eretmochelys imbricata* (CR); and numerous species of cetaceans, e.g. Harbour Porpoise *Phocoena phocoena*, Atlantic Humpback Dolphin *Sousa teuszii* (CR), Common Bottlenose Dolphin *Tursiops truncatus*, Rough-toothed Dolphin *Steno bredanensis* and Killer Whale *Orcinus orca* (DD). Dorcas Gazelle *Gazella dorcas* (VU), Fennec Fox *Vulpes zerda* and Rüppell's Fox *Vulpes rueppellii* occur in terrestrial parts of the site.

### Conservation issues

The key conservation issue is fishing. Within the protected area, fishing is currently mainly limited to artisanal fishing by the Imraguen people whose activities have formed an integral part of the Park's ecosystem for several centuries. Outside the protected area, however, numerous foreign fishing fleets trawl the deeper waters and the site is under pressure to allow increased fishery activities within its limits. Any such increase may threaten both the conservation value of the park and its economic importance as the nursery ground for fish currently exploited outside the park. Recent evidence suggests that some fish stocks are already over-exploited and there has been some destruction of shallow-water vegetation within the site's boundaries by the activities of trawlers. A reduction in prey availability is also believed to be a probable reason for the decline of some populations of piscivorous birds. Other threats include pollution from industrial development at Nouâdhibou and the illegal killing of marine turtles.

Rising sea levels and/or especially high tides pose a risk to breeding birds. Efforts have been made to secure some sites, such as the protection of breeding spoonbills on Ile de Nair.

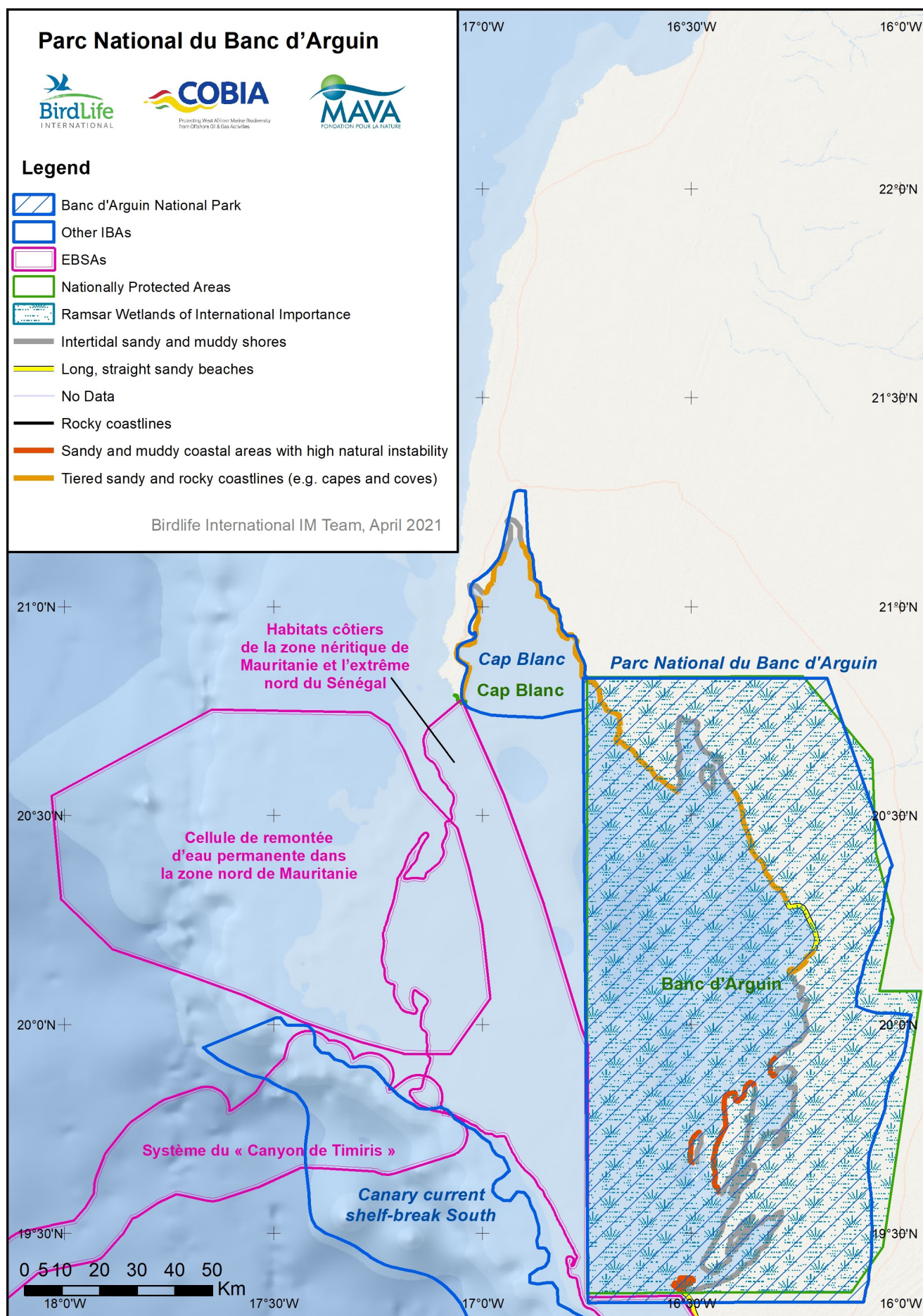
Any developments that increase unsustainable use of the PNBA are threats to the site's ecological integrity; examples include the new city of Chami Moughataa under development in the immediate vicinity of the park, and the Tanit port north of Nouakchott and related infrastructures.

### Risk from Oil and Gas

The proximity of oil and gas concessions to the PNBA and the ongoing development of the oil and gas sector in Mauritania are indicative of potential impacts on the park and its ecosystem, especially to biodiversity reliant on the shallow coastal waters. A major pollution incident could have devastating impact at the site, such as oil deposits on mudflats – key foraging areas for shorebirds.

Any infrastructure or increased traffic through the park as a result of new developments would also pose a risk, especially of disturbance.





**Map 30: Parc National du Banc d'Arguin**

# Canary current shelf-break South

Country: Mauritania

Altitude 0m

Designation Status:  
IBA criteria A4, B3a - 489,745 ha

## Site description

The site is located on the Northern Mauritanian shelf-break 50-1000m deep of the highly productive waters of the Canary current. It is adjacent to the Parc National du Banc d'Arguin.

## Birds & Biodiversity

The site is known to be intensively used for foraging by several seabird species, including Cory's shearwaters *Calonectris borealis* from the Canaries during the breeding period and from Selvagens during the post-breeding period, and several migrants such as Northern Gannet *Morus bassanus*, Pomarine Jaeger *Stercorarius pomarinus*, European Storm-petrel *Hydrobates pelagicus*, various species of terns and Red Phalarope *Phalaropus fulicarius*. The presence of large numbers of seabirds indicates a productive area for fish.

The area is also important for marine mammals, and various species of whales and dolphins have been recorded, including Blue Whale *Balaenoptera musculus*, Bryde's Whale *Balaenoptera edeni* and Atlantic Spotted Dolphin *Stenella frontalis*. Loggerhead Turtle *Caretta caretta* has also been recorded.

Species	Red List Category	Years of estimate	Population estimate
European Storm-petrel <i>Hydrobates pelagicus</i>	LC	2012	56,000
Band-rumped Storm-petrel <i>Hydrobates castro</i>	LC	2012	8,000
Cory's Shearwater <i>Calonectris borealis</i>	LC	2000-2005	13,000
Audubon's Shearwater <i>Puffinus lherminieri</i>	LC	2012	900-4,000
Northern Gannet <i>Morus bassanus</i>	LC	2012	65,000
Red Phalarope <i>Phalaropus fulicarius</i>	LC	2012	109,800
Pomarine Jaeger <i>Stercorarius pomarinus</i>	LC	2012	26,250
Great Skua <i>Catharacta skua</i>	LC	2012	3,000

**Table 18.** Populations of IBA trigger species.

## Risk from Oil and Gas

This marine IBA falls within some of oil Mauritania's concession blocks. Thus, the main potential risks from oil and gas operations described in section 5b) are possible.

See Banc d'Arguin National Park map



# Cap Blanc (Satellite Reserve & IBA) & Baie de l'Étoile

Country: Mauritania

Admin region: : Dakhlet Nouâdhibou

Coordinates: : 20°58'N 17°01'W

Altitude 0–5 m

Designation Status:

IBA criteria B3a, B3b - 310,000 ha

Satellite Reserve – 210 ha

Proposed MPA – 1,200 ha

## Site description

The Baie du Lévrier is the largest bay north of the Banc d'Arguin, bordered to the west by the long Cap Blanc peninsula (Presqu'île du Cap Blanc), which terminates at its southerly point in Râs Nouâdhibou and the Cap Blanc Satellite Reserve, whose coastline is steep and rocky. The IBA includes the whole Baie du Lévrier and the eastern part of the peninsular, including the Cap Blanc reserve and the Baie de l'Étoile proposed MPA, which is a 1,200 ha shallow basin midway along the peninsular. The geology of the site is predominantly sandstone and limestone. The area receives only 24mm rainfall per year on average, and some years there is none.

The vegetation of the terrestrial areas includes *Euphorbia balsamifera*, *Panicum turgidum* and *Frankenia corymbosa*. The aquatic and littoral flora includes seagrasses, *Suaeda arguinensis*, *Arthrocnemum macrostachyum* and *Sesuvium portulacastrum*. The Baie de l'Étoile includes 72 ha of *Spartina maritima* salt marshes and seagrass beds: 133 ha of *Zostera noltii* and 113 ha of *Cymodocea nodosa* (Brêthes & Mayif 2013).

## Birds & Biodiversity

The site supports internationally important numbers of waterbirds, numbering up to 50,000. There is a roost for Western Marsh-harrier *Circus aeruginosus* in marshes of the Baie de l'Étoile. The Cap Blanc reserve is home to the world's largest population of Mediterranean Monk Seal *Monachus monachus* (EN). Additionally, four species of turtles have been recorded, all globally threatened: Leatherback Turtle *Dermochelys coriacea* (VU), Green Turtle *Chelonia mydas* (EN), Loggerhead Turtle *Caretta caretta* (VU) and Hawksbill Turtle *Eretmochelys imbricata* (CR). The Baie de l'Étoile is an important nursery for shrimps and various fish of commercial interest, including mullets, seabass and sole, as well as sharks and rays. This bay also has a high benthic faunal diversity, including three species of endemic crustaceans: *Kalliapseudes mauritanicus*, *Calozodion simile* and *Urothoe atlantica* (Brêthes & Mayif 2013).

Species	Red List Category	Site estimate
<u>Ruddy Turnstone <i>Arenaria interpres</i></u>	LC	1,000
<u>Lesser Black-backed Gull <i>Larus fuscus</i></u>	LC	15,000
<u>Caspian Tern <i>Hydroprogne caspia</i></u>	LC	10,000
<u>Sandwich Tern <i>Thalasseus sandvicensis</i></u>	LC	20,000
<u>A4iii Species group - waterbirds</u>	n/a	20,000-49,999

**Table 19.** Site estimates of selected species

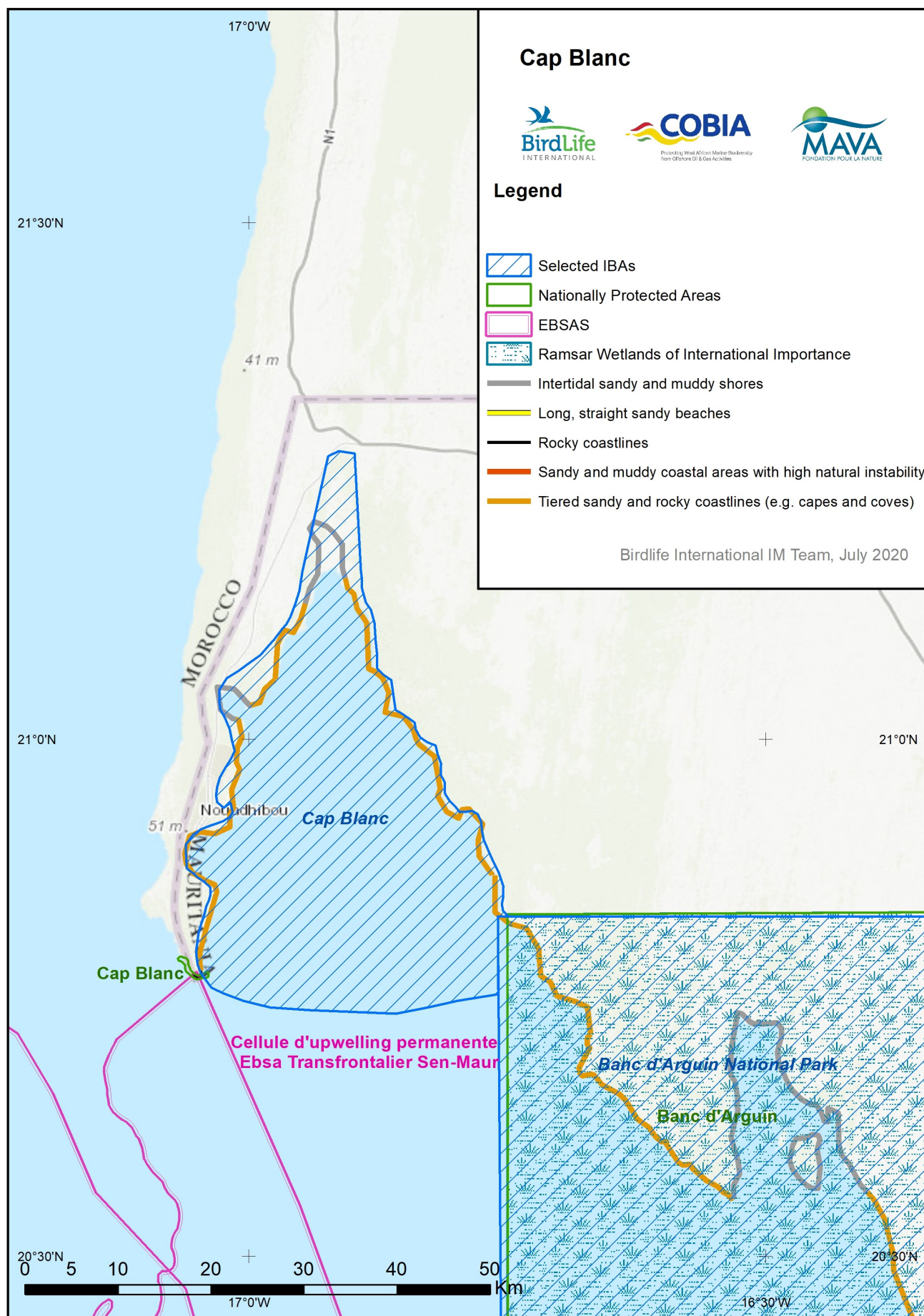
### Conservation issues

Although some caves used by monk seals for breeding may be at risk of collapse due to erosion, and despite some threats of entanglement in fishing gear and disturbance, the population has been steadily increasing in recent years. Various conservation efforts are actively underway.

### Risk from Oil and Gas

The most pressing threat from the oil and gas industry would be an oil spill in the area, which would threaten the monk seals. However, unless concessions become active close to the peninsula, this is only a low risk at present.





**Map 31:** Cap Blanc

# Chott Boul / Chat Tboul

Country: Mauritania  
Admin region: Trarza  
Coordinates: 16°34'N 16°26'W  
Altitude 2–6 m

Designation Status:  
IBA criteria B1a, B3a - 15,500 ha  
Ramsar Site – 15,500 ha  
Included within the Réserve de Biosphère  
Transfrontière du Delta du fleuve Sénégal (RBTDS)

## Site description

Chott Boul is a coastal wetland between Aftout es Sâheli and Diawling, formed by an ancient mouth of the Senegal River, now isolated from it and with only temporary connections to the sea, being located behind a 10km strip of coastal dunes. The marine zone comprises 7000ha of mud flats, intertidal saltmarsh, fresh water and brackish zones, whilst the terrestrial zone comprises 8,500ha of wetland, floodplains with temporary and permanent swamps, lakes and marshes of brackish to hyper-saline water. Fresh water enters the system between September and November from the Hassi Baba swamp of Diawling. A swamp connects the Grand Lac at Chott Boul with the southern floodplain of Aftout es Sâheli. Chott Boul is limited to the north by mobile and stable dunes covered by *Euphorbia balsamifera* and *Tamarix senegalensis* and to the east by a flood plain and ricefields. The northern part of the site is an unvegetated, flat saltpan, whilst the south is characterized by halophytic vegetation, the remnants of floodplain forests *Acacia nilotica*, *Tamarix senegalensis* and grasslands *Sporobolus robustus*, *Vetiveria nigritana* and *Juncus rigidus*. The site is important for fish stocks.

## Birds & Biodiversity

Chott Boul is one of the only sites where Black-necked Grebe *Podiceps nigricollis* overwinters in the area, and together with the southern parts of Aftout es Sâheli holds the only known nesting colony of Lesser Flamingo *Phoeniconaias minor* in West Africa. Fennec Fox *Vulpes zerda* and Pale Fox *Vulpes pallida* occur, as does the nationally vulnerable Desert Monitor *Varanus griseus*.

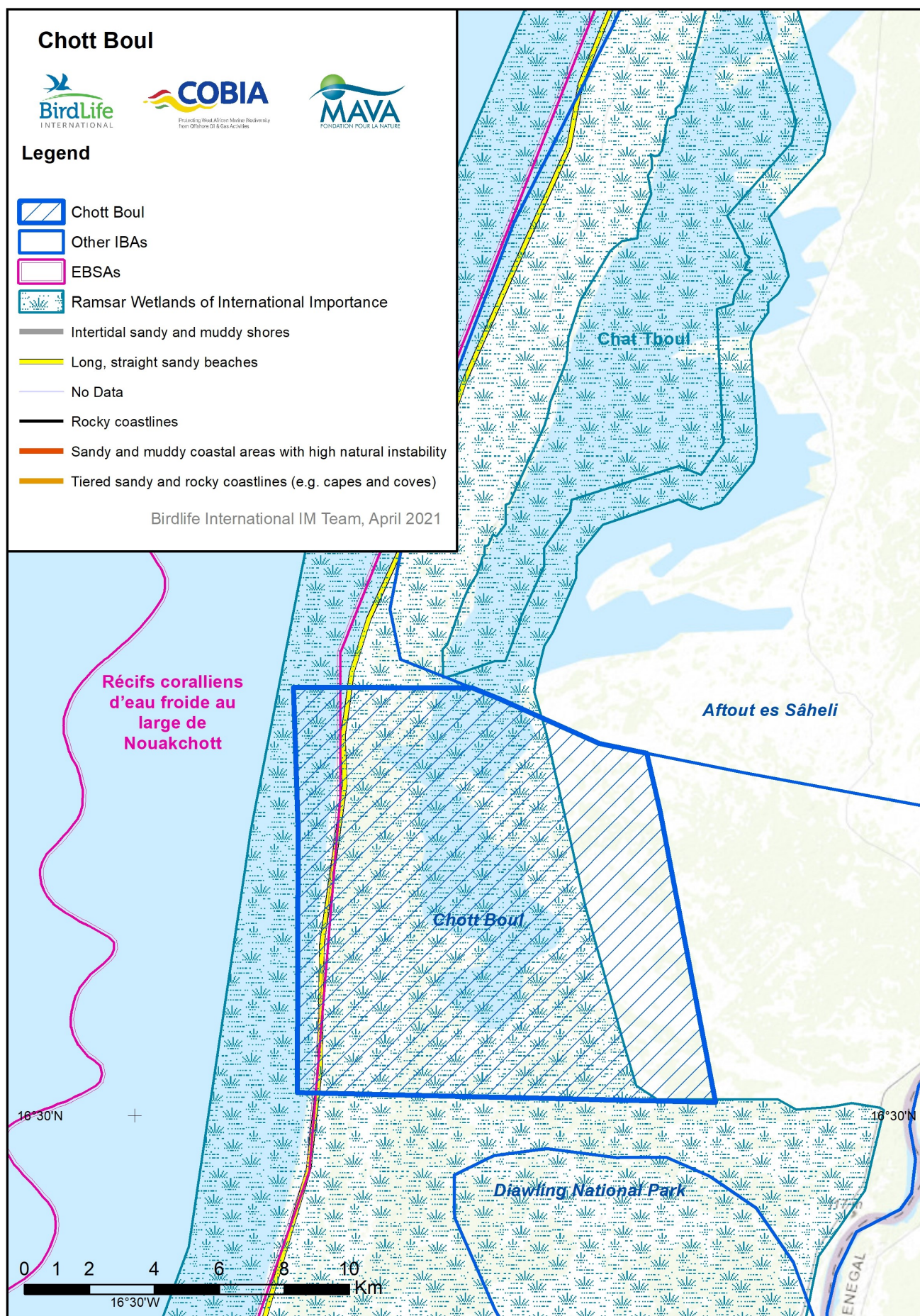
## Conservation issues

The main threats come primarily from development projects and include the intensification of agriculture, resulting in pollution from fertilizer-rich wastewater from ricefields, and accumulation of pesticides from agricultural pest control. Such contaminants become concentrated through evaporation. Another risk comes from the possible expansion of intensive shrimp fishing that occurs in the marshes and swamps in the delta. This form of fishing uses very fine 20 mm mesh nets and poses a risk to fish stocks, as large numbers of juvenile fish are destroyed.

## Risk from Oil and gas

The primary potential risk is from the development of oil and gas related land-based infrastructures, as the site is close to offshore wells.





**Map 32: Chott Boul**

# Parc National du Diawling

Country: Mauritania  
Admin region: Trarza  
Coordinates: 16°13'N 16°23'W  
Altitude 0–6 m

Designation Status: IBA criteria A1, A3, A4, B1a, B3a, B3b - 16,000 ha  
Ramsar Site – 15,600 ha  
National Park – 13,000 ha  
Included in the Réserve de Biosphère Transfrontière du Delta du fleuve Sénégal (RBTDS)

## Site description

The Parc National du Diawling lies on the border with Senegal in the Senegal River Delta. A buffer zone and a peripheral zone cover a further 19,500ha, which includes both Aftout es Sâheli and Chott Boul. The park is contiguous with Parc National des Oiseaux du Djoudj in Senegal, on the opposite bank of the river. It includes a lagoon fed by brackish water from a tributary of the river, significant estuarine and intertidal areas, saline flats and a small area of mangroves, as well as dunes, alluvial plains and an interconnecting network of rivers, lakes and ponds. Dunes form the western border of the park, where there is some tree cover (*Acacia tortilis*, *Euphorbia balsamifera* and *Balanites aegyptiaca*).

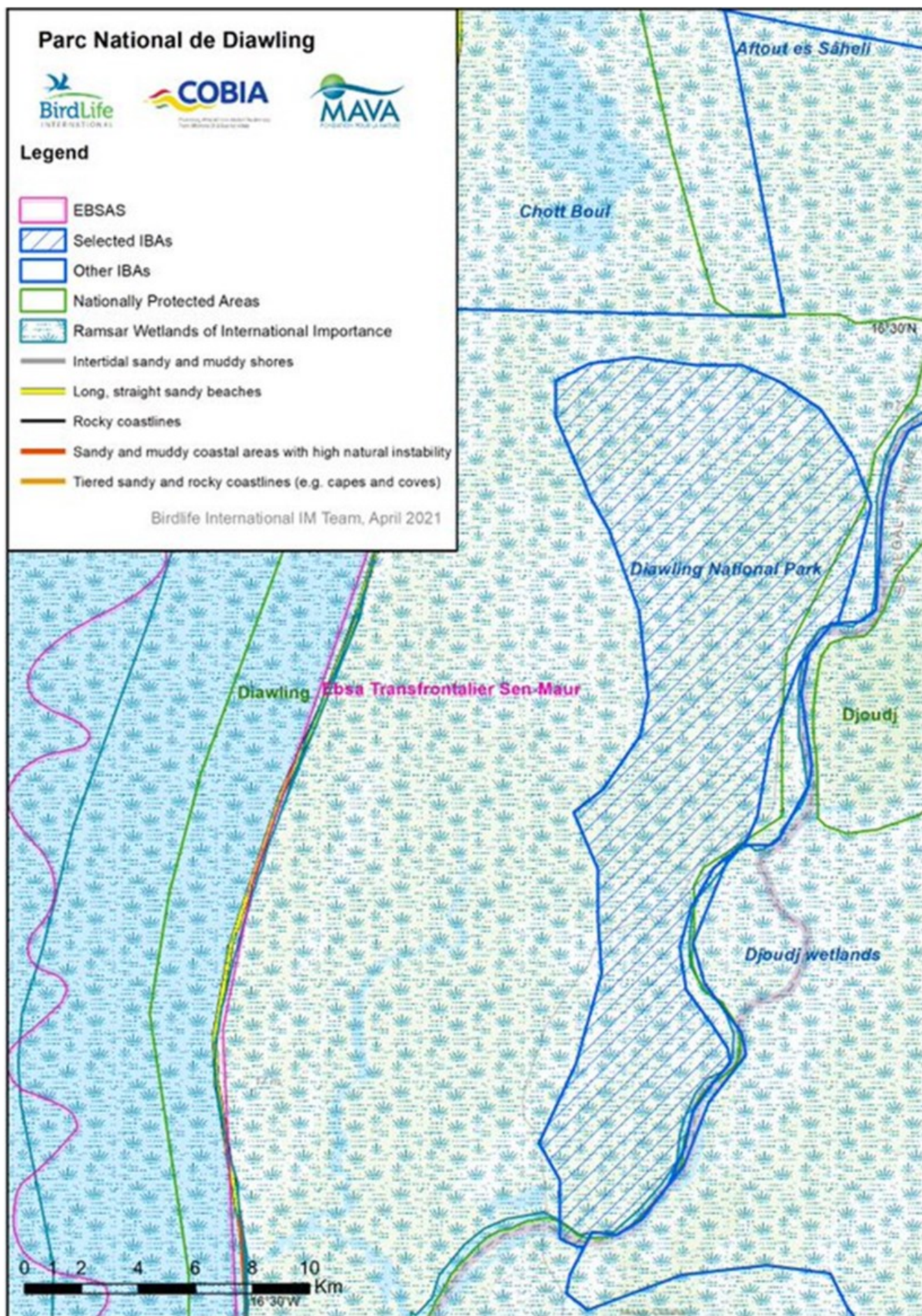
There is little cover on the alluvial plains, but *Tamarix senegalensis* and *Arthrocnemum glaucum* occur on sandy knolls and *Acacia nilotica* beside creeks and pools. Herbaceous cover on the lower zones of the plain is dominated by halophytes, such as *Salsola baryosma*; the grass *Sporobolus robustus* is common in frequently flooded areas. Average annual rainfall is 300 mm. The coastal lagoons and estuarine zone of mangroves provide feeding grounds for fish, shrimp and prawns.

## Birds & Biodiversity

Diawling and adjacent Djoudj in Senegal are extremely important for a wide diversity and number of waterbirds; over 150,000 birds have been recorded in waterbird counts. Diawling hosts many Palaearctic and Afrotropical birds, which are attracted especially to the productive lagoons. Rarer species include the Black Crowned-crane *Balearica pavonina* (VU) and Marbled Teal *Marmaronetta angustirostris* (VU), whilst Arabian Bustard *Ardeotis arabs* (NT) has also been recorded. African Manatee *Trichechus senegalensis* (VU) has been recorded at the site in the past.

Other mammals include Common Warthog *Phacochoerus africanus*, African Wolf *Canis lupaster* and Patas Monkey *Erythrocebus patas*.





**Map 33:** Parc National de Diawling



Species	Red List Category	Site estimate (2014-2017)
<u>White-faced Whistling-duck <i>Dendrocygna viduata</i></u>	LC	20,039-36,323
<u>Fulvous Whistling-duck <i>Dendrocygna bicolor</i></u>	LC	10,283-22,888
<u>Egyptian Goose <i>Alopochen aegyptiaca</i></u>	LC	868-979
<u>Spur-winged Goose <i>Plectropterus gambensis</i></u>	LC	1,185-1,669
<u>Marbled Teal <i>Marmaronetta angustirostris</i></u>	VU	55-108
<u>Garganey <i>Spatula querquedula</i></u>	LC	25,672-67,527
<u>Northern Shoveler <i>Spatula clypeata</i></u>	LC	9,798-18,931
<u>Greater Flamingo <i>Phoenicopterus roseus</i></u>	LC	2,251-3,017
<u>Lesser Flamingo <i>Phoeniconaias minor</i></u>	NT	1,776-4,801
<u>Black Crowned Crane <i>Baelearica pavonina</i></u>	VU	82-166
<u>Black Stork <i>Ciconia nigra</i></u>	LC	12-24
<u>Eurasian Spoonbill <i>Platalea leucorodia</i></u>	LC	966-1,662
<u>Glossy Ibis <i>Plegadis falcinellus</i></u>	LC	332-619
<u>Squacco Heron <i>Ardeola ralloides</i></u>	LC	176-262
<u>Great White Egret <i>Ardea alba</i></u>	LC	1,130-1,526
<u>Great White Pelican <i>Pelecanus onocrotalus</i></u>	LC	6,318-10,122
<u>Long-tailed Cormorant <i>Microcarbo africanus</i></u>	LC	962-2,462
<u>Great Cormorant <i>Phalacrocorax carbo</i></u>	LC	4,802-7,181
<u>Black-tailed Godwit <i>Limosa limosa</i></u>	NT	550-941
<u>Little Stint <i>Calidris minuta</i></u>	LC	1,271-3,398
<u>Collared Pratincole <i>Glareola pratincola</i></u>	LC	1,064-2,439
<u>Slender-billed Gull <i>Larus genei</i></u>	LC	365-729
<u>Common Gull-billed Tern <i>Gelochelidon nilotica</i></u>	LC	248-496
<u>Caspian Tern <i>Hydroprogne caspia</i></u>	LC	707-995
<u>A4iii Species group - waterbirds</u>	n/a	101,244-150,798

**Table 20.** Site estimates of selected species

### Conservation issues

Threats include:

- Threatening spread of invasive aquatic plants such as *Typha domingensis*, *Pistia stratiotes*, *Ludwigia erecta*, *Azolla africana*, *Ceratophyllum demersum* and *Phragmites australis* due to the Diama dam.
- Encroachment by rice farmers due to the lack of a clear and visible delimitation.
- Uncontrolled expansion of vegetable gardening and extension of the areas of invasive woody plants particularly *Prosopis juliflora* and *Tamarix senegalensis*.
- Risk of overgrazing transhumant herds from the north and local animals.
- An intensive shrimp fishery occurs in the area, using fine-mesh nylon nets.

### Risk from Oil and Gas

Since Diawling lost its connection to the sea after construction of the Diama Dam on the lower Senegal River, the site has only low risk from oil and gas developments, based on current concession blocks.



# EBSAs of Mauritania

Country: Mauritania  
Admin region: Nouakchott, Nouâdhibou  
Coordinates: 20°00'N 17°00'W  
Altitude: 0m

Mauritania has described four EBSAs (Ecologically or Biologically Significant Marine Areas):

- **Système du Canyon de Timiris de Mauritanie (Timiris Canyon system of Mauritania)**  
The Timiris Canyon, shaped by an ancient river system, plays an important ecological role as a corridor to connect deepsea flora and fauna with the biodiversity of the inshore and coastal zone. Snaking for 450 km perpendicular to the coast, it has a depth of 250-300 m and is 2-7 km wide. Sediment transport from the coast to the deep sea is facilitated by the canyon structure, with water also transported from the depths to the surface. Canyons play an important role in linking the ecosystems of the abyssal plain and the continental shelf and plateau.
- **Cellule de l'upwelling permanent dans la zone nord de Mauritanie (Permanent upwelling in the northern zone of Mauritania)**  
This EBSA constitutes the core zone (21°N) of the CCLME, one of the world's four most important upwelling systems. It is a dynamic system with high primary productivity, with the most productive area located off Cap Blanc. The upwelling has significant impact on Atlantic Ocean currents and weather patterns.
- **Habitats côtiers de la zone néritique de Mauritanie et l'extrême nord du Sénégal (Coastal habitats of the inshore zone of Mauritania and the extreme north of Senegal)**  
This site runs along the entire coast of Mauritania extending to Langue de Barbarie in Senegal, comprising key marine habitats, with seagrass and maerl beds in the north and numerous rocky areas south of Cap Timiris. There are also significant areas of carbonate shell deposits opposite the Banc d'Arguin. The environmental conditions are highly variable in terms of temperature, salinity, suspended matter, nutrients and agitation, contributing to its high biodiversity and productivity.
- **Récifs coralliens d'eau froide au large de Nouakchott, Mauritanie (Cold Water Coral Reefs off Nouakchott, Mauritania)**  
Cold-water coral reefs occur at the foot of the continental shelf at 600 m deep and extend for 400 km forming seamounts up to 100 m high: the Timiris Mounds off Cap Timiris and the Banda Mounds off Nouakchott.

## Birds & Biodiversity

The Timiris Canyon channels water from the deep to the continental shelf during periods of upwelling, forming hotspots of pelagic biodiversity at the surface. Bottom fauna of the canyon includes carrier crabs *Paramola spp.*, the bivalve *Acesta excavata* and the giant oyster *Neopycnodote zibrowii* (which can live up to 500 years). Corals in the Timiris Canyon appear to be in good condition.

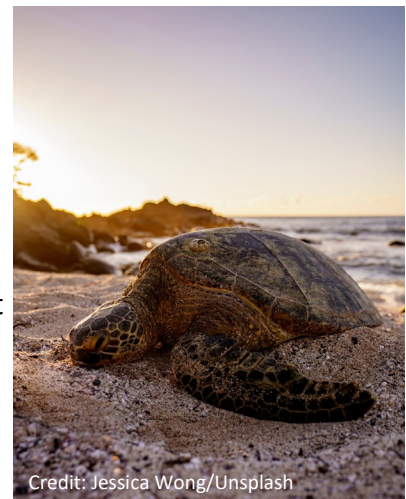
There are large numbers of seabirds of different origin in the permanent upwelling, as well as marine megafauna, including tuna, swordfish, sailfish, sharks, rays, dolphins, beaked whales, baleen whales and sperm whales, with many species of conservation concern, such as rays, sharks, cetaceans and marine turtles. The presence of many pelagic species is seasonal, especially the numerous pelagic seabirds (including gannets and phalaropes), as well as large predators and cetaceans. It is a key area for small pelagic fish (sardinella, sardines, anchovies, horse mackerel and mackerel), which represent more than 85% of the fisheries catches made in the Mauritanian EEZ, as well as for demersal fish.

The permanent upwelling serves as a nursery and habitat for fishery resources and supports emblematic species of great ecological value such as Mediterranean Monk Seal *Monachus monachus* (EN), Atlantic Humpback Dolphin *Sousa teuszii* (CR) and sea turtles. Rocky areas south of Cap Timiris provide habitats for overexploited demersal species such as groupers (*Epinephelus spp.*), whilst key mullet breeding area are located between the south of Nouakchott and Chatt Boul. There is also an abundant population of octopus, (particularly targeted by the artisanal fishery), as well as guitar rays and sharks, cuttlefish, shrimps, sponges, sea stars, sea urchins, hermit crabs and others.

Corals are ecosystem engineers and host a rich fauna. The cold-water coral reefs of Mauritania are important for migratory cetaceans and sea turtles, and provide a nursery area for fish such as mullet and sardinella. There is also a high concentration of seabirds, including Northern Gannet *Morus bassanus* and Red Phalarope *Phalaropus fulicarius*.



Credit: Robert Thiemann/Unsplash



Credit: Jessica Wong/Unsplash

## Conservation issues



Credit: FWC Fish and Wildlife Research Institute/Flickr

Timiris Canyon is highly vulnerable to physical disturbances from bottom trawling, for which the area is licensed and thus subject to various bottom fishing techniques, such as by deep sea hake and shrimp boats. Such fishing should be controlled, and the sides and beds of canyons closed to demersal trawling, whilst all catches of species for which these habitats provide refuges (such as pink lobster) should be prohibited in the canyon beds.

The upwelling area is highly targeted by large industrial fishing vessels in search of small pelagics, threatening the sustainability of the fisheries resource as well as posing a serious threat to megafauna from bycatch of

large pelagic trawlers. Fisheries restrictions are needed, and bycatch mitigation measures should



be implemented, e.g. introduce megafauna avoidance and/or escape devices in small pelagic fisheries and favour selective techniques such as seining over trawling.

The coastal habitats of the inshore zone constitute the main artisanal fishing grounds of Mauritania, on which the country's economy is based. The fish nursery and reproduction areas are of critical importance for the fishery's survival. Trawl and dragnet fishing are largely prohibited. Cold-water coral is a fragile habitat subject to increasing pressure, especially damage to fossil and living coral structures by bottom trawling, which may have significant impacts throughout the reef, leaving long-lasting traces on these deep seabeds. More rational use of coral areas is necessary to ensure the survival of these ecosystems, whose function and importance in the reproduction of fisheries resources is still poorly understood. As a precautionary measure, these ecosystems should be protected from any form of physical disturbance.

### **Risk from Oil and Gas**

Timiris Canyon is at risk from pollution and physical disturbance of the seabed in the event of well drilling. A precautionary approach should be adopted for any developments, with effective monitoring and a mechanism capable of adapting to changing circumstances. The high probability of hydrocarbon presence in the permanent upwelling makes it a potential development zone for the oil and gas sector. It is also a confluence zone for transport vessels coming and going from Europe, creating a threat of oil pollution (heavy maritime traffic), contamination by ballast water and the proliferation of invasive species. A defence zone is required to intervene in the event of an oil spill and prevent damage to the core area.



Cold-water coral is a fragile habitat subject to increasing pressure, especially damage to fossil and living coral structures by bottom trawling, which may have significant impacts throughout the reef, leaving long-lasting traces on these deep seabeds. More rational use of coral areas is necessary to ensure the survival of these ecosystems, whose function and importance in the reproduction of fisheries resources is still poorly understood. As a precautionary measure, these ecosystems should be protected from any form of physical disturbance.

The cold-water corals EBSA is a favoured area for oil exploration and exploitation, and there are increasing risks of pollution by hydrocarbon exploration and exploitation activities. Threats related to oil exploitation and fishing include chronic oil pollution and spoil deposits (oil and gas well operations in the area) and physical disturbance from drilling.

**Senegal**



# Parc National des Oiseaux du Djoudj / Djoudj Wetlands

Country: Senegal  
Admin region: St Louis  
Coordinates: 16°20'N 16°15'W  
Altitude c.0–20 m

Designation Status: IBA criteria A1, A4, B1a, B3a, B3b - 56,000 ha  
National Park – 16,000ha  
Ramsar Site – 16,000 ha  
World Heritage Site criteria vii, x – 16,000ha

## Site description

The Parc National des Oiseaux du Djoudj (PNOD) consists of an inland delta in a shallow depression lying within the floodplain of the Senegal River, on the border with Mauritania, where it is contiguous with Parc National de Diawling. The park lies 60 km northeast of the city of St Louis and 20 km northwest of the Ndiaël basin. It consists of an extensive complex of seasonally inundated brackish lakes and pools lying on impermeable saline soil sand linked by channels to a branch of the Senegal River. It lies within the Sahel zone at sea level and the terrestrial vegetation consists of *Tamarix* and *Acacia* savannah with a ground layer of herbs and grasses. Areas subjected to inundation support *Typha*, *Sporobolus robustus*, *Phragmites* and *Nymphaea*.

The surrounding landscape outside the park is flat, open thorn-bush savannah used for livestock rearing, hunting and rice cultivation. There are seasonally inundated and marshy areas and small channels, especially adjacent to the river, some of which are extremely important for birds in some years or at certain times of year, depending on flood and rain water levels. These additional areas lying outside the National Park and World Heritage Site are therefore incorporated in the IBA and include an area known as *Débi* to the North of the park and the Zone d'Intérêt Cynégétique (ZIC) de Djeuss, a hunting zone, the South. The IBA also extends downstream of the National Park along the river as far as the Maka Diama dam. Most of these areas are incorporated within the management plan for the National Park and its buffer zone.

## Birds & Biodiversity

The site is one of the first migration stopovers after crossing the Sahara for long-distance Palaearctic migrant birds, and also one of the closest areas of suitable habitat to the Sahara for Afrotropical migrant birds. It provides a vital breeding, staging and wintering area with its chain of lakes, backwaters, fords and sandbanks, hosting up to 3 million birds at the peak of the season in December. Djoudj supports a large breeding colony of Great White Pelican *Pelecanus onocrotalus*. Other prominent waterbirds include Purple Heron *Ardea purpurea*, Great White Egret *Ardea alba*, Black-crowned Night-heron *Nycticorax nycticorax* and Great Cormorant *Phalacrocorax carbo*.

Djoudj is closely linked with other wetlands throughout the Senegal River Delta (e.g. Diawling, Ndiaël), and birds move between sites to forage, roost and breed. This is also a key site for Black Crowned Crane *Balearica pavonina* (VU). Seasonally on passage, Djoudj can support high number of Eurasian Spoonbill *Platalea leucorodia*, perhaps around one third of the East Atlantic breeding population.

Djoudj is one of the very few confirmed sites in West Africa for Aquatic Warbler *Acrocephalus paludicola* (VU); a significant part of the global population winter here, with 5,000-10,000 individuals recorded. It has also been estimated that Djoudj holds 2,000,000 Collared Sand Martin *Riparia riparia*, whilst 3,200 Lesser Kestrel *Falco naumanni* have been recorded on passage (in 1994).

Mammals include a small number of reintroduced African Manatee *Trichechus senegalensis* (VU), which occurred naturally in the park until the 1980s, Dorcas Gazelle *Gazella dorcas* (VU), Red-fronted Gazelle *Eudorcas rufifrons* (VU), Common Warthog *Phacochoerus africanus* and African Wolf *Canis lupaster*. West African Crocodile *Crocodylus suchus* has been successfully reintroduced and is reportedly on the increase. African Rock Python *Python sebae* and Nile Monitor Lizard *Varanus niloticus* also occur.

### Conservation issues

The principal human activities are nature conservation and ecotourism inside the National Park, while surrounding areas are used for rice cultivation, livestock rearing and hunting. Low rainfall can be a major problem. The site has been confronted with water scarcity issues, which led to listing on the Montreux Record (Ramsar), although resolution of this problem through dams on the Senegal River led to its removal from the Record. It returned to the Record in 1993 due to ecological perturbations arising from changes in the hydrological regime, which led to large areas of open water becoming infested with Water Cabbage *Pistia stratiotes* and perennial Grass *Paspalum vaginatum*. Currently, a management plan exists with various monitoring and control activities.

The site is facing additional threats of livestock overgrazing in some areas, and loss of natural vegetation such as *Acacia nilotica*, which is exploited for fuel wood. Other threats are illegal fishing activities, which reduce feed resources for birds, use of destructive fishing gear monofilaments, encroachment on the protected area, salinization of soils and noise pollution from rice paddies around the site.

### Risk from Oil and Gas

Since Djoudj lost its connection to the sea after construction of the Diama Dam on the lower Senegal River, the site has only low risk from oil and gas developments, based on current concession blocks. Some breeding birds however no doubt utilise the coastal zone.








Species	Red List Category	Site estimate (2014-2017)
<u>White-faced Whistling-duck <i>Dendrocygna viduata</i></u>	LC	73,734-91,177
<u>Fulvous Whistling-duck <i>Dendrocygna bicolor</i></u>	LC	615-1,704
<u>Spur-winged Goose <i>Plectropterus gambensis</i></u>	LC	3,143-8,354
<u>African Comb Duck <i>Sarkidiornis melanotos</i></u>	LC	460-874
<u>African Pygmy-goose <i>Nettapus auritus</i></u>	LC	53-100
<u>Garganey <i>Spatula querquedula</i></u>	LC	54,917-90,368
<u>Northern Shoveler <i>Spatula clypeata</i></u>	LC	4,311-6,747
<u>Northern Pintail <i>Anas acuta</i></u>	LC	91,905-126,420
<u>Greater Flamingo <i>Phoenicopterus roseus</i></u>	LC	10,758-16,940
<u>Lesser Flamingo <i>Phoeniconaias minor</i></u>	NT	7,943-14,161
<u>Black Crowned Crane <i>Balearica pavonina</i></u>	VU	73-85
<u>Yellow-billed Stork <i>Mycteria ibis</i></u>	LC	1,464-2,553
<u>Eurasian Spoonbill <i>Platalea leucorodia</i></u>	LC	198-218
<u>Black-crowned Night-heron <i>Nycticorax nycticorax</i></u>	LC	17,825-24,495
<u>Squacco Heron <i>Ardeola ralloides</i></u>	LC	353-526
<u>Purple Heron <i>Ardea purpurea</i></u>	LC	188-303
<u>Great White Egret <i>Ardea alba</i></u>	LC	711-1,013
<u>Yellow-billed Egret <i>Ardea brachyrhyncha</i></u>	LC	392-1,049
<u>Great White Pelican <i>Pelecanus onocrotalus</i></u>	LC	13,816-18,392
<u>Great Cormorant <i>Phalacrocorax carbo</i></u>	LC	2,497-2,735
<u>African Darter <i>Anhinga rufa</i></u>	LC	397-553
<u>Pied Avocet <i>Recurvirostra avosetta</i></u>	LC	3,787-8,077
<u>Black-tailed Godwit <i>Limosa limosa</i></u>	NT	2,333-5,245
<u>Collared Pratincole <i>Glareola pratincola</i></u>	LC	825-2,152
<u>A4iii Species group - waterbirds</u>	n/a	299,535-358,172

**Table 21.** Site estimates of selected species

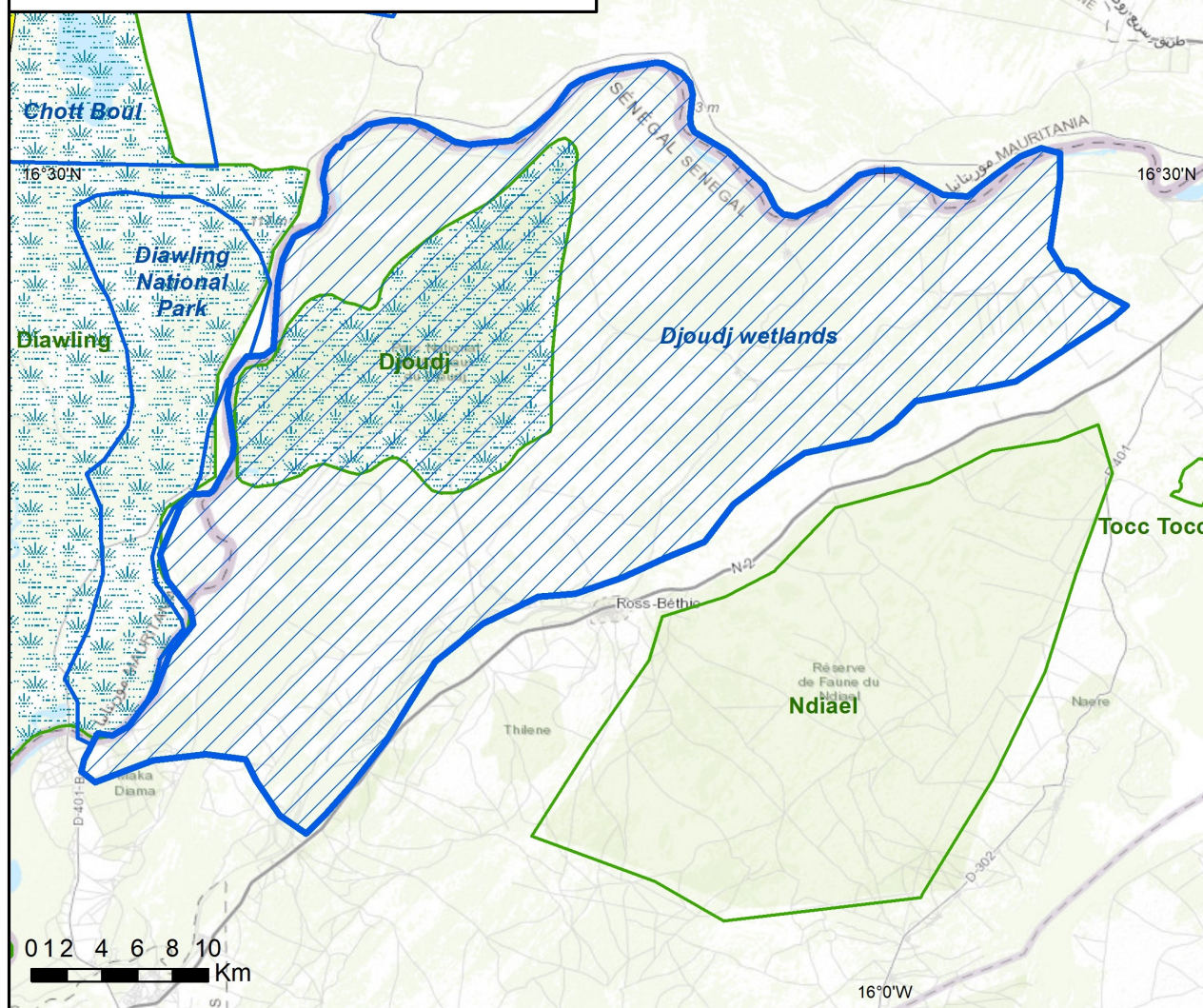
## Djoudj wetlands



### Legend

-  Djoudj wetlands
-  Other IBAs
-  Nationally Protected Areas
-  Ramsar Wetlands of International Importance
-  Intertidal sandy and muddy shores
-  Long, straight sandy beaches
-  Rocky coastlines
-  Sandy and muddy coastal areas with high natural instability
-  Tiered sandy and rocky coastlines (e.g. capes and coves)

Birdlife International IM Team, April 2021



**Map 34: Djoudj Wetlands**



# Réserve Spéciale de Faune de Guembeul & Saint-Louis lagoons

Country: Senegal  
Admin region: St Louis  
Coordinates: 15°59'N 16°28'W  
Altitude c.0 m

Designation Status:  
IBA criteria B1a, B3a – 1,500 ha  
Special Reserve – 720 ha  
Ramsar – 720 ha

## Site description

The Réserve Spéciale de Faune de Guembeul lies 12 km south of Saint-Louis near the rural communes of Ndiébène, Gandiole and Gandon. It consists of an extensive lagoon of variable salinity in a shallow depression 8 km long and 800 m wide, with a relict mangrove along the shore as well as the Gandiolais and Toubé dunes. The site is entirely fenced in. The lagoon is replenished by seasonal rainfall and by inflow of saltwater from the Senegal River mouth. Water levels can be controlled artificially by means of a sluice gate. A number of brackish lagoons around the town of St Louis, all linked to the river estuary, are included in the IBA. These vary significantly in size, depending on the water level in the Senegal River and rainfall. The vegetation around the lagoons is Sahelian thorn-bush savannah dominated by *Acacia spp.*

## Birds & Biodiversity

The permanent presence of water supports migratory birds, such as Black-tailed Godwit *Limosa limosa*, Lesser Flamingo *Phoeniconaias minor*, Eurasian Spoonbill *Platalea leucorodia*, Curlew Sandpiper *Calidris ferruginea* and Pied Avocet *Recurvirostra avosetta*, for which the largest concentrations in Senegal are recorded. Audouin's Gull *Larus audouinii* is recorded regularly in small numbers along the river and lagoons. Large numbers of Northern Shoveler *Spatula clypeata* and Little Stint *Calidris minuta* have been recorded, and Western Reef-egret *Egretta gularis* occurs regularly along the lagoon edges.

A project to reintroduce previously common mammals and reptiles of the Sahel region is based at the reserve, where there is a captive-breeding enclosure for Dama Gazella *Nanger dama* (CR), Scimitar-horned Oryx *Oryx dammah* (EW) and African Spurred Tortoise *Centrochelys sulcata* (VU). Native species include Common Warthog *Phacochoerus africanus*, Patas Monkey *Erythrocebus tas*, and Pale Fox *Vulpes pallida*.

Species	Red List Category	Site estimate (2014-2017)
Pied Avocet <i>Recurvirostra avosetta</i>	LC	1,496-2,680
Black-tailed Godwit <i>Limosa limosa</i>	NT	613-1,108

**Table 22.** Site estimates of selected species

### Conservation issues

The town of St. Louis is an economic and tourism centre, and there is no control of the use of the St. Louis lagoons, which are highly productive, with those outside the reserve supporting local fishing economies. The surrounding areas are used for livestock grazing, agriculture and fuelwood-collection. However, there is no control of such activities, and cutting of *Acacia* trees is an ongoing problem. Illegal fishing and salt extraction occurs inside the reserve. The build-up of rubbish in the lagoons, especially plastic items, is severe.

Nature conservation activities include the experimental breeding centre for Sahelian mammals and reptiles, conservation education and tourism. Lack of funding for repair and maintenance jeopardize proper management of the reserve and the breeding centre. Additionally, the Diama dam has reduced the inflow of freshwater and lowered the water table. There is a need to replace and renew the water-control mechanisms periodically to allow for effective control of water levels to avoid the lagoon drying and losing its value for waterbirds.

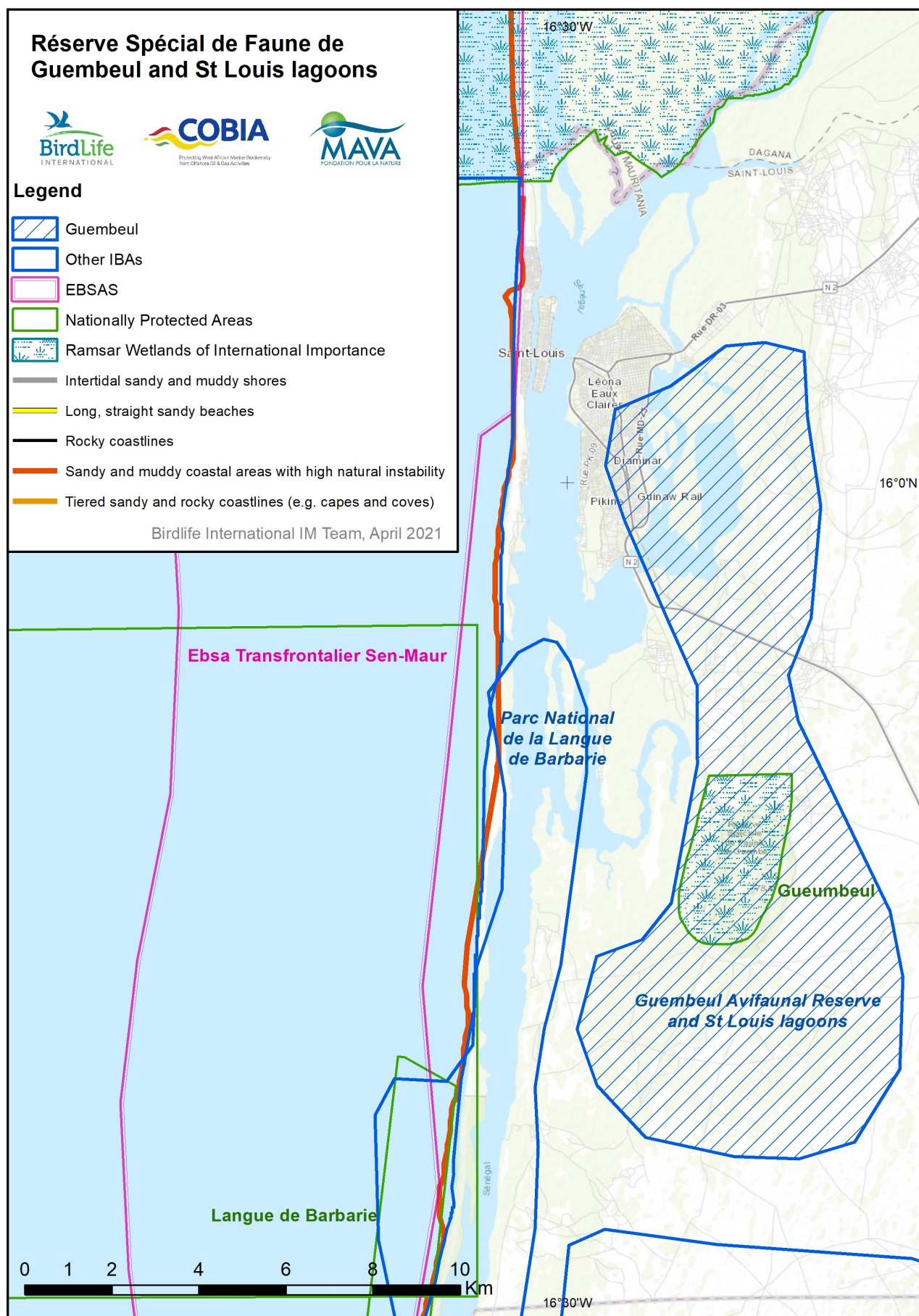
### Risks from oil and gas

As with other coastal sites, the reserve and lagoons could be impacted by accidental oil spills or other forms of pollution, although their link to the sea is not permanent. Many birds that utilise the site forage at sea. Any potential future onshore infrastructural developments would need to be planned sensitively, given the high human population density in much of St. Louis and important cultural and nature values.



Credit: Tom Benson/Flickr





**Map 35:** Réserve Spéciale de Faune de Guembeul & Saint-Louis lagoons

# Parc National de la Langue de Barbarie (PNLB) & PNLB marine IBA

Country: Senegal  
Admin region: St Louis  
Coordinates: 15°55'N 16°30'W  
Altitude c.0 m

Designation Status: IBA criteria B1a, B3a – 2,000 ha  
IBA marine criterion B3a – 103,906 ha  
National Park – 2,000ha

## Site description

PNLB lies southwest of Guembeul, 25 km from St. Louis. It consists of a 20-km length of intertidal flats and sand dunes on a spit formed across the mouth of the Senegal River. It includes both marine and riverine brackish waters. The terrestrial part of the park is formed by three main islands, Ile de Gandiole (2 ha) being the largest. The treeless vegetation on the infertile sandy soils includes *Ipomoea pes-caprae*, *Alternanthera maritima*, *Sporobolus spicatus* and *Sesuvium portulacastrum*. The 22 km wide PNLB Marine IBA runs parallel to the coastline, and is based on seaward extensions around seabird breeding colonies.

## Birds & Biodiversity

The area is important for large numbers of breeding and wintering gulls and terns, which forage offshore, including breeding Common Gull-billed Tern *Gelochelidon nilotica* at the southern limit of its breeding range, as well as Grey-headed Gull *Larus cirrocephalus*, Little Tern *Sternula albifrons*, Sandwich Tern *Thalasseus sandvicensis*, Royal Tern *Thalasseus maximus* and Slender-billed Gull *Larus genei* (Table 23). Audouin's Gull *Larus audouinii* occurs in small numbers along the river and lagoons. Wintering Ospreys *Pandion haliaetus* are common. The long spit of PNLB is an important breeding site for Green Turtle *Chelonia mydas* (EN), whilst other sea turtles also occur.

Species	Red List Category	Breeding birds estimate
Slender-billed Gull <i>Larus genei</i>	LC	17,100
Grey-headed Gull <i>Larus cirrocephalus</i>	LC	18,000
Little Tern <i>Sternula albifrons</i>	LC	105-200
Caspian Tern <i>Hydroprogne caspia</i>	LC	450-765
Royal Tern <i>Thalasseus maximus</i>	LC	5,400-9,000

**Table 23.** Numbers of breeding gulls and terns recorded; (Royal Tern estimate was in 2015)

## Conservation issues

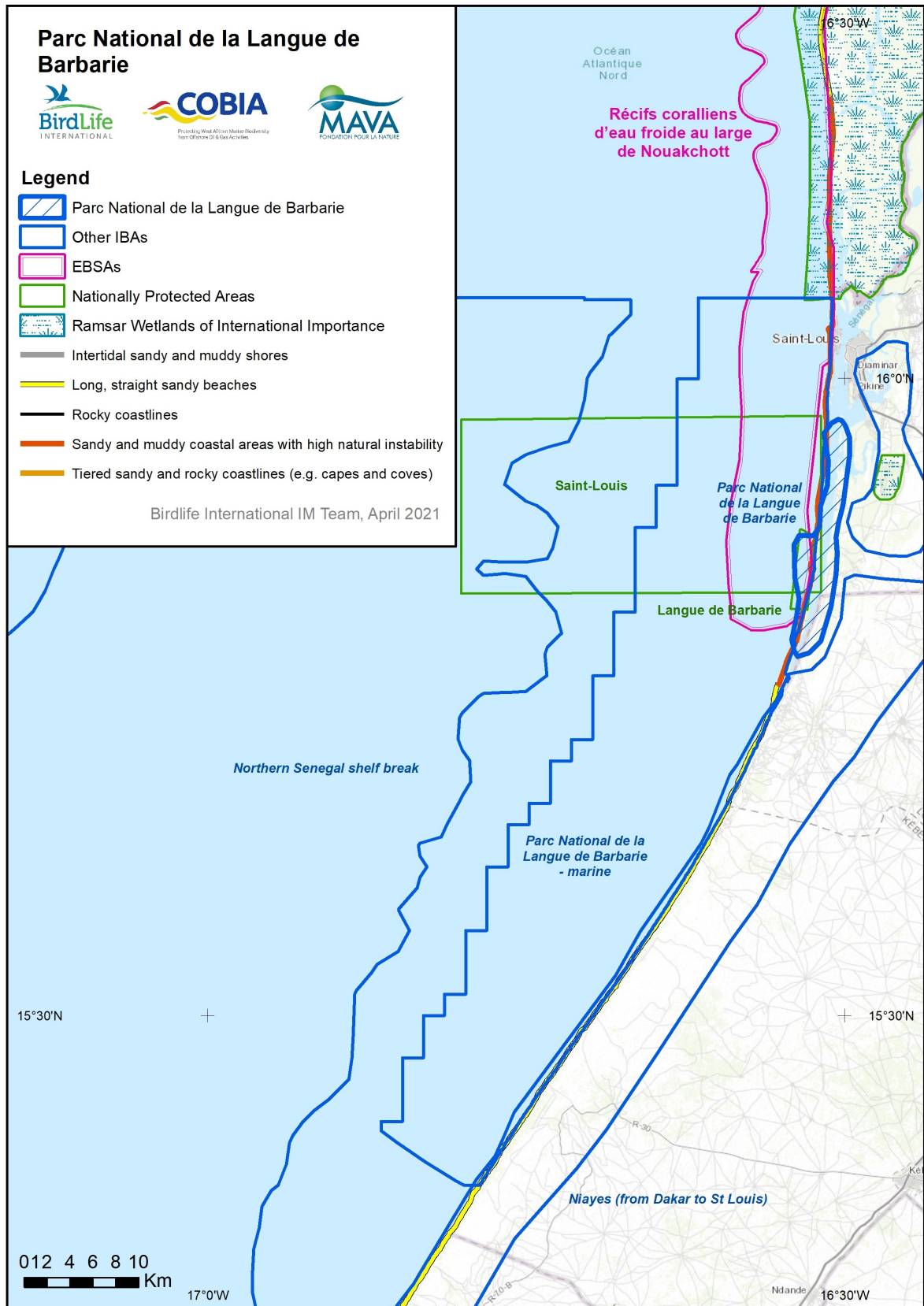
In 2003 the government opened a narrow breach in the long spit at 7 km south of Saint-Louis, but this rapidly widened and has had significant environmental, social and economic impacts in the area. Access to the National Park is restricted to prevent disturbance to breeding birds, though



this remains an issue, and conservation management efforts are limited by lack of funds. The whole area is subject to coastal erosion, exacerbated by rising sea levels.

### Risks from oil and gas

The area is within the Saint-Louis Offshore oil block. Being seaward facing this long park and IBA would clearly be at risk from any pollution incident.



**Map 36:** Parc National de la Langue de Barbarie (PNLB) & PNLB marine IBA

# Northern marine sites: Saint-Louis & Kayar MPAs, Northern Senegal shelf break (marine IBA), Mont sous-marin de Cayar & Canyon de Cayar (EBSAs)

Country: Senegal

Admin region: Saint-Louis, Dakar and Thiès

Coordinates: Kayar MPA: 14°50'N 17°00'W, Cayar Canyon: 15°25'N 18°00'W, Cayar Seamount: 15°50'N 17°50'W, Northern Shelf Break: 15°20'N 17°06'W

Altitude: 0 m

Designation Status:

IBA criterion A4 – 778,844 ha

Saint-Louis MPA – 49,600 ha

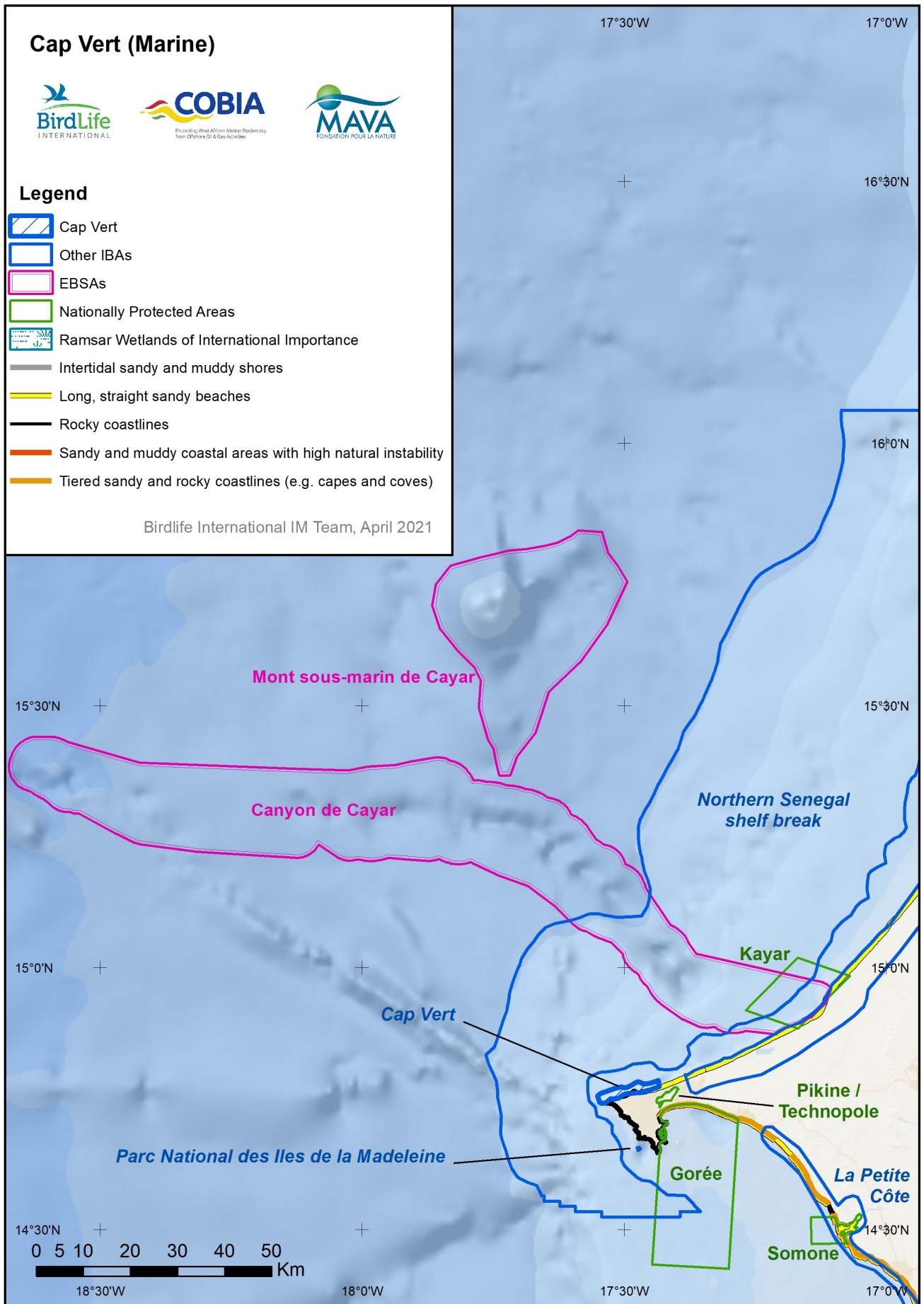
Kayar MPA – 17,100 ha

## Site description

In the offshore waters of Senegal between Saint-Louis and Dakar, there are several marine sites of international importance:

- Saint-Louis MPA: A rectangular 49,600 ha block of sea west of Saint-Louis and PNLB characterised at the coast by muddy sediment with seagrass beds (*Zostera noltii* and *Cymodocea nodosa*) under a strong estuarine influence.
- Kayar MPA: A rectangular 17,100 ha block of sea west of the fishing port of Kayar, which is 60 km northeast of Dakar. The site includes the marine Kayar trench, contiguous with the Cayar Canyon, presenting a mosaic of rocky habitats near the coast, reaching a depth of 1,235 m at 38 km from the coast.
- Mont-sous-marin de Cayar EBSA: The Cayar Seamount complex 300 km NNW of Cap Vert includes three seamounts (Mont de Cayar, Mont Petit Cayar and Mont de Medina) at depths ranging from 200-500 m. The active water dynamics of this complex produce nutrient enrichment and increased primary productivity further spread by ocean currents, resulting in a rich in biodiversity.
- Canyon de Cayar EBSA: Stretching west from the coast at Kayar, the 200 km long and 10 km wide Cayar Canyon lying between 15°25'N and 18°0'W has an average slope of 16 m/km, a maximum slope of 100 m/km and a depth extending from 50 m to 4500 m (Vanney & Mougnot 1990).
- Northern Senegal shelf-break marine IBA: This huge marine IBA extends offshore from Saint-Louis to Cap Vert and further south to Gorée MPA, embracing all other marine sites except for PNLB marine IBA and most of Saint-Louis MPA.
- Parc National de Langue de Barbarie marine IBA: This runs parallel to the coast of north Senegal (see account for Parc National de Langue de Barbarie).





**Map 37:** Northern marine sites: Saint-Louis & Kayar MPAs, Northern Senegal shelf break (marine IBA), Mont sous-marin de Cayar & Canyon de Cayar (EBSAs)

## Birds & Biodiversity

The productive marine waters of Senegal are rich feeding grounds for many species of seabirds, including Cape Verde Shearwater *Calonectris edwardsii* (NT), travelling from its breeding sites in Cabo Verde: there is an estimate of 4,000-9,000 birds present from 2014. Sooty Shearwater *Ardenna grisea* (NT) passes through on migration to southern breeding sites and Scopoli's Shearwater *Calonectris diomedea* breeds in the Mediterranean. The occurrence of these shearwaters from northern, southern and tropical latitudes demonstrates the global importance of these sites.

The rich estuarine waters and seagrass beds of the Saint-Louis MPA support numerous fish species and serve as spawning grounds, vital for local fisheries as well as for the many piscivorous birds that inhabit the Lower Senegal River Delta and environs, including pelicans and terns. The MPA is also important for sea turtles, which breed along the coast. Seagrass beds support many epiphytic algae and a diverse microfauna of benthic invertebrates.

The Kayar MPA supports a high marine biodiversity, and is a major site for the reproduction, nursery and concentration of demersal coastal fish species, including many of the emblematic and endangered fish species of Senegal, such as White Grouper *Epinephelus aeneus* and Mottled Grouper *Mycteroperca rubra* as well as Common Octopus *Octopus vulgaris*.

The Cayar seamounts are important breeding and spawning areas for many pelagic species (Barry-Gérard 1990). Whales and dolphins, seabirds, sea turtles, swordfish, tuna and sharks all concentrate to feed here. An abundant primary production and stocks of zooplankton and micronekton are accessible at shallower levels, with rich stocks of fish and squid in deeper waters (Würtz 2011).

The submarine Cayar Canyon is rich in demersal and pelagic fish, with reproduction and nursery areas (Barry-Gérard, 1990). It is an important area for the migration of seabirds, turtles and pelagic, demersal and deepsea fish. Numerous fish species occur, including several species of tuna, False Scad *Caranx rhonchus*, Bluefish *Pomatomus saltatrix*, Round Sardinella *Sardinella aurita*, Madeiran Sardinella *Sardinella maderensis*, Sparus *coeruleostitus*, *Trachurus trachurus*, *Trachurus trecae*, as well as several species of rays and sharks, including Common Guitarfish *Rhinobatos rhinobatos* (EN), Thornback Skate *Raja clavata* (NT) deepwater sharks (Barry-Gérard, 1990). Loggerhead *Caretta caretta* and Leatherback *Dermochelys coriacea* Turtles and Olive Ridley *Lepidochelys olivacea* feed in the Cayar sites (seamounts and canyon), whilst Green Turtles *Chelonia mydas* pass through this area from breeding sites in Guinea-Bissau (Godley *et al.* 2003).

## Conservation issues

Unsustainable and unregulated fishing is the key threat for all marine sites, with overfishing seriously diminishing fish stocks and endangering many species, especially those at the top of the food chain. This impacts on all marine life at all levels. The biological richness of seamounts and their relatively small surface area render them especially vulnerable to marine impacts such as overfishing, as many deepwater fauna of these areas are long-lived with slow growth rates. There is significant fisheries pressure from both the artisanal and industrial sector. The Kayar MPA is a vital fishing area for coastal populations, and conflicts occur between local fishermen and foreign fleets.

## Risk from Oil and Gas

Given the extensive marine coverage of these sites, especially the Northern Senegal shelf break, all potential impacts of the oil and gas sector are relevant. These include risks on marine life from sonar noise, marine discharges and pollution, artificial lights and offshore structures and increases in marine shipping. Gas has been discovered in the Kayar Offshore Profond oil block.



# Niayes, including Grand Niaye de Pikine / Technopôle

Country: Senegal  
Admin region: Dakar and Thiès  
Coordinates: 15°08'N 16°55'W  
Altitude c.0 m

Designation Status: IBA criteria B1a, B3a – 4,000 ha

## Site description

The Niayes IBA consists of a string of permanent freshwater lakes and temporarily wet depressions (or *niayes*) along a line running northeast from the outskirts of Dakar to 60 km southwest of St Louis. The lakes lie behind the ridge of coastal sandy dunes in shallow depressions at 1–4 m above sea level, over a distance of 150 km. They are replenished by rainfall and from the underlying water table. The scattered wetlands cover 40 km<sup>2</sup> at low water; at high water, they can increase their surface area five-fold. The largest lakes lie at the southern end and include Nhiarhol Pool and lakes Mbao, Mbeubeussé, Retba (or Rose), Tanma, Youyi (or Malika) and Ourouaye. Lac Retba is the largest, with an open water surface of 5 km by 1.7 km wide at low water. Just to the west of the IBA is the Réserve Urbaine Naturelle de la Grand Niaye de Pikine, including the former development site of Technopôle, which is particularly rich in birdlife. The surrounding vegetation is subjected to seasonal inundation and the area is characterized by the African Oil Palm *Elaeis guineensis*. Other vegetation is able to flourish due to the high moisture content of the soils, which results from the water table lying close to the surface and the moisture-bearing Alizé winds blowing in from the Atlantic.

## Birds & Biodiversity

The niayes support a diverse array of birds, with over 150 species recorded, including over 50 breeding. It is particularly important for a wide variety of breeding and wintering waterbirds and raptors, whilst there are large roosts of Black Kite *Milvus migrans* at the niayes close to Dakar. There are records of large numbers of wintering and passage terns, e.g. records of over 13,000 Sandwich Tern *Thalasseus sandvicensis* and 1,500 Little Tern *Sternula albifrons* from the 'Dakar niayes' and tens of thousands of Black Terns at Technopôle. Long-tailed Cormorant *Microcarbo africanus* breeds here, whilst Technopôle has become the most important breeding site in Senegal for Black-winged Stilt

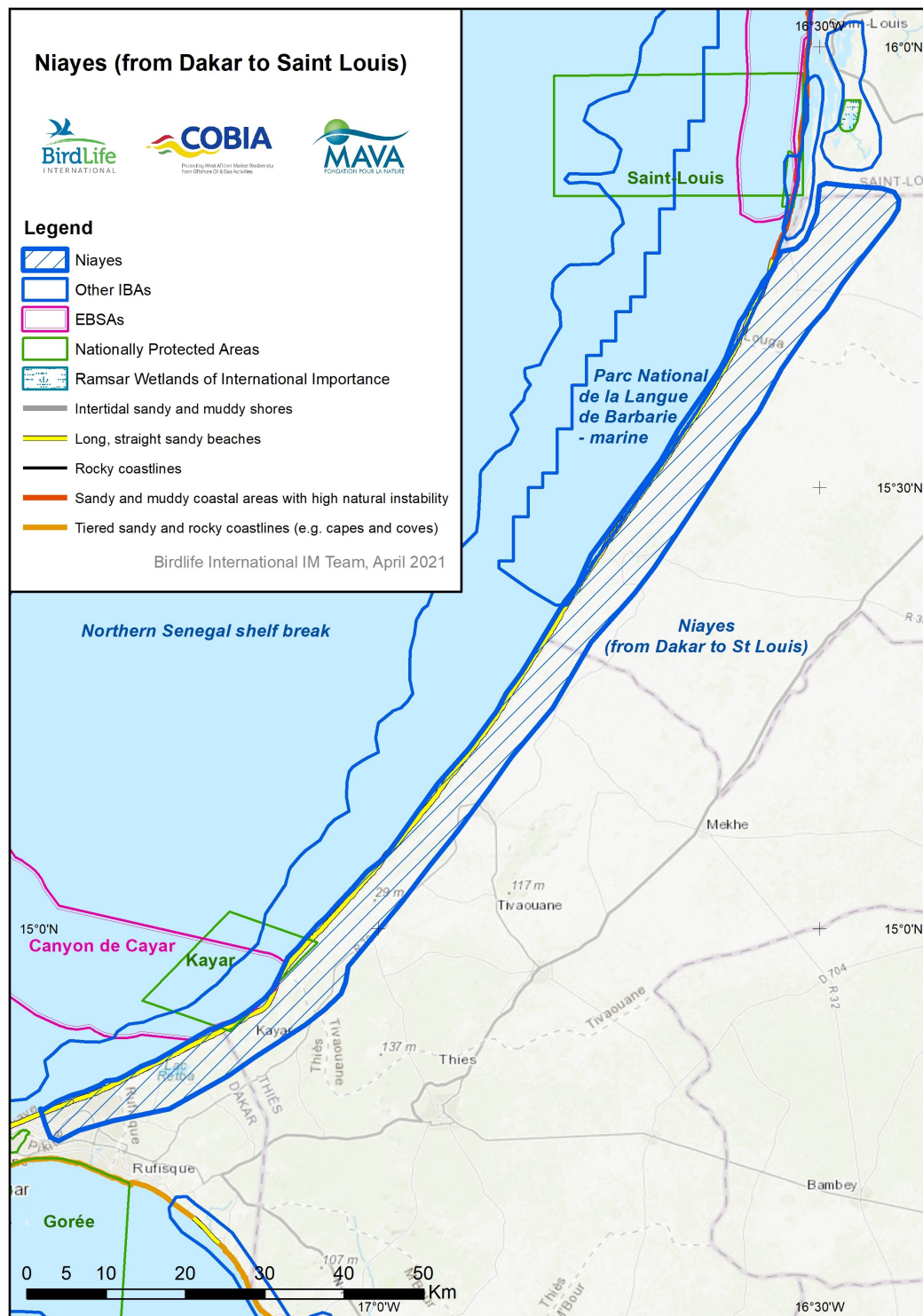
## Conservation issues

Most of the Niayes have no protected status under national legislation and no conservation management. The Réserve Urbaine Naturelle de la Grand Niaye de Pikine was designated as an urban natural reserve in 2020, and is a popular site for visitors and research. The niayes are important for local livelihoods, mainly cattle grazing, fishing, rice farming and market gardening, estimated at 90% of national production. Some individual lakes have religious, cultural and/or tourism significance, whilst Lac Retba is also important for salt production.

The Niayes are threatened by human encroachment, drainage and land reclamation for building, dumping waste and widespread disturbance, especially those close to Dakar and to the main road leading out of the capital. Over-abstraction of water and pollution threaten the hydrology and water quality of the underlying water table. The Niayes represent an important environmental educational resource, with large numbers of birds close to dense urban centres.

### Risks from oil and gas

The Niayes are unlikely to be negatively impacted by offshore oil and gas developments, but they are already under severe pressure from various developments and disturbance, so it is important that any new onshore oil and gas related infrastructure does not impact them.





# Cap Vert

Country: Senegal  
Admin region: Cap Vert  
Coordinates: 14°45'N 17°32'W  
Altitude c.0–40 m

Designation Status: IBA criteria A1, B3a - 3,800 ha

## Site description

This coastal and marine site consists of the coastline of the Cap Vert peninsula, the westernmost point of Africa and the location of Dakar. It runs from les Mamelles and Pointe des Almadies, North to Cambérène, about 19 km in length. It also comprises two islands - Ile de Yoff and Ile de Ngor - and the narrow strip of sea between them and mainland two kilometres offshore. The habitat consists of rocky outcrops and some sandy beaches, with a string of reefs known as the Chaussée des Almadies. The reefs and islands form a degree of natural protection from the Atlantic Ocean for the narrow sea channel less than 1km between them and the mainland.

## Birds & Biodiversity

The site is of considerable importance for seabirds and waterbirds, particularly as a migration route along which move very large numbers of passage shearwaters, petrels, skuas, gulls and terns. Resident terns also use the site, perching on rocks all along the coast and foraging behind fishing boats at sea.

Audouin's Gull *Larus audouinii* is frequent to common off the Pointe des Almadies during January to March. Significant numbers of terns and shearwaters have been recorded, e.g. Sandwich Tern *Thalasseus sandvicensis* with 13,000 recorded wintering along the coast from Kayar to Cap Vert, and up to 23,923 Black Terns *Chlidonias niger*. Other species on passage include Royal Tern *Thalasseus maximus* and Common Tern *Sterna hirundo*. Up to 4,585 Scopoli's Shearwaters *Calonectris diomedea* have also been counted. As counts usually consist of only a few hours watching per day, the actual numbers of birds passing through the site will be considerably more. Large number of passage birds are drawn in around the mainland Pointe des Almadies, and the inner sea channel between the mainland and the islands may be particularly important in bad weather or adverse winds.

Common Bottlenose Dolphin *Tursiops truncatus* is regularly seen, as well as other cetaceans and different species of turtles.

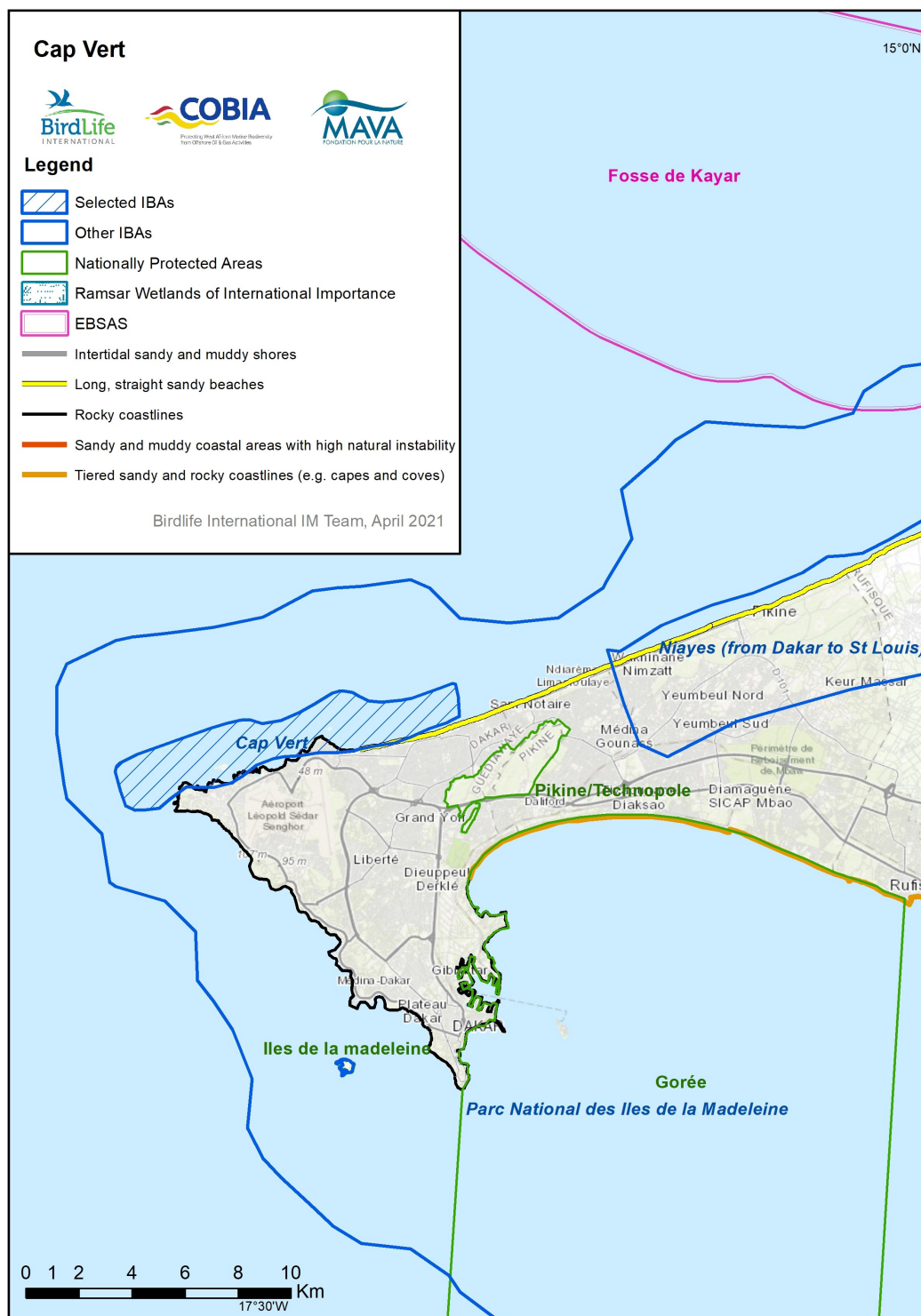
## Conservation issues

Cap Vert is not recognized by any formal government designation, and thus lacks official protection, though part of the site has been declared as an *Aire du patrimoine communautaire* i.e. Community Heritage Area, which recognizes the site's natural, historical and religious importance. Many coastal communities depend on fishing for their livelihoods and there are strong links between fishermen and seabirds. Fishermen use birds to indicate rich fishing areas and many foraging birds follow

fishing boats and *pirogues* (traditional canoes). The coastline is heavily utilised by people living in Dakar and environs. Tern trapping has been reported in the past around the peninsula.

## Risk from Oil and Gas

As Dakar is one of the busiest ports in the region and used by many industrial vessels, one of the most significant risk is probably related to the transportation and transfer of oil and other related products. The site lies within the Cayar Offshore oil block. The marine zone is heavily utilised by migratory species, including whales and dolphins, turtles and seabirds. Large numbers of seabirds feed offshore at the edge of the continental shelf. Any detrimental impact such as an oil spill could have highly damaging consequences on the migratory species that feed in these rich and productive waters.



Map 39: Cap Vert



# Parc National des Îles de la Madeleine (PNIM) & Gorée MPA

Country: Senegal  
Admin region: Cape Vert  
Coordinates: 14°39'N 17°28'W  
Altitude c.0–35 m

Designation Status: IBA criteria A4, B3a - 45 ha  
UNESCO World Heritage Tentative List -15 ha  
National Park – 45 ha

## Site description

PNIM consists of three rocky, volcanic islands lying about 4 km west of the Senegal coast, off the southern end of the Cap Vert peninsula on which Dakar lies, and the areas of sea between the islands. The largest island, Ile aux Serpents, is about 15 ha is covered in steppe-grassland with some trees including baobabs *Adansonia spp.*, jujubas *Ziziphus sp.*, and tamarinds *Tamarindus spp.* The coastal zone of the recently designated Gorée MPA covers the area between the Dakar Plateau and Rufisque, from where it extends south (including the Ile de Gorée) to take in the restricted fishes areas of Hann and the Baie de Hann.

## Birds & Biodiversity

PNIM hosts the only breeding pairs of Red-billed Tropicbird *Phaethon aethereus* known from a continental African country – there are about 50 nests. Great Cormorants *Phalacrocorax carbo* (introduced in the 1980s from Djoudj) and a few Bridled Terns *Sterna anaethetus* also breed. Loggerhead Turtle *Caretta caretta* (VU) has nested on a small beach, and Rough-Toothed Dolphin *Steno bredanensis* and Striped Dolphin *Stenella coeruleoalba* have been recorded. African Spurred Tortoise *Centrochelys sulcata* (VU) has been introduced to the main island. The waters around the islands support a rich underwater fauna, whilst the Gorée MPA supports a diverse fish community, including many commercially important species.

## Conservation issues

The uncontrolled development of sport-fishing and other marine sporting activities may pose some threat to the site's integrity. Casual visitors to the National Park are not controlled and may cause hazards through lighting fires and disturbance to nesting birds.

## Risk from oil and gas

The potential for pollution incidents is high in the area, noting the presence of Dakar port, which receives numerous vessels of all sizes, including oil tankers berthing to supply Dakar, where oil is discharged. The site falls within the Rufisque Offshore oil block.

See Cape Vert map

# La Petite Côte, including Popenguine and Somone

Country: Senegal  
Admin region: Thiès  
Coordinates: La Petite Côte: 14°26'N 17°01'W, Somone/Popenguine: 14°40'N 17°10'W  
Altitude c.0–74 m

Designation Status:  
IBA criteria A4, B1a, B3a, B3b - 14,000 ha  
Avifaunal Reserve – 1,000 ha  
Somone Reserve - 700 ha

## Site description

The site consists of a coastal strip about 70 km long south of Dakar, running from Bargny (20 km south-east of Dakar) south to the village of Mbodiène, which lies just north of the Joal-Fadiouth IBA. The habitat consists of mainly sandy, narrow beaches, offshore sandbars, dunes and saltmarsh, crossed by several small rivers and estuaries. There are a number of shallow lagoons and temporary wetlands in depressions behind the dunes of varying size and salinity i.e. depending on seasonal rainfall, some with associated mudflats and saltmarsh. The lagoons include Yène-Tode (c. 150 ha), Popenguine (c. 10 ha), Somone estuary (c. 30 ha) and Sarène.

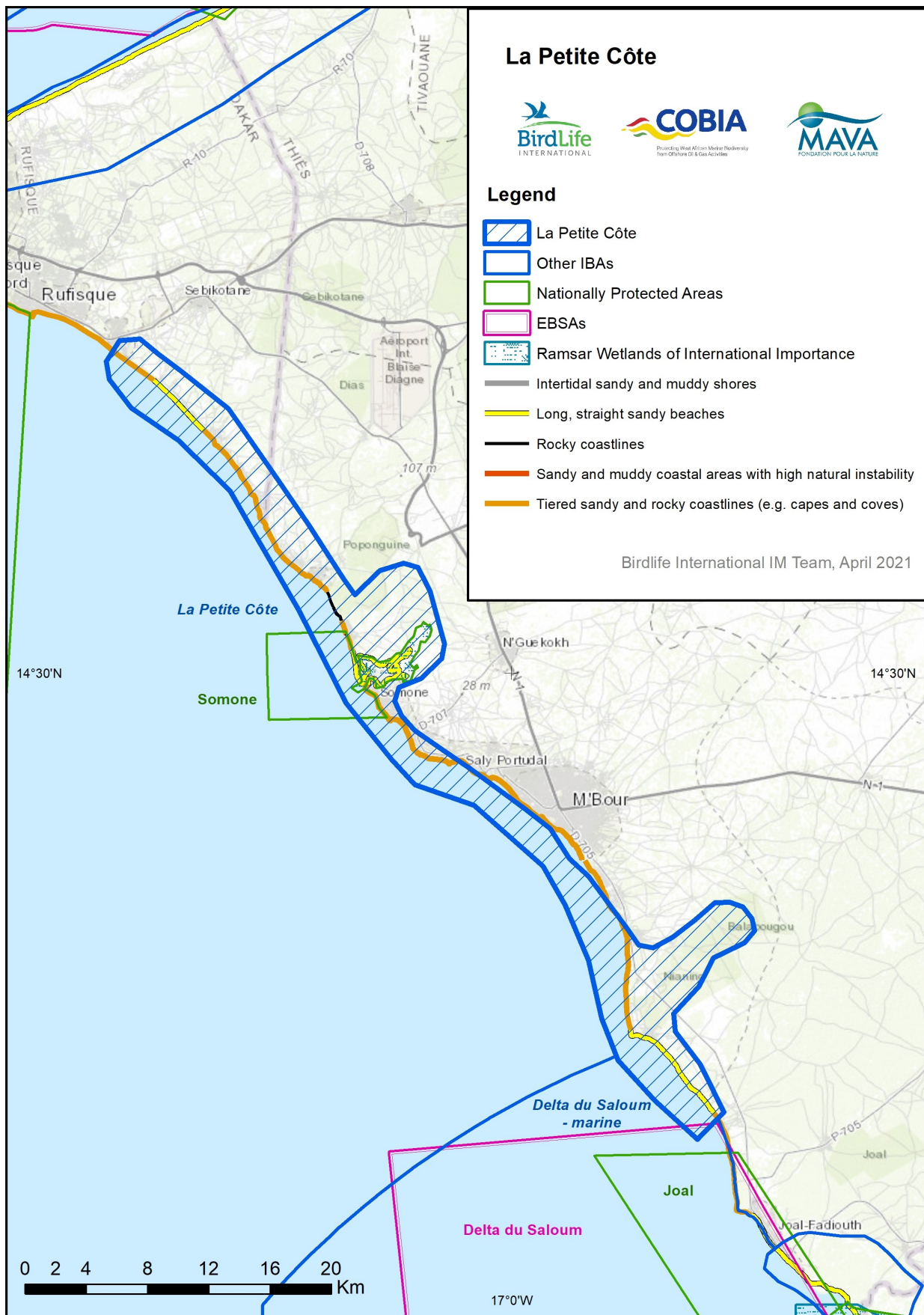
The vegetation is generally sparse; there are some thickets of *Tamarix spp.* on higher ground behind the dunes and, towards the south, *Avicennia spp.* and mangroves on the mudflats. Towards the north, about 15 km of sandy hills and cliffs occur with occasional rocky outcrops behind the dunes, reaching a maximum height of 74 m. One of the rocky outcrops, Cap de Naze, lies just behind Popenguine Avifaunal Reserve, north of Somone. Popenguine consists of a freshwater lagoon and marsh, contained by a man-made barrage.

The 700 ha Réserve Naturelle d'Intérêt Communautaire de la Somone (RNICS), which is also a Ramsar Site and MPA, is flanked by Guéréo, Thiafoura and Sorokhassap villages to the north, and Somone commune to the south and east. It has a tidal lagoon with sandbanks and mangroves. Trees include the baobab *Adansonia digitata*, figs *Ficus platyphylla*, *F. sycomorus* and *F. ovate*, and *Acacia nilotica*. *Rhizophora racemosa* and *Avicennia germinans* are the most abundant mangroves.

## Birds & Biodiversity

The IBA is important for breeding and wintering waterbirds, and for wintering and passage raptors. Lesser Kestrel *Falco naumanni* is regularly seen on passage, and Montagu's Harrier *Circus pygargus* is a frequent winter visitor, occasionally abundant when locusts are numerous. Osprey *Pandion haliaetus* is reported from all parts of the site. There is a Pink-backed Pelican *Pelecanus rufescens* colony 2 km east of Mbour; pelicans disperse along the Petite Côte after breeding. The lagoons attract a reasonable number and diversity of waterbirds, whilst waders and terns are found along the coastline. Sea turtles, especially Green Turtle *Chelonia mydas* (EN), and dolphins occur in the coastal and offshore waters. Somone Lagoon supports a high concentration of waterbirds, including egrets *Ardeola alba*, *Egretta garzetta*, *Egretta gularis*, Royal Terns *Thalasseus maximus* and pelicans.





**Map 40: La Petite Côte**

Species	Red List Category	Site estimate (2014-2017)
<u>Eurasian Spoonbill <i>Platalea leucorodia</i></u>	LC	240-377
<u>Pink-backed Pelican <i>Pelecanus rufescens</i></u>	LC	430-750
<u>Long-tailed Cormorant <i>Microcarbo africanus</i></u>	LC	850-1,615
<u>Great Cormorant <i>Phalacrocorax carbo</i></u>	LC	280-689
<u>Pied Avocet <i>Recurvirostra avosetta</i></u>	LC	360-903
<u>Curlew Sandpiper <i>Calidris ferruginea</i></u>	NT	2,337-6,305
<u>Slender-billed Gull <i>Larus genei</i></u>	LC	1,586-3,041
<u>A4iii Species group - waterbirds</u>	n/a	16,480-21,939

**Table 24.** Site estimates of selected species

### Conservation issues

The IBA includes the Popenguine-Guéréo Avifaunal Reserve and Saloum Reserve (RNICS), Ramsar Site and MPA. Much of the IBA is heavily populated and cultivated behind the dunes and even on some of the offshore sandbars, particularly for market gardening and grazing livestock. There are many fishing villages along the coast with intensive fishing activity close to shore using motorized canoes. There are also high levels of tourist activity in some areas. These threats could lead to localized disturbance and loss of habitat. Catching of terns by children has occurred in the past. Following serious deforestation and drought around Popenguine-Guéréo including destruction of the classified forest on the hills of Cap de Naze, a reforestation and sustainable development programme was established, with creation of the 10,000 ha Espace Naturelle Communautaire Kër Cupaam, which contains the Popenguine Nature Reserve, the classified forest of Popenguine and Somone reserve. The local population has responsibility for management, seconded from the Department of National Parks.

### Risks from oil and gas

Marine traffic passes by the Petite Côte connecting especially with Dakar, with potential for accidents. The long beach coastline is probably more resilient potential damage than the few inlets.



# Joal-Fadiouth & Samba Dia

Country: Senegal  
Admin region: Thiès  
Coordinates: 14°08'N 16°49'W  
Altitude c.0–40 m  
Designation Status:  
IBA criteria B1a, B3a - 1,800 ha  
Marine Protected Area - 17,400 ha  
Samba Dia Biosphere Reserve - 756 ha

## Site description

The Aire Marine Protégée de Joal-Fadiouth (AMPJF) includes a succession of marine, coastal, estuarine, lagoon and savannah habitats, with seagrasses, sandy beaches, mangroves and islets. It lies 144 km southeast of Dakar along the Petite Côte, west and south of the town of Joal-Fadiouth. The IBA incorporates 5 km of sandy coastline, a large estuary and a series of small islands. The estuary consists of expanses of mud and mangroves intersected by creeks, which become at least partially inundated at high tide. At low tide, the mud banks are important feeding areas for waders. Inland, the eastern end of the estuary includes areas of drier land and salt steppe that are not inundated. Just east of Joal-Fadiouth is Samba Dia Biosphere Reserve, a low-lying savanna woodland of 756 ha important for stands of *Borassus* palm.

## Birds & Biodiversity

Joal-Fadiouth is particularly important for wintering waders and terns. Audouin's Gull *Larus audouinii* is a regular wintering species, with frequent observations of hundreds of birds. Breeding birds include Great White Egret *Ardea alba*, Black-headed Heron *A. melanocephala* and Long-tailed Cormorant *Microcarbo africanus*. The MPA is a key site for the reproduction and growth of many fish species. Additionally, it is a feeding and egg-laying site for Green Turtle *Chelonia mydas* (EN). African Manatee *Trichechus senegalensis* (VU) is present in the area as well as Common Bottlenose Dolphin *Tursiops truncatus*.

Species	Red List Category	Site estimate (2014-2017)
Bar-tailed Godwit <i>Limosa lapponica</i>	NT	174-517
Slender-billed Gull <i>Larus genei</i>	LC	1,492-1,853
Grey-headed Gull <i>Larus cirrocephalus</i>	LC	2,586-3,821

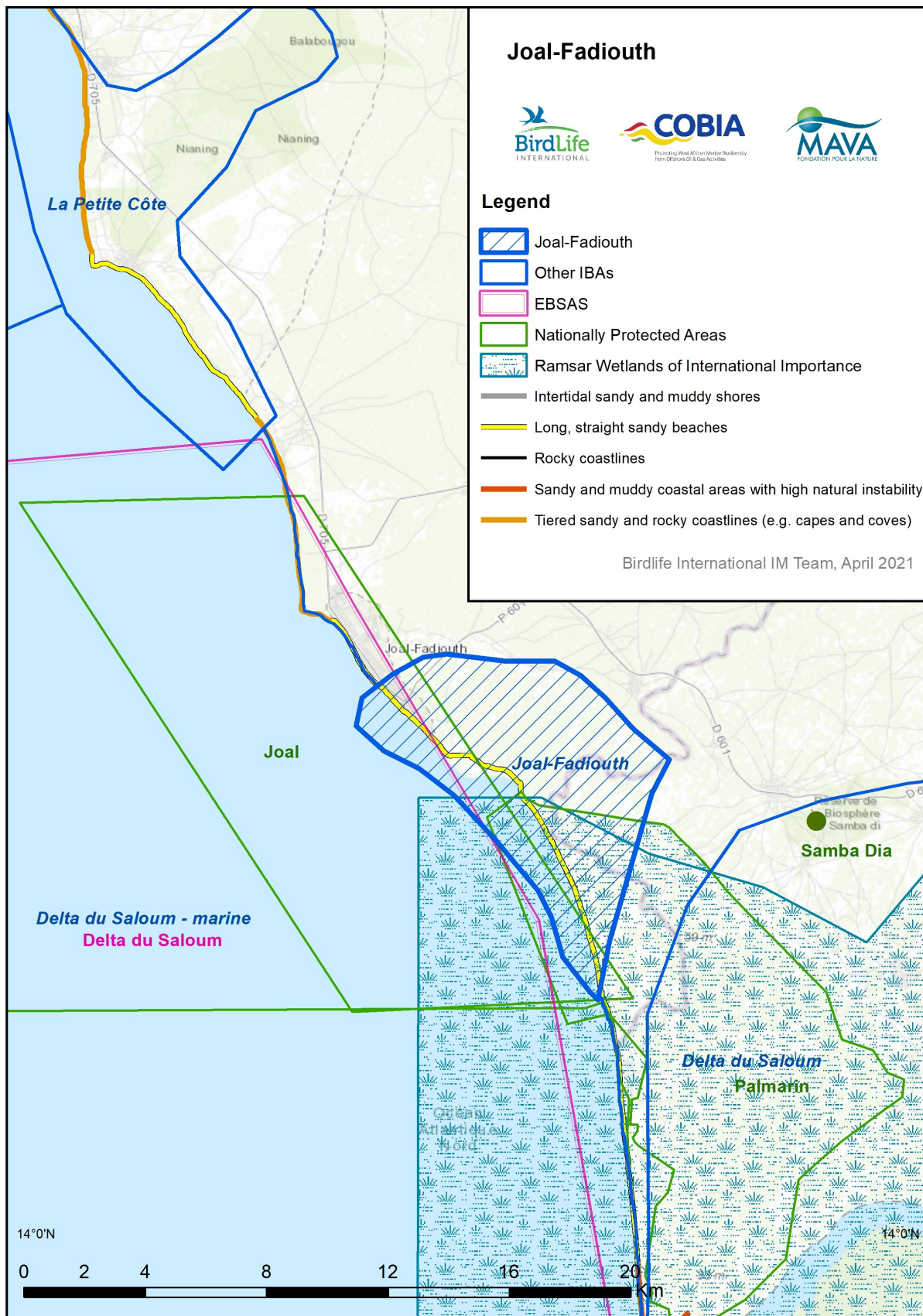
**Table 25.** Site estimates of selected species

## Conservation issues

Joal Fadiouth is just north of the Saloum Delta, which is under national protection designation. The main national designation for Joal-Fadiouth is for the MPA, so much of the terrestrial part of the IBA is under no form of formal protection. Part of the site is of high cultural and touristic value, especially for its historic shell mound islands and associated religious sites. These areas thus receive some measures of local conservation attention.

## Risks from oil and gas

Sensitive coastal areas could be impacted by any pollution incident in the area, both cultural and natural areas. The MPA is within oil concession areas, which have not been developed. The Petite Côte witnesses marine traffic in the approach to Dakar.





# Delta de Saloum, including Sangomar, Bamboung & Gandoul (MPAs) and Palmarin (community reserve)

Country: Senegal  
Admin region: Fatick, Kaolack  
Coordinates: 13°52'N 16°36'W  
Altitude c.0–41 m

Designation Status:  
IBA coastal criteria A1, A3, A4, B1a, B3a, B3b - 180,000 ha  
IBA marine criteria A4, B3a, B3b – 281,385 ha  
National Park –59,934 ha  
Ramsar Site – 73,000 ha  
World Heritage Site criteria iii, iv, v – 180,000 ha  
Palmarin Reserve – 10,430 ha  
Sangomar MPA – 87,437 ha  
Bamboung MPA – 7,000 ha  
Gandoul MPA - 15,732 ha

## Site description

The deltas of the seasonal Sine, Saloum and Diombos Rivers lie southwest of Kaolack, making up the Delta du Saloum site, which is contiguous with Niomi NP in The Gambia. The Biosphere Reserve and IBA cover an area of 180,000 ha, of which half is marine, rivers or inundated areas, one third of which is intertidal. The remaining half is terrestrial savannah or forest, either mainland or islands in the river channels. A part of the site consisting mainly of sea and rivers, with intertidal mangroves and saltwater vegetation, and terrestrial savannah and forest is designated as a national park and Ramsar Site. The Delta du Saloum marine IBA is adjacent to the coastal site, extending out to include the Senegalese EEZ, covering an additional area of 281,385 ha. A large marine zone is also designated as an EBSA. The Saloum area also includes four smaller community-based sites:

- Réserve Naturelle Communautaire de Palmarin (RNCP): This 10,340 ha community reserve in the northern part of the delta between Joal Fadiouth and Dionewar includes a long beach, mangrove channels and agricultural areas.
- Sangomar MPA: This 87,437 ha is south of Joal Fadiouth and north of the Saloum Delta National Park and west of the communes of Bassoul and Djirnda. The area includes the narrow Sangomar Island and areas of mangroves, forests, grassy savannahs, tannes and mudflats. The tree *Tamarix senegalensis* occupies the interface between mangrove and mainland vegetation.
- Bamboung MPA: The 7,000 ha MPA comprises mostly high density mangroves and belongs in the southern part of Saloum Delta.
- Gandoul MPA: This 28,121 ha MPA includes 14 islands; over 35% is farmland in the Niodior district. Fambine channel and Diatt Island are key areas for biodiversity.

The coastal area consists of sea and sandy coast, sand, mud and shell islands and islets, tidal swamps, mangroves, sandbars, lagoons, streams and creeks, savannah and forest. Much of the delta area consists of mangroves principally *Rhizophora* spp. and *Avicennia nitida*, which extend 70 km upstream to Kaolack. North of the main Saloum River channel, the islets are sandy and subject to infrequent tidal flooding, and almost devoid of vegetation or colonized by an herb layer, e.g. *Sesuvium portulacastrum*, *Paspalum vaginatum*. At the edges, where flooding is seasonal, floodplain grasses develop. There are also large areas of saline sand and fossil mangroves, which support little vegetation, and some mangrove-covered islets. South of the river channel, mangroves growing on mud islets, almost entirely covered at high tide, dominate the area. A network of inter-linking channels and seasonal freshwater streams flow into the delta from the landward side. Towards the eastern end of the site, on areas that are never inundated by salt water, there are African baobabs *Adansonia digitata* and *Acacia* trees.

## Birds & Biodiversity

The site is important for a wide variety of waterbirds and seabirds, some occurring in large congregations. The marine and coastal zone, and particularly the sandbars and islands, are the most important breeding sites for gulls and terns on the coast of Senegal. The largest breeding colony of Royal Tern *Thalasseus maximus* in the world occurs here, along with Grey-headed Gull *Larus cirrocephalus*, Caspian Tern *Sterna caspia* and several pairs of Kelp Gull *Larus dominicanus*, whilst the highest counts of wintering Audouin's Gull *Larus audouinii* in Senegal are recorded. The area is also important for wintering Eurasian Spoonbill *Platalea leucorodia*.

The central intertidal zone of river channels, islands, creeks, mangroves and sand- and mudflats is a low tide feeding and roosting area for waders and herons, especially important for Great White Egret *Ardea alba*, Goliath Heron *Ardea goliath* and the only known breeding site in Senegal for Grey Heron *Ardea cinerea*. There are significant numbers of waders, including Eurasian Oystercatcher *Haematopus ostralegus*, Black-winged Stilt *Himantopus himantopus*, Senegal Thick-knee *Burhinus senegalensis* and Whimbrel *Numenius phaeopus*.

The largest concentrations of Osprey *Pandion haliaetus* in Senegal occur here. There is a huge non-breeding roost of raptors on Kousmar Island, a classified forest near Kaolack, where up to 28,000 Lesser Kestrels *Falco naumanni* and 36,000 Swallow-tailed Kites *Elanoides forficatus* have been counted.

Coastal and marine mammals include African Manatee *Trichechus senegalensis* (VU), Atlantic Humpback Dolphin *Sousa teuszii* (CR) and various species of *Stenella* dolphin. The dry forest contains threatened mammal species typical of the Sudan–Sahel interface, including Temminck's Red Colobus *Piliocolobus badius temminckii* (EN), Red-flanked Duiker *Cephalophus rufilatus* and Bohor Reedbuck *Redunca redunca*. Spotted Hyena *Crocuta crocuta* also occurs throughout much of the delta.

There are five species of breeding turtles: Leatherback *Dermochelys coriacea* (VU), Green Chelonia *mydas* (EN), Loggerhead *Caretta caretta* (VU) and Hawksbill Turtles *Eretmochelys imbricata* (CR) and Olive Ridley *Lepidochelys olivacea* (VU). The whole delta and offshore area is an important fish spawning and feeding ground with 114 species recorded. Bamboing is important for juvenile Thiof or White Grouper *Epinephelus aeneus*, a key species in the fisheries sector.



Species	Red List Category	Site estimate (2014-2017)
<u>Greater Flamingo <i>Phoenicopterus roseus</i></u>	LC	1,291-2,515
<u>Black Stork <i>Ciconia nigra</i></u>	LC	17-25
<u>Eurasian Spoonbill <i>Platalea leucorodia</i></u>	LC	289-426
<u>Cattle Egret <i>Bubulcus ibis</i></u>	LC	4,717-7,536
<u>Western Reef-egret <i>Egretta gularis</i></u>	LC	3,089-4,663
<u>Pink-backed Pelican <i>Pelecanus rufescens</i></u>	LC	707-1,292
<u>Long-tailed Cormorant <i>Microcarbo africanus</i></u>	LC	1,786-2,703
<u>Great Cormorant <i>Phalacrocorax carbo</i></u>	LC	3,129-9,208
<u>Eurasian Oystercatcher <i>Haematopus ostralegus</i></u>	NT	717-927
<u>Common Ringed Plover <i>Charadrius hiaticula</i></u>	LC	4,191-5,322
<u>Kentish Plover <i>Charadrius alexandrinus</i></u>	LC	1,127-1,447
<u>Eurasian Curlew <i>Numenius arquata</i></u>	NT	187-288
<u>Bar-tailed Godwit <i>Limosa lapponica</i></u>	NT	3,073-3,553
<u>Curlew Sandpiper <i>Calidris ferruginea</i></u>	NT	1,857-2,211
<u>Slender-billed Gull <i>Larus genei</i></u>	LC	2,131-4,909
<u>Audouin's Gull <i>Larus audouinii</i></u>	LC	467-994
<u>Little Tern <i>Sternula albifrons</i></u>	LC	775-1,520
<u>Lesser Black-backed Gull <i>Larus fuscus</i></u>	LC	5,475-9,476
<u>Grey-headed Gull <i>Larus cirrocephalus</i></u>	LC	573-969
<u>Caspian Tern <i>Hydroprogne caspia</i></u>	LC	3,364-6,322
<u>Hooded Vulture <i>Necrosyrtes monachus</i></u>	CR	2
<u>Lappet-faced Vulture <i>Torgos tracheliotos</i></u>	EN	2
<u>A4iii Species group - waterbirds</u>	n/a	39,928-42,516

**Table 26.** Site estimates of selected species

## Conservation issues

The core area i.e. the National Park/Ramsar site and part of the buffer zone of the Biosphere Reserve/IBA are owned by the State, but the remainder is owned by the local community and managed through liaison between a rural council and National Park and forest service authorities. Human uses within the park include nature conservation, tourism, and gathering of grasses and other plant products. Activities in areas around the site include livestock rearing, agriculture (mainly growing of millet), fishing and hunting.

There are potential threats to the whole delta area, from extension of rice cultivation, general intensification of agriculture and salinization of soils, forest exploitation, destruction of mangroves, fires in the forest zone and overfishing. Local initiatives to regulate exploitation of fish and forest resources at Sangomar include establishment of biological rest areas, regulation of fishing gear, zoning of fishing grounds and regulating collection of forest products.

Illegal collection of molluscs, bird and sea turtle eggs is an issue in some areas. The saltflats upstream of the park and parts of the Fathala forest are currently unprotected, though proposals exist for their inclusion within the park. Efforts to raise awareness and achieve integrated management of the whole delta with local communities are ongoing, especially through Biosphere Reserve actions and smaller community-based MPAs. The delta includes sacred areas to local communities, and there is great historic value in the shell islands, which form the basis of a cultural World Heritage Site.

Traditional human activities (straw cutting and deadwood collecting) at Kousmar do not seem to have a negative impact on the huge raptor roost, although inappropriate use of locust insecticides is an important risk for insectivorous raptors.

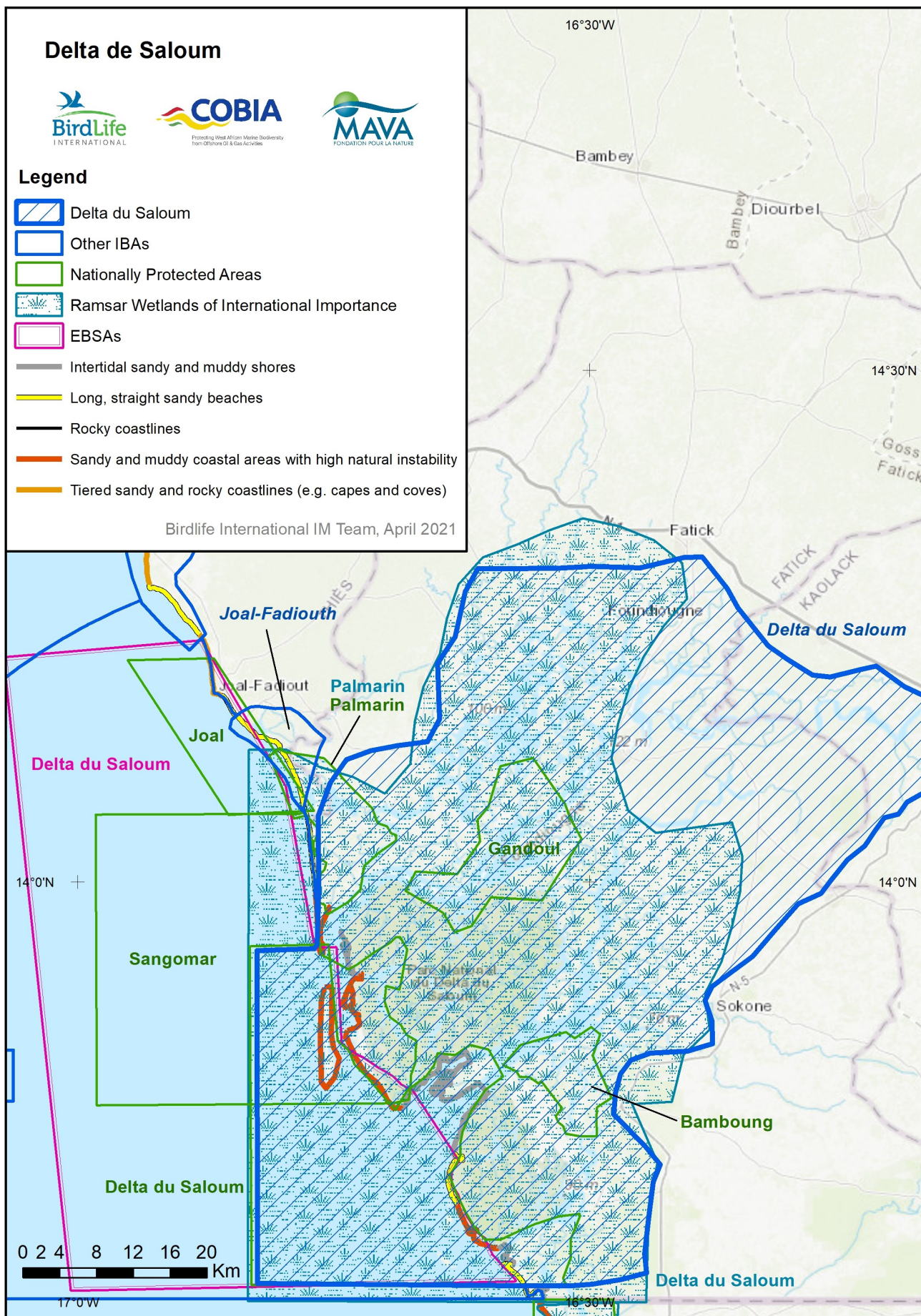
## Risks from oil and gas

The multiple creeks, low-lying islands vital for breeding birds, beaches for breeding turtles and endangered aquatic species such as Atlantic Humpback Dolphin render the delta and MPA very sensitive to any threats from nearby oil and gas operations and passing tankers. An oil spill in this area would be very damaging and logistically difficult to contain. The Saloum MPA falls within the Djiffère oil block.



Credit: Hans Veth/Flickr





# (Réserve Ornithologique de) Kalissaye

Country: Senegal  
Admin region: Ziguinchor  
Coordinates: 12°40'N 16°46'W  
Altitude c.0 m  
Designation Status: IBA criteria B1a, B3a  
Avifaunal Reserve - 16 ha  
Ramsar – 30,000 ha

## Site description

The Réserve Ornithologique de Kalissaye (ROK) lies at the mouth of the Kalissaye River in the Casamance region of southwestern Senegal. This rich coastal and marine site, which is also an IBA, consists of two sandy islands lying off the Pointe de Sankoye. The Kalissaye Ramsar Site is much more extensive, including large areas of gallery forests, stands of mangrove *Avicennia spp.* and *Rhizophora spp.*, bolons and mudflats, marshland, sandy beaches and freshwater rivers. The strong currents in the estuary modify the mobile sand substrate, changing the shape and size of the islands continually. The vegetation on the islands is characterized by littoral sand-loving species such as *Ipomoea pes-caprae*, *Sporobolus spicatus* and *Alternanthera maritima*. ROK was established as a reserve and sanctuary to protect breeding seabirds and sea turtles.

## Birds & Biodiversity

The bird species present include a large colony of Great White Pelican *Pelecanus onocrotalus*, as well as Caspian Tern *Hydroprogne caspia* and Royal Tern *Thalasseus maximus*. However, the presence of breeding terns can be unpredictable and prone to disturbance. Various species of waders are present in the mudflats. For a full account of IBA trigger species see Table 27. Five sea turtle species are known to occur: Hawksbill Turtle *Eretmochelys imbricate* (CR), Leatherback Turtle *Dermochelys coriacea* (VU), Olive Ridley *Lepidochelys olivacea* (VU), Green Turtle *Chelonia mydas* (EN) and Loggerhead Turtle *Caretta caretta* (VU). The site is also a feeding area for African Manatee *Trichechus senegalensis* (VU) and Atlantic Humpback Dolphin *Sousa teuszii* (CR).

Species	Red List Category	Site estimate (2014-2017)
<u>Great White Pelican <i>Pelecanus onocrotalus</i></u>	LC	376-1,008
<u>Slender-billed Gull <i>Larus genei</i></u>	LC	306-513
<u>Grey-headed Gull <i>Larus cirrocephalus</i></u>	LC	914-2,565
<u>Little Tern <i>Sternula albifrons</i></u>	LC	193-349
<u>Common Gull-billed Tern <i>Gelochelidon nilotica</i></u>	LC	196-376
<u>Caspian Tern <i>Hydroprogne caspia</i></u>	LC	1,162-2,280

**Table 27.** Site estimates of selected species



### Conservation issues

There is concern about erosion by ocean currents of the sandbar and the islands that form the IBA/Avifaunal reserve area, due to its importance to the Great White Pelican colony and other breeding species. In the area surrounding the Kalissaye wetlands Ramsar Site, fish smoking activities may impact woody resources. Specific threats include the collection of tern and sea turtle eggs, whilst disturbance of the site has caused desertion of sensitive breeding tern colonies.

### Risks from oil and gas

Kalissaye abuts the SOSS oil and gas block; the estuarine waters and aquatic species could be impacted by any developments.





# Parc National de Basse Casamance

Country: Senegal  
Admin region: Ziguinchor  
Coordinates: 12°24'N 16°36'W  
Altitude c.0–11 m  
Designation Status:  
IBA criteria A1, A3, A4, B1a, B3a – 5,000 ha  
National Park – 5,000 ha

## Site description

Basse Casamance lies in the Casamance River Delta in southwestern Senegal, south of the main river channel about 50 km southwest of Ziguinchor. It is low-lying, with mangroves fringing tidal channels, seasonally bare saline mudflats, wooded savannah and terrestrial forest, including the only remaining patch of Guinea–Congo forest in Senegal. The mudflats are colonized by *Eleocharis mutata* and *E. geniculata*. The Guinea–Congo forest occurs as islands within the Santiaba–Mandjak forest and includes species such as *Parinari excelsa*, *Pithecellobium altissimum*, *Chlorophora regia*, *Detarium senegalense*, and abundant *Treculia africana* forming the lower canopy.

## Birds & Biodiversity

This site contains several species that are not found in any other IBA in Senegal, including Yellow-casqued Hornbill *Ceratogymna elata* (VU), Rufous-winged Illadopsis *Illadopsis rufescens* (NT) and Splendid Sunbird *Cinnyris coccinigastrus*, mainly forest and woodland specialists, also Grey-hooded Capuchin Babbler *Phyllanthus atripennis* (NT). The mudflats support a number of Palearctic migrant waterbirds. Over 50 mammal species have been recorded from this small area, including Temminck's Red Colobus *Piliocolobus badius temminckii* (EN) and African Manatee *Trichechus senegalensis* (VU), a variety of duikers *Cephalophus spp.*, whilst Beecroft's Scaly-tailed Squirrel *Anomalurus beecrofti* is found nowhere else in Senegal. Kob *Kobus kob* has been successfully reintroduced to the park. The African Dwarf Crocodile *Osteolaemus tetraspis* (VU) also occurs here.



Credit: Ivan Sabayuki/Unsplash

Species	Red List Category	Site estimate (2014-2017)
<u>Greater Flamingo <i>Phoenicopterus roseus</i></u>	LC	1,804 individuals
<u>Yellow-billed Stork <i>Mycteria ibis</i></u>	LC	806-1,314 individuals
<u>Black Stork <i>Ciconia nigra</i></u>	LC	60-111 individuals
<u>Western Reef-egret <i>Egretta gularis</i></u>	LC	472-1,000 individuals
<u>Pink-backed Pelican <i>Pelecanus rufescens</i></u>	LC	371-845 individuals
<u>Long-tailed Cormorant <i>Microcarbo africanus</i></u>	LC	4,409-8,971 individuals
<u>Pied Avocet <i>Recurvirostra avosetta</i></u>	LC	304-894 individuals
<u>Curlew Sandpiper <i>Calidris ferruginea</i></u>	NT	883-1,509 individuals
<u>Grey-headed Gull <i>Larus cirrocephalus</i></u>	LC	562-761 individuals
<u>Caspian Tern <i>Hydroprogne caspia</i></u>	LC	534-1,154 individuals
<u>Egyptian Vulture <i>Neophron percnopterus</i></u>	EN	1
<u>Hooded Vulture <i>Necrosyrtes monachus</i></u>	CR	188

**Table 28.** Site estimates of selected species

### Conservation issues

The site is well managed, but is small and close to several population centres, such as Oussouye and Ziguinchor. There are pressures on areas outside the National Park boundary, including an estuarine and an offshore fishery and mangrove exploitation. The lower Casamance River and delta are threatened by increases in salinity resulting from reduced rainfall over the last decades and the intrusion of saltwater further upstream. This has led to localised losses of fish species and pollution of groundwater in the past.

### Risks from oil and gas

As the site is not directly at the coastline, potential impacts of an offshore oil spill or other similar event are not likely to affect the park to a great extent. However, the whole Casamance Delta is within the Senegal Onshore Sud oil block. Environmental impacts in the mangroves and creeks of the Niger Delta have been severe, and could be similar here if oil was exploited in this block.



# Casamance: Abéné, Niamone-Kalounayes, Kassa-Balantacounda & Kaalolaal Blouf-Fogny (MPAs), Kawawana & Kapac Olal de Mlomp (community reserves) & Embouchure de la Casamance (EBSA)

Country: Senegal  
Admin region: Ziguinchor  
Coordinates: Côte: 13°00'N 16°45'W  
Altitude c.0–20 m  
Designation Status: Abéné MPA - 11,900 ha  
Kawawana MPA – 9,665 ha  
Niamone-Kalounayes MPA – 66,032 ha  
Kassa Balantacounda MPA - 23,200 ha  
Kapac Olal de Mlomp MPA – 22,280 ha

## Site description

The Lower Casamance presents a mosaic of habitats within a meandering tropical riverine environment, rich in mangroves, creeks, tidal flats, also with forests, woodlands, plains and agricultural areas. As well as the Basse Casamance National Park and Kalissaye reserve, several other of areas have been designated for their nature values. Whilst some other community areas also exist the main recognised sites include:

- Abéné MPA: This 11,900 ha MPA lies offshore of Kafountine and Kataba 1, with a coastline of nearly 20 km directly south of The Gambia border. A narrow terrestrial part includes the dune part near Niafrang village, a long beach and coastal mangroves. The marine waters comprise rocky habitats (Herr Mactar Gueye, Herr Lamine Diatta, Herr Mam).
- Aire du Patrimoine Communautaire Kawawana (APAC): This 9,665 ha community heritage area set up by communities of eight villages comprises estuarine areas, mangroves forests and mudflats.
- Niamone-Kalounayes MPA: This 66,032 ha MPA lies on the north bank of the Casamance River between Bignona marigot and Soungrougrou River within the Ouonk commune. It contains mangroves, forests, islands, grassy savannah, tannes and mudflats.
- Kassa-Balantacounda MPA: This 23,200 ha MPA lies on the south bank of the Casamance River east of Ziguinchor, including a branch of Sindone River, with mangroves, forests, grassland savannah, tannes, mudflats and a large palm grove.
- Aire du Patrimoine Communautaire Kapac Olal de Mlomp (APAC): This 22,280 ha Community Heritage Area on the south bank of the Casamance River mouth up to Pointe Saint-Georges in the Mlomp commune, Oussouye, comprises 5,500 ha of maritime and 16,780 ha of terrestrial areas. It includes mangroves, palm groves, forests and marshes.
- Kaalolaal Blouf-Fogny MPA: This new MPA comprises several communes around the Casamance River Mouth west of Ziguinchor, mainly within the Bignona district. The area is rich in mangroves, bolongs and estuarine flats.
- Embouchure de la Casamance: This EBSA comprises the Casamance River mouth and smaller estuaries to the north and south, with an offshore area of estuarine influence.

## Birds & Biodiversity

The Lower Casamance is a key area for Black Crowned-crane *Balearica pavonina* (VU), which breeds in the area and feeds in ricefields. Abyssinian Ground-hornbill *Bucorvus abyssinicus* occurs in woodland areas, whilst waders such as Red Knot *Calidris canutus* (NT), Black-tailed Godwit *Limosa limosa*, Bar-tailed Godwit *Limosa lapponica* (NT), Curlew Sandpiper *Calidris ferruginea* (NT), Eurasian Curlew *Numenius arquata* (NT) and Eurasian Oystercatcher *Haematopus ostralegus* (NT) occur on the intertidal flats. The area supports many breeding birds, including pelicans, herons and terns.

Atlantic Humpback Dolphin *Sousa teuszii* (CR), Common Bottlenose Dolphin *Tursiops truncatus*, African Manatee *Trichechus senegalensis* (VU) and African Clawless Otter *Aonyx capensis* (NT). Land mammals include Spotted Hyena *Crocota crocuta* and African Wolf *Canis lupaster*. The area includes important breeding beaches for sea turtles, and populations of West African Crocodile *Crocodylus suchus* and African Dwarf Crocodile *Osteolaemus tetraspis* (VU).

Many estuarine and shallow offshore areas are vital fish nursery areas for pelagic and demersal species, including sharks and rays as well as Great Barracuda *Sphyraena barracuda*, Bagrid Catfish *Hrysichthys nigrodigitatus*, Trevally *Caranx spp.*, Rubberlip Grunt *Plectorhynchus mediterraneus* (DD), African Sickfish *Drepane africana*, White Grouper *Epinephelus aeneus*, *Trachurus trecae*, *Decapterus rhonchus*, Bonga Shad *Ethmalosa fimbriata*, Atlantic Bonito *Sarda sarda*, as well as sardinellas *Sardinella aurita* and *Sardinella maderensis* at the coast. Mulletts are especially abundant in the estuary, including Sicklefins *Neochelon falcipinnis* and Banana Mullet *Mugil bananensis*. Three deep-sea pelagic species with a wide geographical distribution are concentrated off the Senegalese coast from May to October: Bigeye Tuna *Thunnus obesus* (VU), Yellowfin Tuna *Thunnus albacares* (NT) and Skipjack Tuna *Katsuwonus pelamis*, the latter two being most abundant off the Casamance coast.

## Conservation issues

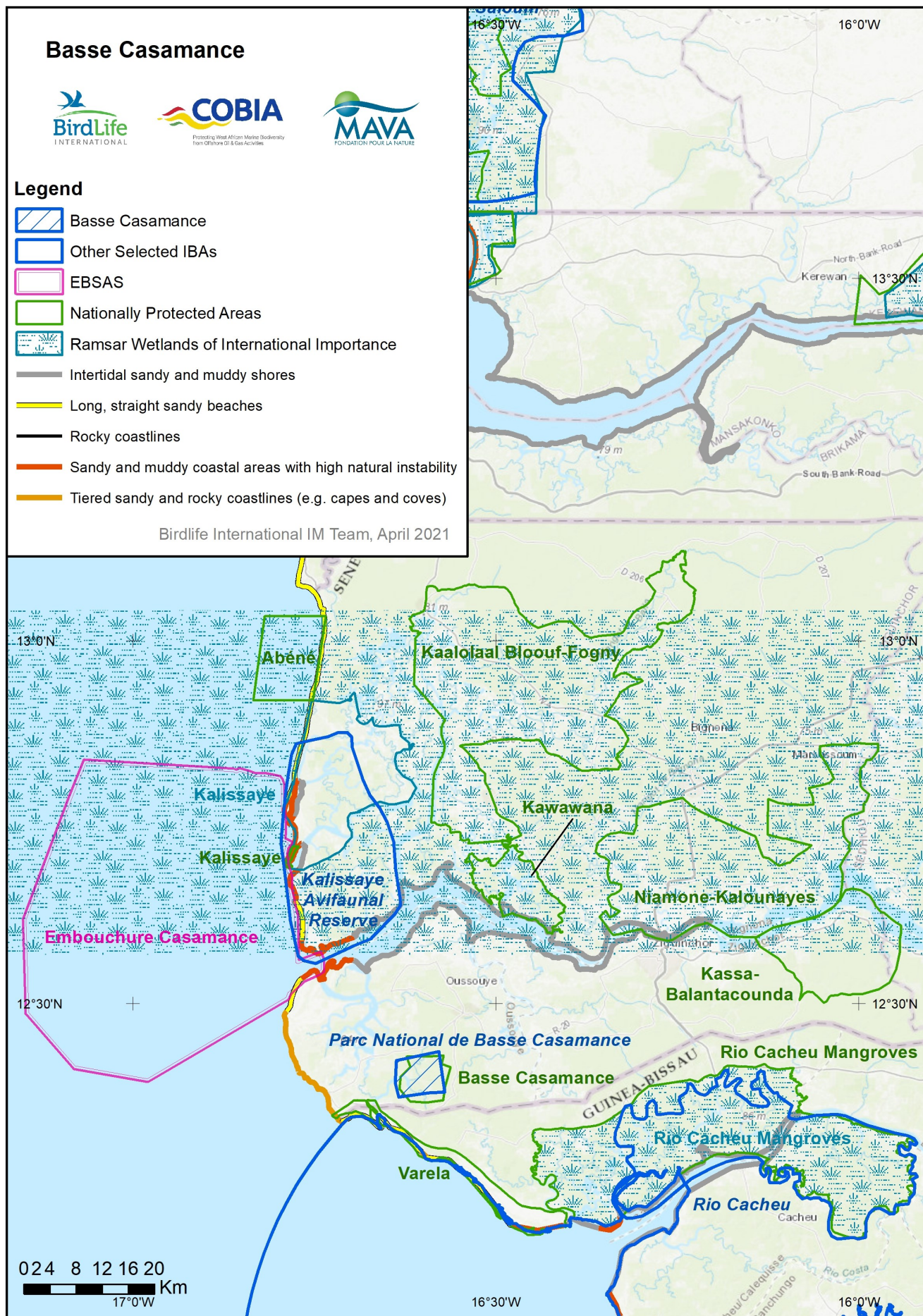
The Abéné MPA was created to protect fishing resources and most community areas promote rational and sustainable management of ecosystems and natural resources. Several sites include sacred areas, such as Kawawana's sacred rivers Mitij and Kilin-Kilin, which are forbidden to entry. At Kapac Mlomp, the commune as a decentralised authority is primarily responsible for management, with representatives of grassroots community groups and village chiefs.

There is a high fishing pressure in much of the area. If well regulated, then these local MPAs and other sites could play an important role in reducing this pressure, especially through restricted fishing in important nursery areas. Coastal erosion is an issue, which can impact turtle breeding beaches.

## Risk from Oil and Gas

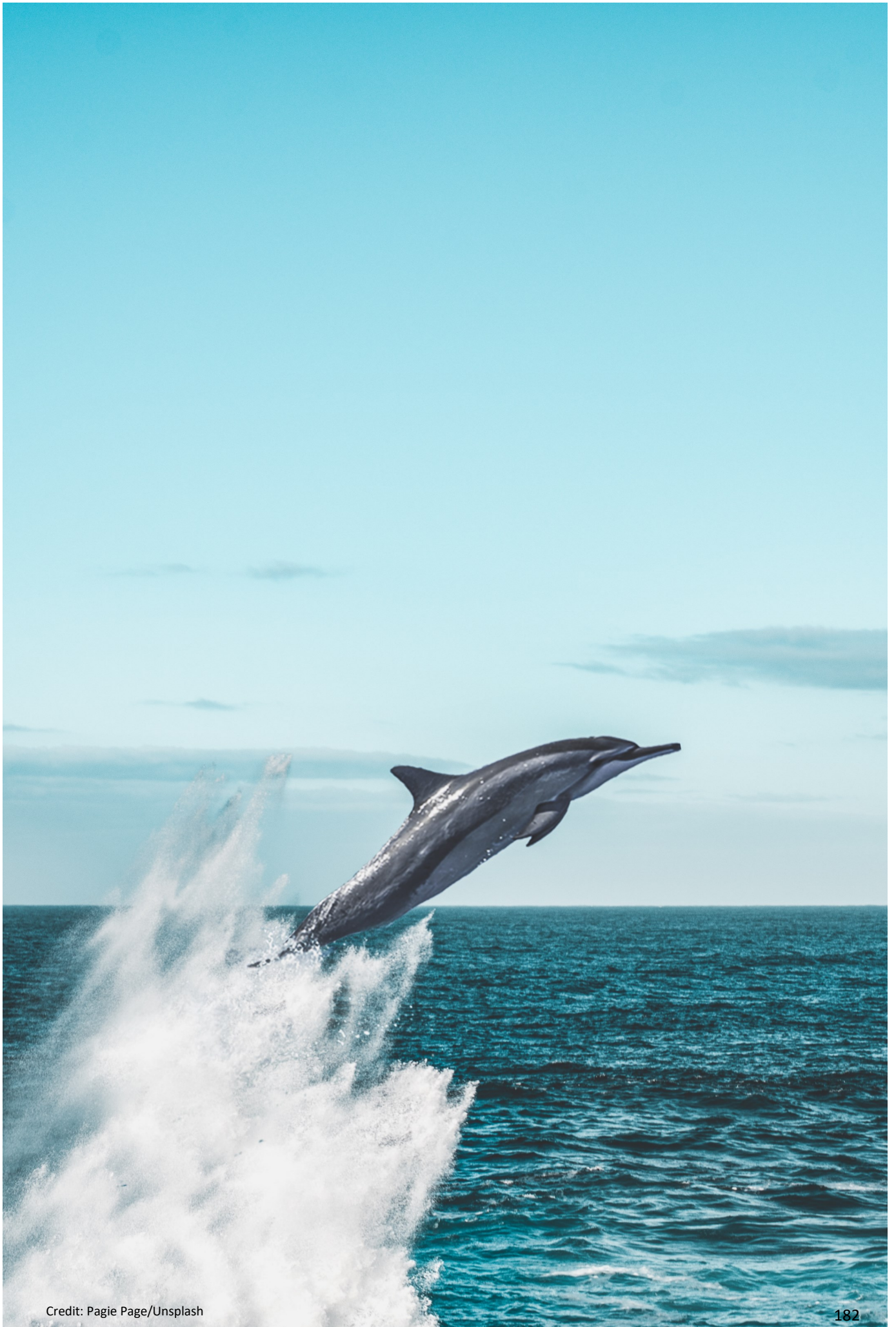
Local pollution incidents have already occurred in the area, through cleaning of fishing and marine transport vessels. Ziguinchor is an important marine transport hub at a core part of the lower Casamance River. Any major oil spill in the area could be catastrophic for fisheries, wildlife and local communities in this rich tropical complex of estuarine waters. Oil has already been discovered in the AGC Shallow oil block shared between Senegal and Guinea-Bissau. Any further developments should require rigorous levels of preparedness and mitigation measures.





Map 43: Basse Casamance





**Guinea-Bissau**



# Arquipélago dos Bijagós / Bolama-Bijagós

## Arquipélago dos Bijagós / Bolama-Bijagós including Orango, João Vieira e Poilão & Urok

Country: Guinea-Bissau  
Admin region: Bolama  
Coordinates: 11°15'N 16°00'W  
Altitude: 0–34 m  
Designation Status:  
IBA criteria A4, B1a, B3a, B3b – 190,000 ha  
IBA marine. criteria B3a - 1,926,990 ha  
Ramsar Site - 1,046,950 ha  
UNESCO World Heritage tentative list.  
Criteria vii, x -101,230 ha  
UNESCO-MAB Biosphere Reserve - 101,230 ha  
Orango National Park – 158,235 ha  
JVP National Park - 49,500 ha  
Urok MPA - 54,500 ha  
EBSA

### Site description

The Arquipélago dos Bijagós, opposite the mouth of Rio Gêba, is composed of 88 islands and a large intertidal area of mudflats and mangroves. About 40% of islands are inhabited, half only seasonally. The land area is 90,000 ha, whilst a further 100,000 ha are uncovered twice daily by the retreating tide, of which 76,000 ha are mudflats and 35,000 ha mangroves, including White Mangrove *Laguncularia racemosa*. The islands also support forests, savannahs and floodplains, as well as temporary and permanent agricultural areas.

The Orango National Park of 158,235 ha comprises the most southerly group of islands, including Orango, Canogo, Imbone, Meneque and Orangozinho and Adonga, Canoupa and Anhatibe islets plus a maritime zone of 132,000 ha. The park, whose boundary extends to 10 km offshore (up to 10m deep isobaths), includes forest, coastal wooded savannah, 16,000 ha of mangroves, channels and shallow seas.

The João Vieira e Poilão Marine National Park includes six small islands in the southeast of the archipelago (João Vieira, Meio, Cavalos, Poilão, Cabras and Aweto) and a large marine area up to the 10m isobaths. About 95% of its 49,500 ha consists intertidal and shallow marine areas. Urok AMPU, a community MPA is a 54,500 ha group of islands in the northern part of the archipelago, includes significant mangrove swamps and vast mudflats, with a 39,800 ha marine area.

The Bolama-Bijagós UNESCO-MAB Biosphere Reserve (created in 1996) and the Ramsar Site (designated in 2014) encompass the whole archipelago, as does the IBA (excluding Ilha de Bolama, the island closest to the mainland). The Bijagós marine IBA includes the whole archipelago plus a large extent of the Guinea-Bissau EEZ.

## Birds & Biodiversity

Over 800,000 Palaearctic waders visit the archipelago during the northern winter, with globally important congregations of over 30 species (Dodman & Sá 2005), including Ruddy Turnstone *Arenaria interpres*, Red Knot *Calidris canutus*, Curlew Sandpiper *Calidris ferruginea*, Little Stint *Calidris minuta*, Sanderling *Calidris alba*, Common Ringed Plover *Charadrius hiaticula*, Grey Plover *Pluvialis squatarola*, Common Redshank *Tringa tetanus*, Black-tailed Godwit *Limosa limosa*. Colonial breeding birds include Caspian Tern *Sterna caspia* and Royal Tern *Thalasseus maximus*, with breeding bird estimates in 2014 of 360-600 and 52,135-86,893 respectively, as well as African Spoonbill *Platalea alba*. There is also a resident population of Timneh Parrot *Psittacus timneh* (EN), and this is one of the most important sites in West Africa for Hooded Vulture *Necrosyrtes monachus* (CR).

The archipelago is probably the most important site globally for African Manatee *Trichechus senegalensis* (VU) and Atlantic Humpback Dolphin *Sousa teuszii* (CR), and Common Bottlenose Dolphin *Tursiops truncatus* is common. Orango NP is one of the key sites in West Africa for Common Hippo *Hippopotamus amphibius* (VU). African Clawless Otter *Aonyx capensis* (NT) occur and Bushbuck *Tragelaphus scriptus* is found on some islands.

The 2 km long beach of the small island of Poilão hosts the largest Green Turtle *Chelonia mydas* (EN) breeding site in Africa, with around 25,000 clutches laid annually (Nô Okinka di Mar 2020). Another four turtle species breed in the archipelago: Hawksbill Turtle *Eretmochelys imbricata* (CR), Loggerhead Turtle *Caretta caretta* (VU), Leatherback Turtle *Dermochelys coriacea* (VU), and Olive Ridley *Lepidochelys olivacea* (VU). Ilha João Vieira and Ilha Orango are also important nesting sites. African Dwarf Crocodile *Osteolaemus tetraspis* (VU) and West African Crocodile *Crocodylus suchus* also occur.

The archipelago supports a rich marine life, with important fish nursery areas and high fish biodiversity. It is especially important for cartilaginous fish, including Great Hammerhead *Sphyrna mokarran* (CR). The archipelago is perhaps the only site in West Africa where sawfish may still persist, potentially Largetooth sawfish *Pristis pristis* (CR) and/or Smalltooth Sawfish *Pristis pectinata* (CR).

## Conservation issues

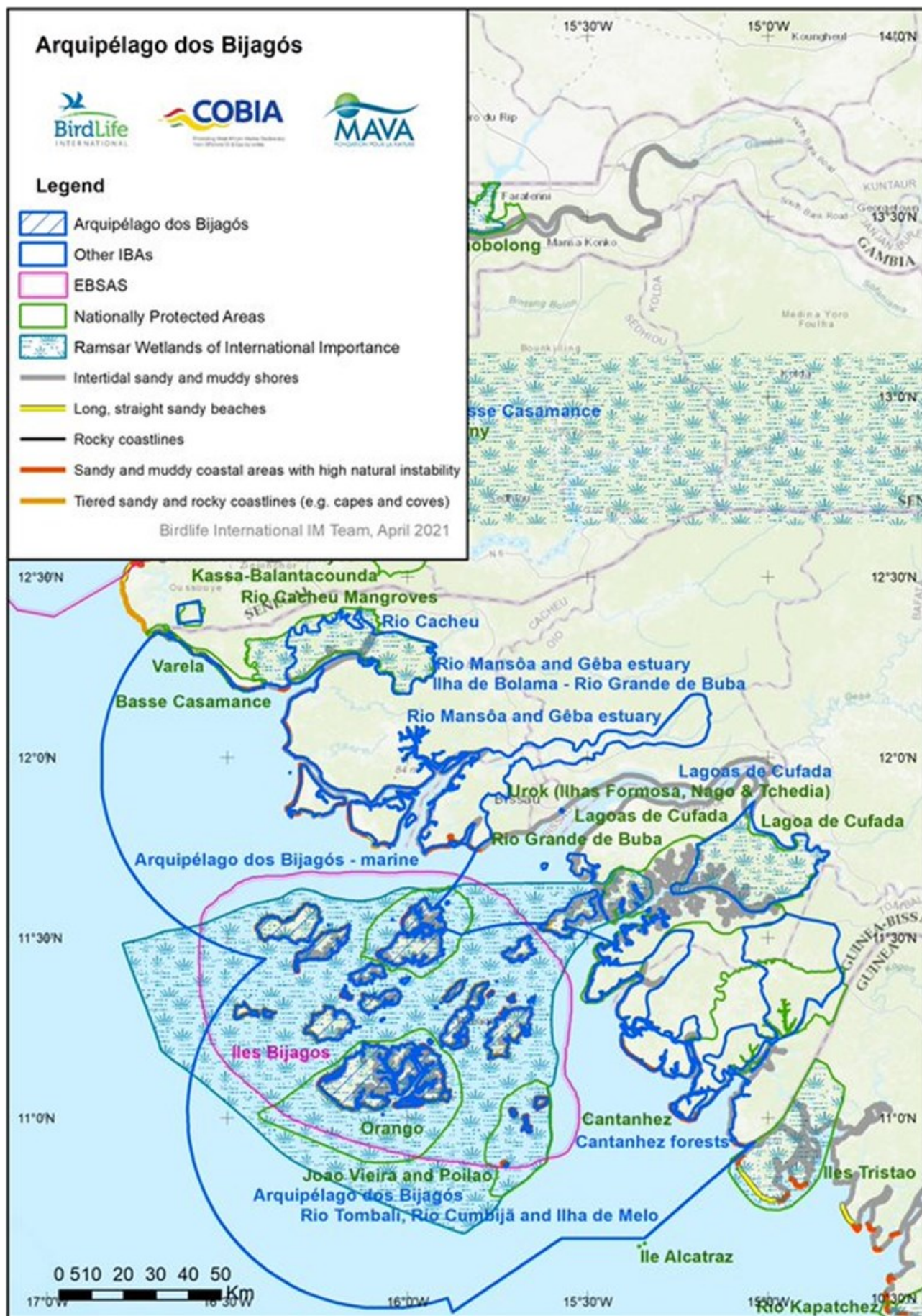
The archipelago has various forms of protection status. The two national parks, Orango and João Vieira e Poilão, are also MPAs, along with Urok (a community MPA), formed alongside zoned management of the Biosphere Reserve, which seeks to promote traditional uses of natural resources while maintaining biodiversity. Government institutes and other agencies are actively engaged in promoting conservation, surveillance and management of the site, although there are no doubt significant logistical and resource challenges. Efforts are underway to define a World Heritage Site, whilst the site is also an EBSA.

Over 30,000 people live in the archipelago. Agriculture, forest exploitation, animal husbandry, fishing, shellfish gathering and tourism (including sport fishing) are the main activities undertaken. Overfishing may pose the greatest threat to the area, whilst woodcutting for fuel, land reclamation for rice production, disturbance of breeding colonies and hunting are also threats.

## Risk from Oil and Gas

Offshore oil production is an important potential threat, given the high natural productivity and very sensitive habitats, notably the large expanse of mudflats, mangroves and shallow waters. Shipping is already a concern, with many vessels passing through the deeper channels of the archipelago. Oil containers should not use these channels. The whole archipelago falls within Oil concession Block 3, granted for exploration purposes, though the two national parks are excluded.





Map 44: Arquipelago dos Bijagos

Species	Red List Category	Site estimate (2014-2017)
<u>Greater Flamingo <i>Phoenicopterus roseus</i></u>	LC	894-1,290
<u>Great White Egret <i>Ardea alba</i></u>	LC	389-913
<u>Western Reef-egret <i>Egretta gularis</i></u>	LC	1,144-2,557
<u>Pink-backed Pelican <i>Pelecanus rufescens</i></u>	LC	1,367-2,259
<u>Great Cormorant <i>Phalacrocorax carbo</i></u>	LC	416-837
<u>Eurasian Oystercatcher <i>Haematopus ostralegus</i></u>	NT	6,324-13,691
<u>Grey Plover <i>Pluvialis squatarola</i></u>	LC	6,710-13,897
<u>Common Ringed Plover <i>Charadrius hiaticula</i></u>	LC	10,662-24,228
<u>White-fronted Plover <i>Charadrius marginatus</i></u>	LC	186-357
<u>Kentish Plover <i>Charadrius alexandrinus</i></u>	LC	402-840
<u>Whimbrel <i>Numenius phaeopus</i></u>	LC	15,437-30,391
<u>Eurasian Curlew <i>Numenius arquata</i></u>	NT	2,768-6,777
<u>Bar-tailed Godwit <i>Limosa lapponica</i></u>	NT	43,606-111,278
<u>Black-tailed Godwit <i>Limosa limosa</i></u>	NT	248-493
<u>Ruddy Turnstone <i>Arenaria interpres</i></u>	LC	1,432-2,828
<u>Red Knot <i>Calidris canutus</i></u>	NT	36,310-94,560
<u>Curlew Sandpiper <i>Calidris ferruginea</i></u>	NT	44,623-116,300
<u>Sanderling <i>Calidris alba</i></u>	LC	16,114-35,413
<u>Little Stint <i>Calidris minuta</i></u>	LC	1,578-5,037
<u>Common Redshank <i>Tringa totanus</i></u>	LC	10,373-23,113
<u>Slender-billed Gull <i>Larus genei</i></u>	LC	268-699
<u>Grey-headed Gull <i>Larus cirrocephalus</i></u>	LC	257-728
<u>Little Tern <i>Sternula albifrons</i></u>	LC	3,084-9,018
<u>Common Gull-billed Tern <i>Gelochelidon nilotica</i></u>	LC	6,003-16,729
<u>Caspian Tern <i>Hydroprogne caspia</i></u>	LC	5,147-9,176
<u>Lesser Crested Tern <i>Thalasseus bengalensis</i></u>	LC	605-1,581
<u>Sandwich Tern <i>Thalasseus sandvicensis</i></u>	LC	6,825-12,176
<u>Royal Tern <i>Thalasseus maximus</i></u>	LC	3,193-9,781
<u>A4iii Species group - waterbirds</u>	n/a	235,431-496,598

**Table 29.** Site estimates of selected species





Credit: Bob Brewer/Unsplash



# Cantanhez Forests

Country: Guinea-Bissau  
 Admin region: Tombali  
 Coordinates: 11°15'N 15°00'W  
 Altitude: 0–40 m  
 Designation Status:  
 IBA criteria A3, A4, B1a, B3a, B3b – 88,357ha  
 Hunting Reserve - 68,000 ha  
 National Park – 105,700 ha

## Site description

The Cantanhez Forests National Park in the southeast includes river floodplains and mangroves along the Rio Cacine and areas of savannah and forest extending inland as far as Cumbijã. It includes the best remaining example of semi-humid forest in the country, which is dominated by *Azelia africana*, *Alstonia congensis*, *Antiaris africana*, *Ceiba pentandra*, *Dialium guineense*, *Ficus spp.* and *Parinari excelsa*. Rainfall is restricted to the period May–November and does not usually exceed 2,600 mm per annum.

## Birds & Biodiversity

The estuarine area and floodplains are important for waterbirds, whilst the forests support important populations of forest birds, such as Yellow-casqued Hornbill *Ceratogymna elata* (VU). Cantanhez Forests Primates include Western Chimpanzee *Pan troglodytes spp. verus* (CR), Western Red Colobus *Piliocolobus badius* (EN), King Colobus *Colobus polykomos* (EN) and Guinean Baboon *Papio papio* (NT). African Manatee *Trichechus senegalensis* (VU) occurs in the upper reaches of the Rio Cacine.

Species	Red List Category	Site estimate (2014-2017)
Greater Flamingo <i>Phoenicopterus roseus</i>	LC	1,777-1,815
Pink-backed Pelican <i>Pelecanus rufescens</i>	LC	846-1,002
Bar-tailed Godwit <i>Limosa lapponica</i>	NT	4,342-6,359
Red Knot <i>Calidris canutus</i>	NT	1,402-2,093
Curlew Sandpiper <i>Calidris ferruginea</i>	NT	3,201-4,355
A4iii Species group - waterbirds	n/a	21,636-27,643

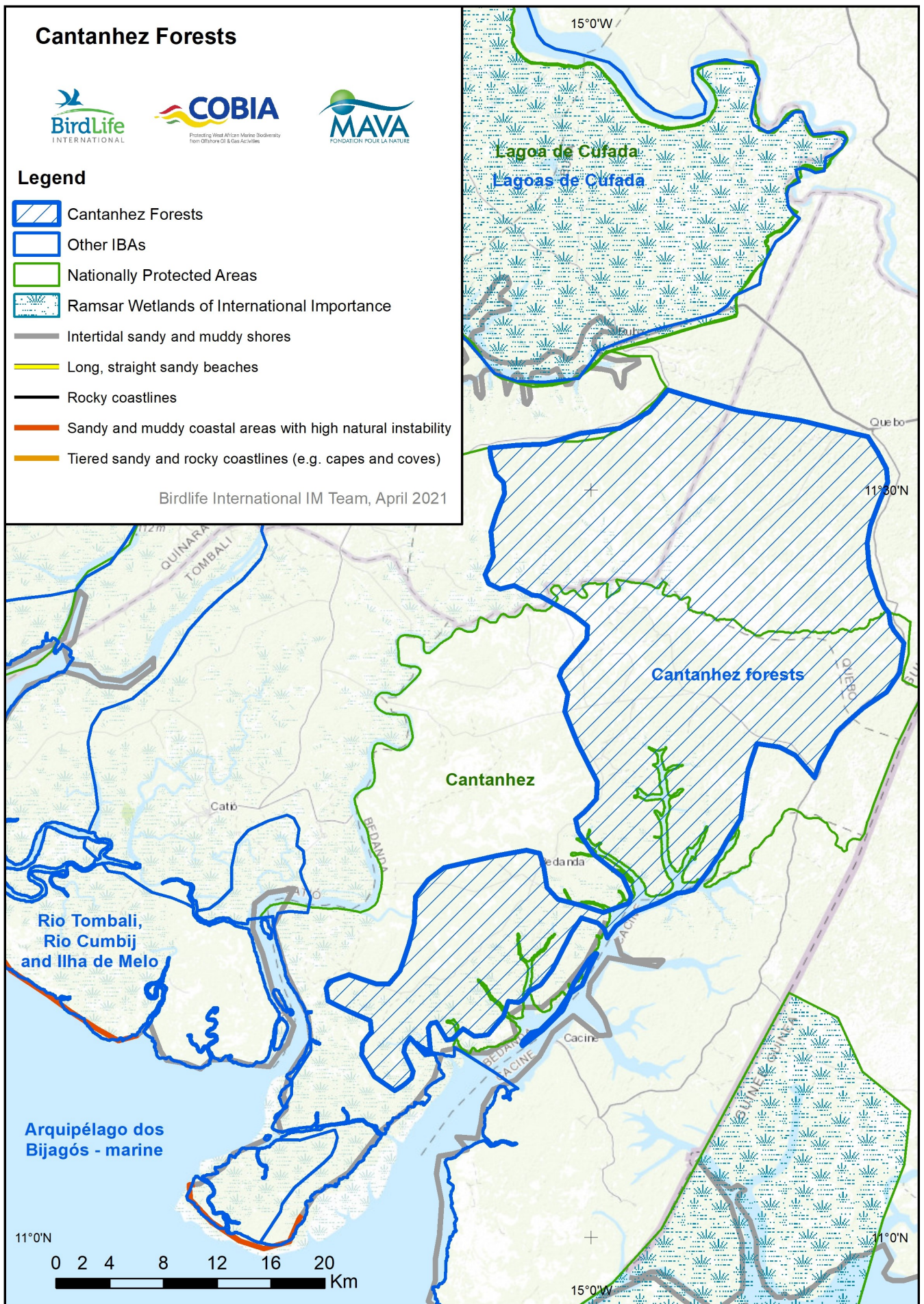
**Table 30.** Site estimates of selected species

## Conservation issues

Despite its protected status, Cantanhez Forests National Park continues to experience encroachment through shifting cultivation leading to degradation and destruction, particularly in the northern sector. Hunting has, with the partial exception of primates, reduced or eliminated populations of larger mammals. While local cultural traditions provide a degree of tolerance and protection to chimpanzees, human-chimpanzee interactions have the potential to deteriorate, especially as further pressure is exerted on the land.

## Risk from Oil and Gas

The site borders onto oil block 3. The coastal areas are most at risk from any offshore developments, especially oil spills.



**Map 45: Cantanhez Forests**



# Ilha de Bolama–Rio Grande de Buba

Country: Guinea-Bissau

Admin region: Bolama, Quinara

Coordinates: 11°30'N 15°30'W

Altitude: 0–5 m

Designation Status:

IBA criteria A4, B1a, B3a – 17,197 ha

UNESCO-MAB Biosphere reserve – part of 101,230 ha

Restricted fishing area – 110,846 ha

## Site description

The Ilha de Bolama lies just north of the mouth of Rio Grande de Buba, which mostly merges into dry and semi-humid forest, though there are extensive mudflats and mangroves at the river mouth and island, and intertidal flats northwards to Ilha das Areias. The estuary contains a mixture of mudflats and stone flats.

## Birds & Biodiversity

Over 75,000 waders are estimated to occur in the intertidal mudflats (Zwarts 1988). 961 Pink-backed Pelicans *Pelecanus rufescens* were estimated from the site in 2017. Atlantic Humpback Dolphin *Sousa teuszii* (CR) and African Manatee *Trichechus senegalensis* (VU) inhabit the estuarine and offshore waters.

## Conservation issues

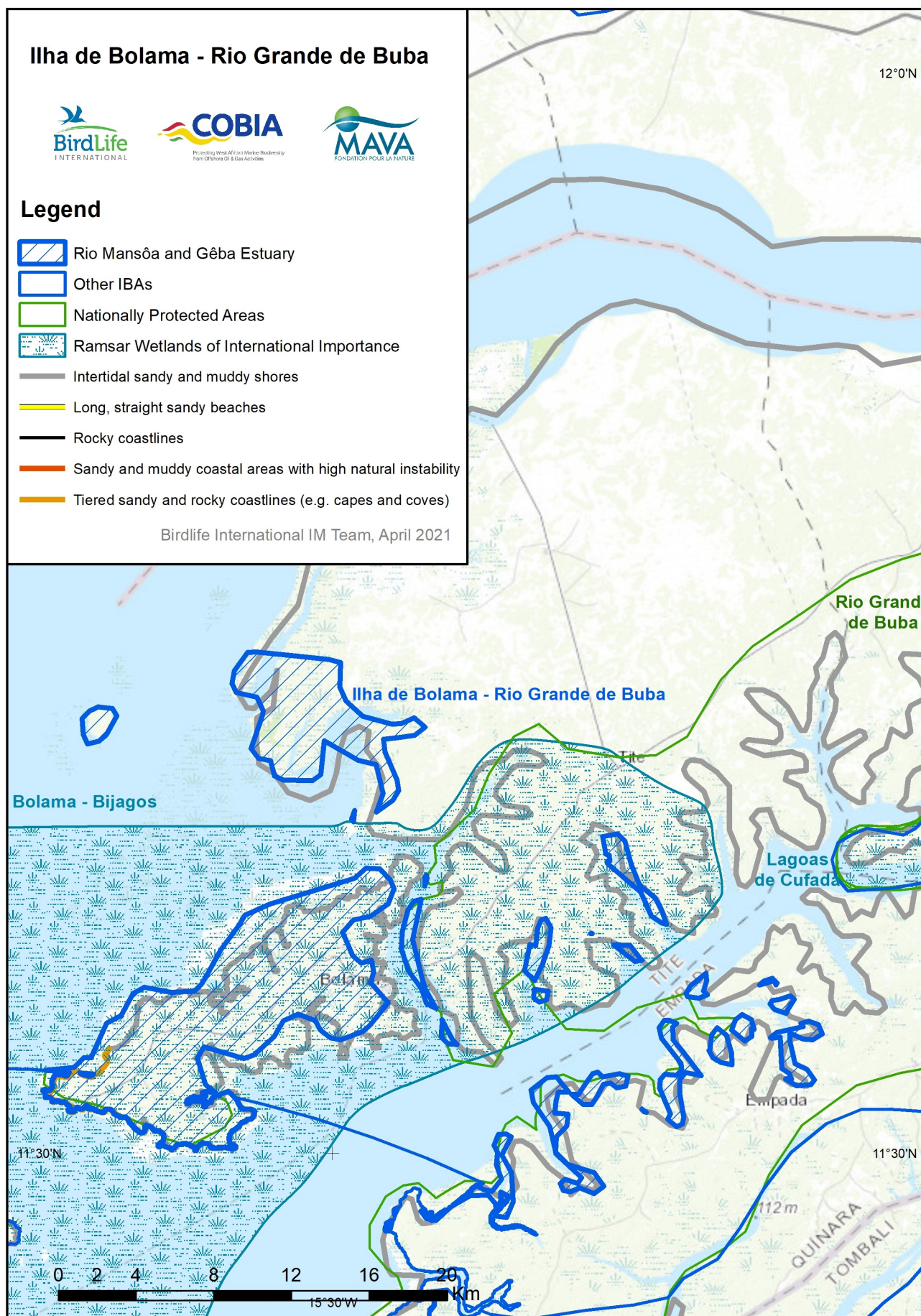
The protected area status of the site as a restricted fishing zone is not clear. Unlike the Ilha de Bolama, the banks of the estuary of the Rio Grande de Buba are relatively sparsely inhabited and there has been comparatively little clearance for agriculture.

## Risk from Oil and Gas

The areas most at risk from the oil sector are the intertidal mudflats north of Ilha Bolama on the southern part of Rio Gêba, and not far from the capital and port of Bissau. Oil and gas are brought into Bissau, and a dedicated power ship based at Bissau converts hydrocarbons to electricity, providing 100% of the country's needs. Tidal flats are vulnerable to any type of pollution. The site is within oil Block 3.







**Map 46:** Rio Grande de Buba



# Lagoas de Cufada

Country: Guinea-Bissau  
Admin region: Quinara  
Coordinates: 11°43'N 15°20'W  
Altitude 0–40 m  
Designation Status:  
IBA criteria A1, A3, B1a, B3a – 89,000 ha  
Ramsar Site -139,098 ha  
Natural Park – 89,000 ha

## Site description

Lagoas de Cufada is Guinea-Bissau's first protected area, located immediately north and west of Buba. It is bordered to the north by Rio Corubal, to the south by Rio Grande de Buba and to the west by one of its tributaries, the Fulacunda. The site comprises Lagoa de Cufada, a 413 ha permanent eutrophic freshwater lake with abundant aquatic vegetation (especially water lilies *Nymphaea spp.*) and adjoining river floodplain, Lagoa de Bionra (32 ha, permanent) and Lagoa de Bedasee (19 ha, seasonal). Other habitats include seasonally flooded marshes, fringing mangroves and extensive mudflats. There are 37,700 ha of forest, within which there are two sacred groves of primary forest, as well as 26,000 ha of savannah. Average annual rainfall varies between 1,850–2,500 mm.

## Birds & Biodiversity

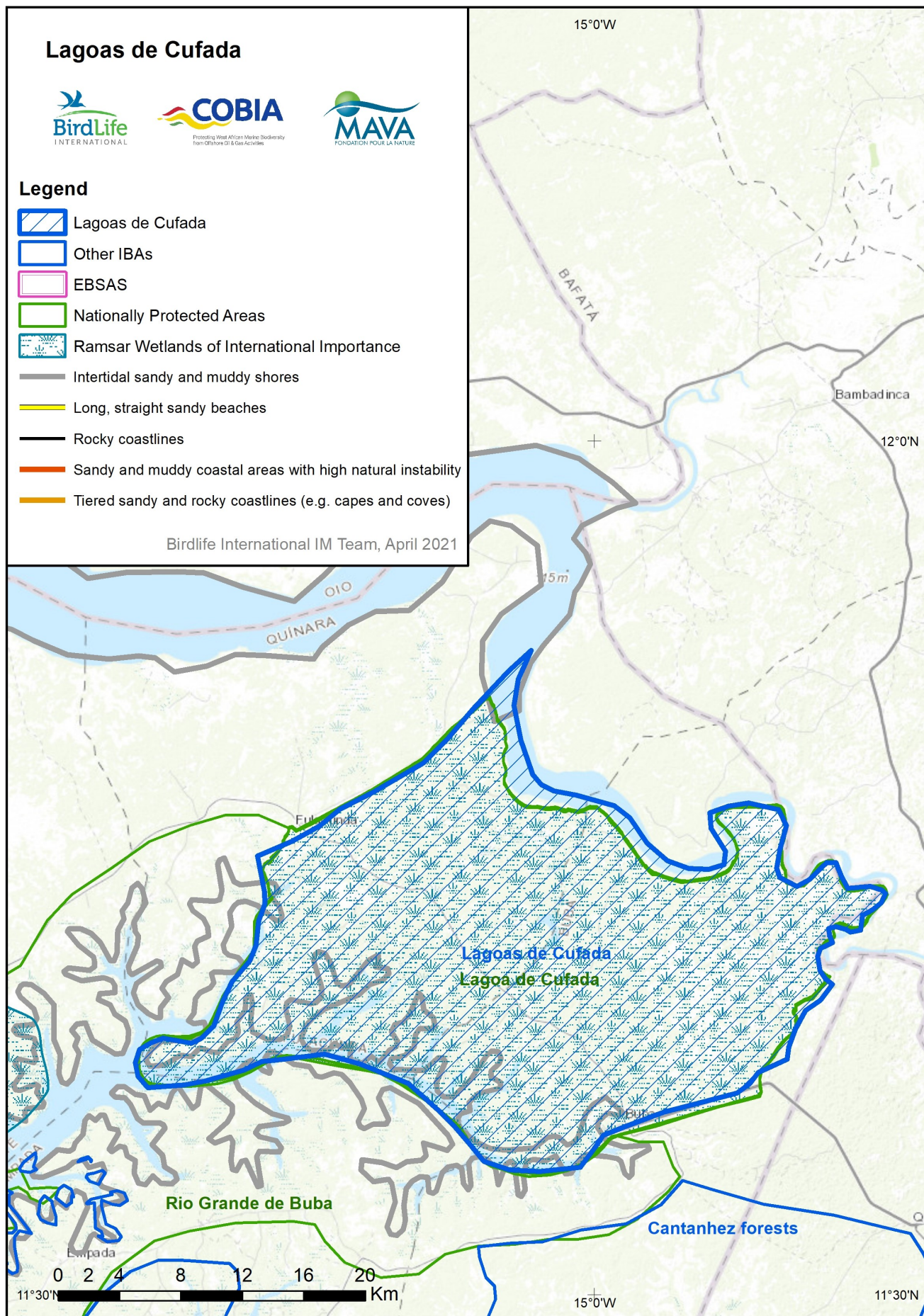
At least 315 bird species have been recorded, including African Pygmy-goose *Nettapus auritus*, with a past count of >1,000 (192–292 estimated from 2014–2017), Black Crowned-crane *Balearica pavonina* (VU), Yellow-casqued Hornbill *Ceratogymna elata* (VU) and Grey-hooded Capuchin Babbler *Phyllanthus atipennis* (NT). Mammals recorded include Western Chimpanzee *Pan troglodytes* *spp. verus* (CR), Western Red Colobus *Piliocolobus badius* (EN), King Colobus *Colobus polykomos* (EN), Kob *Kobus kob*, Bay Duiker *Cephalophus dorsalis* (NT), Common Waterbuck *Kobus ellipsiprymnus*, Roan Antelope *Hippotragus equinus*, African Buffalo *Syncerus caffer* (NT), Common Hippo *Hippopotamus amphibius* (VU) and African Manatee *Trichechus senegalensis* (VU). African Dwarf Crocodile *Osteolaemus tetraspis* (VU) also occurs.

## Conservation issues

The site is formally protected as a natural park. Large expanses of vegetation are burned annually to facilitate hunting and shifting rice cultivation. Cash cropping also takes place on a small-scale and areas have been cleared for banana, cashew and timber production. Hunting and fishing are common activities and there is some evidence of overfishing.

## Risk from Oil and Gas

Estuarine tributaries of Rio Grande de Buba could be of potential risk from oil and gas operations, but the overall threat is low.



**Map 47: Lagoas de Cufada**



# Rio Cacheu / Parque Natural dos Tarrafes de Rio Cacheu (PNTC)

Country: Guinea-Bissau  
Admin region: Cacheu  
Coordinates: 12°10'N 16°20'W  
Altitude 0–10 m  
Designation Status:  
IBA criteria A3, B1a, B3a – 54,000 ha  
Ramsar Site – 88,615 ha  
Natural Park – 88,615 ha

## Site description

Rio Cacheu is an outstanding intertidal forested wetland, with about 30,000 ha of mangroves as well as tanne, mud- and sandbanks, semi-dry woodland, palm forest, savannah and agricultural land. The western part of the park lies on the north bank of the Rio Cacheu, which bisects it, then the eastern part lies on the south bank. Six mangrove species have been recorded: *Avicennia germinans*, *Rhizophora racemosa*, *Rhizophora mangle*, *Rhizophora harrisonii*, *Laguncularia racemosa* and *Conocarpus erectus*. Their density offers an ideal spawning and nursery habitat for a significant population of fish and shellfish. There are numerous villages within the park and a number of sacred forests.

## Birds & Biodiversity

The site is a haven for around 250 bird species including breeding Black Crowned-crane *Balearica pavonina* (VU), whilst Lesser Flamingo *Phoeniconaias minor* (NT) is a regular visitor. Mammals include Common Hippo *Hippopotamus amphibius* (VU), African Manatee *Trichechus senegalensis* (VU), Common Bottlenose Dolphin *Tursiops truncatus*, Atlantic Humpback Dolphin *Sousa teuszii* (CR), and African Clawless Otter *Aonyx capensis* (NT). African Dwarf Crocodile *Osteolaemus tetraspis* – (VU) also occurs.

Species	Red List Category	Site estimate (2014-2017)
<u>Lesser Flamingo <i>Phoeniconaias minor</i></u>	NT	101-175 individuals
<u>Curlew Sandpiper <i>Calidris ferruginea</i></u>	NT	1,185-1,646 individuals

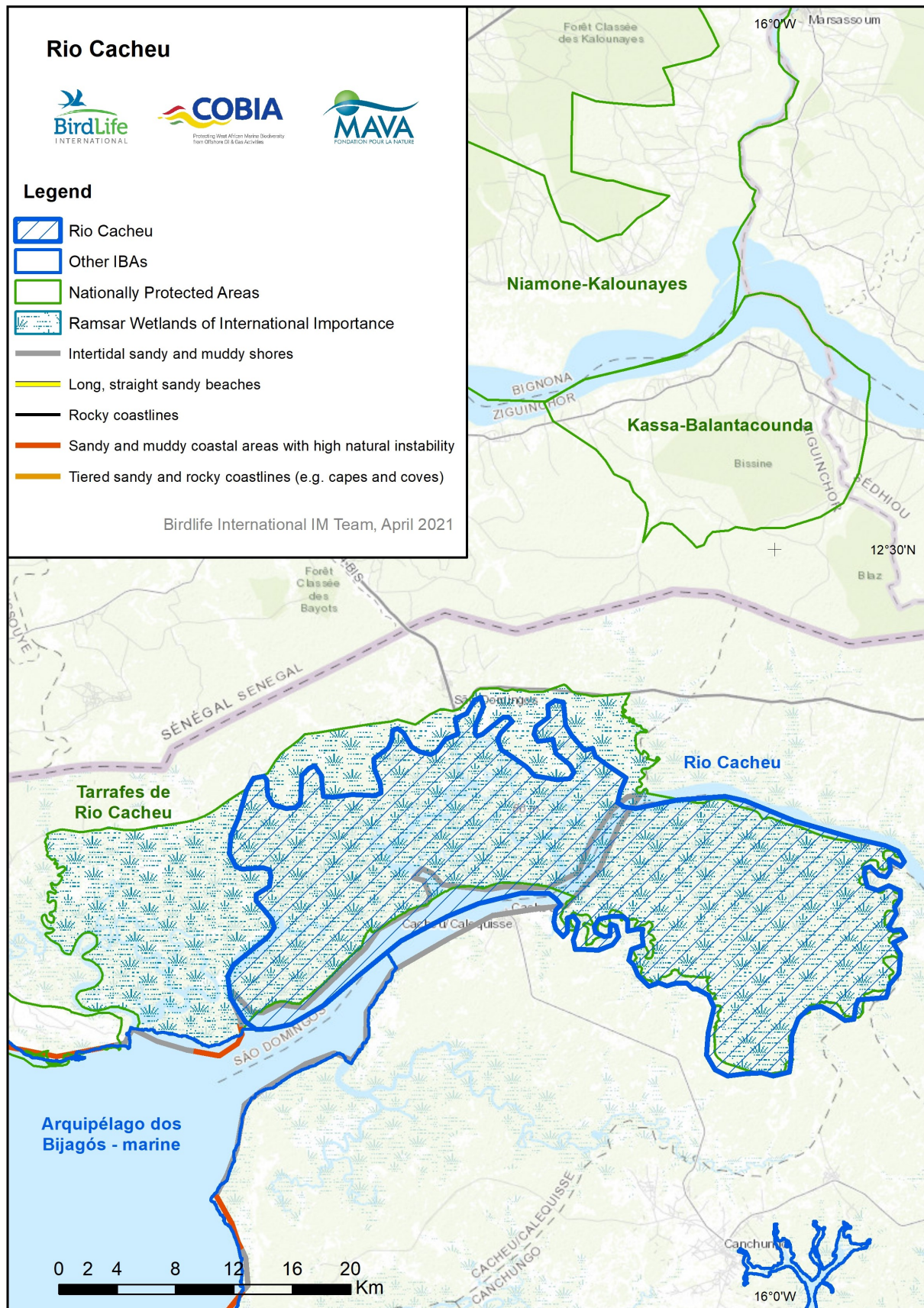
**Table 31.** Site estimates of selected species

## Conservation issues

PNTC is a designated protected area and managed for its nature values. Aside from its natural beauty and rich biodiversity, the site has a significant cultural value for the numerous ethnic groups living within its borders, who have practiced agriculture and artisanal fishing for generations, as well as collecting molluscs and crustaceans and savannah woodland products, particularly palm oil and palm wine. Clearing mangroves for fuel wood, particularly for drying fish, and for rice cultivation are the main threats, whilst some hunting and slash and burn agriculture also occurs.

## Risk from Oil and Gas

Exploration is underway in oil Block 1, which borders the park. The site could be severely impacted by any major pollution incident. Any development could also lead the small town of Cacheu on the opposite bank of the park to swell, with increased river traffic.



**Map 48:** Rio Cacheu



# Rio Mansôa and Gêba Estuary

Country: Guinea-Bissau  
Admin region: Biombo, Cacheu  
Coordinates: 11°55'N 15°54'W  
Altitude 0–10 m  
Designation Status:  
IBA criteria A4, B1a, B3a – 119,743 ha  
Hunting Reserve

## Site description

The IBA comprises much of the estuary, fringing mangrove and woodland of the Rio Mansôa, together with an area of the northern shore of the Canal do Gêba and part of the estuary of the larger Rio Gêba. To the west, the site includes two large, mangrove-fringed islands—Ilha de Jeta and Ilha de Pexice—as well as several smaller ones in Rio Mansôa mouth. Eastwards the site extends along the shoreline of the Canal do Gêba as far as the Ilhéu dos Pássaros, a little way downstream of Bissau. The banks of the mouth of Rio Gêba are bordered with mangroves and soft mud, while there are sandbars and mudbanks in the channel. The site includes large areas of mudflats, a small extent of marsh, and 3,000 ha of mangrove.

## Birds & Biodiversity

The Ilhéu dos Pássaros is an important roost-site where over 15,000 birds have been recorded, including herons and spoonbills. Over 37,000 wintering waders have been counted in the Rio Gêba area. The floodplains and ricefields of the Rio Mansôa are especially important for Black Crowned-crane *Balearica pavonina* (VU). At the northwestern point off Ilheu de Jeta is the islet of Bantambour, the most important site in Guinea-Bissau for breeding gulls and terns, especially Royal Tern *Thalasseus maximus* (NT). African Manatee *Trichechus senegalensis* (VU) occurs in some areas, as does Atlantic Humpback Dolphin *Sousa teuszii* (CR). Sea turtles also breed, especially at the western islands.

## Conservation issues

The IBA has no formal protection status, and the situation of the hunting reserve is not clear. Some informal protection measures are underway at Bantambour, through engagement with local communities on Ilheu de Jeta. Mantem Marsh, important for cranes, and other areas are threatened by reclamation for agriculture and grazing. A considerable area of mangrove has been cleared around the city of Bissau.

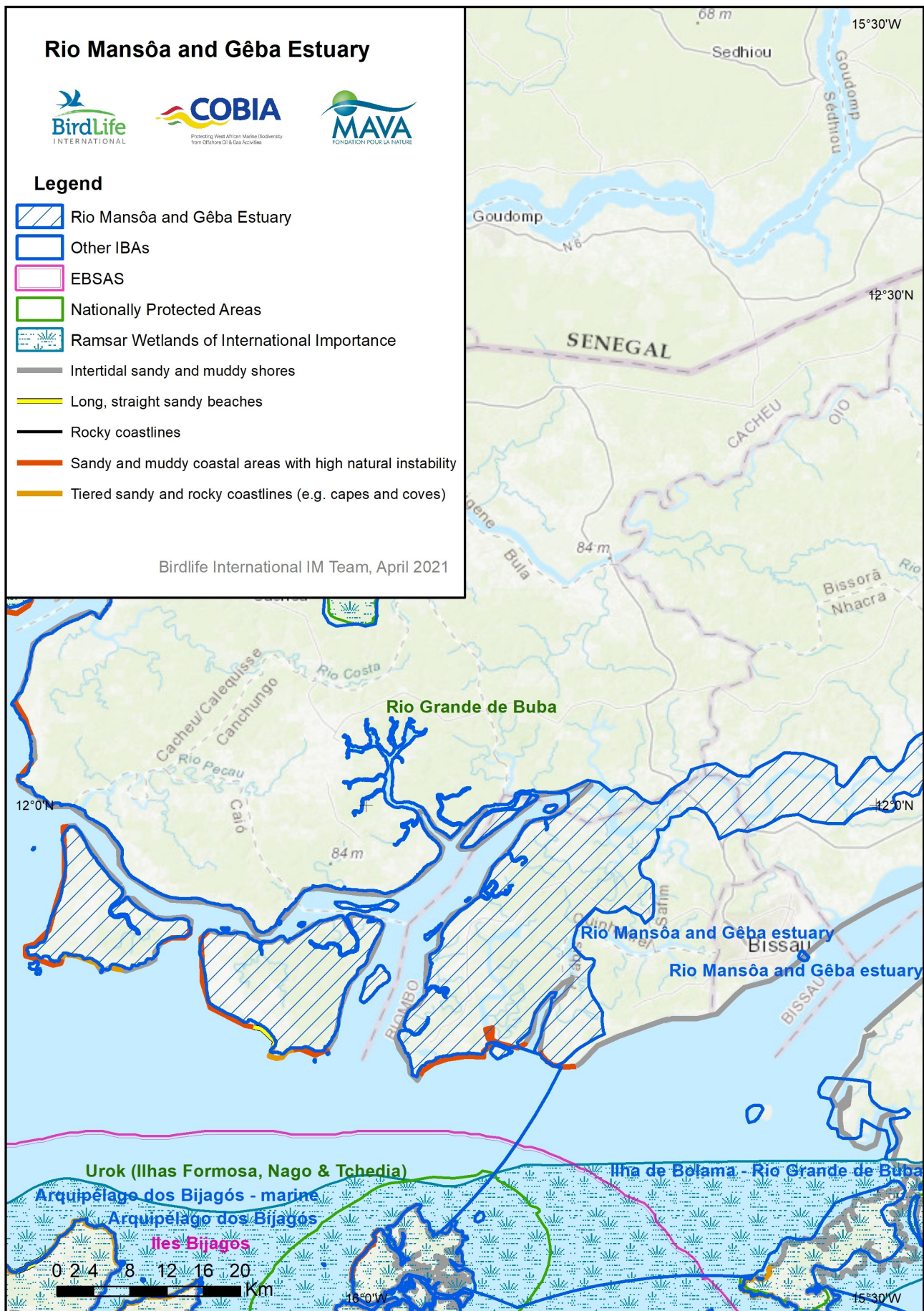
## Risk from Oil and Gas

Any industrial development in Guinea-Bissau is likely to be centred on Bissau and thus there is a potential threat of pollution to at least part of this site. The hydrocarbon-fuelled power ship that provides the country's electricity sits in the Rio Gêba at Bissau. The Rio Gêba witnesses significant marine traffic. All these issues present a risk of pollution, whilst any infrastructural developments relating to oil and gas are likely to occur near Bissau. The site abuts oil Block 1; most seabirds breeding at Bantambour will forage within this concession.

Species	Red List Category	Site estimate (past counts)
<u>Black Heron <i>Egretta ardesiaca</i></u>	LC	1,354
<u>Western Reef-egret <i>Egretta gularis</i></u>	LC	2,244
<u>Grey Plover <i>Pluvialis squatarola</i></u>	LC	3,200
<u>Common Ringed Plover <i>Charadrius hiaticula</i></u>	LC	853-3,156
<u>Kentish Plover <i>Charadrius alexandrinus</i></u>	LC	1,500
<u>Bar-tailed Godwit <i>Limosa lapponica</i></u>	NT	303-633
<u>Ruddy Turnstone <i>Arenaria interpres</i></u>	LC	700
<u>Red Knot <i>Calidris canutus</i></u>	NT	73-143
<u>Curlew Sandpiper <i>Calidris ferruginea</i></u>	NT	802-1,966
<u>Collared Pratincole <i>Glareola pratincola</i></u>	LC	2,500
<u>Slender-billed Gull <i>Larus genei</i></u>	LC	219-287
<u>Common Gull-billed Tern <i>Gelochelidon nilotica</i></u>	LC	377
<u>Caspian Tern <i>Hydroprogne caspia</i></u>	LC	1,586-3,975

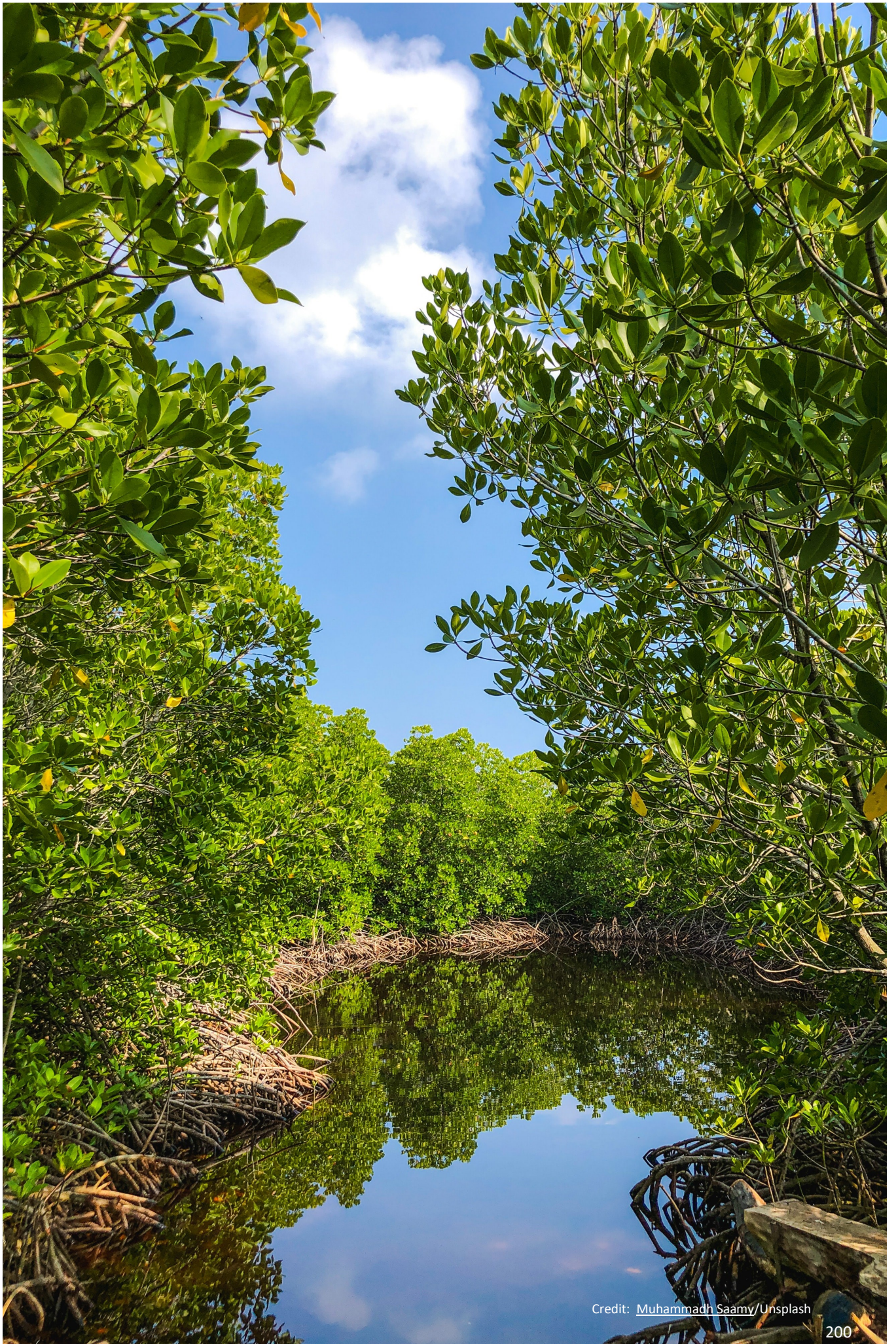
**Table 32.** Site estimates of selected species





**Map 49:** Rio Mansôa and Gêba Estuary





Credit: [Muhammadiyah Saamy/Unsplash](#)



# Rio Tombali, Rio Cumbijã and Ilha de Melo

Country: Guinea-Bissau  
Admin region: Tombali, Quinara  
Coordinates: 11°15'N 15°20'W  
Altitude 0–5 m  
Designation Status:  
IBA criteria A1, A3, B3a, B3b – 69,615 ha

## Site description

This IBA on the southeast coast near the town of Catió consists of Rio Tombali estuary, the coastal mudflats between the mouths of Rio Tombali and Rio Cumbijã, and Ilha de Melo to the south. The site includes about 30,000 ha of sandflats and mudflats and 45,000 ha of mangroves, drier woodland and forest. There are extensive rice-growing areas around Catió and the 120 ha Lagoa de Cufar.

## Birds

Zwarts (1988) estimated that over 160,000 wintering waders use the mudflats. Yellow-casqued Hornbill *Ceratogymna elata* (VU) occurs in the forests. Colonial breeding birds include Yellow-billed Stork *Mycteria ibis* and African Darter *Anhinga rufa* (300 pairs of each recorded). African Manatee *Trichechus senegalensis* (VU) and Atlantic Humpback Dolphin *Sousa teuszii* (CR) occur.

Species	Red List Category	Site estimate (past counts)
Pink-backed Pelican <i>Pelecanus rufescens</i>	LC	1,250
Grey Plover <i>Pluvialis squatarola</i>	LC	9,800
Common Ringed Plover <i>Charadrius hiaticula</i>	LC	13,400
Kentish Plover <i>Charadrius alexandrinus</i>	LC	6,400
Whimbrel <i>Numenius phaeopus</i>	LC	13,900
Bar-tailed Godwit <i>Limosa lapponica</i>	NT	28,200
Ruddy Turnstone <i>Arenaria interpres</i>	LC	1,200
Red Knot <i>Calidris canutus</i>	NT	40,600
Curlew Sandpiper <i>Calidris ferruginea</i>	NT	25,200
Little Stint <i>Calidris minuta</i>	LC	13,600
Common Redshank <i>Tringa totanus</i>	LC	4,700
A4iii Species group - waterbirds	n/a	100,000-500,000

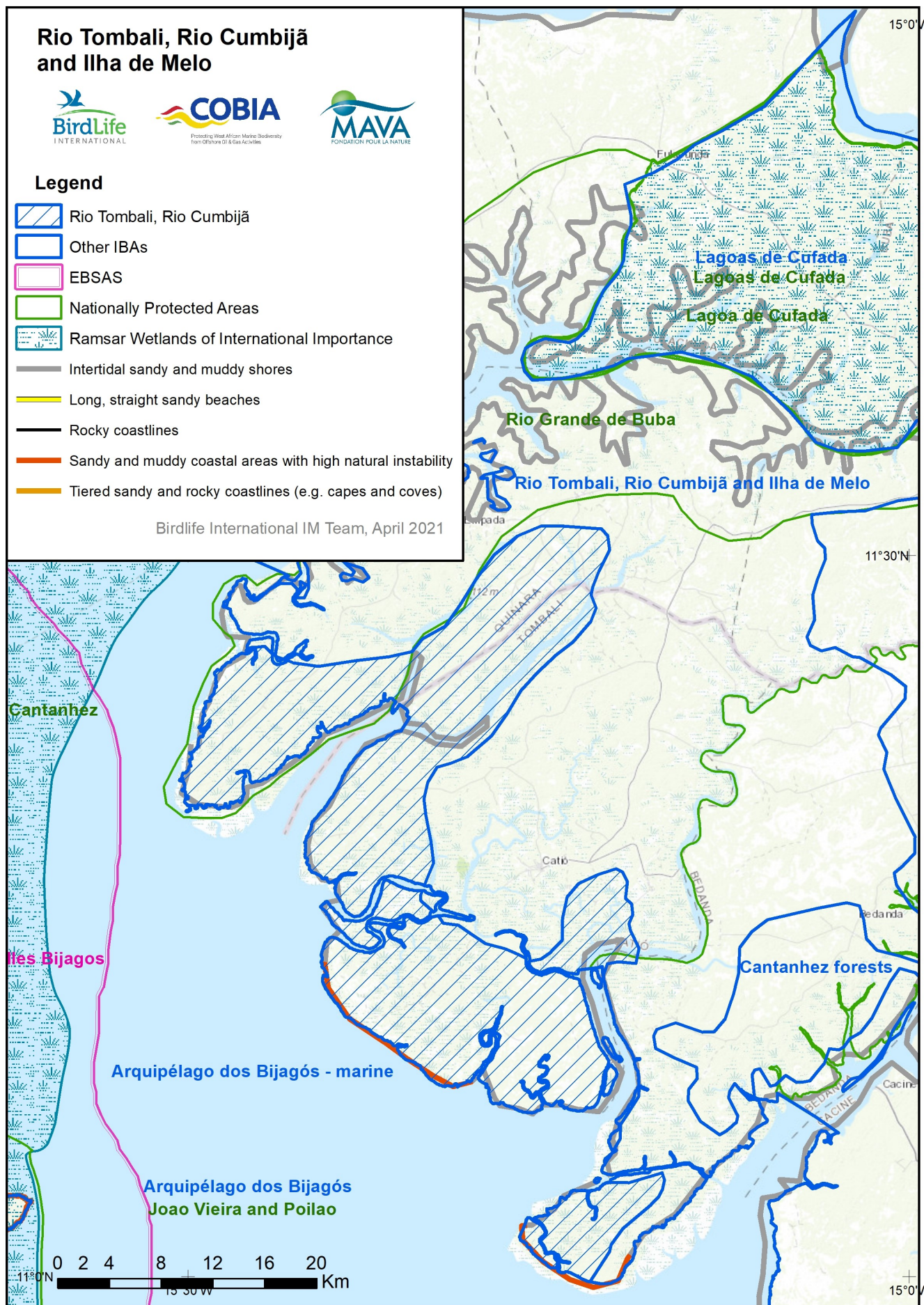
**Table 33.** Site estimates of selected species

## Conservation issues

The IBA has no protection status. Main threats include clearance of mangroves for fuelwood and rice cultivation.

## Risk from Oil and Gas

The site largely falls within oil Block 3. With its long seaward front, a pollution incident may pose the greatest threat from the oil and gas sector.



**Map 50:** Rio Tombali, Rio Cumbijã and Ilha de Melo



**Sierra-Leone**

# Scarcies River Estuary

Country: Sierra Leone  
Admin region: Kambia District  
Coordinates:  
Altitude : 0-10 m  
Protection Status : MPA 63,394 ha

## Site description

The Scarcies River Estuary incorporates the drainage basins of both the Great Scarcies and the Little Scarcies Rivers. The rivers have high water levels in the rainy season and reveal shallows and sandbanks in the dry season. There are extensive ricefields and remains of mangroves, which make up about 10% of the area, mostly in the northwest around Yeliboya Island; the largest mudflats are west of Kortimaw Island in the shared river mouth (van der Winden *et al.* 2007). Mangrove species include *Rhizophora racemosa*, *Rhizophora mangle*, *Rhizophora harrisonii*, *Conocarpus erectus*, *Avicennia germinans* and *Laguncularia racemosa*.

## Birds & Biodiversity

White-faced Whistling-ducks *Dendrocygna viduata* are common in the ricefields, and Common Gull-billed Tern *Gelochelidon nilotica* and Lesser Crested Tern *Thalasseus bengalensis* have been recorded in internationally important numbers. African Manatee *Trichechus senegalensis* (VU), West African Crocodile *Crocodylus suchus* also occur, whilst some sea turtles also breed. Many marine fish species use this area for spawning, breeding and foraging.

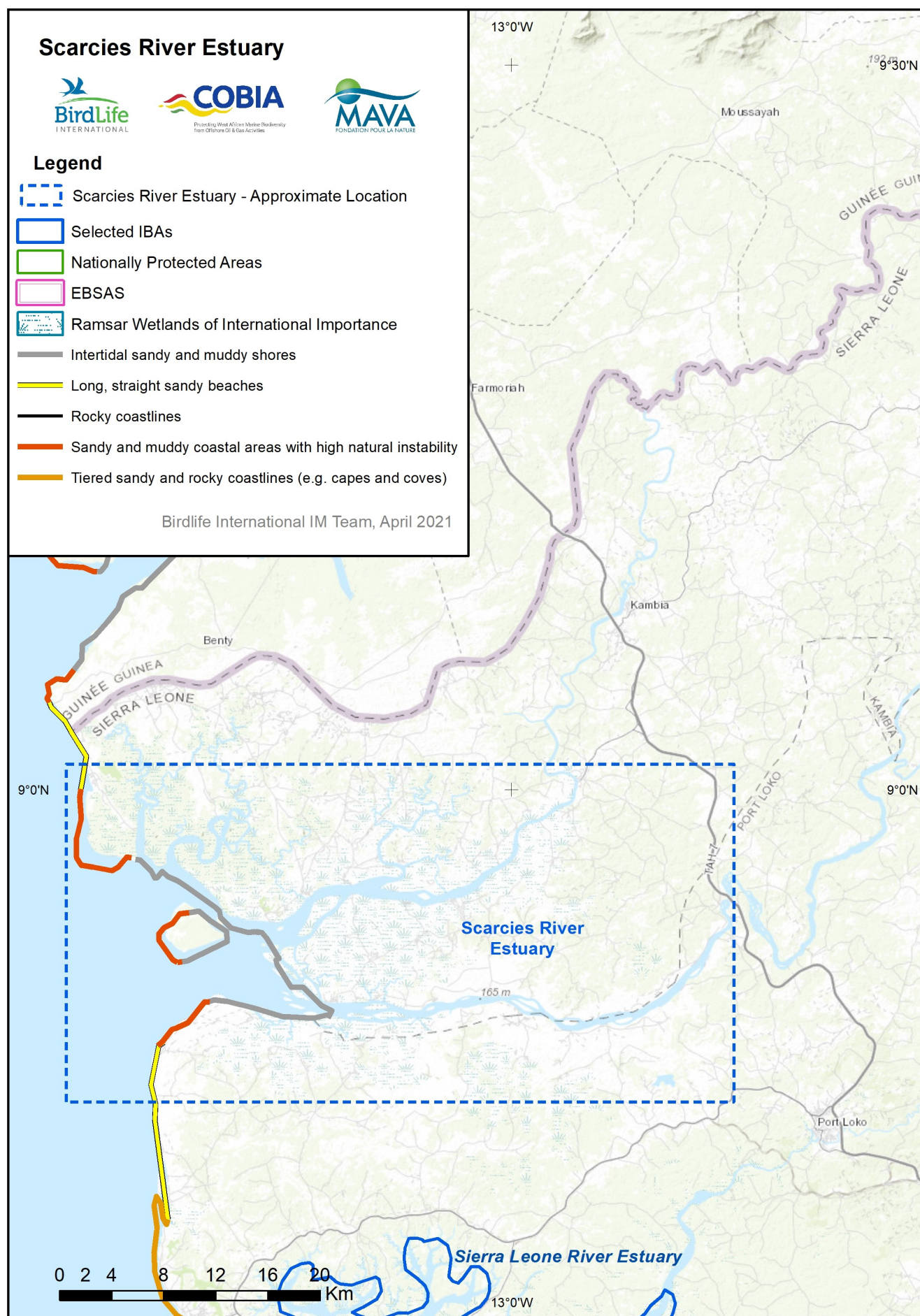
## Conservation issues

The site has been designated as an MPA, though implementation of any management measures appears to be limited. The efficiency of traditional by-laws as an approach to coastal ecosystem management is weak and resource exploitation largely remains open access (Konoyima & Johnson 2020). Conversion to ricefields, salt production and infrastructural development have been the main drivers of widespread mangrove deforestation, though remaining mangrove areas have high species diversity, mature forests and high regeneration levels, implying high production potential should human pressures be lowered or management measures initiated (Konoyima 2020).

## Risk from Oil and Gas

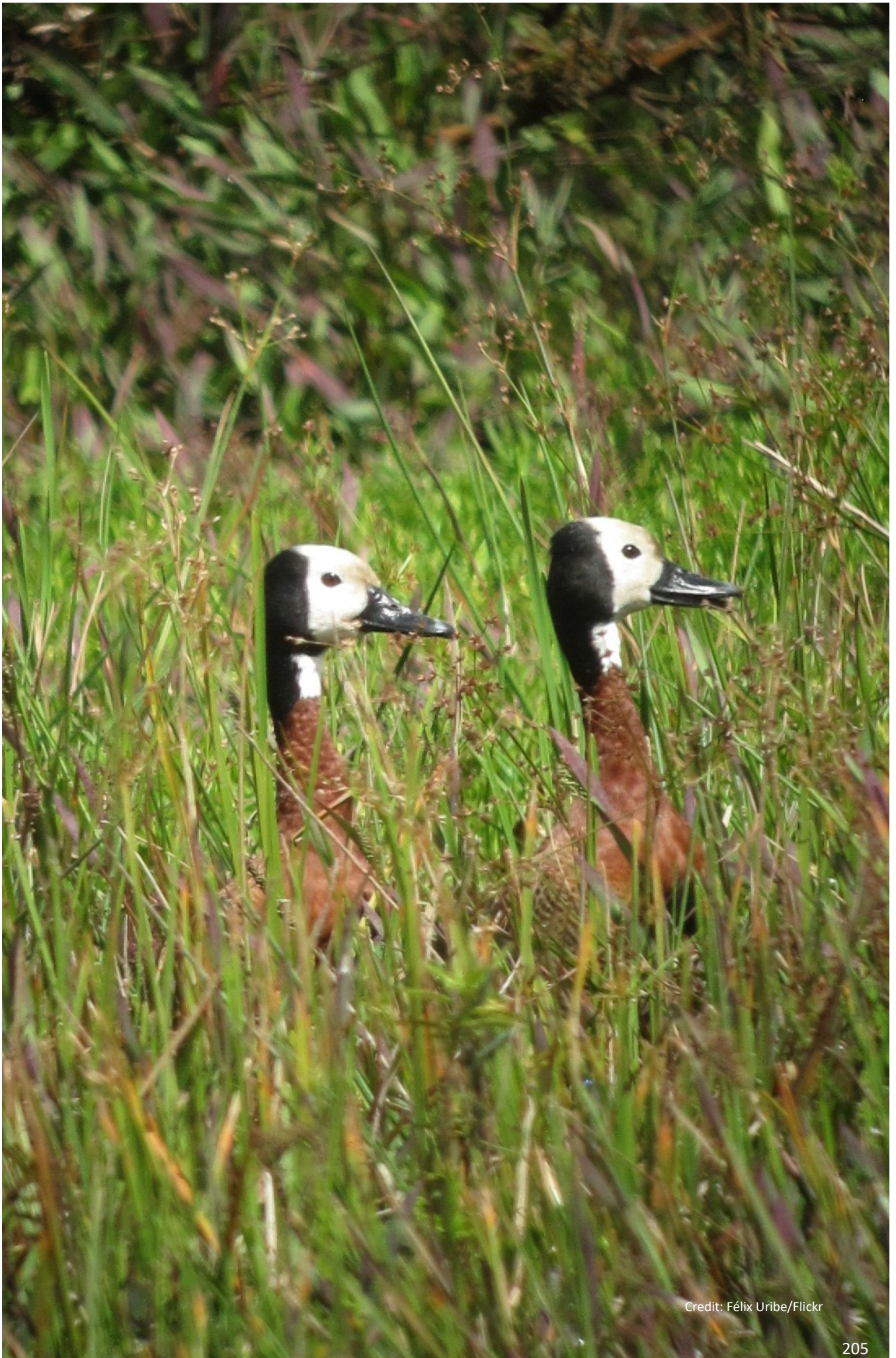
A number of oil and gas exploration projects are anticipated in offshore oil blocks that would most likely impact Scarcies Estuary, should any incident occur. As with other complex estuarine habitats with mangroves and intertidal flats, an oil spill presents probably the most significant risk.





**Map 51: Scarcies River Estuary**





Credit: Félix Uribe/Flickr



# Sierra Leone River Estuary (SLRE)

Country: Sierra Leone  
Admin region: Western Area  
Coordinates: 08°37'N 13°03'W  
Altitude: 0–75 m  
Designation Status:  
IBA criteria A1, B1a – 295,000 ha  
Ramsar Site -295,000 ha  
Marine Protected Area – 25,000 ha

## Site Description

SLRE is a drowned estuary of the Rokel or Seli River, bounded to the north by a coastal plain indented by creeks, and to the south by the Western Area Peninsula. The estuary mouth widens to 11 km and abruptly deepens along its southern shore to form a natural harbour - the third largest in the world. A mud and sand foreshore backed by mangrove gives way to 1,800 ha of intertidal mudflats and muddy sandflats. Mangroves extend to 34,000 ha, representing 19% of the national mangrove area.

## Birds & Biodiversity

SLRE is one of the most important sites for wintering waders in Sierra Leone, with at least 36 wader species recorded in numbers regularly exceeding 20,000. Concentrations are usually found along the banks of the Bunce River and Aberdeen Creek, where mangrove provides suitable roosting sites, as well as breeding habitat for such species as the Green-backed Heron *Butorides striata*. Hooded Vulture *Necrosyrtes monachus* (CR) occurs (12 estimated in 2014-2019). African Manatee *Trichechus senegalensis* (VU) occurs in the estuary, and five species of sea turtles.

## Conservation issues

SLRE is a Ramsar Site, whilst a small portion (25,000 ha) is designated as an MPA with official protection. The estuary is threatened by vegetation clearance and unsustainable fishing. There are legal restrictions against fishing activities by large trawlers, and only artisanal fishing by small 2–8 man canoes with nets of larger mesh size or fishing line is permitted, although there is little enforcement. Mangroves along the banks and creeks are being cleared for small-scale farming as well as cut down and sold for firewood.

## Risk from Oil and Gas

Dumping of untreated waste from industries in the Freetown area and oil spillage from tankers unloading at the main port might pose additional threats to the wildlife in the estuary.



Credit: Mariko Margetson/Flickr



# Western Area Peninsula Forest National Park

Country: Sierra Leone  
Admin region: Western Area  
Coordinates: 08°23'N 13°10'W  
Altitude 200–900 m  
Designation Status:  
IBA criteria A1, A2, A3 – 18,337 ha  
National Park – 18,337 ha  
No Hunting Forest Reserve – 17,688 h

## Site Description

SLRE is a drowned estuary of the Rokel or Seli River, bounded to the north by a coastal plain indented by creeks, and to the south by the Western Area Peninsula. The estuary mouth widens to 11 km and abruptly deepens along its southern shore to form a natural harbour - the third largest in the world. A mud and sand foreshore backed by mangrove gives way to 1,800 ha of intertidal mudflats and muddy sandflats. Mangroves extend to 34,000 ha, representing 19% of the national mangrove area.

## Birds & Biodiversity

SLRE is one of the most important sites for wintering waders in Sierra Leone, with at least 36 wader species recorded in numbers regularly exceeding 20,000. Concentrations are usually found along the banks of the Bunce River and Aberdeen Creek, where mangrove provides suitable roosting sites, as well as breeding habitat for such species as the Green-backed Heron *Butorides striata*. Hooded Vulture *Necrosyrtes monachus* (CR) occurs (12 estimated in 2014-2019). African Manatee *Trichechus senegalensis* (VU) occurs in the estuary, and five species of sea turtles.

## Conservation issues

SLRE is a Ramsar Site, whilst a small portion (25,000 ha) is designated as an MPA with official protection. The estuary is threatened by vegetation clearance and unsustainable fishing. There are legal restrictions against fishing activities by large trawlers, and only artisanal fishing by small 2–8 man canoes with nets of larger mesh size or fishing line is permitted, although there is little enforcement. Mangroves along the banks and creeks are being cleared for small-scale farming as well as cut down and sold for firewood.











## Risk from Oil and Gas

Dumping of untreated waste from industries in the Freetown area and oil spillage from tankers unloading at the main port might pose additional threats to the wildlife in the estuary.

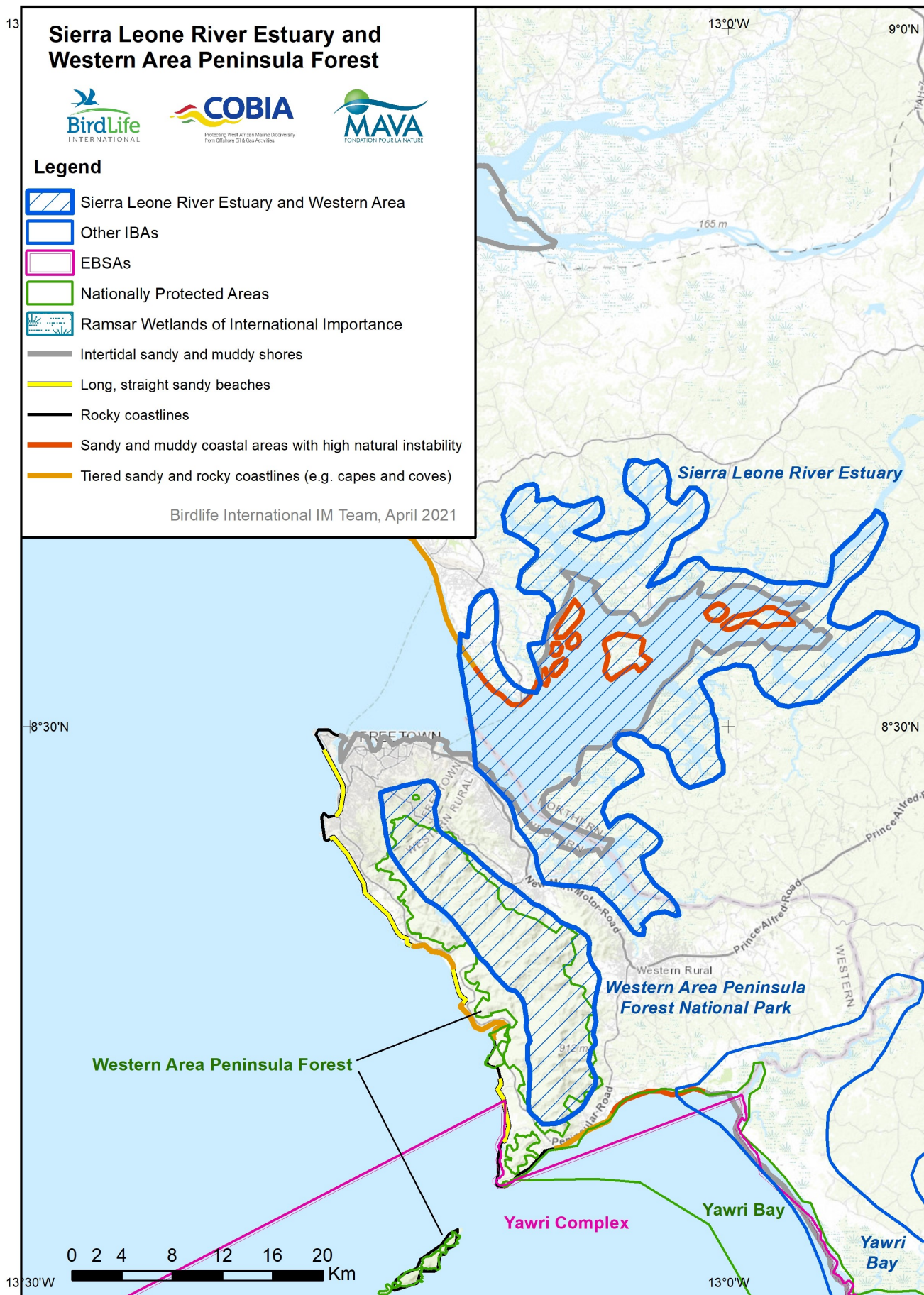
## Sierra Leone River Estuary and Western Area Peninsula Forest



### Legend

-  Sierra Leone River Estuary and Western Area
-  Other IBAs
-  EBSAs
-  Nationally Protected Areas
-  Ramsar Wetlands of International Importance
-  Intertidal sandy and muddy shores
-  Long, straight sandy beaches
-  Rocky coastlines
-  Sandy and muddy coastal areas with high natural instability
-  Tiered sandy and rocky coastlines (e.g. capes and coves)

Birdlife International IM Team, April 2021



**Map 52:** Sierra Leone River Estuary and Western Area Peninsula Forest



# Yawri Bay & Yawri Complex EBSA

Country: Sierra Leone  
Admin region: Southern Province  
Coordinates: 08°12'N 12°55'W  
Altitude 0–10 m

Designation Status:  
IBA criteria A1, A4, B1a, B3a, B3b – 33,605 ha  
UNESCO World Heritage Tentative List -15 ha  
National Park – 45 ha

## Site Description

This site is located on the southern side of the Western Area Peninsula, about 60 km south-east of Freetown. It is a shallow coastal wetland, with a 9,100 ha expanse of intertidal mudflats, that extends along 60 km of foreshore and is backed primarily by mangrove swamps covering 24,505 ha - 14% of the total area of mangrove swamp in Sierra Leone - interlaced with a network of creeks. The bay's topography and location mean that its waters are sheltered. It is therefore an important spawning ground for fish. This has led to the development of fishing communities and the establishment of commercial fisheries along its shores.

The Yawri Complex EBSA comprises a large tract of marine waters, extending westwards from Banana Islands at the mouth of Yawri Bay, thence south to the southeast point of Sherbro Island, including the Turtle Islands.

## Birds & Biodiversity

At least 46 bird species occur at the site, and waterbird numbers regularly exceed 20,000. Timneh Parrot *Psittacus timneh* (EN) occurs. African Manatee *Trichechus senegalensis* (VU) has been recorded in the bay, and Maxwell's duiker *Philantomba maxwellii* inhabits the coastal forest. Marine life includes five species of sea turtles and a high number of fish species.

Species	Red List Category	Site estimate (2014-2019)
<u>Western Reef-egret <i>Egretta gularis</i></u>	LC	404-963 individuals
<u>Pink-backed Pelican <i>Pelecanus rufescens</i></u>	LC	193-819 individuals
<u>Great White Pelican <i>Pelecanus onocrotalus</i></u>	LC	544-940 individuals
<u>Pied Avocet <i>Recurvirostra avosetta</i></u>	LC	833-1,589 individuals
<u>Eurasian Curlew <i>Numenius arquata</i></u>	NT	139-535 individuals
<u>Bar-tailed Godwit <i>Limosa lapponica</i></u>	NT	723-1,354 individuals
<u>Black-tailed Godwit <i>Limosa limosa</i></u>	NT	391-1,147 individuals
<u>Curlew Sandpiper <i>Calidris ferruginea</i></u>	NT	1,684-4,023 individuals
<u>Little Tern <i>Sternula albifrons</i></u>	LC	394-1,007 individuals
<u>A4iii Species group - waterbirds</u>	n/a	15,297-24,198 individuals

**Table 34.** Site estimates of selected species

### Conservation issues

Yawri Bay is a designated MPA, and its northern shore and southern end of Kagboro Creek River are proposed Game Sanctuaries. Local chiefdom authorities have passed by-laws controlling fishing and woodcutting, but no official land-use policy exists. Mangroves are threatened by woodcutting to provide fuel for smoking fish. Sustained fishing pressure by trawlers, mostly foreign, illegally operating within a 12-mile exclusion zone, poses a threat to fish stocks. Heavy metal poisoning from large-scale mining operations upstream along the Bumpeh River is suspected to kill fish and may affect bird numbers.

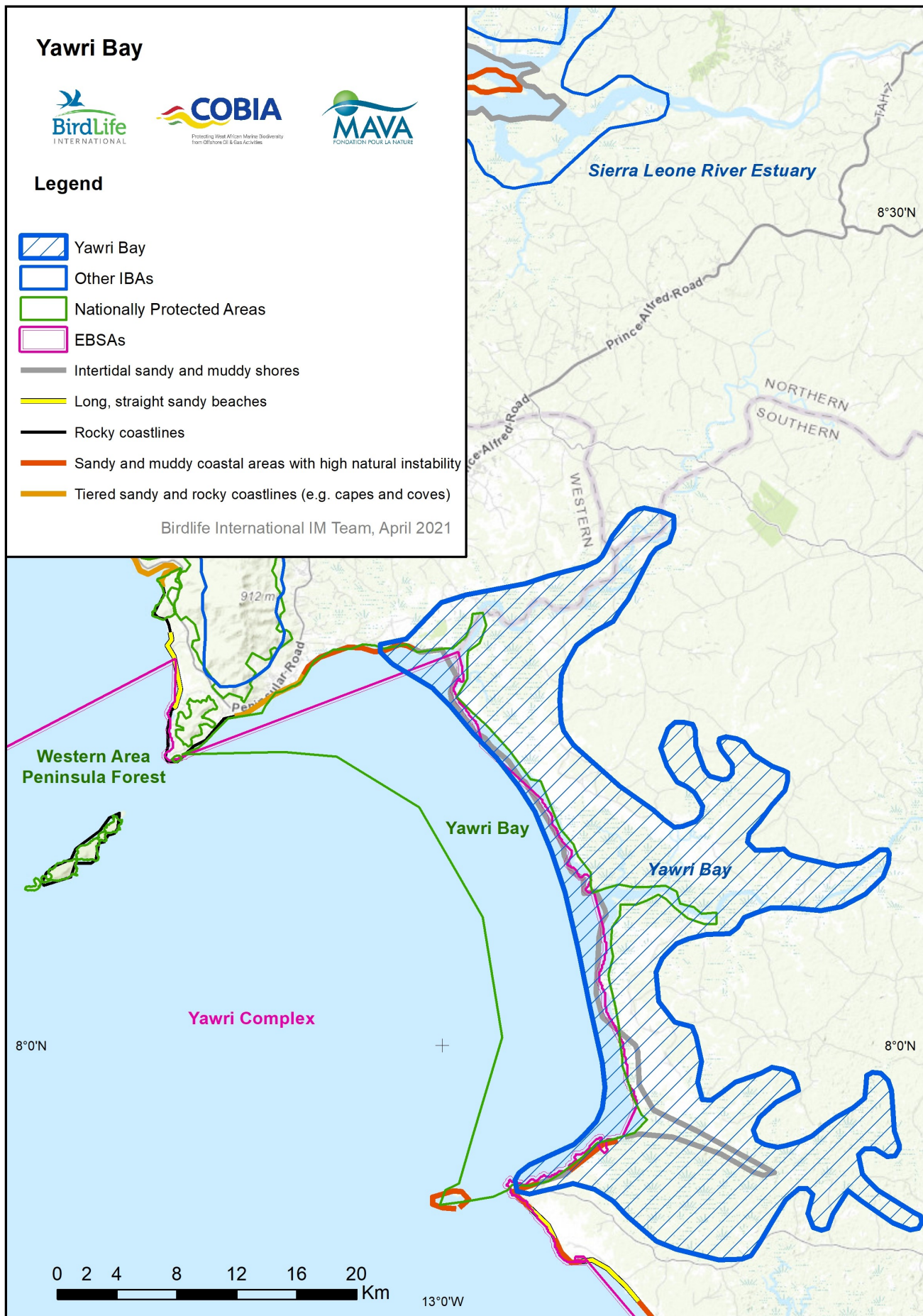
### Risk from Oil and Gas

Exploration is underway in blocks SL1, 2, 8A and 8B, which are all in proximity to Yawri Bay. A pollution incident could directly impact the site's integrity, of particular concern as this is probably the most important site for fish spawning in Sierra Leone.



Credit: Andrei Prodan/Unsplash





**Map 53: Yawri Bay**





Credit: FredR/Flickr



# Sherbro River Estuary

Country: Sierra Leone  
Admin region: Bonthe District  
Coordinates: Latitude:  
7°45'0" Longitude: -12°55'0.01  
Altitude: 0-10 m  
Protection Status: MPA - 30,242 ha

## Site description

Forming the southern border of the estuary, Sherbro Island is a remote area of the southeastern coast with extensive mangrove forests fringed by mudflats and sandbanks, with the much smaller Turtle Islands to the west. The whole estuary accounts for 54% of the country's mangrove cover. *Rhizophora racemosa* is the dominant species growing to 40 m in height. There are also small islands near the town on Bonthe on the east shore of Sherbro Island. Various creeks and channels feed into the Sherbro River and Sherbro Strait.

## Birds & Biodiversity

The estuary has been found to support over 30,000 waterbirds, including high counts of Common Redshank *Tringa totanus* and Black Tern *Chlidonias niger*; terns feed especially at the currents between islands and inlets bordering the sea. The mudflats with highest bird numbers occur in the Delken area, along the northern shore of Sherbro Island. The site may be the most important in Sierra Leone for African Skimmer *Rynchops flavirostris*.

African Manatee *Trichechus senegalensis* (VU) and African Clawless Otter *Aonyx capensis* (NT) have been observed in the Sherbro estuary. The Turtle Islands in particular are important breeding sites for sea turtles, and crocodiles also occur in the estuary. The area supports high fish diversity, and the estuary is rich in crustaceans, such as Gladiator Swimcrab *Clallinectes pallidus*, African Ghost Crab *Oxypoda africana*, and snails and bivalves, such as *Neritina oweniana* and *Donax rugosus*.

## Conservation issues

Along with other sites, the Sherbro River Estuary is a designated MPA, although management procedures do not seem to be in place. Local villages hunt most types of wildlife, and the capture of adult sea turtles and egg collection on Turtle Islands is likely severe (Van der Winden *et al.* 2007).

## Risk from Oil and Gas

As for other intertidal areas, an oil pollution incident in the vicinity would pose a major risk. Any onshore activities would risk the integrity of the site.

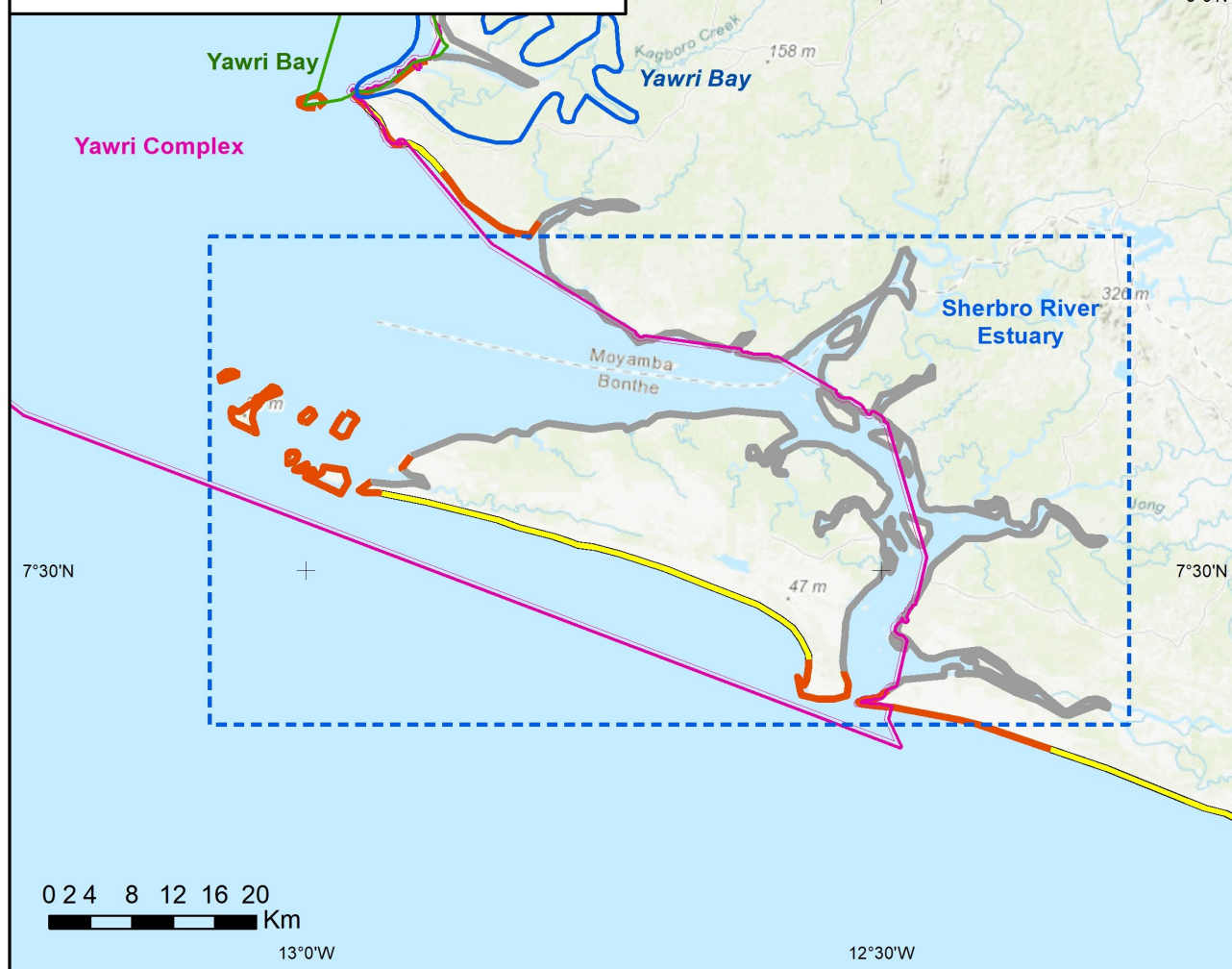
## Sherbro River Estuary



### Legend

- Sherbro River Estuary - Approximate Location
- Other IBAs
- Nationally Protected Areas
- EBSAs
- Ramsar Wetlands of International Importance
- Intertidal sandy and muddy shores
- Long, straight sandy beaches
- Rocky coastlines
- Sandy and muddy coastal areas with high natural instability
- Tiered sandy and rocky coastlines (e.g. capes and coves)

Birdlife International IM Team, April 2021



**Map 54:** Sherbro River Estuary



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# ANNEXURES 1 - METHODOLOGY

The methodology used to carry out this work consisted of collecting documentary data and also compiling the geospatial data required to produce the maps.

## **Documentary review**

The literature review is the major component of the study. It consisted in gathering relevant documents on sensitive areas, habitats, species, ecosystems that may be impacted, but also vulnerable to oil and gas activity in West Africa. This review made it possible to examine various documents dealing with the themes of sensitive ecosystems, sensitive sites, key species and relevant international conventions.

Within each theme, sections have been identified. In each one, an inventory was made, i.e. what is present, showing why the section is important, the conservation measures that are being put in place and the possible risks linked to offshore oil and gas activity.

The documents researched are diverse in nature and origin. They include study reports, scientific articles, theses, academic dissertations and technical documents related to oil and gas activity. The documentation has been made on the basis of online research and the collection of information and documents available from the national partners of the project, but also of the syntheses produced in the framework of the COBIA project by the national partners.

## **Methodology choice**

The choice of this vulnerability analysis methodology is explained by the fact that the sections presented are ecosystems, habitats of species that are all vulnerable in some way to offshore oil and gas activity. Depending on the location of a species, habitat and ecosystem, the level of risk in the face of danger is different depending on whether the site is being explored, exploited or dismantled. The same applies to the sensitivity of habitats, species and ecosystems to risk. The fact that there are no precise points of sources of danger is another difficulty in prioritising risk, since the entire EEZ of the four countries is likely to be sites that could present a danger in the event of an oil or gas discovery.

## **Strategy for carrying out the study**

A team of experts from Flora and Fauna International (FFI) and Birdlife International. The strategy for carrying out the study consisted of entrusting the sections to the various experts according to their areas of expertise in order to produce draft versions of the sections.

The description of the sites: protected areas and IBA was also carried out in this study by experts from BirdLife. These were then submitted to the national project partners for comments before consolidation.

The different section versions thus produced were then consolidated into one document and submitted to an external person for technical validation.

## **Cartography**

Data collection was carried out in the databases of IUCN, UNEP-WCMC, OBIS, RAMPAO, CCLME, BirdLife, country data shared by IMROP, DAMCP, as well as Global databases. The maps were produced by the Birdlife team using ArcGisPro software.

# ANNEXURES 2 - SITE DESIGNATION

## National Protected Areas

IUCN defines a protected area as: "a clearly defined geographical space that is recognized, consecrated and managed, through legal or other effective means, to ensure the long-term conservation of nature and its associated ecosystem services and cultural values". For the sustainable use of natural resources, IUCN proposes six categories of protected areas (Table 36)

Table 36: IUCN category of protected areas

Category	Description
I	Integral protection Ia Strict Nature Reserve and Ib Wilderness Area
II	Ecosystem conservation and protection e.g. National Park
III	Conservation of natural elements e.g. natural monument
IV	Conservation through active management e.g. habitat/species management area
V	Landscape/seascape conservation and recreation e.g. protected landscape/seascape
VI	Sustainable use of natural ecosystems e.g. managed natural resource protected area

Sources : Dudley, N. Éditeur 2008.

## Ramsar Sites

The Convention on Wetlands is an intergovernmental treaty that was adopted on 2 February 1971 in the Iranian city of Ramsar on the southern shores of the Caspian Sea. It provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. The Convention's mission is "the conservation and wise use of all wetlands through local and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world". Wetlands are among the most diverse and productive ecosystems. They include all lakes and rivers, underground aquifers, swamps and marshes, wet grasslands, peatlands, oases, estuaries, deltas and tidal flats, mangroves and other coastal areas, coral reefs, and all human-made sites such as fish ponds, rice paddies, reservoirs and salt pans. A Ramsar site is the designation of a "Wetland of International Importance" listed under the Ramsar Convention by a State Party. A Ramsar site must meet a set of criteria, such as the presence of vulnerable species of fish and water birds.

## World Heritage

The World Cultural and Natural Heritage Convention, adopted by The United Nations Educational, Scientific and Cultural Organization (UNESCO) in 1972, seeks to encourage the identification, protection and preservation of cultural and natural heritage around the world considered to be of outstanding value to humanity. Natural heritage refers to outstanding physical, biological and geological formations, habitats of threatened species of animals and plants and areas with scientific, conservation or aesthetic value. It is the first international treaty, which, on a global scale, aims at the protection of nature through the protection of defined natural areas. Sites that have been inscribed on the World Heritage List, without prejudice to national sovereignty or ownership, constitute a world heritage 'for whose protection it is the duty of the international community as a whole to cooperate'. Without the support of other countries, some of the world's outstanding cultural and natural sites would deteriorate or, worse, disappear, often through lack of funding to preserve them. The Convention is thus an agreement, ratified almost universally, that aims to secure the necessary financial and intellectual resources to protect World Heritage sites. The Convention is also important because it allows for the protection of landscapes and the raising of public awareness from both a cultural and a natural point of view.



# ANNEXURES 2 - SITE DESIGNATION

## Marine Protected Areas

There are many definitions for Marine Protected Areas (MPAs). However, they can be defined broadly as a clearly defined geographical area, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of marine nature with associated ecosystem services and cultural values. MPAs are created by delineating zones with permitted and non-permitted uses within that zone. It is vital to have in depth knowledge of the area so as to define ecological boundaries and set pre-defined management objectives for the MPA. It is also important to have the support of the public and established techniques for surveillance and monitoring of compliance.

## Ecologically or Biologically Significant Marine Areas EBSAs

In 2008, the ninth meeting of the Conference of the Parties to the Convention on Biological Diversity COP 9 adopted the following scientific criteria for identifying ecologically or biologically significant marine areas EBSAs in need of protection in open-ocean waters and deep-sea habitats:

Uniqueness or Rarity; Special importance for life history stages of species; Importance for threatened, endangered or declining species and/or habitats; Vulnerability, Fragility, Sensitivity, or Slow recovery; Biological Productivity; Biological Diversity; Naturalness.

COP 10 requested the Executive Secretary to organize a series of regional workshops with a primary objective to facilitate the description of EBSAs through application of scientific criteria as well as other relevant compatible and complementary nationally and intergovernmentally agreed scientific criteria, as well as the scientific guidance for the application of EBSA criteria (CBD Secretariat 2009).

Several sites in West Africa were described during the "South East Atlantic Regional Workshop to Facilitate the Description of Ecologically or Biologically Significant Marine Areas, held in Swakopmund, Namibia, 8 - 12 April 2013.

## Key Biodiversity Areas (KBA)

KBAs are sites contributing significantly to the global persistence of biodiversity in terrestrial, freshwater and marine ecosystems. At the World Conservation Congress, held in Bangkok, Thailand, in 2004, the IUCN Membership requested a worldwide consultative process to agree a methodology to enable countries to identify Key Biodiversity Areas. A Global Standard for the Identification of KBAs was published in 2016 by the IUCN Species Survival Commission (SSC) and the IUCN World Commission on Protected Areas (WCPA). It builds on more than 30 years of experience in identifying important sites for different taxonomic, ecological and thematic subsets of biodiversity. These include, in particular, the 13,000 IBAs identified by BirdLife International, plus Alliance for Zero Extinction (AZE) sites, B-ranked sites, Important Fungus Areas, Important Plant Areas identified by Plantlife International, Prime Butterfly Areas, and KBAs covering multiple taxonomic groups in freshwater, marine and terrestrial systems under previously published criteria.

KBAs can support the strategic expansion of protected-area networks by governments and civil society working toward achievement of the Aichi Biodiversity Targets (in particular Target 11 and 12), as established by the Convention on Biological Diversity (Butchart et al. 2012); serve to inform the description or identification of sites under international conventions (such as Ecologically and Biologically Significant Areas described under the Convention on Biological Diversity, wetlands of international importance designated under the Ramsar Convention, and

## ANNEXURES 2 - SITE DESIGNATION

natural World Heritage Sites); inform private sector safeguard policies, environmental standards, and certification schemes; support conservation planning and priority-setting at national and regional levels; and provide local and indigenous communities with opportunities for employment, recognition, economic investment, societal mobilisation and civic pride.

### Important Bird and Biodiversity Areas IBAs

An IBA is an area identified as a place of international significance for the conservation of birds and other biodiversity, based on an internationally agreed set of criteria Table 37. Initially, IBAs were identified only for terrestrial and freshwater environments, but over the past decade, the IBA process and method has been adapted and applied in the marine realm. To date, there are more than 13,000 IBAs in over 200 countries and territories. This network may be considered the minimum essential to ensure the survival of birds species across their ranges and throughout their life cycles.

Table 37: List of criteria for the identification of IBAs

IBA Criterion		Description
Global range criteria		
A1: Globally Threatened Species		The site is known or thought regularly to hold significant numbers of a Globally Threatened species
A2: Restricted Range Species		The site is known or thought to hold a significant population of at least two range-restricted species.
A3: Biome-restricted assemblages		The site is known or thought to hold a significant component of the group of species whose distributions are largely or wholly confined to one biome.
A4: Congregations		The site is known or thought to hold congregations of $\geq 1\%$ of the global population of one or more species on a regular or predictable basis.
Regional range criteria applicable in West Africa		
B1: Species of conservation concern	B1a: globally Near Threatened species	The site regularly holds significant numbers of a Near Threatened species.
B3: Regionally important congregations	B3a: biogeographical populations	The site is known or thought to hold, on a regular basis, $\geq 1\%$ of a biogeographic or other distinct population of a congregatory waterbird, breeding seabird or other species.
	B3b: multi-species aggregations	The site is known or thought to hold, on a regular basis, $\geq 20,000$ waterbirds or $\geq 6,700$ pairs of seabirds of one or more species
	B3c: bottleneck sites	Site known or thought to exceed thresholds set for migratory species at bottleneck sites.



# ANNEXURES 3 - INTERNATIONAL AGREEMENTS

## Introduction

Having recognized the value of nature, nearly every country in the world articulated commitment to conserve and promote the sustainable use of biodiversity through the ratification of global and/or regional multilateral environment agreements MEAs such as the Convention on Biological Diversity, the Abidjan Convention and others. These agreements foster multinational co-operation, capacity building, and collaborative research and conservation, which ultimately benefits the species or other biodiversity element of interest.

“MEAs are means to resolve transboundary problems and adopt harmonized approaches, they offer access to worldwide knowledge, tools and financial resources, and they can give conservation agencies a stronger mandate domestically.” Steiner, 2003 The Convention on Biological Diversity CBD, among MEAs, is considered the umbrella biodiversity convention and the CBD Strategic Plan for Biodiversity 2011-2020 is a foundation for sustainable development for the whole United Nations system. A post-2020 Global Biodiversity Framework is current being developed and, not only it is expected that it gains the same level of prominence, it should also provide the legal framework that will shape strategic planning of the various other agreements.

Through the adoption of the CBD, States recognized the paramount importance to “anticipate, prevent and attack the causes of significant reduction or loss of biological diversity at source” whilst also recognizing the need for in-situ conservation of biological diversity: ecosystems and natural habitats and maintenance and recovery of viable populations of species in their natural surroundings.

Several intergovernmental agreements address threats to marine organisms and habitats. These international regulations are important

because they give political impetus to conservation plans and actions, and, because they are, in most cases, contractually and legally binding, holding governments accountable for conserving the species and other biodiversity elements that are under within their borders. Moreover, many such agreements include frameworks and propose management plans, expediting and expertly guiding actions on the ground.

This Addendum to the Atlas of ecological and biological sensitivity in coastal and offshore areas of West Africa aims at providing quick access to selected relevant articles of Decisions, Resolutions and other provisions of international agreements that prescribes measures that should be followed by governments, industries and other stakeholders involved in extractive operations, particularly oil & gas developments.

By laying out extracts of international regulations, this Addendum intends to support the compliance of commitments made under such agreements, particularly within those areas that are most sensitive for their biodiversity values in West Africa.

The provisions entered here, should be observed either individually or combined and be carried out by a country either unilaterally or in cooperation and collaboration with neighbour countries, and where appropriate, assisted by regional and international organizations.

Large range of migratory species travel across jurisdictions of multiple countries. Therefore, for such species, particularly, management measures must be taken by multiple countries, in cooperation.

One should observe that implementation of the provisions in this Addendum should not prevent the consideration and application of the various others provisions adopted under the MEAs outlined in this document and others not addressed herewith.

<sup>12</sup>. Achim Steiner, Lee A. Kimball and John Scanlon. 2003. Global governance for the environment and the role of Multilateral Environmental Agreements in conservation. Oryx Vol 372, 227-237.

# ANNEXURES 3 - INTERNATIONAL AGREEMENTS



## Convention on Biological Diversity

**Project countries which are Party of the Convention:**  
Guinea-Bissau, Mauritania, Senegal and Sierra Leone

### Elements underpinning the Convention

**Objectives:** The conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.

**Vision of the Convention:** Living in harmony with nature where by 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people.

**Mission of the Convention:** Make effective and urgent action to halt the loss of biodiversity in order to ensure that by 2020 ecosystems are resilient and continue to provide essential services, thereby securing the planet's variety of life, and contributing to human well-being, and poverty eradication.

To ensure this, **pressures on biodiversity are reduced**, ecosystems are restored, biological resources are sustainably used and benefits arising out of utilization of genetic resources are shared in a fair and equitable manner; adequate financial resources are provided, capacities are enhanced, biodiversity issues and values mainstreamed, appropriate policies are effectively implemented, and decision-making is based on sound science and the precautionary approach.

**Strategic document:** Strategic Plan for Biodiversity 2011-2020.<sup>13</sup>

### **Obligations under the Strategic Plan most directly related or relevant to operations of the oil & gas industry:**

**Aichi Target 2:** By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.

**Aichi target 3:** By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.

**Aichi Target 4:** By 2020, at the latest, governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.

**Aichi Target 8:** By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.

<sup>13</sup> A new post-2020 Global Biodiversity Framework is current under development and should be aligned with the current plan.



# ANNEXURES 3 - INTERNATIONAL AGREEMENTS

## Obligations resulting from Decisions of the Conference of the Parties COP:

### Apply Environment Impact Assessment and Mitigate of Negative Impact:

- ⇒ Observe best Environment Impact Assessment EIA practices and apply mitigation hierarchy when developing new projects and plans. CBD/COP/Decision/14/3 – Mainstreaming of biodiversity in the energy and mining, infrastructure, manufacturing and processing sectors
- ⇒ Apply emphasis on the contribution of environmental impact assessments EIAs and strategic environmental assessments SEAs to further strengthen sustainable use of living and non-living resources. CBD/COP/Decision/10/29 - Marine and coastal biodiversity

### Businesses engagement in delivering countries' commitments on biodiversity:

Governments are the actors accountable for implementation of intergovernmental agreements at the national level.

Recognizing the potential impacts of business operations on biodiversity and the role that the business community and civil society need to play for the implementation of the three objectives of the Convention, at all levels, through various Decisions, Governments are called to engage with businesses to, among other responsibilities:

- ⇒ **Communicate the importance of biodiversity to companies** operating within the jurisdiction of their countries, including state-owned companies and small and medium enterprises, CBD/COP/Decision/8/17 - Private-sector engagement and
- ⇒ Improve actions and cooperation for **enhancing the engagement of the business community** in the implementation of the three objectives of the Convention CBD/COP/Decision/9/26 - Promoting business engagement
- ⇒ **Include biodiversity conservation** concerns into **operations and policies of business**, through regulations and economically and socially sound incentive measures, national biodiversity strategies and action plans. CBD/COP/Decision/10/21 - Business engagement
- ⇒ Promote the development and implementation of biodiversity strategies within business sectors. CBD/COP/Decision/12/10 - Business engagement

<sup>14</sup> This session outlines an extract of those Decisions of the CBD that relates to business developments, particularly of the oil & gas industry and/or those Decisions that should be observed nationally in order to safeguard biodiversity in response to potential impacts resulting from operations of such industry. It does not intent to be a comprehensive list of all national obligations to conserve, promote the sustainable use and the fair and equitable sharing of the benefits resulting from the use of genetic resources.

# ANNEXURES 3 - INTERNATIONAL AGREEMENTS

## Businesses are invited to:

- ⇒ Assess the impact of operations on biodiversity and ecosystem functions and prepare action plans in this respect. [CBD/COP/Decision/12/10 - Business engagement](#)
- ⇒ Adopt practices and strategies that contribute to achieving the goals and objectives of the Convention and to consider the use of voluntary standards and certification schemes that incorporate effective safeguards for biodiversity. [CBD/COP/Decision/11/7 - Business and biodiversity](#)
- ⇒ Align investments in support of the conservation and sustainable use of biodiversity and ecosystem services. [CBD/COP/Decision/11/7 - Business and biodiversity](#)
- ⇒ Monitor and assess impacts on biodiversity and ecosystem services, including related risks and opportunities, and of how this may affect their business activities. Also, develop and apply processes and production methods that minimize or avoid negative impacts on biodiversity. [CBD/COP/Decision/10/21 - Business engagement](#)
- ⇒ Participate in the development of national biodiversity strategies and action plans, and to encourage such companies to adopt practices that support the implementation of national biodiversity strategies and action plans and the objectives of the Convention. [CBD/COP/Decision/8/17 - Private-sector engagement](#)
- ⇒ Develop and promote the business case for biodiversity, to develop and promote the wider use of good practice guidelines, benchmarks, certification schemes and reporting guidelines and standards, to share information on biodiversity status and trends, and finally to align their policies and practices more explicitly with the three objectives of the Convention and its goals and targets. [CBD/COP/Decision/8/17 –Private-sector engagement](#)

## Reduce Negative impacts of Extractive Activities:

Apply efforts to minimize the specific as well as cumulative detrimental impacts of human activities on marine and coastal biodiversity, including extraction of non-living resources, shipping, infrastructure. [CBD/COP/Decision/10/29 - Marine and coastal biodiversity](#)

Stop the degradation and loss of ecologically important ecosystems and habitats e.g estuaries, coastal sand dunes, mangroves forests, salt marshes, seagrass beds, and biogenic reefs due to coastal development and other factors in coastal area and are invited to apply marine spatial planning tools for better integration of conservation objectives in marine and other sectoral development programmes, and in overall plans for economic development. [CBD/COP/Decision/10/29 - Marine and coastal biodiversity](#)

Apply the ecosystem approach in the achievement of sustainable development goals. [CBD/COP/Decision/9/7 - Ecosystem approach](#)

## Respond to physical or biological hazards:

Design adaptive integrated marine and coastal area management programmes that respond to environmental change, as well as recurrent or emerging physical or biological hazards, as long-term mitigation tools complementary to early warning systems for coastal/marine hazards. [CBD/COP/Decision/8/22 - Marine and coastal biological diversity: enhancing the implementation of integrated marine and coastal area management.](#)



# ANNEXURES 3 - INTERNATIONAL AGREEMENTS

## Address Anthropogenic underwater noise:

- ⇒ Take measures to **minimize** the significant adverse **impacts of anthropogenic underwater noise** on marine biodiversity, including the full range of best available technologies and best environmental practices. *CBD/COP/Decision/11/18 - Marine and coastal biodiversity: sustainable fisheries and addressing adverse impacts of human activities, voluntary guidelines for environmental assessment, and marine spatial planning*

## Protect Areas Key for Biodiversity:

- ⇒ **Integrate protected areas into sea and landscapes** and work to **incorporate the concept** of the need to effectively manage protected areas and other effective conservation measures OECMs **into the mining** and other sectors. *CBD/COP/Decision/14/8 – Protected areas and other effective area-based conservation measures*

## Understand the Status and trend in marine biodiversity in critical habitats:

- ⇒ Undertake research to improve understanding of marine biodiversity, especially in selected seabed habitats and marine areas in need of protection. These researches should include the elaboration of **inventories and baselines** to be used including for assisting in the **assessment of the status and trends of marine biodiversity and habitats**, particularly in those ecosystems and critical habitats that are relatively unknown. *CBD/COP/Decision/9/20 – Marine and coastal biodiversity*

## The CBD Programme of work on Marine and Coastal Biodiversity

*CBD/COP/Decision/7/5 - Marine and coastal biological diversity*

The 'Programme of work on marine and coastal biological diversity', asks for direct action to be undertaken to protect the marine environment from negative impacts by:

- ⇒ promoting adequate protection of areas important for reproduction such as spawning and nursery areas and restoration of such areas and other important habitats for marine living resources,
- ⇒ promoting action to reduce and control sea-based sources of pollution,
- ⇒ achieving substantial progress in protecting the marine environment from land-based activities, including proper coastal land use, watershed planning, and integration of integrated marine and coastal area management into key sectors,
- ⇒ promoting urgent and special attention and measures in respect to closed and semi closed seas

With the adoption of this Programme, Governments also agrees that an effective marine and coastal biodiversity management framework would comprise sustainable management practices and actions to protect biodiversity over the wider marine and coastal environment, including integrated **networks of marine and coastal protected areas** consisting of:

- ⇒ Marine and coastal protected areas, where **threats are managed** for the purpose of biodiversity conservation and/or sustainable use and where extractive uses may be allowed; and
- ⇒ Representative marine and coastal protected areas where extractive uses are excluded, and other significant human pressures are removed or minimized, to enable the integrity, structure and functioning of ecosystems to be maintained or recovered.

# ANNEXURES 3 - INTERNATIONAL AGREEMENTS



Convention on Wetlands  
Convention sur les zones humides  
Convención sobre los Humedales

**Project countries which are Party of the Convention:**  
Guinea-Bissau, Mauritania, Senegal and Sierra Leone

## Elements underpinning the Convention

### The three pillars of the Convention:

- ⇒ Promote the wise use of all their wetlands
- ⇒ Designation of suitable wetlands for the list of Wetlands of International Importance the “Ramsar List” and ensure their effective management
- ⇒ International cooperation on transboundary wetlands, shared wetland systems and shared species

**Mission of the Convention:** The conservation and wise use of all wetlands through local and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world.

**Strategic document:** 4<sup>th</sup> Strategic Plan 2016-2024

**Vision of the Strategic Plan:** Wetlands are conserved, wisely used, restored and their benefits are recognized and valued by all.

**What are Wetlands:** For the Convention, wetlands include marine and coastal, inland and human-made wetlands. They can be permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres.

### Obligations under the Strategic Plan most directly related or relevant to operations of the oil & gas industry:

**Goal:** Addressing the Drivers of Wetland Loss And Degradation

- ⇒ Target - Wetland benefits are featured in national/local policy strategies and plans relating to key sectors such as water, energy, mining, agriculture, tourism, urban development, infrastructure, industry, forestry, aquaculture, fisheries at the national and local level.
- ⇒ Target - The public and private sectors have increased their efforts to apply guidelines and good practices for the wise use of water and wetlands.

### Goal - Wisely Using All Wetlands

Target - Enhanced sustainability of key sectors such as water, energy, mining, agriculture, tourism, urban development, infrastructure, industry, forestry, aquaculture and fisheries, when they affect wetlands, contributing to biodiversity conservation and human livelihood

<sup>15</sup> Marine/Coastal Wetlands A -- Permanent shallow marine waters in most cases less than six metres deep at low tide; includes sea bays and straits. B -- Marine subtidal aquatic beds; includes kelp beds, sea-grass beds, tropical marine meadows. C -- Coral reefs. D -- Rocky marine shores; includes rocky offshore islands, sea cliffs. E -- Sand, shingle or pebble shores; includes sand bars, spits and sandy islets; includes dune systems and humid dune slacks. F -- Estuarine waters; permanent water of estuaries and estuarine systems of deltas. G -- Intertidal mud, sand or salt flats. H -- Intertidal marshes; includes salt marshes, salt meadows, saltings, raised salt marshes; includes tidal brackish and freshwater marshes. I -- Intertidal forested wetlands; includes mangrove swamps, nipah swamps and tidal freshwater swamp forests. J -- Coastal brackish/saline lagoons; brackish to saline lagoons with at least one relatively narrow connection to the sea. K -- Coastal freshwater lagoons; includes freshwater delta lagoons. Zka -- Karst and other subterranean hydrological systems, marine/coastal



# ANNEXURES 3 - INTERNATIONAL AGREEMENTS

## Obligations resulting from Resolutions of the Conference of the Parties COP:

### Adjust policies, plans and activities of the industry sector:

- ⇒ Make use of the '**Guidance for addressing the implications for wetlands of policies, plans and activities in the energy sector**', which outlines the potential impacts resulting from energy sector activities, the ways in each energy sector can integrate policies and planning. [Resolution XI.10 - Wetlands and energy issues](#)
- ⇒ Incorporate the 'Integrated Framework and Guidelines' within relevant national policies and regulations. [Resolution XI.9 - An Integrated Framework and Guidelines for avoiding, mitigating and compensating for wetland losses](#)
- ⇒ Review, amend and take action on existing policies and practices that adversely affect coastal wetlands within a context of **Integrated Coastal Zone Management**. [Resolution VIII.4 - Wetland issues in Integrated Coastal Zone Management ICZM](#)
- ⇒ Review and modify existing **policies that adversely affect intertidal wetlands** which includes tidal flats, salt marshes, mangroves and seagrass beds, to seek to introduce measures for the long-term conservation of these areas. [Resolution VII.21 - Enhancing the conservation and wise use of intertidal wetlands](#)
- ⇒ Reinforce and strengthen efforts to **ensure that any project, plans, programmes and policies** with the potential to alter the ecological character of wetlands in the Ramsar List, or impact negatively on other wetlands in national territories, **are subjected to rigorous impact assessment procedures and formalize such procedures under policy, legal, institutional and organizational arrangements**. [Resolution VII.16 - The Ramsar Convention and impact assessment: strategic, environmental and social](#)
- ⇒ Review existing or evolving, policy, legal and institutional frameworks to identify and promote those **measures which encourage conservation and wise use of wetlands** and identify and remove measures which discourage conservation and wise use. [Resolution VII.15 - Incentive measures to encourage the application of the wise use principle](#)
- ⇒ Adopt the 'Guidelines for **reviewing laws and institutions to promote the conservation and wise use of wetlands**'. Governments undertaking or planning to undertake reviews of their laws and institutions are encouraged to ensure that these not only aim to remove constraints to conservation and on the implementation of wise use, but also seek to introduce positive incentive measures to support the effective application of the wise use obligation. [Resolution VII.7 - Guidelines for reviewing laws and institutions to promote the conservation and wise use of wetlands](#)

# ANNEXURES 3 - INTERNATIONAL AGREEMENTS

## Business - extractive industries responsibilities to reduce impact of activities:

Governments are the actors accountable for implementation of intergovernmental agreements at the national level.

AWARE of the potential for certain activities related to extractive industries, if not appropriately managed and regulated, to have direct and indirect negative impacts on the ecological character of wetlands, including Ramsar sites, Governments are called to engage with businesses to, among other responsibilities:

- ⇒ Encourage private companies to endorse and apply standards of sustainable business conduct that ensure the integrity and the ecosystem services of wetlands in general, and Ramsar Sites in particular. [Resolution XI.20 - Promoting sustainable investment by the public and private sectors to ensure the maintenance of the benefits people and nature gain from wetlands](#)
- ⇒ Adopt and make use of the 'Guidance addressing the implications for wetlands of policies, plans and activities in the energy sector'. [Resolution XI.10 - Wetlands and energy issues](#)
- ⇒ Undertake, at national level, development of specific ecological impact criteria to be applied in selection of energy generation sites in relation to wetlands, ensuring that these criteria take into account the wide range of natural river and wetland characteristics such as hydromorphology, water quality and quantity, sediment transport and distribution, presence of rare or endemic species and habitats, biodiversity and other ecosystem functions. [Resolution XI.10 - Wetlands and energy issues](#)
- ⇒ Review and revise regulatory and permitting procedures related to extractive industrial activities, in order to ensure that impacts on wetland ecosystems and their ecosystem services are avoided, remedied or mitigated as far as possible, and that any unavoidable impacts are sufficiently compensated for in accordance with any applicable national legislation. [Resolution X.26 - Wetlands and extractive industries](#)
- ⇒ Engage with relevant private sector interests at international, national and local levels to establish and/or strengthen corporate social responsibility programmes related to extractive industries, paying particular attention to actions that avoid, remedy or mitigate the direct and indirect impacts of extractive industries on biodiversity and the indigenous peoples and other local communities. [Resolution X.26 - Wetlands and extractive industries](#)

## Apply Environment Impact Assessment:

- ⇒ Emphasize to businesses the importance of Strategic Environmental Assessment SEA, particularly in relation to the extractive industries sector, and to apply the SEA and EIA guidance Ramsar COP Resolution X.17 in order to address specific issues associated with direct and indirect impacts of the full spectrum of activities of the extractive industries on wetlands, including exploration, development, operation, closure and post-closure phases. [Resolution X.26 - Wetlands and extractive industries](#)
- ⇒ Make use of the Biodiversity-Inclusive Environmental Impact Assessment and Strategic Impact Assessment. This Resolution addresses wetland-specific aspects of the Convention on Biological Diversity Guidelines on this subject. The document includes an indicative set of screening criteria for those activities that should be assessed, such as mining, as well as activities planned to take place in areas important for ecosystem services, or habitat for threatened species, and others. [Resolution X.17 - Environmental Impact Assessment and Strategic Environmental Assessment: updated scientific and technical guidance](#)



# ANNEXURES 3 - INTERNATIONAL AGREEMENTS

## Protect and safeguard biodiversity:

- ⇒ Develop and implement management plans for index nesting and foraging sites, by integrating specific means for the conservation, protection or restoration of coastal habitats for the different marine turtle species. Additionally these site management plans should be integrated with coastal zone management plans. [Resolution XIII. 24 - The enhanced conservation of coastal marine turtle habitats and the designation of key areas as Ramsar Sites](#)
- ⇒ Take the measures required to reduce threats to marine turtle nesting areas, such as noise and light pollution and beach erosion. [Resolution XIII.24 - The enhanced conservation of coastal marine turtle habitats and the designation of key areas as Ramsar Sites](#)

### Existing Ramsar Sites with coastal and marine turtle habitats

#### *Country - Name of Site - Species present*

Guinea-Bissau - Archipel Bolama-Bijagós - Cm, Dc, Lo, Cc, Ei

Mauritania - Parc national du Banc d'Arguin - Cm3, Cc

Mauritania - Parc national du Diawling - Cm, Cc

Mauritania - Chat Tboul - Cm, Cc

Senegal - Parc national du Delta du Saloum - Cm

Senegal - Kalissaye - Cm

Senegal - Réserve Naturelle d'Intérêt Communautaire de la Somone - Cm

Senegal - Réserve Naturelle Communautaire de Palmarin – Dc

- ⇒ Make use of the Ramsar 'Integrated Framework and Guidelines' which addresses approaches to **avoid wetland loss**, such as risk-based approaches as well as responses to degradation. [Resolution XI.9 - An Integrated Framework and Guidelines for avoiding, mitigating and compensating for wetland losses](#)
- ⇒ Enhance efforts to address the root causes of the continuing decline in waterbird status. [Resolution X.22 - Promoting international cooperation for the conservation of waterbird flyways](#)
- ⇒ Adopt the Principles and guidelines for incorporating wetland issues into Integrated Coastal Zone Management ICZM. The Resolution urges Parties to ensure that coastal wetlands and their values and functions for human well-being, including their role in mitigating the impacts of climate change and sea-level rise and their importance for the conservation of biological diversity, are fully recognized in planning and decision-making in the coastal zone, including through ICZM initiatives. [Resolution VIII.4 - Wetland issues in Integrated Coastal Zone Management ICZM](#)

<sup>16</sup> Species involved nesting beaches, nursery areas, feeding areas:

Lepidochelys olivacea = **Lo** IUCN Red List status: Vulnerable

Lepidochelys kempii = **Lk** IUCN Red List status: Critically Endangered

Chelonia mydas = **Cm** IUCN Red List status: Endangered

Chelonia agassizii or C. mydas agassizii = **Ca** IUCN Red List status: Endangered

Caretta caretta = **Cc** IUCN Red List status: Endangered

Eretmochelys imbricata = **Ei** IUCN Red List status: Critically Endangered

Dermochelys coriacea = **Dc** IUCN Red List status: Vulnerable

Natator depressus = **Nd** IUCN Red List status: Data Deficient

# ANNEXURES 3 - INTERNATIONAL AGREEMENTS



**Project countries which are Party of the Convention:**  
Guinea-Bissau, Mauritania, Senegal and Sierra Leone

## Elements underpinning the Convention

**Objectives:** The World Heritage Convention WHC provides an intergovernmental framework for international cooperation for the identification and conservation of the world's most outstanding natural and cultural properties.

**Primary obligations:** Parties to the Convention recognizes the duty of the State in ensuring the identification, protection, conservation, presentation and transmission to future generations of the cultural and natural heritage situated on its territory. It will do all it can to this end, to the utmost of its own resources and, where appropriate, with any international assistance and co-operation, in particular, financial, artistic, scientific and technical, which it may be able to obtain Convention text, Article 4

**Strategic Document:** Strategic Action Plan for the Implementation of the WHC 2012-2022.

**Vision of the Strategic Plan:** International cooperation and shared responsibility through the WHC ensures effective conservation of our common cultural and natural heritage, nurtures respect and understanding among the world's communities and cultures, and contributes to their sustainable development

**Mission of the Strategic Plan:** To identify, protect, conserve, present and transmit to future generations the world's outstanding cultural and natural heritage cf. Art. 4

**Obligations under the Strategic Plan most directly related or relevant to operations of the oil & gas industry:**

Goal: The Outstanding Universal Value of World Heritage sites is maintained

Goal: Heritage protection and conservation considers present and future environmental, societal and economic needs

Strategic Objective: Ensure the effective **Conservation** of World Heritage Properties

### **Operational Guidelines of the Convention WHC.19/01:**

- ⇒ The protection and management of World Heritage properties should ensure that their Outstanding Universal Value OUV, including the conditions of integrity and/or authenticity at the time of inscription, are sustained or enhanced over time. A regular review of the general state of conservation of properties, and thus also their OUV, shall be done within a framework of monitoring processes for World Heritage properties, as specified within the Operational Guidelines Paragraph 96
- ⇒ Legislative and regulatory measures at national and local levels should assure the protection of the property from social, economic and other pressures or changes that might negatively impact the OUV, including the integrity and/or authenticity of the property. States Parties should also assure the full and effective implementation of such measures Paragraph 98



# ANNEXURES 3 - INTERNATIONAL AGREEMENTS

## Obligations resulting from Decisions of the WH Committee:

### Sustainable Development in Africa:

African States Parties to focus their development efforts to benefit local communities, including them in the decision-making, and building on their knowledge and needs with progressive and proactive conservation of natural and cultural heritage; and to create enabling environments for innovative solutions inclusive of green and blue economies while progressing towards other Sustainable Development Goals." *WHC 43 COM 5D - Priority Africa, Sustainable Development and World Heritage*

Integrate the protection of the Outstanding Universal Value of World Heritage properties with inclusive and sustainable development needs through the effective implementation of the World Heritage Sustainable Development Policy WH-SDP aligned with the 2030 Agenda for Sustainable Development. *WHC 43 COM 5D - Priority Africa, Sustainable Development and World Heritage*

States Parties to the *World Heritage Convention*, international agencies and development partners, international finance institutions, industries, private sector, and other partners including multi and bi-lateral partners are called to join in ensuring policy coherence and harness synergies in multilateral agreements, investments, and protocols. These include the UN 2030 Agenda, and the "Africa 2063" Agenda as well as the WH-SDP to deliver multiple benefits, with inclusive governance mechanisms that bring all round benefits to the local communities in and around World Heritage properties. *WHC 43 COM 5D - Priority Africa, Sustainable Development and World Heritage*

### Apply Environment Impact Assessment:

The protection of the Outstanding Universal Value should be ensured by including Environmental Impact Assessment EIA, Heritage Impact Assessment HIA, Strategic Environmental Assessment SEA, in national and international development projects, in accordance with Paragraph 172 of the Operational Guidelines. *WHC 43 COM 5D - Priority Africa, Sustainable Development and World Heritage.*

### No-Go to extractive industries in WH Sites:

Governments and leading industry stakeholders are urged to respect the "No-go" commitment by not permitting extractives activities within World Heritage properties, and by making every effort to ensure that extractives companies located in their territory cause no damage to World Heritage properties, in line with Article 6 of the Convention. *WHC 37 COM 7- Emerging trends and general issues*

Extractive industries called to extending the commitment made by Shell and the International Council on Mining and Metals ICMM to not explore or develop oil, gas and mineral resources within World Heritage properties to other companies and parts of the industry, and also to ensure that existing and future operations in areas surrounding World Heritage properties are compatible with the protection of their Outstanding Universal Value and do not threaten their integrity. *WHC 37 COM 7 - Emerging trends and general issues*

Companies in extractive industries and investment banks are called to follow examples of other companies to the "No go" commitment. *WHC 38 COM 7 – State of Conservation of World Heritage Properties - Updates on previously reported issues*

<sup>17</sup> "Outstanding Universal Value means cultural and/or natural significance which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity. As such, the permanent protection of this heritage is of the highest importance to the international community as a whole."

# ANNEXURES 3 - INTERNATIONAL AGREEMENTS



## Convention on Migratory Species

### Project countries which are Party of the Convention:

Guinea-Bissau, Mauritania and Senegal Sierra Leone is not a Party of the Convention, but is located within its range

### Obligations resulting from Decisions of the WH Committee:

**Objectives:** Take action to **avoid any migratory species becoming endangered**, through promotion, co-operation and support of research relating to migratory species; providing immediate protection for migratory species included in Appendix I list migratory species which are endangered; and concluding Agreements covering the conservation and management of migratory species included in Appendix II list migratory species which have an unfavourable conservation status and which require international agreements for their conservation and management, as well as those which have a conservation status which would significantly benefit from the international cooperation that could be achieved by an international agreement.

**Strategic document:** Strategic Plan for Migratory Species 2015-2023

**Mission of the Strategic Plan:** To promote actions to ensure the favourable conservation status of migratory species and their habitats, and to ensure the ecological integrity, connectivity and resilience of migration systems."

### Obligations under the Strategic Plan most directly related or relevant to operations of the oil & gas industry:

**Goal:** Address the underlying causes of decline of migratory species by mainstreaming relevant conservation and sustainable use priorities across government and society.

**Target:** Multiple values of migratory species and their habitats have been integrated into international, national and local development and poverty reduction strategies and planning processes, including on livelihoods, and are being incorporated into national accounting, as appropriate, and reporting systems.

**Target:** Incentives, including subsidies, harmful to migratory species, and/or their habitats are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation of migratory species and their habitats are developed and applied, consistent with engagements under the CMS and other relevant international and regional obligations and commitments.

**Goal:** Reduce the direct pressures on migratory species and their habitats.

**Target:** Governments, key sectors and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption, keeping the impacts of use of natural resources, including habitats, on migratory species well within safe ecological limits to promote the favourable conservation status of migratory species and maintain the quality, integrity, resilience, and ecological connectivity of their habitats and migration routes.

**Target:** Multiple anthropogenic pressures have been reduced to levels that are not detrimental to the conservation of migratory species or to the functioning, integrity, ecological connectivity and resilience of their habitats.



# ANNEXURES 3 - INTERNATIONAL AGREEMENTS

**Programme of Work on Migratory Species and Flyways** [Resolution 12.11/Annex 1](#) Purpose The overall purpose of the POW is to identify and promote implementation of activities at the international and national levels that will effectively contribute to an improvement in the status of migratory birds and their habitats worldwide. This should also achieve an improvement in migratory bird species throughout the world's flyways by: a Providing a framework for effective protection of migratory birds throughout their lifecycles; and b Enhancing synergies among relevant flyway-related instruments and programmes.

## Obligations resulting from Resolutions of the Conference of the Parties COP:

### Address Impacts Oil Pollution:

- ⇒ Promote the **conservation of small cetaceans and sirenians** with the actors of civil society including those outside the area, such as **oil companies**, fish and aquaculture industries, and tourist operators. [CMS/Resolution 7.16 Rev.COP12 -Regional Coordination for Small Cetaceans and of Sirenians in Central and West Africa](#)

Governments are called to:

- ⇒ Implement a monitoring process in order to assess the cumulative environmental impacts of oil pollution on migratory species;
- ⇒ Develop, apply and, where necessary, strengthen comprehensive environmental protection legislation;
- ⇒ Develop, apply and, where necessary, strengthen measures to enforce such legislation at sea, in freshwater systems and on land;
- ⇒ Develop, apply and strengthen, as necessary, measures of preparedness to respond to oil spills, such as facilities and trained personnel;
- ⇒ Apply existing and further develop guidelines for the treatment of oil-affected wildlife with a view to rehabilitating the individuals involved;
- ⇒ Seek appropriate partnerships with industry to address oil pollution, taking the “polluter pays principle” fully into account; and
- ⇒ Take full account of the precautionary principle in the location of oil installations and movement of oil containers in relation to migratory species habitats. [CMS/Resolution 7.3 Rev.COP12 - Oil Pollution and Migratory Species](#)
- ⇒ All relevant international, regional and national organizations and bodies are invited to cooperate with CMS in efforts to **prevent oil pollution** and to **minimize the negative impacts** on migratory species of the release of crude and refined oils into the environment. [CMS/Resolution 7.3 Rev.COP12 - Oil Pollution and Migratory Species](#)

### Apply Environment Impact Assessment:

- ⇒ Include in EIA and SEA, as complete a consideration as possible, of effects involving impediments to migration of transboundary effects on migratory species, and of impacts on migratory patterns or on migratory ranges. [CMS/Resolution 7.2 Rev. COP12 - Impact Assessment and migratory species](#)
- ⇒ Make use of the “Impact Assessment: Voluntary Guidelines on Biodiversity-inclusive Impact Assessment”. [CMS/Resolution 7.2 Rev. COP12 - Impact Assessment and migratory species](#)

# ANNEXURES 3 - INTERNATIONAL AGREEMENTS

## Address Anthropogenic underwater noise caused by oil and gas industry:

- ⇒ Make full use of the ‘Guidelines on impacts of anthropogenic noise..’ in order to assess, mitigate and minimize negative effects of anthropogenic marine noise on marine biota. [CMS/Resolution 12.14 - Adverse impacts of anthropogenic noise on cetaceans and other migratory species](#)
- ⇒ Endorses the “CMS Family Guidelines on Environmental Impact Assessments for Marine Noise-generating Activities” attached as Annex - [CMS/Resolution 12.14 - Adverse impacts of anthropogenic noise on cetaceans and other migratory species](#)
- ⇒ Consult with any stakeholder conducting activities known to produce anthropogenic marine noise with the potential to cause adverse effects on CMS listed marine species and their prey, such as **the oil and gas industry**, shoreline developers, **offshore extractors**, oceanographic and geophysical researchers recommending, how best practice of **avoidance, diminution or mitigation of risk** should be implemented. In any case of doubt the precautionary approach should be applied. [CMS/Resolution 12.14 - Adverse impacts of anthropogenic noise on cetaceans and other migratory species](#)
- ⇒ Need for international, national and regional limitation of harmful anthropogenic marine noise through management including, where necessary, regulation. [CMS/Resolution 12.14 - Adverse impacts of anthropogenic noise on cetaceans and other migratory species](#)
- ⇒ Use noise reduction techniques for offshore activities such as: air-filled coffer dams, bubble curtains or hydro-sound dampers, or different foundation types such as floating platforms, gravity foundations or pile drilling instead of pile driving. [CMS/Resolution 12.14 - Adverse impacts of anthropogenic noise on cetaceans and other migratory species](#).

## Protect and safeguard sites for migratory species:

- ⇒ Take into account and make explicit by description, schematic maps or conceptual models, the relationship between areas important to migratory terrestrial, avian and aquatic species and other areas which may be ecologically linked to them: in physical terms, for example as connecting corridors; or in other ecological terms, for example as breeding areas related to non-breeding areas, stopover sites, feeding and resting places. [CMS/Resolution 12.7 - The Role of Ecological Networks in the Conservation of Migratory Species](#)
- ⇒ Collaborate to identify, designate and maintain comprehensive and coherent ecological networks of protected sites and other adequately managed sites of international and national importance for migratory animals while taking into account resilience to change, including climate change, and existing ecological networks. [CMS/Resolution 12.7 - The Role of Ecological Networks in the Conservation of Migratory Species](#).

## Address threats in critical sites for migratory species:

- ⇒ Address immediate threats to national sites important for migratory species within ecological networks, making use of international lists of threatened sites, such as the ‘World Heritage in Danger’ list of UNESCO, the ‘Montreux Record’ of Ramsar and the ‘IBAs in Danger’ list of BirdLife International. [CMS/Resolution 12.7- The Role of Ecological Networks in the Conservation of Migratory Species](#)
- ⇒ Afford high priority to the conservation of sites and habitats identified as being of importance to migratory birds based on sound scientific information expanding and strengthening existing flyway site networks, including the African-Eurasian Waterbirds Agreement Site Network. [CMS/Resolution 12.11- Flyways](#)

# ANNEXURES 3 - INTERNATIONAL AGREEMENTS



Agreement on the Conservation of  
African-Eurasian Migratory Waterbirds



**Project countries which are Party of the Agreement:** Guinea-Bissau, Mauritania, Senegal Sierra Leone is not a Party of the Agreement, but is located within its range

## Elements underpinning the Agreement

**AEWA Mission:** To undertake coordinated and concerted actions at flyway level for the conservation of migratory waterbirds and their habitats

**Strategic Document:** AWEA Strategic Plan 2019-2027 AEWA/MOP7

**Goal of the Strategic Plan:** To maintain migratory waterbird species and their populations in a favourable conservation status or to restore them to such a status throughout their flyways

**Purpose of the Strategic Plan:** By 2027 the status of AEWA populations is improved

Plan of Action for Africa 2019-2027:

**TARGET:** At least two-thirds of all flyway network sites are actively protected and actively managed, focusing in particular on internationally important sites and those in transboundary areas.

**TARGET:** Legal or administrative measures are in place at national level – and being implemented effectively – to avoid, mitigate and compensate for adverse impacts of development activities and other pressures, including the impacts of climate change, on sites of national and international importance for migratory waterbirds in all Contracting Parties.

**Activity -** Ensure application of EIA/SEA procedures and International Finance Corporation Standards

**TARGET:** National habitat conservation and management priorities have been identified and integrated into relevant sectoral policies of at least two-thirds of Contracting Parties

**Activity -** Ensure that AEWA 'wider habitat' priorities are fed into sectoral policy development

**Action:** Parties work with corporate sector to mitigate impacts of developments e.g. 'land grabbing' and oil on key waterbird habitats, and implement a no net habitat loss policy

Flyway: "...the biological systems of migration paths that directly link sites and ecosystems in different countries and continents".CMS  
- [https://www.cms.int/sites/default/files/document/inf\\_04\\_1b\\_flyway\\_wg\\_review1\\_e\\_only\\_0.pdf](https://www.cms.int/sites/default/files/document/inf_04_1b_flyway_wg_review1_e_only_0.pdf)

AEWA covers 255 species of birds ecologically dependent on wetlands for at least part of their annual <https://www.unep-aewa.org/en/species>



# ANNEXURES 3 - INTERNATIONAL AGREEMENTS

## Obligations resulting from Resolutions of the Meeting of the Parties MOP:

### Respond to Oil Spills and Contaminants:

- ⇒ **Prioritize addressing mortality if seabirds from oil spills and contaminants** by identifying the key coastal and at-sea areas where responses to oil spills would be most urgently required within the AEWA region in relation to the presence of AEWA-listed seabirds. [AEWA/MOP7/Resolution 7.6 - Priorities for the conservation of seabirds in the African-Eurasian Flyways](#)
- ⇒ Identify relevant frameworks tasked with oil spill response; and ensure that AEWA seabirds and seabird sites are adequately represented within existing regional **oil spill plans**. [AEWA/MOP7/Resolution 7.6 - Priorities for the conservation of seabirds in the African-Eurasian Flyways](#)

### Apply Environmental Impact Assessment by Extractive Industries:

- ⇒ Apply the guidance on Environmental Impact Assessment EIA Ramsar Resolution X.17 adapting the EIA guidance where appropriate in order to ensure that it adequately addresses direct and indirect impacts on wetlands of the exploration, development, operation, closure and post-closure phases of extractive industrial activities. [AEWA/MOP5/Resolution 5.14 – Waterbirds, Wetlands and the impacts of Extractive Industries](#)
- ⇒ Ensure that in applying the EIA guidance and other necessary measures, adequately address the impacts on wetlands important for migratory waterbirds of the full spectrum of activities associated with extractive industries. [AEWA/MOP5/Resolution 5.14 –Waterbirds, Wetlands and the impacts of Extractive Industries](#)
- ⇒ Apply the ‘Framework for processes of detecting, reporting and responding to change in wetland ecological character’ Ramsar Resolution X.16 when extractive industrial activities may directly or indirectly impact Ramsar sites. [AEWA/MOP5/Resolution 5.14 –Waterbirds, Wetlands and the impacts of Extractive Industries](#)
- ⇒ Consider a precautionary approach when the SEA or EIA predicts any substantial or irreversible loss of wetland ecosystem services important to waterbirds through appropriate mitigation measures to prevent or reduce such impacts and, as a last resort, to consider compensation in accordance with national legislation and Ramsar ‘Resolutions VII.24 - Compensation for lost wetland habitats and other functions’ and ‘Resolution VIII.20 - General guidance for interpreting “urgent national interest” under Article 2.5 of the Convention and considering compensation under Article 4. [AEWA/MOP5/Resolution 5.14 –Waterbirds, Wetlands and the impacts of Extractive Industries](#)

### Sensitivity mapping and reduced impact to seabirds:

Implement the AEWA recommendations to ensure that national coastal and marine spatial planning initiatives prioritise the collection, collation and integration of seabird data, including marine Important Bird and Biodiversity Areas, Marine Protected Areas, temporal/spatial usage and species sensitivity mapping outputs, during the planning process and that human impacts on AEWA listed seabirds is minimised. [AEWA/MOP6/Resolution 6.9 - Improving the Conservation Status of African-Eurasian Seabirds](#)

# ANNEXURES 3 - INTERNATIONAL AGREEMENTS



**The Convention for Co-operation in the Protection, Management and Development of the Marine and Coastal Environment of the Atlantic Coast of the West, Central and Southern Africa Region known in short as the Abidjan Convention**

- ⇒ **Project countries which are Party of the Convention:** Guinea-Bissau, Mauritania, Senegal and Sierra Leone
- ⇒ **Objectives:** to prevent, reduce, combat and control pollution of the Convention area and to ensure sound environmental management of natural resources

**Obligations articulated under articles of the Convention text that are mostly directly related or relevant to operations of the oil & gas industry:**

## **Pollution from Ships**

- ⇒ Prevent, reduce, combat and control pollution in the Convention area caused by normal or accidental discharges from ships, and ensure the effective application in the Convention area of the internationally recognized rules and standards relating to the control of this type of pollution. [Article 6](#)

## **Pollution from activities related to the exploration and exploitation of the continental shelf, the seabed and its subsoil**

- ⇒ Prevent, reduce, combat and control pollution resulting from or in connection with activities relating to the exploration and exploitation of the sea-bed and its subsoil subject to national jurisdiction and from artificial islands, installations and structures under national jurisdiction. [Article 10](#)

## **Pollution from or through the atmosphere**

- ⇒ Prevent, reduce, combat and control pollution from or through the atmosphere of the Convention area. [Article 11](#)

## **Cooperation in combating pollution in cases of emergency**

- ⇒ Co-operate in taking all necessary measures to deal with pollution emergencies in the Convention area, whatever the cause of such emergencies, and to reduce or eliminate damage resulting therefrom. [Article 12](#)
- ⇒ Any Government which becomes aware of a pollution emergency in the Convention area should, without delay, notify the Abidjan Convention Secretariat or directly another Government likely to be affected by such emergency. [Article 12](#)

## **Environment Impact Assessment**

- ⇒ Develop technical and other guidelines to assist the planning of development projects in such a way to minimize their harmful impact on the Convention area. [Article 13](#)
- ⇒ Include an assessment of the potential environment effects in any planning activity entailing projects within the national territory, particularly in the coastal areas that may cause substantial pollution or significant and harmful changes to the environment [Article 13](#)

# ANNEXURES 3 - INTERNATIONAL AGREEMENTS

## **Additional Protocol do the Abidjan Convention on Environment Norms and Standards for Offshore Oil and Gas Exploration and Exploitation Activities:**

**Objective of the Protocol:** Prevent, reduce or eliminate pollution or damage to the coastal zone and the marine environment resulting from offshore oil and gas exploration and exploitation.

### **General commitment of parties under the Protocol:**

⇒ **Prevent, mitigate, combat and control pollution** in the Protocol Area resulting from offshore exploration and exploitation, and ensure, in particular, that the best available techniques and environmentally effective and economically appropriate techniques are implemented. [Article 4](#)

### **The Protocol outlines measures that should be followed by Parties on:**

- Authorization for exploitation and exploration – conditions, permits
- Assessment and mitigation of environment impact resulting from oil & gas exploration activities – general obligations, measures to storage and use harmful or noxious substances and materials, discharge or oily mixtures, fluids and drill cutting discharges, wastewater, garbage, seismic surveys, port reception facilities,
- Safeguards – safety and security, emergency response plans, notifications, mutual assistance in events of oil spill, monitoring, decommissioning and sensitive areas
- Cooperation – scientific and technical, international standards, practices and procedures, mutual information sharing, transboundary pollution and liability and compensation

### **Measure on environment impact resulting from exploration activities**

⇒ Governments shall require operators to use the best available techniques, and ecologically effective and economically appropriate practices, and to observe national and internationally accepted standards in order to mitigate the specific risks and potential impacts of pollution resulting from the exploration or exploitation of offshore oil and gas. [Article 9](#)



# ANNEXURES 3 - INTERNATIONAL AGREEMENTS



## Project countries which are Signatories of the Memorandum of Understanding MOU:

Guinea-Bissau, Mauritania, Senegal and Sierra Leone

### The MOU:

#### Governments Signatories of the MOU recognize that :

- ⇒ Populations of **marine turtles** frequenting the territorial waters and beaches of the Atlantic coast of Africa, from the Strait of Gibraltar to the Cape of Good Hope, including Macaronesia, **are seriously threatened**;
- ⇒ **Pollution of various marine habitats**, destruction of coastal wetlands, industrial fishing activities, international trade and other man-induced threats, if not properly mitigated and managed, **could lead to a further decline** in marine turtle populations;
- ⇒ Members of the six species of marine turtles concerned -- namely, *Caretta caretta*, *Chelonia mydas*, *Dermochelys coriacea*, *Eretmochelys imbricata*, *Lepidochelys kempii*, and *Lepidochelys olivacea* -- are highly migratory, which makes their survival dependent on the conservation of widespread marine habitats including migratory corridors, coral reefs, feeding grounds, and nesting beaches;
- ⇒ Concerted, co-ordinated action must be taken immediately to address the threats posed to the existing populations;

#### And agree to:

Work closely together to improve the conservation status of the marine turtles and the habitats on which they depend.

Commit to put in place measures for the conservation and strict protection of marine turtles at all stages of their life cycle including eggs, hatchlings, juveniles, sub-adults and adults.

#### Action Plan associated to the MOU:

#### Conservation and management plan for marine turtles of the Atlantic Coastal of Africa

##### Most directly relevant activities under the AP to operations of the oil & gas industry:

- ⇒ Minimize the effects of marine extractive industries on marine turtles and their habitats.
- ⇒ Develop and implement best practice guidelines to mitigate against negative impacts of seismic exploration on marine turtles and their habitats, e.g. as employed by the oil and gas industry;
- ⇒ Develop and implement best practice guidelines to mitigate against negative impacts of offshore mining on marine turtles and their habitats.

# ANNEXURES 3 - INTERNATIONAL AGREEMENTS



## Western African Aquatic Mammals

Memorandum of Understanding concerning the Conservation of the Manatee and Small Cetaceans of Western Africa and Macaronesia

**Project countries which are Signatories of the MOU:** Mauritania and Guinea-Bissau. Senegal and Sierra Leone are both within the geographical range of the MOU but are not Signatory Parties

### The MOU:

#### Governments Signatories of the MOU recognize that:

- ⇒ International responsibilities to conserve the West African manatee and small cetaceans of the African Eastern Atlantic Basin and Macaronesi
- ⇒ Many activities in the region, such as fishing, tourism and oil and gas exploration, extraction and other mining activities, while socially and economically important, should be conducted in a sustainable manner to minimise the threats to manatees and small cetaceans;

#### And agree to:

- ⇒ Work closely together in the region and to foster cooperation, build capacity and ensure coordinated region-wide actions to achieve and maintain a favourable conservation status for manatees and small cetaceans and their habitats and to safeguard the associated values of these species for the people of the region.
- ⇒ Take steps, for the respective species, to conserve manatees and small cetaceans and fully protect those species listed in CMS Appendix I that occur in the region.

### Action plans associated to the MOU:

#### Most directly relevant provisions under the APs to operations of the oil & gas industry:

##### Action Plan for the Conservation of the West African Manatee Annex I to the MOU

**Objective:** Ensure all littoral developments and activities take into account effects on small cetacean populations and the environment.

**Actions:** Ensure best practice according to global standards in coastal and offshore activities, including those related to oil and gas exploration and exploitation

**Objective:** Promote reduction and elimination of acoustic pollution.

**Objective:** Identify and mitigate other potential threats to small cetaceans, including ship strikes, entanglement in lost fishing gear and diseases.

##### Action Plan for the Conservation of Small Cetaceans of Western Africa and Macaronesia Annex II to the MOU

**Expected Outcome:** Rehabilitation of West African Manatee habitats.

**Action:** Ensure that key sites for manatees are protected from pollution.

# ANNEXURES 3 - INTERNATIONAL AGREEMENTS



## Monk Seal

Memorandum of Understanding concerning Conservation Measures for the Eastern Atlantic Populations of the Mediterranean Monk Seal *Monachus monachus*

### Project countries which are Signatories of the MOU:

Mauritania Senegal, Sierra Leone and Guinea-Bissau are not within the geographical range of the MOU

### The MOU:

#### Governments Signatories of the MOU recognize that:

- ⇒ International responsibilities to conserve the Eastern Atlantic Populations of the Mediterranean Monk Seal.
- ⇒ The Eastern Atlantic Populations of the Mediterranean Monk Seal greatly suffer from entanglement and mortality in fishing gears, over fishing, hunting, and pollution from plastic and intensive maritime traffic. In addition, destruction of breeding sites and collapsing breeding cave further accelerate habitat loss to monk seals.

#### And agree to:

- ⇒ Work closely together in the region and to foster cooperation, build capacity and ensure coordinated region-wide actions to achieve and maintain a favourable conservation status for monk seals and their habitats and to safeguard the associated values of these species for the people of the region.
- ⇒ As Appendix I listed species, take steps to commit member states to ban seal hunting and capture, and to conserve its habitat to counteract factors impeding migration. This includes surveying other threat factors as well as preventing disturbance to the species.

### Action plans associated to the MOU:

#### Most directly relevant provisions under the AP to operations of the oil & gas industry:

**Goal:** Promote the recovery of the Mediterranean monk seal in the Eastern Atlantic at a level considered as favourable conservation status.

**Objective:** Establish mechanisms to co-ordinate and finance the conservation actions set out in the Plan

**Action:** Provide human and financial resources needed to implement the Plan

**Objective:** Surveying, monitoring and furthering knowledge of population status, habitat and problems affecting the species

**Action:** Monitoring of environmental conditions, including evaluation and continuous monitoring of health levels in the marine environment from pollution by hydrocarbons

**Action:** Evaluation and monitoring interactions between fisheries and seals

**Action:** Reducing and minimize causes of mortality

**Action:** Making specific action plans available for emergencies, especially to deal with catastrophes from hydrocarbon pollution



# ANNEXURES 3 - INTERNATIONAL AGREEMENTS



## Concerted Action for the Atlantic Humpback Dolphin (*Souza teuszii*)

**Project countries which are confirmed Range States:** Mauritania, Guinea-Bissau, and Senegal are confirmed Range States. Sierra Leone is listed as a potential Range State.

### The Concerted Action:

The long-long term goal is to demonstrably improved conservation status of the Atlantic Humpback Dolphin throughout its distribution range by adopting actions that would strengthen the sound management of coastal marine habitat.

*The Concerted Action for the Atlantic Humpback Dolphin was first adopted at the COP12 in 2017. A report on implementation was submitted to COP13 in 2020 together with a proposal for extension and revision, which was approved by the Parties.*

### Activities and outcomes expected:

- ⇒ Evaluating the creation, optimisation or otherwise strengthening the effectiveness of new or existing border-crossing Marine Protected Areas (MPAs).
- ⇒ Discussion of feasible conservation measures, especially ways to reduce mortality in fisheries
- ⇒ Formulation of a feasible Plan of Action (PoA) for the five-year period 2018-2023, including undertake a status evaluation of Atlantic Humpback Dolphin in each of the Range States

There are other International Agreements relevant to oil and gas activities and their impact on the environment, although without a specific biodiversity focus. These include:

Convention	Focus	Signatories
International Convention for the Prevention of Pollution From Ships MARPOL Annex I – Prevention of Pollution by oil	Ballast water, operational fuel and accidental oil leaks	Mauritania, Senegal, Sierra Leone and Guinea-Bissau
International Regulations for Preventing Collisions at Sea COLREG	Targets navigation safety but also risk of spillage and the resulting pollution	Mauritania, Senegal and, Sierra Leone.
London Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter	Marine pollution: solid waste and effluent release	Sierra Leone

