

Case Study #10: Yawri Bay, Sherbro River Estuary and Lake Piso - Grand Mano Landscape, Sierra Leone & Liberia

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1. Context and landscape

The **Grand Mano Landscape** in **Sierra Leone and Liberia** is described as follows (see Terms of reference for the development of a **Grand Mano Master Plan** under the Wetlands International/ EU-PAPBio project: *Management of Mangrove Forest from Senegal to Benin*) ([ref](#)) and map below):

Extending from the outskirts of Freetown (Sierra Leone) to Monrovia (Liberia), the Grand Mano Landscape includes, in Sierra Leone, the **Yawri Bay** and the **Sherbro River Estuary proposed Ramsar sites and Marine Protected Areas (MPAs)**, the Sewa Waanje Reserve, and the Strict Transboundary 2 Mangroves Reserve in Sulima. In Liberia, it includes the **Lake Piso Ramsar site and proposed MPA**. It hosts many species of global significance which, despite conservation efforts, continue to be threatened by various factors resulting from human activities and climate change, compounded by institutional, regulatory, financial, management, and governance weaknesses.

The **Grand Mano Master Plan** ([ref](#)) was prepared for the Governments of Sierra Leone and Liberia and the regional Mano River Union, to address these challenges and establish mechanisms to improve the situation, in particular to promote transboundary conservation efforts between Sierra Leone and Liberia. Formulation of the Plan was led by Wetlands International Africa (WIA) in consultation and collaboration with stakeholders, under the '*Management of Mangrove Forests from Senegal to Benin Project*', (part of the EU PAPBio programme). The Master Plan notes in the Preface:

"The coastal ecosystems in Sierra Leone and Liberia, including the vital mangrove forests, are facing severe challenges and are in decline. The exact size of coastal wetlands in these countries is unknown, but it is crucial to note that a significant portion of these ecosystems exists, totalling 1712.4 km², with 995.2 km² found within the Grand Mano Landscape.

Despite the importance of these ecosystems, they are under threat due to various factors such as population growth and inadequate governance. Over the past 13 years, beginning in 2010, approximately 129 km² of mangrove forests have been lost at a rate of 2% per year, largely due to excessive logging of mangrove wood and changes in land use for agriculture and settlements. This loss extends to lowland coastal forests, exacerbating the situation."



Map of the three proposed Marine Protected Areas and Ramsar sites in the Grand Mano Landscape

The Grand Mano Landscape is also part of wider designated and recognized coastal and marine seascapes, including 2 EBSAs (Ecologically or Biologically Significant Marine Areas) ([ref](#)) ([ref](#)) of the South Eastern Atlantic Ocean. These are: the (massive) **Area of Convergence of the Canary and Guinea Currents EBSA** ([ref](#)) and the **Yawri Complex EBSA** ([ref](#)), which follows a similar boundary to the coastal parts of the Yawri Bay and Sherbro Estuary MPAs (including Yawri Bay, Banana and Turtle Islands, and extending southward to Sherbro Island) It also extends further - 10 km west of the bay - into the adjacent continental shelf waters of Sierra Leone.

This whole West African coastline is enormously diverse and complex – with myriads of different habitats and zones on land, in fresh water, and in the open ocean. Some of the most productive ecosystems on the planet occur in the transition zones where land meets the sea, such as coastal zones and estuaries (including **mangroves, seagrass meadows and inshore coastal islands**), and further offshore, where open seas, oceanic upwellings, and converging currents harbour extraordinary marine biodiversity and life forms. There are multiple (and mostly very poorly studied) ecological interactions between animal species and groups, coupled with the influences of geography, hydrology and Atlantic oceanic weather systems – all affecting land, freshwater and marine habitats, wild animals and human communities along the coast and throughout the Grand Mano landscape.

The landscape, and the people and wild animals which inhabit it, epitomise connectivity – both

between land and water and along the coast. Coastal communities, fishers, and farmers move and interact along the whole coastline and crossing national boundaries. Many mammals, fish and birds (terrestrial, freshwater, and marine) move, feed, breed and roost in various habitats. Long-distance migrants (e.g. Afro-Palaeartic seabirds, shorebirds and landbirds) arrive or leave at different seasons and times of the year to breed or ‘overwinter’, interacting with people and resident wildlife species. These wider land and seascapes, along with the Ramsar sites and Marine Protected Areas, are critically important for people and livelihoods, biodiversity conservation, and for their contributions (including as part of wider ocean ecosystems) to maintain stability and resilience, and mitigating impacts of climate change for people and biodiversity. All these coastal communities (human and other species and habitats) are particularly vulnerable to the impacts of climate change, sea level rise, coastal erosion, loss of habitats, and decline in ecosystem services. (See, for example, outputs from the 2020 USAID/ WABiCC (*West Africa Biodiversity and Climate Change*) programme in Sherbro River Estuary ([ref](#))).

Yet despite their importance, these areas remain poorly understood from a scientific perspective. Despite protected area designations and various conservation efforts, many sites lack adequate management plans, regulatory, enforcement and monitoring mechanisms and funding and resources for their effective protection, restoration and monitoring. Most ecological and socio- economic research has related to productivity of systems and species for human uses (especially fishing and offtakes), sustainable use of habitats (e.g. mangroves) and issues of regulation, human-wildlife conflict or community livelihoods. This is needed for improved management but knowledge gathering also needs to go further, with more focus on ecological inter-dependencies, ecosystem services, impacts of climate change and adaptive management to develop ecosystem and community resilience.

Some processes for management planning, regulation and monitoring of land and resource management, including exploitation and harvesting, are underway in all three Ramsar sites. These efforts are supported by international bodies and donors helping partnerships to strengthen regulation, local governance and involvement of communities in co-management and citizen science monitoring (e.g. the Yawri Bay Management Plan funded by the Critical Ecosystem Partnership Fund – see *Sites, below*). New ‘Blue Carbon’ opportunities in mangroves are also bringing new finance into conservation management and community benefit-sharing (e.g. *West Africa Blue projects, see below*). These are also helping to strengthen and deepen understanding of these critical ecosystems and the roles that wild animals play in shaping them and maintaining their ecological health and functions.

2. Ecosystems and Animals - impacts and interactions in the Grand Mano landscape

Here, we showcase a few of the species, habitats, ecosystems and ecological interactions which are known or likely to be important in the three Ramsar sites, MPAs and wider Grand Mano landscape. We highlight the need for more research and targeted monitoring for local communities, governments, scientists, site managers, community scientists and others, to understand, manage and protect these ecosystems in perpetuity. This is necessary for the benefit of local and wider communities who rely on their biodiversity, resources and ecosystem services for sustainable development and long-term resilience in the face of climate change.

As described above, the whole coastline where ‘the land meets the sea’ is incredibly complex, diverse and productive. Land and terrestrial habitats, forest and fresh water, transition into estuaries, mangrove swamps, brackish and saltwater lagoons, mudflats, seagrass meadows, open sea water, and coastal and offshore sand bars and islands. This transition zone is also highly vulnerable to impacts of human over-exploitation, development, pollution and the impacts of sea level rise, storm surges and other direct effects of climate change. These pressures result in erosion, saltwater intrusion, loss of land and property and rapid declines in biodiversity and the availability of ecosystem services. The term ‘interface environment’ was coined to describe these marine/continental complexes and classify the component ‘lagoon and estuarine environmental systems’ (LEEs) they contain ([ref](#)).

3. Ecosystems - three Ramsar sites in Grand Mano landscape

The Yawri Bay (proposed) Ramsar site is a mostly shallow coastal/ marine zone with intertidal mudflats and sand along the continental foreshore, backed by mangrove swamps and creeks. It incorporates the offshore islands and the stretch of sea water lying between Banana Islands and the Western Peninsula to the north, and Plantain Island and the Shenge Peninsula to the south. The whole area (except for the central bay and open sea more than 6 kms from the shore), also has the status of a **Marine Protected Area** (designated but not yet fully gazetted under Sierra Leonean law). The site includes all of the intertidal waters (and mangroves) extending many kms. up the Calmont Creek and three main rivers (Ribbi, Bumphe and Kagboro). It also contains some inland swamp and forest habitats (which, together with the coastal wetlands, also qualify as an Important Bird Area (IBA) ([ref](#)) and proposed Ramsar Site (principally for breeding seabirds and wintering sea and shorebirds, both Palaearctic and Afrotropical migrants and resident species). The bay and the whole Yawri Complex (including Sherbro) is rich in biodiversity, including the West Africa manatee (*Trichechus senegalensis*) and Royal tern *Sterna maxima*. In the National Biodiversity Strategy and Action Plan (NBSAP), the site is classified as a major breeding and nursery ground for a range of both pelagic and demersal fishes. The bay’s topography is mostly gentle, a feature that protects it from the strong current of the Atlantic Ocean, thus providing a very suitable spawning and nursery area for fish and other marine life.



Yawri Bay Draft Management Plan. Prepared on behalf of the Ramsar Steering Group and Yawri Bay stakeholders: Government of Sierra Leone (National Protected Areas Authority, Ministry of Fisheries and Marine Resources); Western Rural and Moyamba District Councils; NGOs Conservation Society of Sierra Leone (CSSL), Wetlands International (WI), The Reptiles and Amphibians Programme (RAP-SL); Paramount Chiefs and Elders (Ribbi, Bumpeh and Kagboro Chiefdoms) & community groups (Community Management Associations in 10 clusters) with funding from CEPF (Critical Ecosystem Partnership Fund) ([ref](#)).

The Sherbro River Estuary (SRE) Ramsar Site and proposed MPA is also a component part of the Yawri Complex, south of and contiguous with Yawri Bay. SRE has a comparable diversity of habitats, including lowland coastal forests, rocky waterways, sandy beaches, inter-tidal mudflats, sand flats and mangrove swamps at confluences with the sea or along rivers and creeks that receive salty water. Various vegetation types are present, with mangrove forests predominant (seven different species). There are four proposed estuarine/ coastal MPAs in Sierra Leone (with the Scarcies and Sierra Leone River (SLRE) estuaries in the north of the country). Together, these four estuaries (Scarcies, SLRE, Yawri Bay and SRE) account for over 90% of the country's mangrove area and Sherbro River Estuary alone accounts for over half ([ref](#)). Animal species include West African manatee, Maxwell's duiker, *Cephalophus maxwelli*, primates including Campbell's monkey *Cercopithecus campbelli*, Sooty mangabey *Cercopithecus atys*, Spot-nosed monkey *Cercopithecus petaurista*, Western Chimpanzee *Pan troglodytes verus* and at least four species of Atlantic marine turtles. As in the rest of the Yawri Complex, the SRE is a highly suitable spawning ground for fish and a reproduction ground for other marine fauna. Some 150 species of fish have been recorded

including commercial species such as herring (*Sardinella alba*, *Sardinella maderensis*, and *Sardinella aurita*), bonga (*Ethmalosa fimbriata*), latti (*Ilisha africana*), shine nose (*Galeoides decadactylus*), mullet (*Mugil* sp), tilapia, and catfish (*Synotondis* sp., *Chrysichthys* sp, *Arius* sp., *Bagrus* sp.) Other species such as groupers and sharks are present but are increasingly rare. Molluscs, crustaceans, and various zooplankton and phytoplankton are also found, but scientific information about them is scant ([ref](#)). A bird species of growing interest in terms of its use of and influence on mangrove ecosystems in and around Sherbro and elsewhere in Sierra Leone (as well as Guinea Bissau and Liberia) is the Endangered **Timneh Parrot**, *Psittacus timneh*. Recent surveys have discovered new breeding areas in the coastal regions, (potentially some of the highest numbers of Timneh Parrots known anywhere in their range), highlighted the importance of mangroves to these birds and identified critical habitat needing protection (see *Timneh Parrot* below).

Lake Piso Multiple Sustainable Use Reserve ([ref](#)) ([ref](#)) ([ref](#)) is the southernmost of the three Ramsar sites and MPAs in the Grand Mano landscape – near Robertsport to the west of Monrovia. The MPA boundary extends as far north as the border with Sierra Leone which is formed by the Mano River. The Reserve and MPA epitomise the terrestrial (freshwater) -coastal -marine interface, diversity and connectivity including trans-border between countries. Nearly contiguous areas of mangrove swamps, wetlands, sand dunes and mudflats cross this trans-border area, with strong ecological, hydrographic and oceanic connectivity likely influencing the whole area. This connectivity also applies to the fauna, with many key mobile species such as fish, manatees, sea turtles and seabirds dispersing and migrating across the different zones and along the coastline. It is hugely important to local communities, (more than 7,000 people from the Vai and Mende ethnic groups), who depend upon Lake Piso for transportation, commercial and non-commercial fishing, sand for construction, subsistence farming and trade and other activities including some tourism and water sports.

Lake Piso itself has multiple habitats and zones, supporting a high diversity of fauna and ecological processes. It consists of a large (40 sq miles) coastal lagoon open to the sea, fed by a number of creeks and rivers which drain swamps above the lagoon. Toward the seaward end, the swamps are tidal and support mangroves. Inland, the lagoon is surrounded by forested hillsides. There are four main vegetation types around the wetland: tropical evergreen forest, mangrove swamp forest, freshwater swamp forest, and coastal savannah woodland. Coastal sand covers most of the land area (inland for c. 8 to 10 km from the coast). There is a series of small lakes and swamps on the sandy forested spit that separates the lake from the sea. The site is important both as a nursery and spawning ground for fish and sea turtles and as feeding and roosting areas for large numbers of shore and seabirds. The lake is also known as Fisherman's Lake and the name Piso is said to mean "pigeon's hole" – a reference to the flocks of pigeons that once came to Lake Piso for water and are believed to have lived in caves on its banks. The surrounding area supports a variety of wildlife, including forest buffalo, antelopes, duikers, monkeys, bushbucks, crocodiles and manatees. Two globally endangered primates occur: the Olive colobus, (*Procolobus verus*) and the Chimpanzee (*Pan troglodytes*). The site is also an IBA (Important Bird Area) ([ref](#)) including for landbirds - biome-restricted (Guinea-Congo forest biome) bird species, indicating the importance of its diverse terrestrial as well as wetland habitats.



Local women's group project, Lake Piso Multiple Use Reserve and Ramsar site – photo SCNL
(Society for the Conservation of Nature in Liberia)

4. Wild animal impacts and ecosystems in the Grand Mano Landscape and Ramsar sites

4a) Wildlife in the land-sea-coastal interface – estuaries, mangroves, seagrass meadows Studies from coastal and estuarine systems elsewhere in Africa have revealed important roles played by animals in these ecosystems and show the need for more such studies and better understanding of the dynamics and ecological functioning of all the connected coastal, estuarine and oceanic ecosystems in the Grand Mano landscape.

Coastal and estuarine Fish, for example, play key roles in the flow of energy and nutrients and facilitate exchanges within and between coastal and marine systems through their migrations and use of inshore breeding refuges. Estuaries and mangrove ecosystems (including in Grand Mano) act as spawning grounds and nurseries for juvenile fish. The favourable conditions found in estuaries and lagoons, such as nutrition, shelter and often relatively high temperatures, encourage rapid growth in young fish. Most research studies carried out in Grand Mano Ramsar sites relate to the management, monitoring and regulation of exploited fish species in both artisanal and industrial fisheries. These studies inform conservation needs and management of exploited species and the establishment of mechanisms to ensure sustainable use and equitable distribution of benefits in fishing communities. Such efforts are central to conservation and fisheries management plans for the MPAs. (See for example CEPF (Yawri Bay) and EU-PAPBio Mangroves (Grand Mano) projects above and West Africa Blue projects (Sherbro) below).

The West African Manatee (*Trichechus senegalensis*) is a 'mega-herbivore' found in shallow-water coastal and inland riverine habitats with abundant plant resources in the sub-tropics. In West Africa,

from Mauritania to Angola, (including Sierra Leone and Liberia) and inland as far as Mali, Niger and Chad, in the lower, mid and even upper reaches of several major river systems. It is a diverse feeder consuming a wide range of aquatic angiosperms and occasionally fish, clams, crabs, and mussels. As a species which moves between marine, estuarine, and freshwater habitats and migrates along the coast and up and down river systems, it almost certainly has profound impacts on ecosystem dynamics and trophic and community interactions of many other species. Research on other Sirenians has shown marked impacts of their herbivory on the biomass, productivity, and composition of macrophyte communities, knock-on effects on other communities (e.g. invertebrates) and on carbon storage in vegetation and sediments. Manatees also connect disparate ecosystems via their movements, compete with other herbivores, and are prey for some predators, including humans. They may also play roles in seed dispersal and bioturbation and their presence may also contribute to increase in fisheries productivity, due to the enrichment of water by manatee dung. Despite these potentially vital ecological roles, there is a huge knowledge gap regarding the ecology, behaviour and conservation needs of the West Africa manatee. There is a crucial need for research to understand their ecology and conservation needs and the species' impacts on West African ecosystems and biodiversity, especially in the face of ongoing seagrass declines and other impacts of climate change ([ref](#)) ([ref](#)).

The draft **Action Plan for the Conservation of the West African Manatee** ([ref](#)) prepared under the Convention on Migratory Species (CMS), summarises current knowledge of the numbers, distribution, threats, ecology and conservation status across the range states (which include Sierra Leone and Liberia), together with the needs for research and conservation action. Ecological values of the West African manatee (including potential positive impacts for wetland ecosystem management) include the control of plant growth in rivers and waterways, for example clearing channels of overabundant vegetation or invasive species such as water hyacinth. In some areas, there may be a positive relationship between the presence of manatees and an increase in fisheries productivity, due to the enrichment of water by manatee dung.

Many other groups and species of mammals, birds, reptiles, crustacea and invertebrates – which are generally considered 'terrestrial' may also use estuarine, coastal and inland riverine and wetland habitats at different stages of their life cycles or migrations. This is especially true in **mangrove ecosystems**, which are often the interface between land and sea and also a connecting ecosystem in the hinterland behind coastlines, sometimes reaching far inland and across country boundaries as in Grand Mano (*see site descriptions above*). Many 'freshwater' species can also migrate and interact up and down tidal estuaries and river systems and in different conditions of salty, brackish or freshwater which vary, depending on the season and the rains.

The Global Rewilding Alliance 'Global' report lists a wide range of animals and life forms which interact with and influence mangrove ecosystems around the world, sometimes acting as ecosystem engineers. For example, teredinid bivalves (shipworms), which burrow into dead wood in the intertidal zone of mature mangrove forests, creating refuges for terrestrial centipedes, crickets and spiders. Shore crabs (*Carcinus* spp) and fiddler crabs (family *Ocypodidae*) appear to be a major driver of recruitment, tree density and distribution, and size structure in mangrove and other coastal tropical forests. They also serve as a primary food source for stingrays, shorebirds and fish. Small-bodied 'terrestrial' predators, such as predatory ants and birds, may sometimes protect

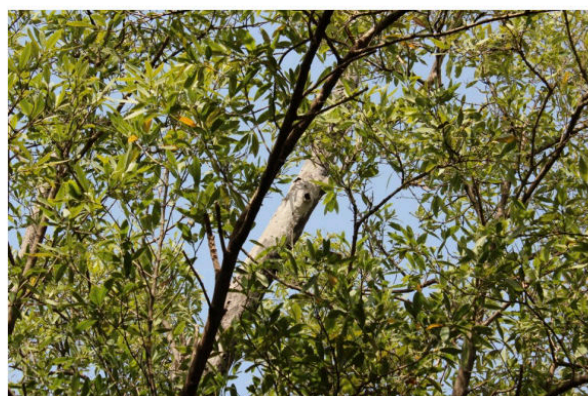
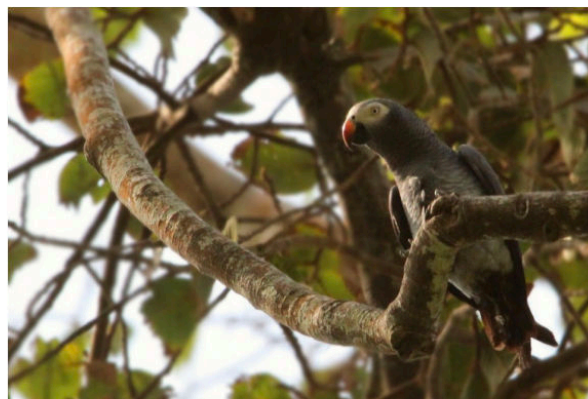
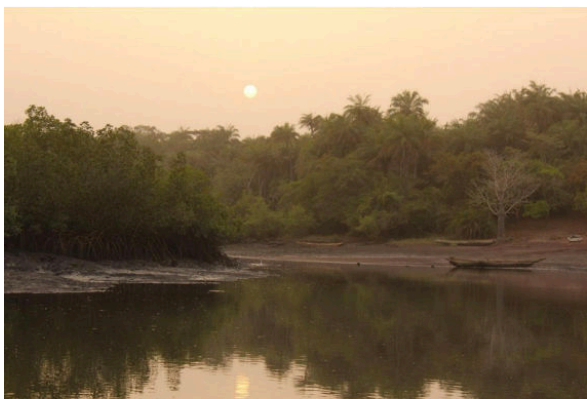
mangroves from the negative effects of insect and crab herbivory on mangrove photosynthesis. See [*Taking Animals into Account: GRA Report to the Ramsar Convention – pp. 25-25*](#).

Larger ‘terrestrial’ animals, typically not associated with ‘coastal or marine’ sites, may nonetheless occupy functional niches and influence many ecosystem processes in the interface zones between land and sea, especially in **mangrove ecosystems**. Their ecological roles include grazing, predation, disturbance, defaecation, seed dispersal and more. Species include forest buffalo, *Syncerus caffer*, small antelopes and duikers, various primates, **Timneh parrot**, and other landbird species occurring in these West African Ramsar sites and wider landscapes. However, there is very little published research on the specific influence of wild animals in mangroves in these sites.

The Timneh parrot, *Psittacus timneh* (EN) is endemic to the western parts of the moist Upper Guinea forests and bordering savannas of West Africa, from Guinea-Bissau east through southern Guinea, Sierra Leone, and Liberia east to at least 70 km east of the Bandama River in Côte d'Ivoire ([ref](#)). It is distinct from the grey parrot *P. erithacus* though not yet recognized as a full species by IUCN. There is no natural range overlap between Timnehs and the grey parrot. Timnehs typically inhabit dense forest, but also forest edges and clearings, gallery forest along waterways, savanna woodland and **mangroves** and may make seasonal movements out of the driest parts of their range in the dry season.

The connection between **Timneh parrots and mangroves** has been under-appreciated generally. They have now been documented nesting in mangroves in Guinea-Bissau and Sierra Leone (and grey parrots, *Psittacus erithacus*, in Nigeria and Angola). It is not clear whether these are ‘preferred’ breeding habitats or whether the nesting (or roosting) sites are refuges (possibly the only safe spaces left protected from human activities due to their inaccessibility) – *Rowan Martin pers. comm.*

The importance of the mangrove ecosystems in Sierra Leone and Liberia for Timneh parrots is just being discovered. World Parrot Trust (WPT) -backed surveys in 2018 found previously undocumented breeding areas in coastal Sierra Leone, and some of the highest densities of Timneh Parrots known anywhere in their range, where several hundred parrots congregate overnight. One of only two known, significant roost sites is also on Rendall island in Sherbro. Recent surveys in Liberia have identified a second comparably-sized roost site and ongoing work is building a more comprehensive picture of the region and identifying sites for potential reintroduction ([ref](#)). Mangroves, particularly those in western areas of the Grand Mano landscape (Yawri and Sherbro) are now considered a significant habitat for the conservation of this endangered species (*Rowan Martin, pers. comm.*).



Timneh parrots and mangroves, Guinea Bissau (Rowan Martin, World Parrot Trust)

The paragraphs above relate to the importance of mangroves for Timneh parrots and their conservation, not the ecological importance of the parrots and their impacts (as breeding and roosting populations) on the mangrove ecosystems and other species. Research into the diet and feeding habits of Timnehs in Guinea-Bissau, based on direct observations and the gathering of local ecological knowledge, found no evidence they specifically eat or disperse mangrove seeds ([ref](#)). There is emerging evidence that the role of some parrot species in dispersing seeds (and as ‘gardeners of the forest’) has been underappreciated ([ref](#)). Other species have been observed carrying tree fruits around and spilling seeds on the ground. This could be a very helpful line of research on Timnehs in Sierra Leone and Liberia, both to help illuminate their roles and impacts on mangrove and wetland ecosystems and to provide knowledge to support conservation and reintroduction programmes for the species in West African mangrove ecosystems.

4b) Wildlife in other coastal/ offshore habitats - islands, sand bars, marine

As described above, the West African manatee is a denizen of both coastal/ inshore and inland riverine systems, but may also move further offshore and migrate along coastlines. The other species and groups considered here are generally categorised as ‘marine’ or offshore but equally may move and migrate between different parts of coastal mangrove, inland and offshore marine ecosystems. In doing so, they interact with and influence these interconnected ecosystems and the other animal species within them.

The Atlantic Humpback Dolphin (*Sousa teuszii*) is listed as Critically Endangered on the IUCN Red List and considered one of the least understood coastal dolphin species, despite its dependence on nearshore habitats that bring it into close contact with human activities throughout its distribution

range. The principal threat to the species, similar to other marine mammals and the West African manatee, is bycatch (incidental entanglement or capture in artisanal gillnets and potentially by industrial trawler nets) – throughout its West and Central African range. Other threats come from deliberate hunting for ‘marine bushmeat’ for human consumption, habitat loss and degradation and disturbance from other human activities including tourism. The major challenge to effective conservation of the species is a lack of sufficient knowledge and understanding of the species’ ecology, its functional role in ecosystems and effects on other species. This knowledge gap weakens efforts to enhance conservation and build wider ecosystem and community resilience in MPAs and beyond. As a marine predator, *Sousa teuszii* almost certainly has substantial top-down ecological effects on nearshore ecosystems in areas with healthy populations. However, there are no targeted studies of their diet or interactions with prey species. Like other *Sousa* species, it is likely that Atlantic humpback dolphins feed on a wide variety of benthic and pelagic fish, cephalopods and invertebrates, and that importance of different prey species in their diet (and hence their ecosystem impact as a top predator) will vary between geographic areas and habitats ([ref](#)).

The species was already known from **Liberia**, (listed as one of the range states) and also one of six countries involved in the Consortium for the Conservation of the Atlantic Humpback Dolphin (CCAHD) project ‘*Harnessing local ecological knowledge to fill data gaps and support conservation of the Critically Endangered Atlantic humpback dolphin*’ ([ref](#)) ([ref](#)) ([ref](#)). This project worked with local coastal conservation groups (including in Liberia and Guinea just to the north of Sierra Leone) to conduct surveys and interviews with fishers and members of coastal communities. The aim was to document the valuable local ecological knowledge (LEK) they possess about dolphins, their habitats, their interactions with fisheries, and other perceived threats.

In **Sierra Leone**, *Sousa teuszii* was only discovered in February 2024 (‘*First confirmed records of Atlantic humpback dolphins in Sierra Leone!*’) ([ref](#)). The observation was made in the area of Sherbro River Estuary MPA by field workers carrying out coastal surveys as part of the West Africa Blue ‘*Sherbro River Estuary (community-centric mangrove conservation and restoration) project*’. This ‘Blue Carbon’ initiative promotes sustainable management of coastal ecosystems and is partly funded by carbon credits ([ref](#)). Subsequently there have been more (live and dead) observations by the West Africa Blue team who record all sightings as part of biodiversity surveys and project implementation.

Marine Sea Turtles

In **Sierra Leone**, five marine turtle species occur along the Atlantic coast and have been recorded nesting on beaches on the mainland and offshore islands in Grand Mano. These species include the Leatherback (*Dermochelys coriacea*), Olive Ridley (*Lepidochelys olivacea*), Green (*Chelonia mydas*), Loggerhead (*Caretta caretta*) and Hawksbill (*Eretmochelys imbricata*). All are considered globally threatened, including their Atlantic subpopulations ([ref](#)). Leatherbacks nest on beaches in the Turtle and Sherbro Islands (the 52km ‘long beach’ on Sherbro is thought to host the largest population of nesting leatherbacks in Sierra Leone based on recent nest monitoring carried out by RAP-SL - Reptiles and Amphibians of Sierra Leone). There is also evidence of nesting activities of the other species on the Sherbro and Turtle Islands, and other beaches on the mainland including Shenge, Lumley, Bureh Town, John “O”bey and the Turners Peninsula beach ([ref](#)) ([ref](#)).

All of these continental coastal areas are home to major settlements whose residents depend on the same mangrove, beach and marine ecosystems. Fishing is the main activity of coastal communities (90% of the estimated 6 million people in the country rely on coastal fisheries for their protein supplies) ([ref](#)) ([ref](#)). Unfortunately, pressures on fish stocks (including from commercial foreign fleets), coupled with lack of awareness and enforcement of endangered species and habitat conservation regulations has led to the exploitation of marine turtles and other threatened/endangered species within coastal areas. This is in addition to threats to marine sea turtles, (as with manatees and other marine animals) from accidental bycatch in fishing nets, collection of turtle eggs, pollution and loss of nesting habitats (through sand mining and natural erosion, especially where mangroves have been removed).



Green Turtle, Turtle Islands, Sierra Leone (Eddy Aruna, RAP-SL - Reptiles & Amphibians Sierra Leone)

As with other fauna in Grand Mano Ramsar sites, there are very few studies of ecological impacts and interactions between sea turtles and the wetland ecosystems they share with people. New approaches are considering the joint impacts on ecosystems and aiming to develop 'win-win' solutions for biodiversity conservation and peoples' livelihoods as well as capacity to adapt to climate change and achieve future resilience. For example, supporting mangrove restoration, coastal stabilisation and more energy-efficient alternatives to using mangrove wood for fish drying can generate significant benefits for both people and wildlife. Central to the success of marine turtle conservation efforts is the active engagement and involvement of local communities. The head of RAP-SL is Eddy Aruna ([see video: Sierra Leone / Tusk Award for Conservation in Africa Winner 2024](#)). He reports that collaborations with the coastal communities and fishers not only minimize direct threats faced by marine turtles but also enhance marine turtle data collection, monitoring and support for jointly conceived conservation and sustainable development initiatives. RAP-SL is extending these programmes along other beaches and communities in Sierra Leone, with donor support and in collaboration with other initiatives, aiming to create long-term sustainable management of mangrove ecosystems and financial and community support mechanisms (e.g. West Africa Blue projects – see above, under *Atlantic Humpback Dolphin*). They are also extending monitoring to manatees, which share these same ecosystems and interact closely with communities. This work promotes greater understanding of ecosystem functions and services, and the joint benefits to human and wildlife communities. Research and monitoring under some of these wider programmes may start to help reveal more of the key wild animal roles in sustaining ecosystems and

ecosystem services important for human communities.

Seabirds and shorebirds – *resident, breeding and Afro-Palaearctic migrants (East Atlantic Flyway)*. Seabird nesting colonies and sea and shorebird congregations (for example migrant species wintering or in stop-over sites on migration in coastal habitats – including mangroves, mudflats and offshore islands) are certain to have impacts on the ecology of those ecosystems and through interactions with other animal species. These impacts are especially significant due to the large numbers involved (e.g. colonial breeding seabirds and large flocks of shorebirds), which are often the basis for the conservation designation of the coastal wetland IBAs, Ramsar sites and MPAs. However, the vast majority of research and monitoring in the Grand Mano landscape and along the West Africa coastline is focussed on monitoring populations and trends and assessing needs for conservation action. For example, the regular Wetlands International, coordinated International (African) Waterbird Census database and reports ([ref](#)) ([ref](#)).

Studies from other regions, for example, in the Seychelles islands (Indian Ocean), showed the huge influence that very mobile seabirds can bring to mangrove ecosystems on islands. Through the deposition of nutrient-rich guano in their breeding colonies, seabirds contribute substantial nutrient ‘subsidies’ that enrich mangroves and their associated invertebrate fauna. These nutrients are also exported to nearby coastal habitats through tidal flow, improving the nutrient status and health of mangroves and adjacent coastal habitats. The conservation of seabirds can therefore be vital to maintain and enhance their role in mangrove productivity, ecosystem function and provision of services and resilience ([ref](#)).

5. Conclusion

This case study shines a light on three proposed Marine Protected Areas (MPAs) and Ramsar sites in West Africa (Sierra Leone and Liberia) and some of the myriad creatures known to inhabit these wetland ecosystems and their different freshwater, coastal, transition and marine zones, especially in coastal mangroves. We argue that there is a huge need for greater attention and support to be given to these key sites and ecosystems and the wild animals which help to shape them, in order to maintain their essential ecological functions and services, without which coastal communities and animals cannot survive. Research and monitoring can help reveal more of the key wild animal roles in sustaining ecosystem services important for human communities. Greater knowledge and more attention to the impacts of animals on wetland ecosystems in West African Ramsar sites, as well as support to the adoption of rewilding approaches, will contribute to better conservation management of Ramsar wetlands and to developing solutions that support human communities and wild animals sharing the same landscapes, to help reverse biodiversity declines and adapt and develop resilience in the face of climate change.