MEADOWS OF KNOWLEDGE

PUTTING WEST AFRICA ON THE GLOBAL SEAGRASS MAP

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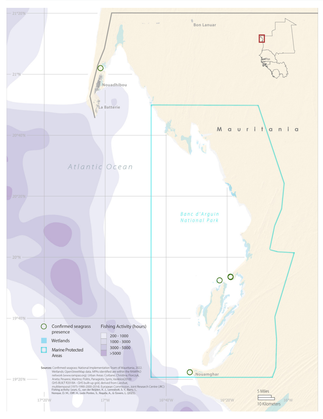
RESILIENSEA | ABOUT THE PROJECT

On a global scale, seagrass plays a major role in terms of food security, shoreline protection, carbon sequestration, provision of livelihoods for coastal communities, and biodiversity enhancement by providing habitats for megafauna of special interest and endangered species such as dugongs, seahorses and sea turtles, among countless others.

Despite the presence of seagrass meadows (*H. wrightii, C. nodosa*, and *Z. noltei*) in West Africa, this region has historically been one of the least studied areas of seagrasses in the world. Without adequate data and knowledge of seagrasses in West Africa, these ecosystems have often been omitted from protection, conservation and management policies. A recent seagrass programme funded by the MAVA foundation has supported research and capacity- building activities to map and monitor seagrasses within seven West African pilot countries: Cabo Verde, The Gambia, Guinea, Guinea-Bissau, Mauritania, Senegal and Sierra Leone. Through this programme, the ResilienSEA (Resilient Seagrasses) project (2018–2022) was launched and has sought to enhance scientific expertise and build capacity to improve seagrass protection within these countries.

Over the past five years, these pilot countries have mapped the presence of seagrasses at various national pilot sites, where further research, management and outreach activities have been conducted. Approximately 83,288 ha of seagrasses have been documented within these countries to date, and monitoring activities have even prompted the discovery of several previously unknown seagrass meadows. The 'Meadows of Knowledge' atlas showcases the recent strides made in West Africa to discover, map and monitor seagrass meadows, ultimately providing a baseline for the status of seagrasses in this region as of 2022.

BANC D'ARGUIN NATIONAL PARK | MAURITANIA



The Banc d'Arguin National Park is located in the north-west of Mauritania, where the Atlantic Ocean meets the Sahara Desert. This intertidal landscape contains vast mudflats, sand banks and dunes, seagrass meadows and mangroves.

According to local findings, the intertidal and subtidal seagrass beds cover large areas of the Banc d'Arguin, estimated at approximately 1,000 km². There are two ResilienSEA monitoring sites within the Banc d'Arguin National Park: Belkhayznaya and El Aîn. The Mauritanian National Implementation Team monitored both sites with regular frequency between 2020-2021. Throughout this period, the average coverage of *Z. noltei* in Belkhayznaya was 34 per cent with an average canopy height of 11 cm.

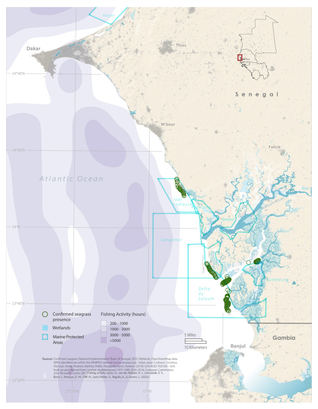
All three seagrass species are found in El Aîn, though their abundance varies. Throughout the same monitoring period of 2020 to 2021, the average coverage of *Z. noltei* and *C. nodosa* in El Aîn was 17 per cent and 39 per cent, respectively, while average canopy heights were 8 cm and 16 cm, respectively. For *H. wrightii*, the average coverage observed was 11 per cent, with an average canopy height of 7 cm.

GAMBOA | CABO VERDE

Santiago Island is Cabo Verde's main island and is home to half of the nation's population. A ResilienSEA expedition led along its shores, between Gamboa beach and Santa Maria Islet, identified an extensive and healthy H. wrightii seagrass meadow. As of 2021, the seagrass area at the Gamboa site is estimated to be 6,243 m².

The sediment below this meadow is composed of a mix of mud and sand, and there is a notable presence of brown algae (*Phaeophyceae*). The average seagrass coverage of *H. wrightii* throughout the Gamboa monitoring site is above 60 per cent, with canopy heights averaging 9.5 cm. Between 2016 and 2021, parameters such as the total cover, biomass, rhizome and canopy height of the species have increased, while the shoot density has decreased fivefold.

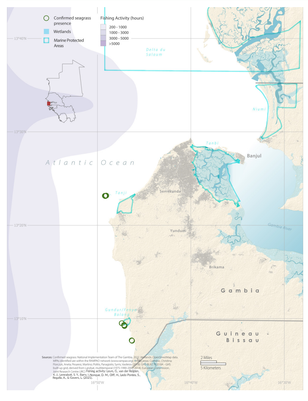
SALOUM DELTA NATIONAL PARK | SENEGAL



The Saloum Delta National Park belongs to the larger Saloum Delta Biosphere Reserve, which was created in 1976. The park covers an area of 76,000 ha and is located in the estuarine area of the Sine-Saloum hydrographic basin in the centre-west of Senegal on the Gambian border.

Seagrasses are abundant within the park, with occurrences of *Z. noltei* being the first verified record of the species existing south of Mauritania. In the *C. nodosa* meadows observed, seagrass blades were thick and long, and had a maximum canopy height of 80 cm. In the park's observed *Z. noltei* and *H. wrightii* meadows, both were characteristically thin and not particularly long, with maximum canopy heights of 11 cm and 16 cm, respectively. Within the Saloum Delta National Park, the average coverage of seagrasses varies, but can be 95 per cent or even 100 per cent depending on the sampling location, with high shoot density of the plants generally observed. The proliferation of epiphytes varies significantly (with low-medium- to-high observations made), as does the seasonal occurrence of algae, which was recorded as reaching up to 50 per cent.

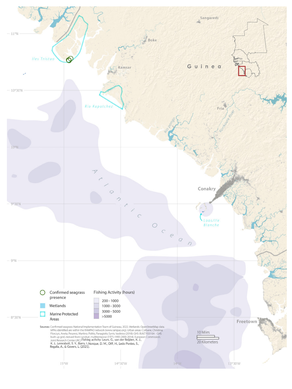
BIJOL ISLANDS | THE GAMBIA



The Bijol Islands are the primary seagrass data-collection site in The Gambia. In particular, the north-west area of the islands is home to approximately 50 ha of continuous *H. wrightii* seagrass meadows, and *C. nodosa* is also found around the islands at a lesser frequency.

Monitoring from 2021 observed that year-round, the sediment in this area was primarily sandy with a mix of mud, and there was a high presence of shells and fairly low presence of epiphytes. In January, the average seagrass coverage of *H. wrightii* was 45.5 per cent, with a shoot density of 28 per cent and an average canopy height of 13 cm. Later that year in November, the average seagrass coverage of *H. wrightii* was 26 per cent, with a shoot density of 43 per cent and an average canopy height of 11 cm.

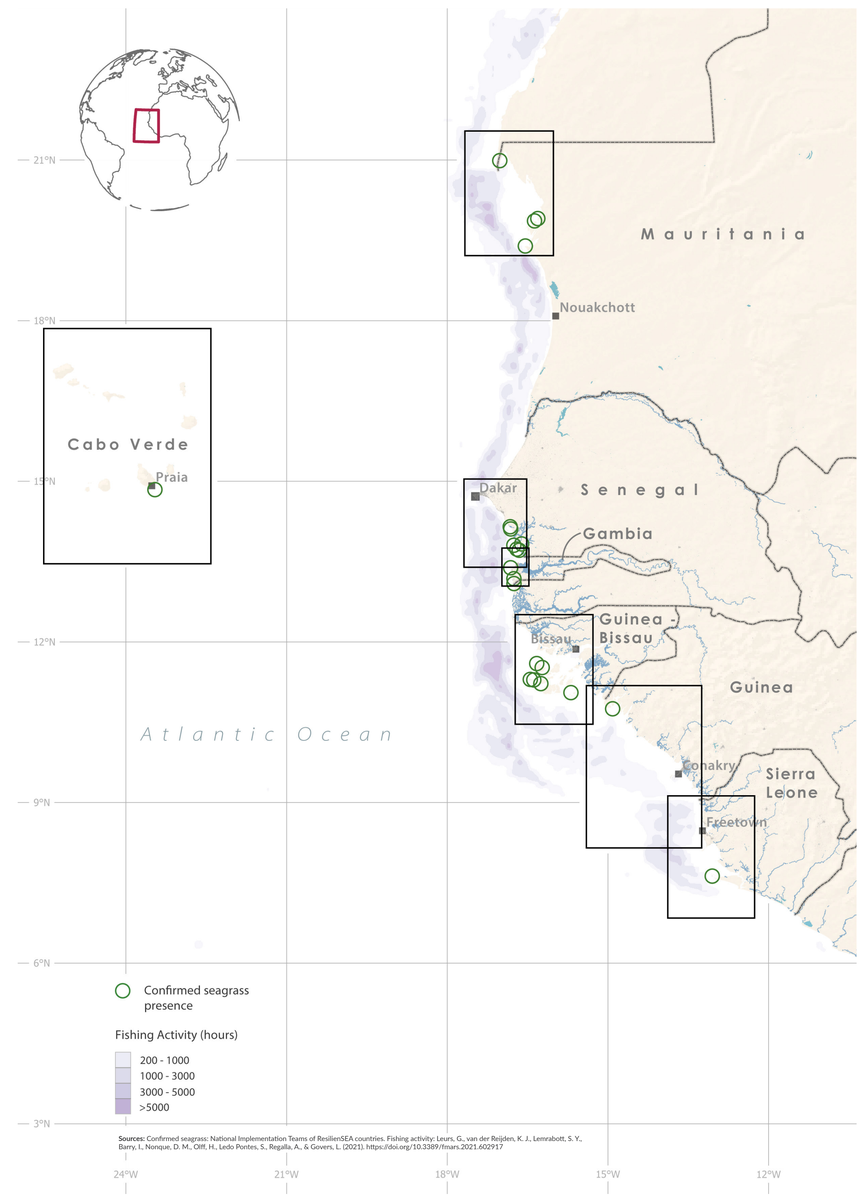
TRISTAO ISLANDS | GUINEA



In March 2020, *H. wrightii* was discovered at the tip of the Tristao Islands in the district of Katfoura – an area which is often frequented by sea turtles. Thorough mapping of the site has yet to be completed. Compared with other pilot sites, the Tristao Islands can be difficult to access, which hinders mapping and monitoring of the health and density of seagrass meadows. Additionally, the limits of seagrass bed depths towards the open sea have not yet been established, since special diving equipment is required to explore these areas.

Of the seagrass areas in the Tristao Islands visited to date, the average coverage of *H. wrightii* was between 30 and 40 per cent, with average canopy heights of 14 cm. The sediment within these areas was notably sandy and muddy.

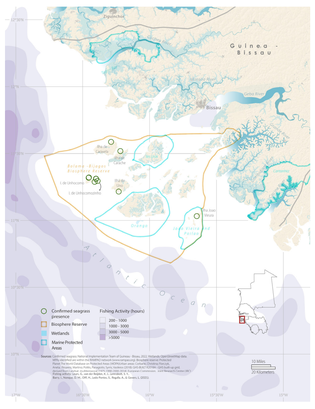
COUNTRY	*C. nodosa*	*H. wrightii*	*Z. noltei*
Mauritania	✓	✓	✓
Cabo Verde		✓	
Senegal	✓	✓	✓
The Gambia	✓	✓	
Guinea-Bissau		✓	
Guinea		✓	
Sierra Leone		✓	



UNHOCOMO AND UNHOCOMOZINHO | GUINEA-BISSAU

Unhocomo and Unhocomozinho are member islands of the Boloma Bijagós Biosphere Reserve and are situated 113 km from the city of Bissau. To understand the variability of seagrass along the islands, three sampling stations (Ancante, Canneronho, and Ancobo) were established. The results show that these monitoring sites are colonized by a single seagrass species, *H. wrightii*.

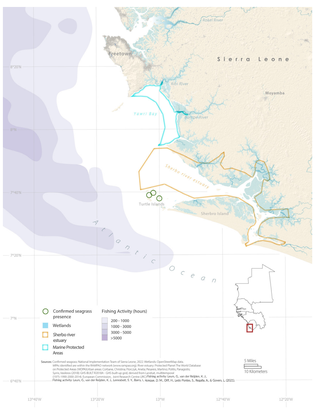
In Ancante, the average seagrass coverage observed was less than 25 per cent, while the average density was 283 individuals in an area of 50 cm2. There was no observable presence of epiphytes, but rocks were colonized with algae and corals. In Canneronho, the average coverage observed was less than 25 per cent, while the average density was 259 individuals in an area of 50 cm2. Again, there was no presence of epiphytes, but rocks were colonized with algae and corals. In Ancobo, The average seagrass coverage was observed less than 25 per cent, while the average density was 155 individuals in an area of 50 cm2. Unlike the other two sites, a strong proliferation of epiphytes was observed in the Ancobo area, and the rocks were covered with algae and corals.



TURTLE ISLANDS | SIERRA LEONE

The Turtle Islands are eight small islands located in the Southern Province of Sierra Leone, and are part of the Sherbro River Estuary MPA. Although the 2003 World Atlas of Seagrasses indicated that H. wrightii was present in Sierra Leone, no specific details or locations of seagrass meadows were established until December 2019, when a successful ResilienSEA project confirmed a large *H. wrightii* meadow along the shores of the Turtle Islands.

Since 2019, all subsequent field monitoring has occurred within the Turtle Islands, with monitoring sites established around Bumpetuk Island, Mania and Sei. On Bumpetuk Island, the average seagrass coverage of *H. wrightii* during monitoring periods has been below 50 per cent in most areas, with canopy heights ranging between 3 and 7 cm at a depth of approximately 1.5 m under water. The Mania and Sei sites were established in 2022, so field monitoring activities have been limited. However, early estimations of Sei are promising – dense *H. wrightii* meadows thought to cover at least 1,000 m2 and average coverage expected to be between 95 and 99 per cent. Average canopy heights are estimated to be 9–11 cm.



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