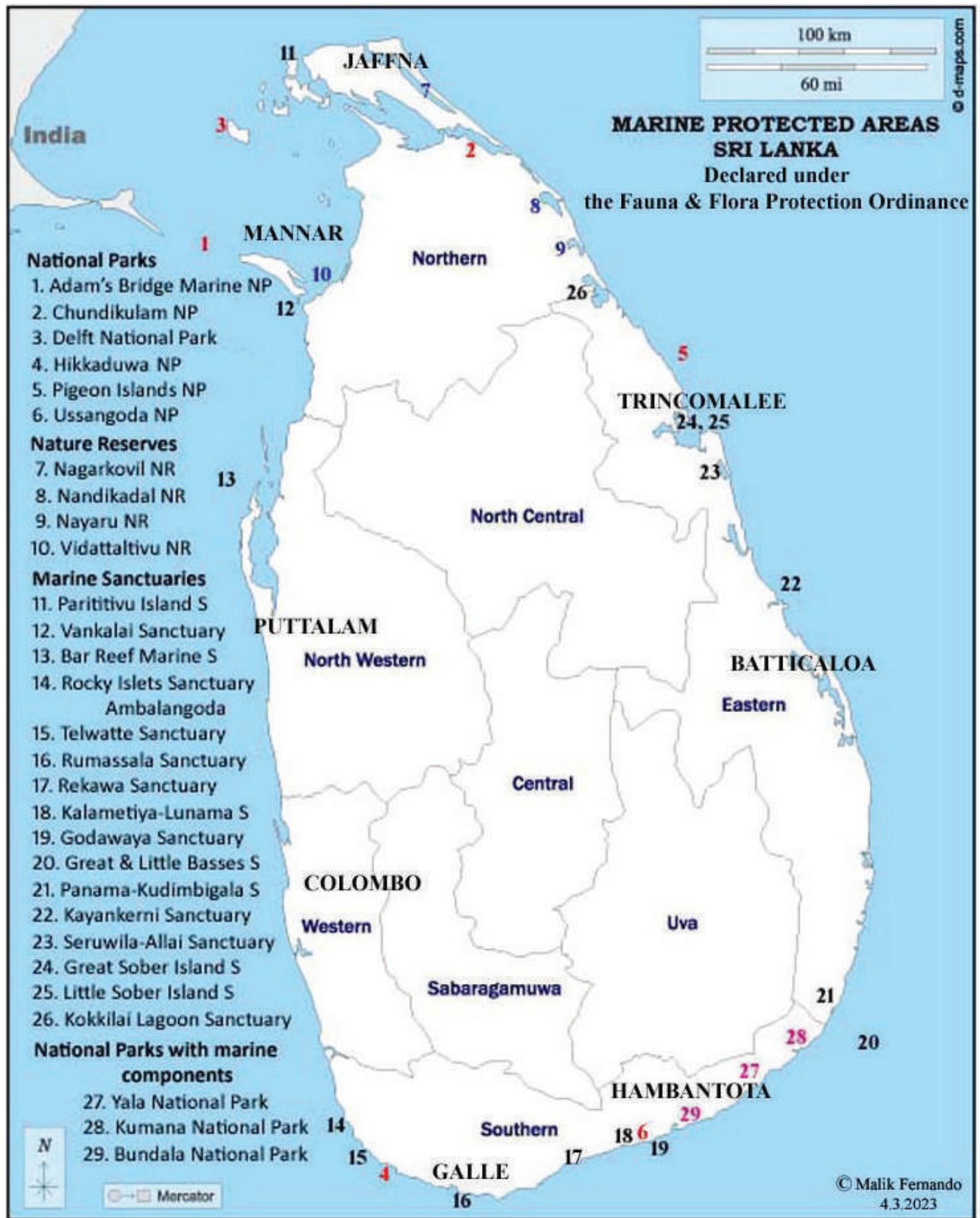




*A Directory of
Marine Protected Areas
in Sri Lanka*



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A Compilation by the Marine Committee of the
Wildlife and Nature Protection Society of Sri Lanka

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LIST OF ABBREVIATIONS

ADB	Asian Development Bank
CEA	Central Environmental Authority
CCD	Coast Conservation Department
CRMP	Coastal Resources Management Project
CZMP	Coastal Zone Management Plan
DFAR	Department of Fisheries and Aquatic Resources
DFC	Department of Forest Conservation
DoA	Department of Archaeology
DWC	Department of Wildlife Conservation
FFPO	Fauna & Flora Protection Ordinance and its amending Acts
ISEA	Integrated Strategic Environment Assessment of the Northern Province of Sri Lanka
MPA	Marine Protected Area
MPAs	Marine Protected Areas
NR	Nature Reserve
PA	Protected Area
SAM	Special Area Management or Strategic Adaptive Management

FOREWORD

The compilation of the Directory of Marine Protected areas is a project initiated by the Marine Sub Committee of the Wildlife and Nature Protection Society (WNPS). The WNPS is fortunate to have had Dr Malik Fernando, Past President, reputed diver, and conchologist lead this vital project, ably assisted by a knowledgeable and energetic team in the Marine Sub Committee.

This initiative was mooted because it was felt that whilst there is extensive awareness and knowledge of terrestrial protected areas, there is very limited awareness of the marine protected areas. This status, in an island whose ocean area is 7.5 times that of its land area is rather alarming.

This extensive piece of research aims to bridge this lacuna, by offering all discerning individuals an opportunity to learn more about the Island's Marine Protected Areas.

However, the overarching and most vital purpose of this document is that it will serve as a robust fact base to ensure that these areas, which have been protected based on sound scientific rationale, are not compromised in the interest of competing development activity that will result in dire environmental and economic consequences.

Whilst there is a reasonably extensive degree of historical information, this document falls short in recording the most recent and updated status of these areas. This is due to many factors, one being the lack of updated reports or any credible information. This thereby opens an opportunity for likeminded citizens to engage with the WNPS in updating this document.

We look forward to your participation, on this intriguing and purposeful journey, to protect Sri Lanka's amazing Marine Protected Areas

Graham Marshall
Vice President WNPS, and Chair Marine Sub Committee

June 2023

ACKNOWLEDGEMENTS

This Directory is the work of many people—members of the Marine Sub-Committee of the Wildlife & Nature Protection Society (WNPS), other members of the WNPS and professional colleagues. The Society is grateful for the contributions made by all, and we extend our thanks to them.

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The photographers who supplied images for this publication are acknowledged in the captions; they are the copyright holders of the respective images. We thank them too.

INTRODUCTION

Protected Areas, in the conservation sense, are areas declared as such by legislative instruments to preserve the natural environment of the area concerned and its animal and plant inhabitants as well as its mineral and cultural content. In other words, the whole landscape. The aims of such legislation may be to protect unique vegetation assemblages, the habitats of animals and plants threatened with extinction as a result of habitat loss or due to excessive human exploitation, to preserve the watershed of reservoirs or to preserve continuity of habitats for wildlife in the face of dwindling forest cover as a result of expanding human settlements, among others. The protection of coral reefs, seagrass beds, estuaries and lagoons are deemed important for a number of reasons—preservation of fish breeding sites, feeding grounds of marine mammals (dugong) and reptiles (turtles) and coastal protection being some.

This Directory concerns protected areas that include the marine environment exclusively or include seashores and the adjacent sea, and in some instances coastal wetlands, as a part of a largely terrestrial protected area. Details of the criteria used for selecting the PAA included in this Directory are discussed in detail in the Chapter—**'Extant Legislation (a) Categories of Protected Areas'**.

The need for a Directory that includes the reasoning behind the decision to establish the MPAA is highlighted by competing interests of Government agencies that pit conservation needs against land use projects. A good understanding of the reason/s that led to the declaration of a part of Sri Lanka as a protected area should be readily available for those who have to decide on the competing interests of conservation needs against those of “developers” who apply for the release of portions of protected areas for the purposes of commercial enterprises. Unfortunately, the logic behind the decision to declare protection at the time the Government took

the decision is not readily available, or information is scanty.

We attempted to refer to the Cabinet papers containing the justification for declaring areas protected, but soon decided not to embark on what promised to become a time-consuming process; the gazettes containing the declaration are very brief, with only the coordinates that define the boundaries. Most information that we were able to obtain regarding MPAA was from research reports, recommendations, and published studies of established PAA. Governmental agencies that have listed protected areas have, in general, confined the information to the area protected, the date of declaration, and the coordinates of the location. The boundaries of the PAA have been obtained from the published gazettes—most often from private collections of these documents as very few are available on the internet. Maps of PAA have also been obtained from research publications available on the internet.

Protected areas are declared so, in order to preserve that parcel of land, or body of water, together with the living and non-living features within its boundaries for the benefit of future generations. Releasing such protected lands for other purposes should be undertaken only with the greatest circumspection, and in the National interest.

The history and evolution of Marine Protected Areas in Sri Lanka, and the benefits that could be expected, are discussed in the essay that follows.



MARINE PROTECTED AREAS IN SRI LANKA

HISTORY AND EVOLUTION

Protection of Marine Biodiversity in Sri Lanka – the early days

The number of Marine Protected Areas in the world has increased sharply, from just 118 in 1970 to well over 6,300 in 2011 (Thorpe et al, 2011). The status of coral reefs and other marine organisms in Sri Lanka, and the history of their protection have been described by Arjan Rajasuriya from the National Aquatic Research and Development Agency (NARA) in 1997. Legislation to protect marine organisms has existed in Sri Lanka for more than a century. An example from the late 19th century is the Chanks Ordinance of 1880, that was introduced to regulate the collection and export of chanks—*Turbinella pyrum*; hak bella (S); sanku (T)— from around the Gulf of Mannar and the Jaffna Peninsula. Subsequently this legislation was expanded to introduce a ban on the collection of chanks, sea cucumbers or beche-de-mer, corals and mollusc shells from Mannar to a point 2 miles south of Talawila.

Later, selected marine organisms were protected under the Crown Lands Ordinance of 1929, where removal of coral and certain organisms were prohibited from specific locations. Sanctuaries were declared in Ambalangoda and Hikkaduwa Rocky Islets by Gazette No. 8675 of 25th October 1940. Similarly, the Naval Headworks in Trincomalee and the Great and Little Sober Islands within the Trincomalee harbour were declared in 1963. In 1973 the Paraitivu Island west of the Jaffna Peninsula and in 1974 the Pigeon Islands north of Trincomalee were declared as sanctuaries (Gazette No. 136 of 1st November 1974). In the case of the offshore islands, it appears that the sanctuary status was not extended to include the adjacent waters (Rajasuriya, 1997)—the aim was to protect bird colonies; and a historical site (the Sober Islands).

In 1982, an Inter-Ministerial Committee on Marine Parks and Sanctuaries formed by the National Aquatic Resources Agency (NARA) had identified more than 20 coral-bearing sites around Sri Lanka worthy of protection by being declared as sanctuaries. These have not all been declared as protected areas; the best known are the Hikkaduwa Marine Sanctuary (declared in 1979), later upgraded to a National Park and the Bar Reef Marine Sanctuary (declared in 1992) under section 2(2) of the Fauna and Flora Protection Ordinance (Chapter 469) as amended by Act No. 44 of 1964 and Act No. 1 of 1970 (Rajasuriya, 1997). A number of other coral-bearing areas have been declared in recent years, such as at Kayankerni in the east, and Vankalai, in the north-west. The latter has other types of habitats as well as corals; details of these would be found in the pages of the Directory. Up to 2018, twenty-seven (27) reserves (under various categories) and sanctuaries had been established throughout the Island that include varying proportions of marine habitats, resulting in an estimated 100,966.38 ha or more (DWC figures, 2018) of marine habitats being protected.

Marine Protected Areas

An MPA is defined by the World Conservation Union (IUCN 1994) as “any area of inter-tidal or sub-tidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment” (Kelleher & Kenchington, 1991). The definition is broad and includes many coastal ecosystems, such as **estuaries, lagoons, salt marshes, mangroves, and beaches** as well **as true marine ecosystems and oceanic waters**. MPAs vary from large fishery reserves and multiple-use parks to small, strict, conservation zones

and sanctuaries depending on the habitats, the resources available for management and the conservation objectives (Perera & De Vos, 2007). Marine protected areas can provide some tangible benefits, including conserving biodiversity and provision of important research sites for continued studies.

It is well established that well managed MPAs can lead to significant improvement in habitat structure (Ashworth & Ormond, 2005) and increase living forms both inside and outside park boundaries. Globally, therefore, marine protected areas are receiving increasing attention as management tools for protecting marine populations from human activities. Exploited species generally attain a greater density, biomass, and size inside the MPAs, whereas the organisms on which they normally feed tend to be less abundant. Moreover, organisms that use exploited species as a food source, shelter or attachment also tend to be more abundant in MPAs. But other species may be less abundant inside MPAs, because of reduction in availability of food and/or an increase in competitive interaction with target species (Deepananda & Macusi, 2012).

The importance of the sea around our Island is often forgotten or overlooked. Aligned with the United Nations Convention of the Law of the Sea,

which was ratified by Sri Lanka in July 1994, the country enjoys a total extent of approximately 489 000 km² of maritime waters. The island, on the other hand, has a relatively small land area of 65 611.04 km² which gives a land to ocean area ratio of 1 to 7.5. The coastal zone is therefore of strategic significance to its populace due to accessibility to the vast resource base of the marine environment surrounding the island, from any point on the 1585 km coastline, in principle (Hettiarachchi & Samarawickrama, 2005).

The marine protected areas in Sri Lanka are constituted either wholly of off-shore marine (underwater) habitats (for example the Kalpitiya Bar Reef Sanctuary), or islands and the surrounding waters (e.g., Pigeon Islands, Delft Island) or seashores and coastal habitats that abut a protected terrestrial habitat—such as the Bundala National Park, where 18% of the declared area consists of the seashore and coastal lagoons. In this article the latter groups are classified as protected areas with marine components. Sri Lanka has Marine National Parks, National Parks with marine components, Nature Reserves with marine components, and a number of Marine Sanctuaries and Sanctuaries with marine components.

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EXTANT LEGISLATION

Protected Areas have been declared in Sri Lanka under various pieces of legislation e. g. the Forest Ordinance, the Fisheries Act, the National Environmental Act, and the Coast Conservation Act among others. This Directory of Marine Protected Areas deals specifically with certain Protected Areas that have been declared under the "FFPO" - the Fauna and Flora Protection Ordinance (Chapter 469) as amended by Acts of 1964, 1 of 1970 and 49 of 1993 and the Fauna and Flora Protection (Amendment) Act, No.22 of 2009.

Categories of Protected Areas

The principal enactment of the FFPO provides for the establishment of National Reserves (i.e., protected areas of whatever type). Under this heading are designated reserves with varying degrees of protection. In addition to the National Reserves, there is provision for the declaration of Sanctuaries on lands that are not declared as National Reserves.

In general, the various categories of protected areas differ from each other in the type of activity permitted within them and the degree of human

TIMELINE OF PROTECTION

1889: First attempts to stop the destruction of wildlife, by the Conservator of Forests.

Around the turn of the century: 160 sq. miles between the Menik Ganga and the Kumbukkan Oya (Yala), and 256 sq. miles in the North-Western Province (Wilpattu) were proclaimed as Reserves under the Forest Ordinance.

1937: The Fauna and Flora Protection Ordinance, No. 2 of 1937 passed by the legislature.

1949: The Wildlife Department established.

- DWC website, 2022

CATEGORIES OF PROTECTED AREAS IN SRI LANKA DECLARED UNDER THE FFPO

- (a) *Strict Natural Reserves (SNR) – 3;*
- (b) *National Parks (NP) – 25;*
- (c) *Nature Reserves (NR) – 9;*
- (d) *Jungle Corridors – 2;*
- (e) *Marine National Parks – 1;*
- (f) *Marine Reserves – 0;*
- (g) *Buffer Zones – 0;*
- (h) *Sanctuaries and Managed Elephant*

Reserves – 68+1.

- With numbers declared as at 2022 (DWC website)

ACTIVITIES THAT ARE RESTRICTED IN SELECTED PROTECTED AREAS

- **Strict Nature Reserve (SNR):** *Entry prohibited, except for official duty or authorised scientific research.*
- **National Parks (NPP):** *Entry prohibited except with conditional permits for observing and studying wildlife.*
- **Nature Reserves (NRR):** *Entry prohibited except with permits, but less restrictive than that for NPP.*
- **Marine National Parks (MNPP):** *Somewhat similar to NPP; entry permitted for observing or studying fauna and flora; activities that existed prior to the declaration as a PA allowed to continue, with conditions.*
- **Sanctuaries (SS):** *May include State as well as private land; entry is not prohibited; all wildlife in sanctuaries are protected, but the habitat is protected only in state-owned land, allowing human activities to continue on privately owned land.*

visitation permitted-the strictest being the Strict Natural Reserves. Sanctuaries differ from the Reserves in one major area, in that sanctuaries can include privately owned land, in which pre-existing human activity can continue. The reserves are all on state lands, limited human activity such as research and observation of wildlife being permitted in some with permission.

Protected areas do not all receive the same degree of protection, when considering the laws, and various operational factors. The box shows a comparison of the degree of protection afforded to various PAs declared under a number of pieces of legislation, administered by different authorities.

PROTECTED AREAS UNDER ALL AUTHORITIES IN DESCENDING ORDER OF DEGREE OF PROTECTION

Tier Ia: *Strict Nature Reserves (DWC) & Conservation Forests (DFC)*

Tier Ib: *Reserved Forests (DFC)*

Tier II: *National Parks (DWC)*

Tier III: *Archaeological Reserves (DoA)*

Tier IV: *Nature Reserves and Wildlife Sanctuaries (DWC)*

Tier V: *Environmental Protection Areas (CEA)*

Tier VI: *Managed Fishery Areas (DFAR)*

Tier VII: *Protected Area Buffer Zones (DWC)*

Tier VIII: *Wildlife/Forest/Leopard/ Elephant Corridors (DWC)*

- Avijja Fonseka, pers. comm.

Marine Protected areas in Sri Lanka

The exact number of MPAs in Sri Lanka vary based on how they are defined; eight have been established with the primary purpose of protecting seagrass meadows, coral reefs, rocky reefs, and mangrove fringes. These eight MPAs are the Hikkaduwa Marine NP, Bar Reef Marine Sanctuary in Kalpitiya, and Vidattaltivu Nature Reserve on the west coast; Adam’s Bridge Marine NP in the northwest; Rumassala Marine Sanctuary in the southwest; Pigeon Islands Marine NP and Kayankerni Marine Sanctuary in the east; and the Great Basses and Little Basses Marine Sanctuary in the south (Nishan Perera - pers. comm.).

The category of *Marine National Park* was created in 2009 by the FFPO amendment of that year, and Adam’s Bridge Marine National Park was the first declared under this category. However, other areas of marine habitats had been declared previously under the category National Parks (e.g. Hikkaduwa and Pigeon Islands). The list of PAs in the DWC website of 2022 indicates that no Marine Reserves have been declared, but there are a number of Nature Reserves declared, with marine components of varying extent, included in this directory (Vidattaltivu NR [2016], Nayaru NR [2017], and the Nandikadal NR [2017]).

The Protected Areas in Sri Lanka that include marine habitats fall into two groups-those reserves and sanctuaries that are entirely marine, and those that include marine habitats as part of a largely terrestrial ecosystem. The scheme adopted in this directory is to categorise the PAs as set out below:

- Marine National Parks
- Marine Nature Reserves
- Marine Sanctuaries
- Protected Areas with Marine Components

- this is an artificial classification for convenience. The rationale on which this classification is based is discussed in the paragraphs that follow.

Protected Areas Described

The Protected Areas included in this Directory have been selected to meet the requirements of the publication-i.e., protected areas that include marine habitats declared under the FFPO. The starting points were an IUCN publication (IUCN 2022, internet) using data from the DWC (2018) that listed a selection of PAs in three categories including the total declared area of the PA, the area covered by marine habitats, and the marine area as a percentage of the total declared area; and a compilation by Leslie Joseph (undated) containing

a list of 'Marine Protected Areas bordering the coast of Sri Lanka', quoting a draft CZMP of 2003. A number of PAs in that list were excluded, as they were inland sites far removed from the coast, or islands-a list of these is given in the relevant article. The final list of PAs treated in this directory was decided on a number of criteria (listed below, this page), some of which, no doubt, are arbitrary and open to question, but nevertheless, felt to be important topics for discussion. The PAs included in this Directory are given on the following page, listed under the relevant category.



...A Marine Protected Area is defined by the World Conservation Union (IUCN 1994) as “any area of inter-tidal or sub-tidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment”. It can include many coastal ecosystems, such as estuaries, lagoons, salt marshes, mangroves, and beaches as well as true marine ecosystems and oceanic waters...

(Kelleher & Kenchington, 1991).

CRITERIA FOR INCLUSION IN THE DIRECTORY OF MARINE PROTECTED AREAS

1. The area protected is largely sea, may contain islands.
2. The area protected is largely terrestrial, but abuts the coastline that is also protected, extending to the adjacent sea area or not.
3. The area protected is largely terrestrial, abuts the coastline, and contains coastal lagoons and wetlands extending for varying distances inland.
4. Islands in the sea that alone are protected, with evidence of corals and other biodiversity including seagrass meadows in the surrounding waters that may not themselves be protected.
5. Protected beaches that abut unprotected habitats with important wetlands.

Protected Areas included in the Directory with selection criteria

Criterion 1: The area protected is largely sea, may include islands.

1. Hikkaduwa Marine National Park.
2. Pigeon Islands Marine National Park.
3. Adam's Bridge Marine National Park.
4. Bar Reef Marine Sanctuary.
5. Rumassala Sanctuary.
6. The Great Basses & Little Basses Marine Sanctuary.
7. Kayankerni Marine Sanctuary.

Criterion 3: The area protected is largely terrestrial, abuts the coastline, and contains coastal lagoons and wetlands extending for varying distances inland.

1. Chundikulam National Park.
2. Nayaru Nature Reserve.
3. Nandikadal Nature Reserve.
4. Nagarkovil Nature Reserve.
5. Vidattativu Nature Reserve.
6. Vankalai Sanctuary.
7. Telwatte Sanctuary.
8. Kalametiya - Lunama Sanctuary.
9. Panama-Kudimbigala Sanctuary.
10. Seruvila-Allai Sanctuary.
11. Kokkilai Sanctuary.
12. Yala National Park.
13. Kumana National Park.
14. Bundala National Park.

Criterion 2: The area protected is largely terrestrial, but abuts the coastline that is also protected, extending to the adjacent sea area or not.

1. Delft Island National Park – includes a 100m wide belt of near shore water.
2. Ussangoda National Park – includes a 500m wide belt of near shore water.

Criterion 4: Islands in the sea that alone are protected, with evidence of corals and other biodiversity including seagrass meadows in the surrounding waters that may not themselves be protected.

1. Paravitivu (Paraitivu) Island Sanctuary.
2. Rocky Islets Sanctuary.
3. The Great and Little Sober Islands Sanctuaries.

Criterion 5: Protected beaches that may abut unprotected habitats with important wetlands.

1. Godawaya Sanctuary.
2. Rekawa Sanctuary.

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THE MARINE NATIONAL PARKS

As of June 2022, there were six National Parks declared, three—Adam’s Bridge, Hikkaduwa, and Pigeon Islands—being entirely marine, and the other three being largely terrestrial with marine components—Delft Island, Ussangoda, and Chundikulam.

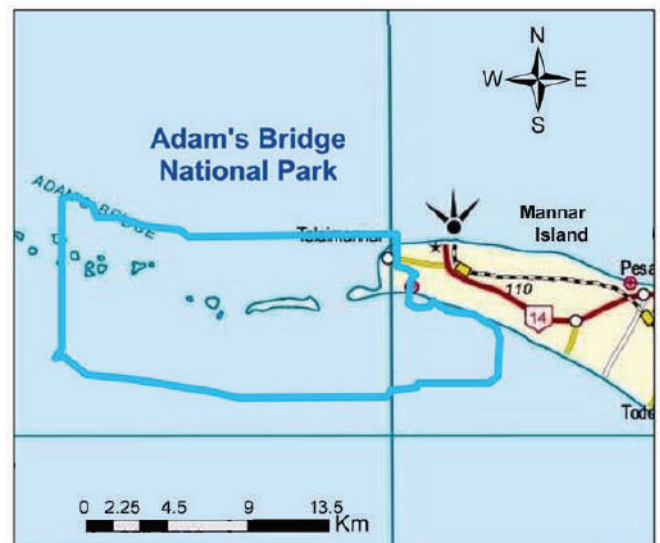
1. Adam’s Bridge Marine National Park
2. Delft Island National Park – includes a 100 m wide belt of near shore water
3. Hikkaduwa Marine National Park
4. Ussangoda National Park – includes a 500 m wide belt of near shore water
5. Pigeon Islands Marine National Park
6. Chundikulam National Park

ADAM'S BRIDGE MARINE NATIONAL PARK

The Adam's Bridge National Park, occupying an area of 18,990 ha, surrounds the Sri Lankan section of the Adam's bridge, situated about 30 kilometres northwest of Mannar town. It was proposed as a trans boundary nature reserve (connecting with India) in 2015 by the Integrated Strategic Environmental Assessment (ISEA) of the Northern Province project conducted by the government with the assistance of the United Nations Development Program and the United Nations Environmental Program on account of it being an important bird migratory path and to promote marine biodiversity conservation (Mallawatantri et al, 2014).

The Adam's Bridge is a chain of limestone shoals and sand dunes between Pamban island of India and the Mannar island of Sri Lanka. According to geological evidence, the bridge formerly was a land connection between the two countries, passable by foot in the 15th century, until storms deepened the channels. Temple records even suggests that the Adam's bridge was completely above sea level before a cyclone in 1480. The bridge is 30 km long and separates the Palk Strait and Gulf of Mannar.

The sea areas between the sand dunes are very shallow; between 1 to 10 meters deep. The park lies on the route of migratory birds that visit Sri Lanka. The sand dunes of the Adam's bridge serve as breeding grounds for some of those birds, such as the brown noddy. The shallow waters around the sand dunes host a variety of fish and seagrasses. Dolphins, Dugongs and Turtles can be seen in the sea surrounding the park.



Map prepared by Samangi Alawattagama

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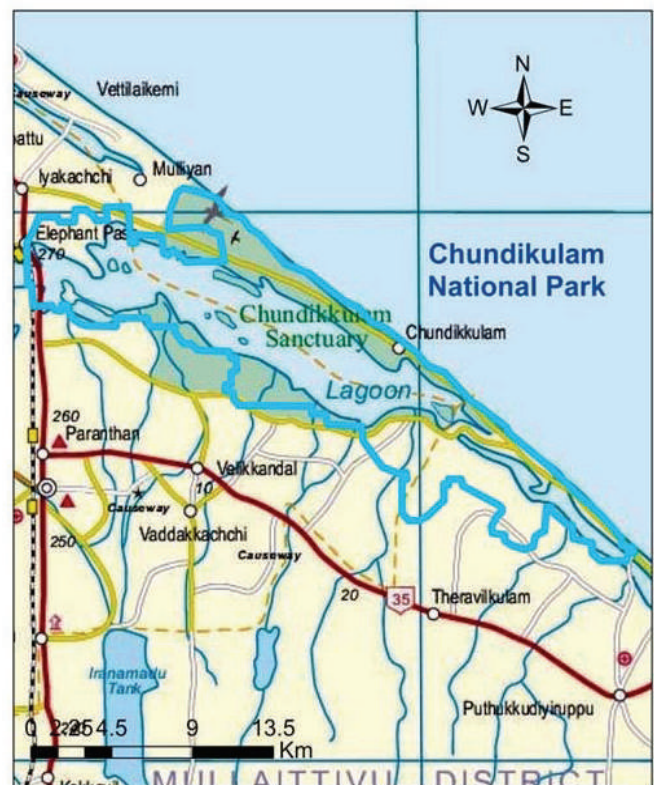
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CHUNDIKKULAM NATIONAL PARK

The Chundikkulam Lagoon and its surrounding area was designated as a bird sanctuary on 25 February 1938 under the *Fauna and Flora Protection Ordinance* (No. 2) of 1937.

Following the cessation of hostilities between the Liberation Tigers of Tamil Eelam (LTTE) and Government troops in 2009, the Sri Lanka military started building military bases in the sanctuary and excluded local residents and fishermen from the area. The Chalai Lagoon, to the south of the Chundikkulam Lagoon, was the location of the main Sea Tiger base. The Nandikadal Lagoon, where the LTTE made its last stand, is the next lagoon to the south-east. The army opened the Chundikkulam Nature Park Holiday Resort in the northern part of the Chundikkulam Sanctuary in January 2012.

With the Sri Lanka government taking full control of the area, it announced plans to convert various sanctuaries in the Northern Province into national parks. An Integrated Strategic Environmental Assessment of Northern Province produced by the government with the assistance of the United Nations Development Programme and the United Nations Environment Programme and published in October 2014 recommended that Chundikkulam sanctuary be extended westwards towards Elephant Pass and south-eastwards towards Chalai and Pallamatalan and be upgraded to a national park. The recommendation was based on the grounds that this was a feeding ground and roosting site of migratory as well as resident birds



Map prepared by Samangi Alawattagama

The Chundikkulam NP is outlined in blue on a Survey Department map that shows the sanctuary area shaded in green. The long, narrow strip of water stretching south-east is the Chalai Lagoon.

and for the purpose of wetland conservation and protection of important mangrove vegetation. As a result, the sanctuary's area grew from 11,149 ha (27,550 acres) to 19,565 ha (48,347 acres), partly as a result of absorbing state-owned forests nearby.

The Chundikkulam sanctuary became a national park on 22 June 2015 with an area of 19,565 ha (48,347 acres) of which 25% consists of marine habitats.

The Chundikkulam Lagoon is partly surrounded by mangrove swamps and seagrass beds.

The surrounding area includes palmyrah palm

plantations, scrub forests and a variety of dry zone flora. Numerous varieties of waterbirds and waders are found in the park including bar-tailed godwit, black-tailed godwit, black-winged stilt, brown-headed gull, common sandpiper, curlew sandpiper, Eurasian coot, Eurasian curlew, Eurasian spoonbill, Eurasian teal, Eurasian wigeon, garganey, greater flamingo, gull-billed tern, marsh sandpiper, northern pintail, oriental ibis, painted stork, ruff, shoveler, terek sandpiper and wood sandpiper. Mammals found in the park include leopard, sloth bear and deer. Mugger crocodile and saltwater crocodile have also been seen in the park.

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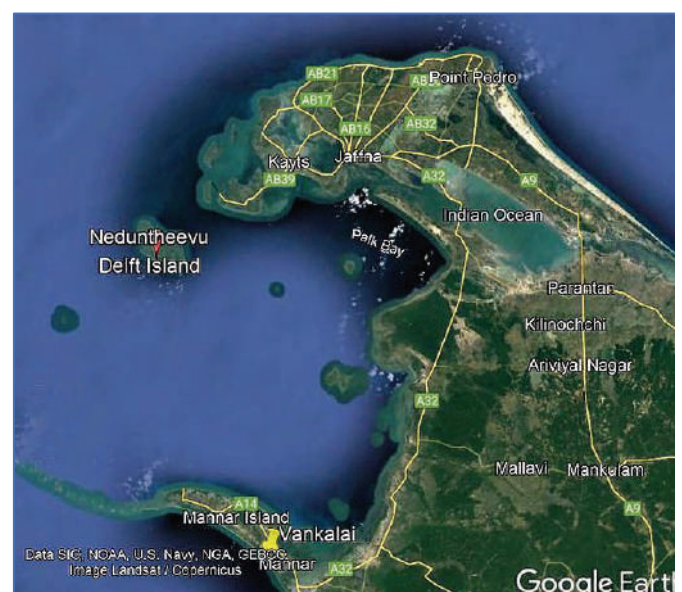
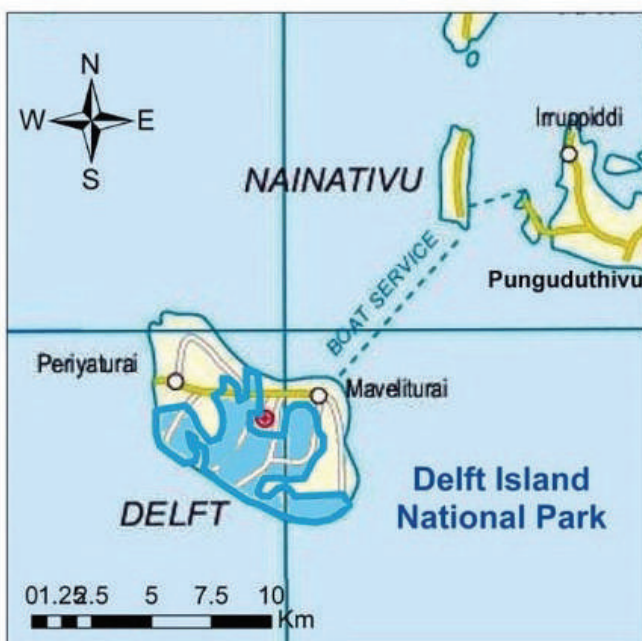
3 DELFT NATIONAL PARK

Delft, or Neduntivu, is an island situated in the Gulf of Mannar, in northern Sri Lanka. In 2015 a part of the island and a 100 m belt of the adjacent sea 1,846.28 ha in extent, was declared a National Park, following the recommendation in the ISEA of the Northern Province (Mallawatantri et al, 2014) for the purposes of biodiversity conservation, protection of important bird migratory paths, and protection of important wetlands. It was also recognised as the only place in Sri Lanka where wild ponies can be seen. Only a small proportion of the total park area consists of marine habitats.

The island is flat with shallow waters and beaches of coral rubble and sand surrounding it. The vegetation is semi-arid tropical with palmyrah, dry shrubs and grasses growing on grey porous

coralline soil. The island, and the surrounding water, is home to most of the birds and aquatic animals common to the northern part of Sri Lanka. It is the only place in Sri Lanka to observe wild ponies, believed to have been introduced to the island by the Portuguese. The island was named Delft, after the Dutch city of that name, by Rijckloff van Goens, who also named seven other islands after cities in his home country. Even though the name is only as old as the colonial period, the history of the island itself goes back to around 1000 years ago, to the times of the Chola Dynasty, of which an old temple can be seen on the western coast of the island. See Goonatilake et al, 2013 for detailed information about Delft.

The island can be reached by boat from Pungudutivu, to which there is a road from Jaffna town.



Map prepared by Samangi Alawattagama



N 9° 29.849' E 79° 39.989'



(Left) Part of the intertidal shore at Delft, the habitat of many mollusc species, including the uncommon *Clithon oulaniensis*, shown above.



Ariophanta exilis



N 9° 29.563' E 79° 40.491'

(Above) A colony of *Planaxis sulcatus* at another intertidal location.



(Left) Two land snail species that are found inland.

Cryptozonia semirugata

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3. Goonatilake, S. de A., Ekanayake, S., Kumara, T.P., Liyanapathirana, D., Weerakoon, D.K. and Wadugodapitiya, A., 2013. Sustainable Development of Delft Island: An ecological, socio-economic and archaeological assessment, Occasional Papers of IUCN Sri Lanka No. 14, January 2013.

4

HIKKADUWA NATIONAL PARK

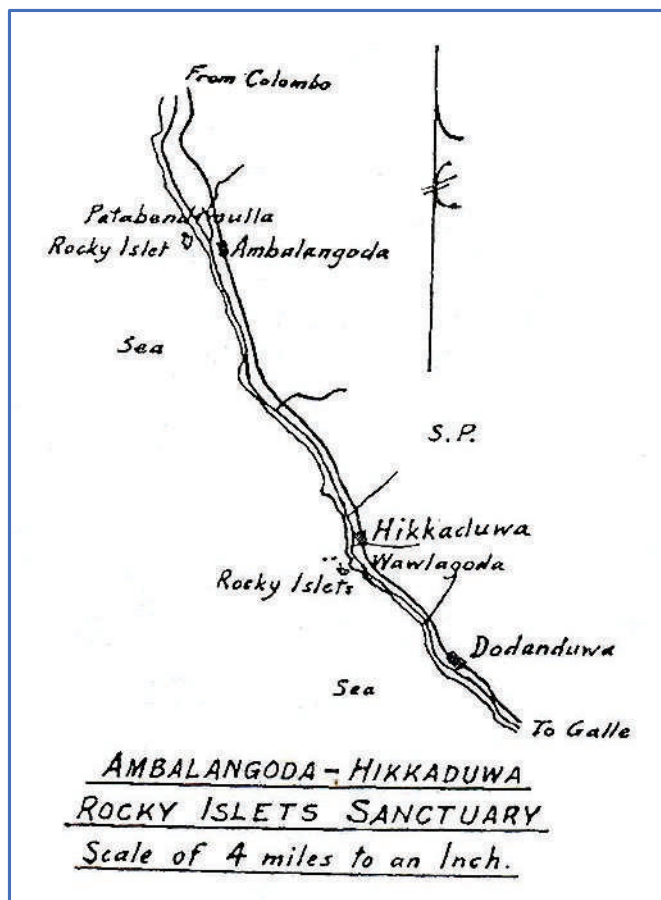
The Hikkaduwa National Park was declared in 2002, with a total area of 101.58 ha; it had previously been protected to lesser degrees.

The Government of Ceylon, by its Gazette of October 25th, 1940, declared as sanctuaries under the FFPO, to be effective from the 1st November 1940, the Rocky Islet at Hikkaduwa, together with the Ambalangoda Rocky Islet. This was to protect the seabird roosting sites.

Subsequently, in 1961, the reef area was declared a Fisheries Protected Area under the Fisheries Ordinance to halt indiscriminate fishing. The Hikkaduwa Marine Sanctuary was then created in 1979 under the FFPO covering an area of 44.5 ha. In 1998 it was declared a Nature Reserve and the protected area extended to 104 ha; subsequently



Map prepared by Samangi Alawattagama



From the Government Gazette of 25.10.1940

it was upgraded to the status of a National Park in 2002. Hikkaduwa was one of the pilot sites for implementing SAM planning by the CCD from 1992 - 1996. This process was re-initiated under the ADB funded CRMP project in 2002.

The Hikkaduwa area contains a complex of coastal ecosystems including marine habitats, beaches, and low-lying wetlands, while a few rocky islets are located off the coast. Coral reefs such as at Hikkaduwa are extremely important in shoreline protection and assist in dissipating wave energy

during the monsoon season and storms. The reef also influences the current patterns and water movement along the coastline. Due to its protected status, the reef is an important refuge for many commercially important fish species, especially those collected for the ornamental fish trade.

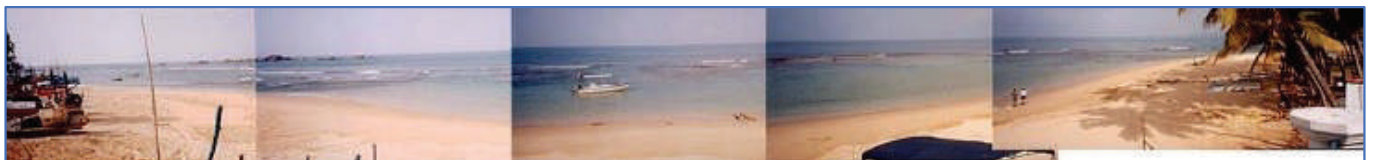
The fringing reef at Hikkaduwa is a typical representation of shallow fringing reef systems along the southern coast of Sri Lanka. The reef is relatively small but contains high biodiversity and has been of conservation interest since the 1960's due to its location in the vicinity of one of the most popular tourist destinations in Sri Lanka. Although it was declared a Sanctuary in 1979 and later a National Park in 2002 in the expectation that it would receive greater protection, the reef is highly degraded due to both natural and anthropogenic impacts as well as indifferent management.

The Hikkaduwa reef has a shallow reef crest enclosing a shallow reef lagoon on the leeward side. The lagoon has a depth of 0.5-1.5m and is dominated by stands of live and dead coral

interspersed by sand. The seaward side of the reef crest has an outer reef slope composed primarily of limestone and some live coral. The Hikkaduwa Ganga and several small canals open out to the sea near the reef.

The degradation of the reef due to human impacts and coral bleaching has reduced its appeal for tourists, and it is possible that the use of the reef for recreational purposes such as coral viewing may decrease. Increased sedimentation has resulted in filling of the reef lagoon with sand and accretion of the beach leading to smothering of corals and reduction of the reef area.

High sedimentation, physical damage to corals from glass bottom boats, pollution and uncontrolled tourism are degrading the reef ecosystem and decreasing water quality. The reef was also severely degraded by coral bleaching due to increased water temperatures during an El Niño event in 1998.



A montage showing a panoramic view of the Hikkaduwa National Park. The reef crest with the lagoon in the foreground; on the horizon at left are the Rocky islets. At left extreme are beached fishing boats—the result of the 2004 December 26th tsunami. These photographs were taken at the end of January 2005.

- Malik Fernando -

References

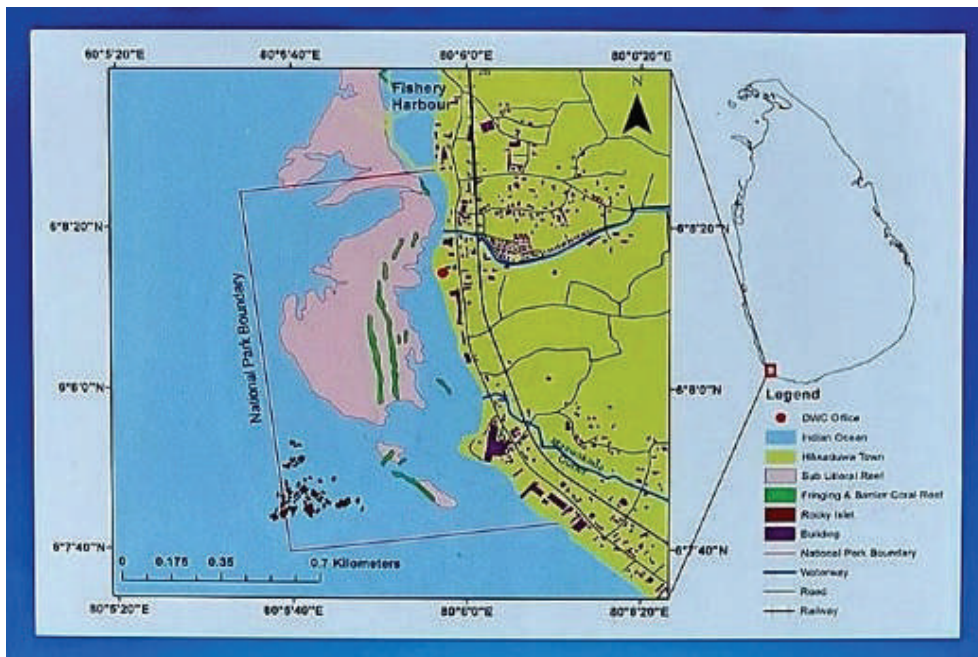
1. *Report of the SLSAC Reef Clean-up Project at Hikkaduwa National Park on the 29th & 30th January, 2005. Sri Lanka Sub-Aqua Club, Colombo. Privately circulated.*

UPDATE 28.2.2023



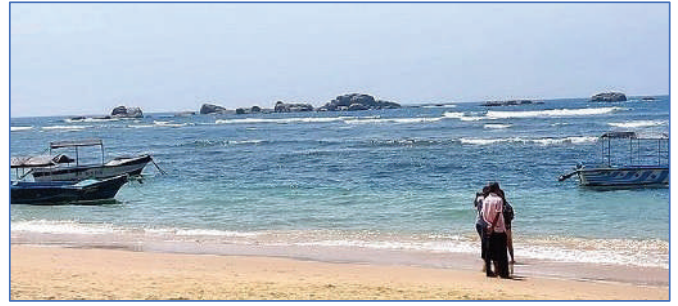
The Park was visited on 28.2.2023. Above is the signboard displayed alongside the DWC building (right) that was set up as a Visitor Centre but never functioned as such.

The DWC building appears uninhabited and disused, viewed from the beach. There is nothing to indicate the function and purpose of this building.



An enlargement of the map on the signboard shows the National Park boundary as a rectangle: the pink area is the "sublittoral reef", the dark greenish vertical lines indicate the "fringing & barrier coral reef". The "waterway" indicated in dark blue appears non-functional as it was quite silted and covered in vegetation when viewed from the bridge carrying the coastal road over it. On the seaside was a large sand barrier suggesting that no water had flowed along it for some time. This is beneficial to the Park.

(Right) The Rocky Islets seen from the beach. The line of distant breakers indicate the position of the seaward edge of the barrier reef. Beyond, the reef goes down in a succession of terraces and boulders to the sand bottom. Towards the right-hand side—the north—is an area reserved for bathers and swimmers. The main boat anchorage is towards the southern part of the NP.



The main boat anchorage area. The small boats are mostly glass-bottomed boats for tourist excursions, some also dive boats used by a number of dive stations along the beach. There were two glass-bottomed boats in operation on my visit.

MALIK FERNANDO,

IMAGES AND UPDATE.

14.2.2023

5

PIGEON ISLANDS NATIONAL PARK

Large Pigeon Island and Small Pigeon Island were together declared a sanctuary in 1963 for the purpose of protecting birds. In 2003 it was upgraded to the status of a National Park under the FFPO, and the boundaries extended to include adjacent marine waters, resulting in a total protected area of 471.4 ha. Pigeon Island has been proposed as a SAM (Strategic Adaptive Management) site by the CCD.

The Pigeon Islands National Park comprises of two small islands (Large and Small Pigeon Islands) and several rocky islets located about 1 km offshore.

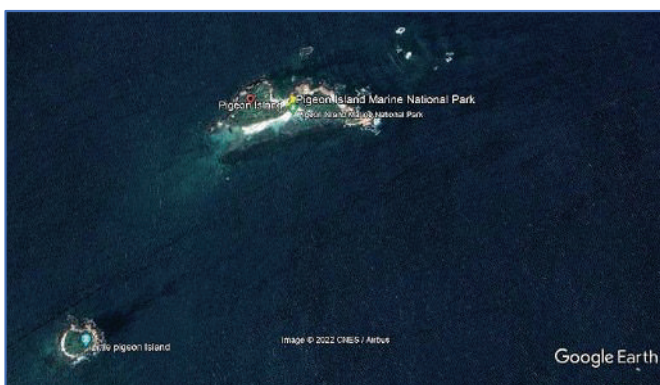


Map prepared by Samangi Alawattagama

Large Pigeon Island and some rocky islets contain fringing coral reefs while rocky habitats dominated by soft corals are present around Small Pigeon Island and the surrounding areas. These coral reefs were some of the few that were not affected by the 1998 mass coral bleaching event. Therefore, they contain extensive areas of healthy live coral and are some of the best remaining coral reefs in the country. Due to the security situation in the area the reefs were not extensively affected by human activities until recently. Since the 2002 ceasefire agreement, the Pigeon Islands National Park has become a popular tourist destination; and increased visitation has led to habitat degradation.



Large Pigeon Island – a Google Earth image



The Pigeon Islands in relation to each other

The reefs are being further threatened by destructive fishing practices in the vicinity.

The reefs are part of an extensive system of marine habitats in the Trincomalee area and are some of the best examples of small island fringing reefs in the country. They are also some of the few major coral reefs that escaped bleaching in 1998 and are therefore some of the few remaining reefs with high live coral cover. It is also possible that the reefs are an important source of coral larvae for other reefs in surrounding areas.

Large Pigeon Island has two small beaches on the southwestern and northern flanks of the island. The island is surrounded by a fringing coral reef which has developed on hard substrate, within a depth range of 1 to 6m. The main reef area is in front of the southwestern beach and is about 200 m long and 100 m wide. Scattered coral communities interspaced by rocky habitats are found around the island up to a depth of 15m.

Small Pigeon Island is surrounded by rocky reef habitats interspersed with old limestone reef structures and sandy patches. There are several rock outcrops about 300-500 m to the north, south and southeast of Large Pigeon Island. Coral Island is a small rocky outcrop located about 500m north of Pigeon Island, and another rocky outcrop is located about 300 m offshore. Fringing coral reefs have also developed on the northern and southern sides of Coral Island within a depth range of 1-6m.

The National Park is located within the low country dry zone with a mean annual temperature of around 27° C and annual rainfall between 1,000-1,700 mm. Most rain is received during the northeast monsoon from October to February during which the reef area is subjected to strong winds and currents and rough seas.

The reef areas have extensive turf algae while the island is dominated by dry zone scrub vegetation. The reefs are used as a site for SCUBA diving and



The Big Pigeon Island, seen from an approaching boat



The Small Pigeon Island, seen from a boat

snorkelling. Physical damage to the reef as a result of destructive fishing and uncontrolled tourism could lead to severe reef degradation and loss of biodiversity and fish abundance.

Destructive fishing practices, particularly the use of dynamite is causing extreme damage to reefs

in the area. Uncontrolled tourism has resulted in pollution, collection of corals and other marine organisms as souvenirs and physical damage to the reef from boat anchoring and reef walking. Extensive collection of ornamental species is also affecting populations of some fish species.



Protoreaster linckii, a starfish seen on the sand around the Small Island



The Pigeon Islands corals in 2004 (above) and a diver doing a reef survey (below). From a Sri Lanka Sub-Aqua Club survey report.



Acanthaster planci, the crown-of-thorns starfish, feeding on coral at the Big Island.

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Mats of the green alga *Boodlea montagnei* growing on dead coral at Big Pigeon Island.

Photo: Malik Fernando

6

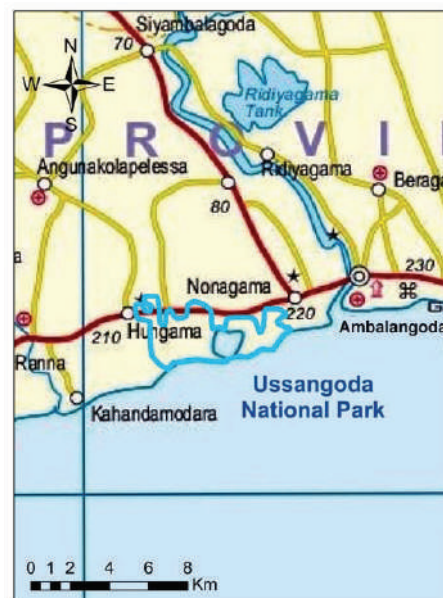
USSANGODA NATIONAL PARK

The Ussangoda National Park, including a 500 m wide belt of near shore water, was created in 2010. The objectives of establishing the new national park were providing long term protection for the area's biological, archaeological, and geographical values. The park borders the Kalametiya-Lunama Sanctuary to its west. The total area encompassed by the park is 349 hectares, of which 57% consists of the sea and adjacent coastline.

The Ussangoda reef is composed largely of rock boulders with an overgrowth of coral and extends along approximately 200 m of coastline. The reef rises to a shallow crest to seaward, enclosing a sheltered reef lagoon. One hundred and twelve species of fish and 135 species of invertebrates including 31 species of hard coral were reported from the area by Perera & Weerakkody (2004).

Ussangoda is known for its unusual soil structure, flora, and location. The soil has a brick-like hard quality with a reddish colour which is unique to this patch of land. In several places, especially the cliff-side exposures facing the sea, the rocks and soil can be seen to be stratified with multiple layers with distinct colouring. The rock debris has high iron concentration, being attracted by magnets.

Ussangoda is located geographically close to the archaeological site known by the local name "Miniha Gal Kanda", where evidence for pre-historic human existence has been found. (Wikipedia, 2022)



Map prepared by Samangi Alawattagama



The rocky shore at Ussangoda, the lagoon at left. Photo: Malik Fernando

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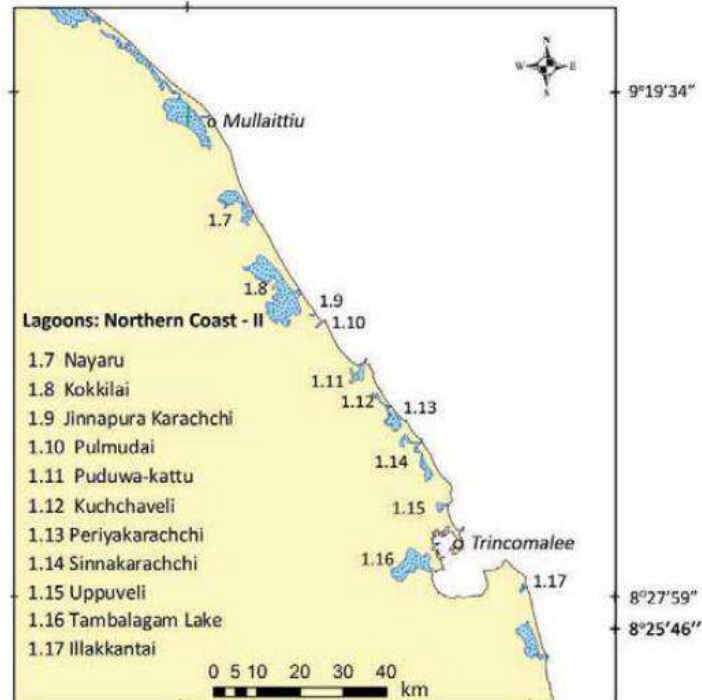
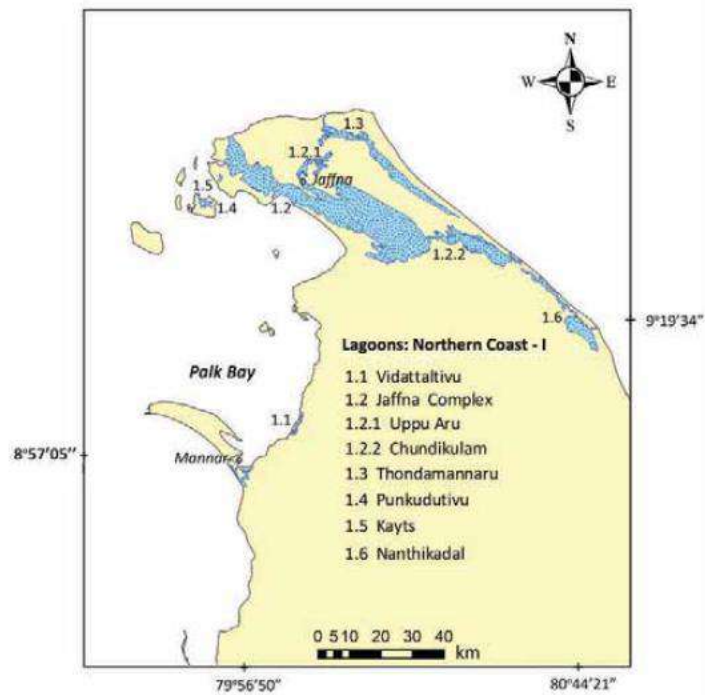
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2. Perera, E.N.R. & Weerakkody, P., 2004. A Biodiversity status profile of sub-tidal and inter-tidal habitats of the Rekawa, Ussangoda and Kalametiya Area, Occasional Papers of IUCN Sri Lanka, No. 5, March 2004.

THE MARINE NATURE RESERVES

Four Nature Reserves (as of July 2022) are included in the Directory. Three are coastal lagoons including varying extents of the surrounding land—the Nagarkovil NR being in the north, on the east coast of the Jaffna peninsula, while the Nayaru and Nandikadal NRs are on the east coast; these are two out of a string of east coast lagoons. The Vidattaltivu NR is on the west coast, comprising of a variety of brackish and marine habitats, including corals, mangroves, and seagrass meadows.

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7. Nagarkovil Nature Reserve
 8. Nandikadal Nature Reserve
 9. Nayaru Nature Reserve
 10. Vidattaltivu Nature Reserve

LAGOONS OF NORTHERN SRI LANKA



Maps reproduced from E.I.L. Silva et al, 2013, from an IWMI publication.

7

NAGARKOVIIL NATURE RESERVE

The Nagarkovil Nature Reserve, with an area of 7,882 ha was established in 2016 by the Department of Wildlife Conservation. The reserve takes its name from the town of Nagar Kovil that lies on the strip of land between the north-eastern shore of the Thondamannaru lagoon and the coast. The reserve consists largely of the lagoon, with some of the lagoon shore included in places and a short extent of seashore as well.

No information has been found regarding its importance and reasons for protection.



Map prepared by Samangi Alawattagama

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3. Protected Areas of Sri Lanka, Wikipedia:
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8

NANDIKADAL NATURE RESERVE

Also Nanthikadal Nature Reserve

The Nandikadal Nature Reserve, with an area of 4141.67 ha, was established in 2017 by the Department of Wildlife Conservation with the intention of protecting the site. It is best known as the location of the last and decisive battle of the Sri Lanka Civil War. In 2010 the DWC had proposed the establishment of the “Nanthikadal Sanctuary” with the justification stated as “Feeding ground and roosting of migratory & resident birds, wetland conservation.” (Mallawatantri et al, 2014)

No further information has been found.



Map prepared by Samangi Alawattegama

References

1. Mallawatantri, A., Marambe, B., Skehan, C., eds., October 2014. *Integrated Strategic Environment Assessment of the Northern Province of Sri Lanka* (PDF). Central Environmental Authority, Sri Lanka and Disaster Management Centre of Sri Lanka. Table 4-3, p. 75. ISBN 978-955-9012-55-9.

NAYARU NATURE RESERVE

The Nayaru lagoon and some of the surrounding area were declared a Nature Reserve in January 2017, following a recommendation contained in the ISEA report by Mallawatantri et al (2014) on account of it being the feeding grounds and roosting area of migratory and resident birds, as well as for the conservation of the associated wetlands and important mangrove vegetation. It covers a total area of 4,464.35ha of which 25% consists of marine habitats. (There is no data to indicate how much is really seashore/marine, how much is lagoon and how much terrestrial. The map based on the gazette co-ordinates at right shows that most of the area within the borders is lagoon.)

The ISEA report also proposed to upgrade the nearby Kokilai Sanctuary (established 18.5.1951, 1995 ha in extent) as a National Park as it included highly significant waterbird habitats (Mallawatantri et al., 2014), but this has not been done. More information is available in the chapter on Marine Sanctuaries.



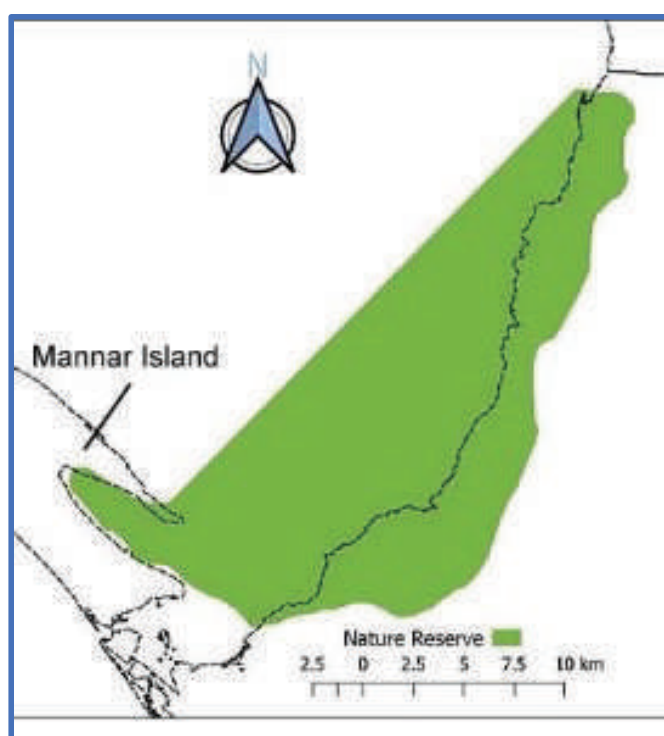
Map prepared by Samangi Alawattegama

References

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10

VIDATTALTIVU NATURE RESERVE



Map adapted from an EFL document.

The Vidattaltivu Nature Reserve (29,180 ha) was declared in 2016 (Gazette Extraordinary No. 1956/13 of 1.3.2016) by the Department of Wildlife Conservation under the name Wedithalathive Nature Reserve. It is a very large, protected area that contains extensive areas of seagrass meadows, mangroves and a coral reef called the Maldiva Bank (coral island). This followed the area being identified as needing protection by the Strategic Environmental Assessment (SEA) of the Northern Province conducted in 2012. This is the only area in the whole of Sri Lanka where mangroves grow on the coast, facing the sea. The maps show the location of the NR – the

boundary superimposed on a road map (below), and the protected area shaded on the map at left. It will be noted that the eastern boundary of the NR abuts the main road from Pooneryn to Mannar.

The Nature Reserve covers a large extent of ocean, protecting sea grass habitats that are crucial for dugongs, as well as some terrestrial areas which protect Sri Lanka's largest mangrove ecosystem. Mangroves and reefs are a first line of coastal defence against storm surges and waves, and from potential tsunamis, while safeguarding against coastal erosion. They also sustain juvenile populations of fish, prawns, crabs, and other marine and brackish water organisms, so the clearing of mangroves would lead to the collapse of these

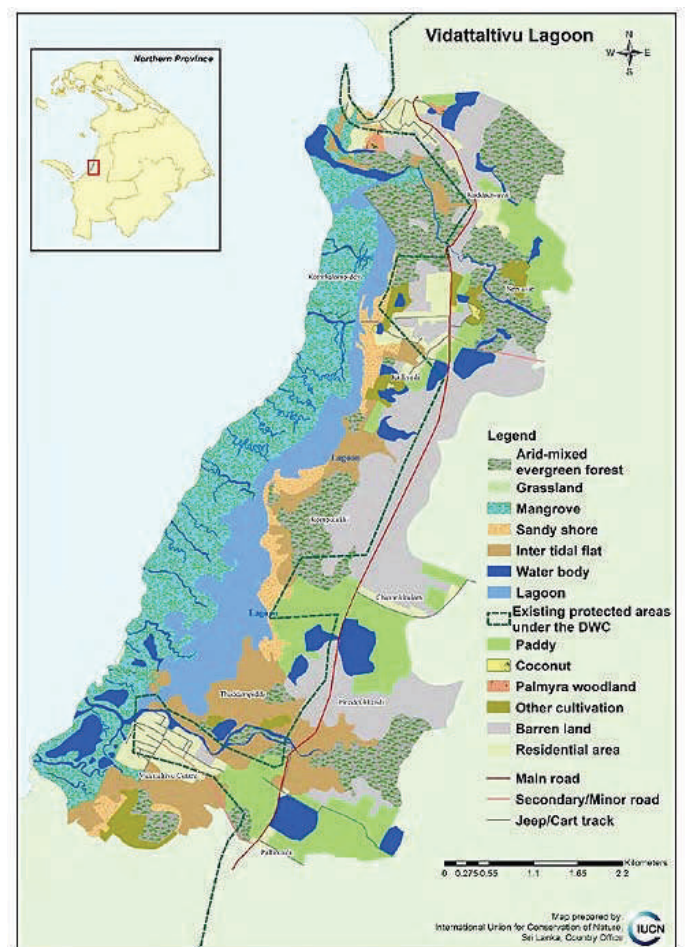
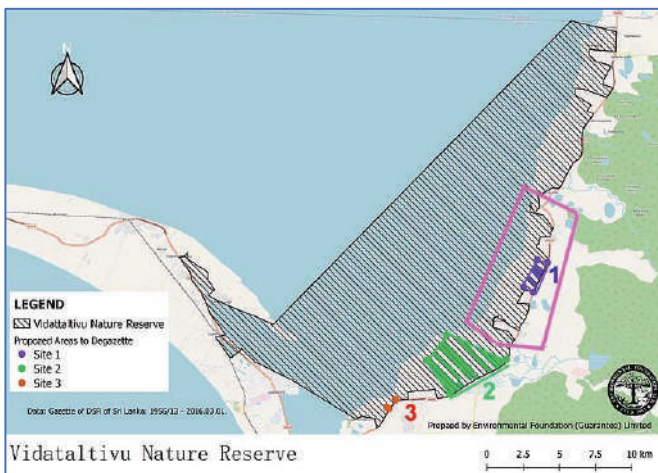


Map prepared by Samangi Alawattagama



At Vidattaltivu the mangroves come right up to the sea (top right), whereas in all other locations they border lagoons or estuaries. There are many water channels within the mangroves, making this an ideal location for recreational boating and kayaking (top left). Local artisanal fishermen make a living from the bounty of the mangroves (left, below).

- Images and information, pers. comm. Arjan Rajasuria



populations which would affect artisanal fisheries, which is a common livelihood in the area.

The Vidattaltivu NR is under threat, with an attempt to de-gazette a portion to make way for aquaculture. In 2017, the National Aquaculture Development Authority (NAQDA) made the request to de-gazette by submitting a Cabinet paper that was co-sponsored by the then Minister of Fisheries and Aquatic Resources and Minister of Sustainable Development, Wildlife Conservation and Buddhasasana. An Environmental Impact Assessment, and a subsequent assessment of

the EIA report by a Technical Expert Committee appointed by the DWC in 2019, have found against

the proposal on the grounds of the obvious ecological impact resulting from fragmentation of the ecosystem. Despite these findings, NAQDA and the Ministry of Fisheries are still pursuing their case for de-gazetting, as on 23.12.2022.

The areas requested for aquaculture—pond culture of fish and shellfish, including an exotic species of prawn *Litopennaeus vannamei*—are in 3 blocks located on the landward border of the NR where there are no mangroves, as claimed by the project proponents. Block 1 appears to border the lagoon or comes very close to it. Block 2 is large, beyond the southern extremity of the lagoon, and extending almost up to the shore. Block 3 is small, almost at the southern extremity of the NR. The danger of permitting such developments in peripheral zones is that effluents with hazardous components, both

chemical and biological, would inevitably infiltrate throughout the ecosystems and effect downstream fauna and flora.

The map at left on page 28 shows the NR with the numbered project sites, and on the right the ecosystems in a part of the NR.

The project sites are numbered 1, 2, and 3, with the ecosystems within the violet rectangle shown enlarged in the map at right. The pale blue strip is the lagoon, lying in between the shore to the east, and a strip of mangroves and the open sea to the west.

The maps are adapted from an EFL Outreach Note, and from Weerakoon et al, 2020.

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THE MARINE SANCTUARIES

Sixteen marine sanctuaries that comply with one of the criteria listed in the chapter 'Introduction: Extant Legislation' are described in this Directory. The list has been compiled with reference to a number of publications, including Green (1990), Leslie Joseph (undated), and IUCN and DWC articles available on the Internet (see References for details). A number of sanctuaries listed as "marine sanctuaries" in some of these publications were excluded (see Box 1). Information listed in some tables was of doubtful veracity and have not been reproduced here. The sanctuaries are described in the order in which they are listed in Table 1.

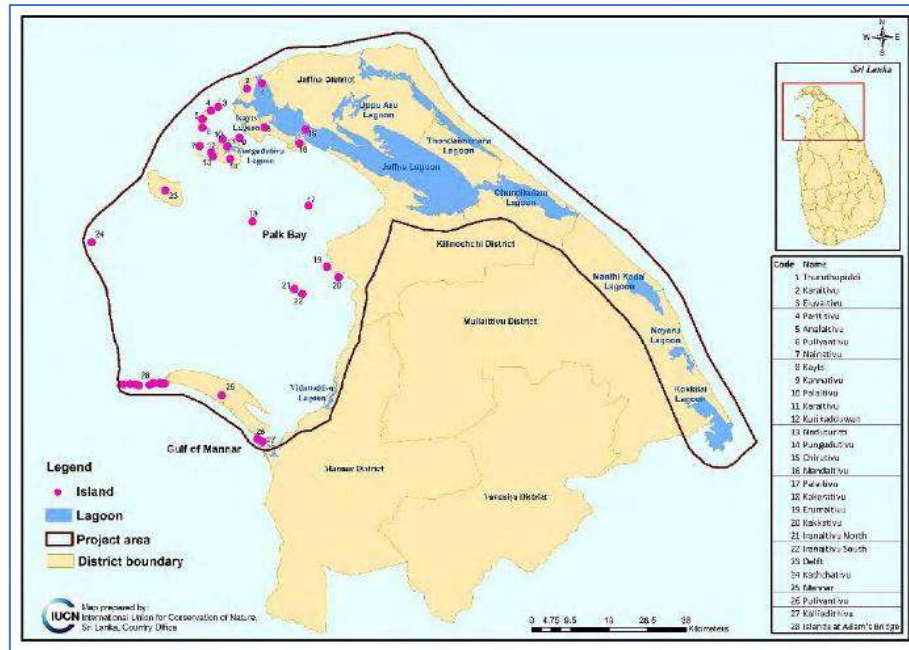
Box 1**SANCTUARIES EXCLUDED**

1. **Muthurajawela** - an inland wetland.
2. **Honduwa Island** - an island in Lunuganga, a sanctuary for Hog deer.
3. **Parapuduwa Nun's Island** - an island hermitage in Ratgama lake.
4. **Polgasduwa Sanctuary** - another island hermitage in Ratgama lake.
5. **Medin Duwa** - one of the islands in Madu Ganga.
6. **Naval Headworks** - watershed protection, Trincomalee.
7. **Nimalawa** - an inland sanctuary.

Table 1: List of Marine Sanctuaries – anticlockwise from Jaffna

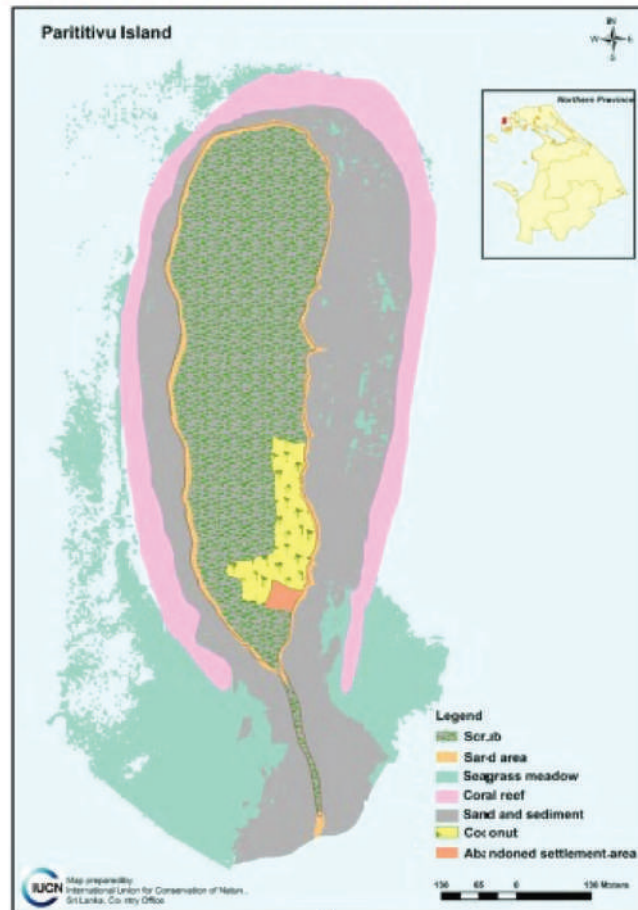
District	Marine Sanctuary	Extent (Ha)	Year Declared
Jaffna	11. Paravitivu (Paraitivu) Island	97.1	1973
Mannar	12. Vankalai	4,839.00	2008
Puttalam	13. Bar Reef	30,669.90	1992
Galle	14. Rocky Islets, Ambalangoda	1	1940
ditto	15. Telwatte	1,425	1938
ditto	16. Rumassala	1,707	2003
Hambantota	17. Rekawa		2006
ditto	18. Kalametiya-Lunama Sanctuary	712	1984
ditto	19. Godawaya		2006
ditto	20. Great Basses & Little Basses Sanctuary	67,282.3	2019
Ampara	21. Panama-Kudumbigala	6,533.90	2006
Batticaloa	22. Kayankerni Sanctuary		
Trincomalee	23. Seruwila-Allai Sanctuary	15,540	1970
ditto	24. Great Sober Island	65	1963
ditto	25. Little Sober Island	7	1963
Mullaitivu	26. Kokkilai lagoon	1,995.00	1951

THE JAFFNA ISLANDS



Source: Weerakoon et al, 2000 – an IUCN publication

Parititivu Island (Sinhala: *Paludoova*)



Map of Parititivu – Weerakoon et al, 2007

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1. Green, M.J.B., Ed., 1990. IUCN Directory of South Asian Protected Areas: 247-248. World Conservation Monitoring Centre, IUCN.
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3. Weerakoon, D., Goonatilake, S. de A., Wijewickrama, T., Rajasuriya, A., Perera, N., Kumara, T. P., de Silva, G., Miththapala, S. and Mallawatantri, A., 2000. *Conservation and sustainable use of biodiversity in the islands and lagoons of northern Sri Lanka*. Colombo, Sri Lanka: IUCN Sri Lanka Country Office. Xx+330. Retrieved on 12.8.2022 from <https://doi.org/10.2305/IUCN.CH.2020.18.en>

VANKALAI SANCTUARY

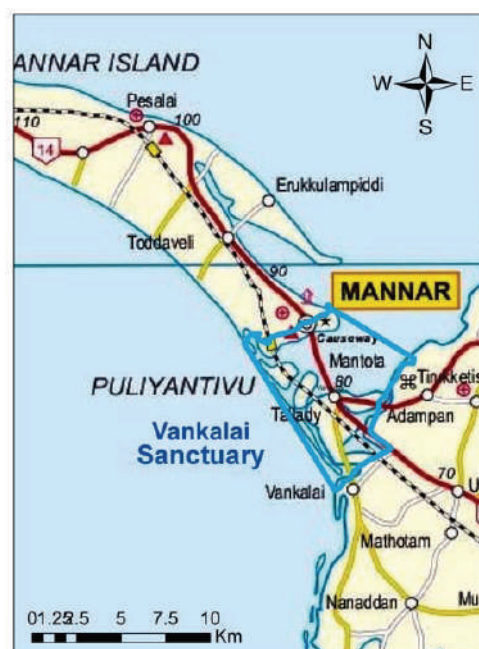
Declared a sanctuary under the FFPO by the DWC in 2008, the Vankalai Sanctuary was established as a Ramsar site bearing No. 1910 on 12.7.2010.

The Sanctuary is in the North-West of Sri Lanka covering an area of 4,839 ha. It covers the area between Mannar Island and the mainland, including the causeway, and consists of several ecosystems which range from arid-zone thorn scrubland, arid-zone pastures and maritime grasslands to sand dunes, mangroves, salt marshes, lagoons, tidal flats, sea-grass beds, and shallow marine areas. The National Wetland Directory (2013) refers to the area bounded by Vankalai, Pulliyantivu and Tiruketiswaram as the 'Vankalai Triangle'. Its boundary to the north-east is contiguous with the Vidattaltivu Nature Reserve.

This sanctuary is highly productive, supporting high ecosystem and species diversity. The site provides excellent feeding and living habitats for many waterbird species, including annual migrants, which also use this area on arrival and during their exit from Sri Lanka, being the end of the Central-South Asian migratory bird flyway. The site's coastal and marine ecosystems are important for over 60 species of fish, marine turtles, and rare species such as Dugongs (*Dugong dugon*). The Vankalai Sanctuary sustains diverse food chains, while also sustaining the livelihoods of

fisheries-dependent communities in the area. Civil unrest has kept human activity out of this region for nearly two decades, hence there are only a few permanent settlements in the area. Locals engage in small-scale livestock grazing, subsistence, and commercial fishing. Part of the Vankalai Sanctuary is an archaeological site since it is partly located in the major port of ancient Sri Lanka (Mantai), dated from the 6th century BC to 13th century AD. The Department of Wildlife Conservation is directly responsible for managing this diverse and culturally rich wetlands.

– Ramsar Sites Information Service, 2010 –



Map prepared by Samantha Alawattegama

References

1. CEA, 2013. National Wetland Directory of Sri Lanka, available at <http://203.115.26.10/wetland/more-details.php?id=79&action=edit>
2. Ramsar Sites Information Service, available at <https://rsis.ramsar.org/ris/1910>.

13

BAR REEF MARINE SANCTUARY

The Bar Reef Marine Sanctuary, declared in 1992, is a complex of offshore continental shelf patch reefs, constituting one of the largest coral reef systems in Sri Lanka. The marine sanctuary includes shallow coral reefs, and sandstone habitats that are located deeper than the true coral reefs. The sanctuary is offshore of the Puttalam estuarine system which includes Dutch Bay and Portugal Bay, in a relatively remote region of the country, northwest of the Kalpitiya Peninsula. Located within the coordinates 8° 32' N and 79° 40' E to 8° 8' N and 79° 48' E, the sanctuary is 30, 670 ha in extent.

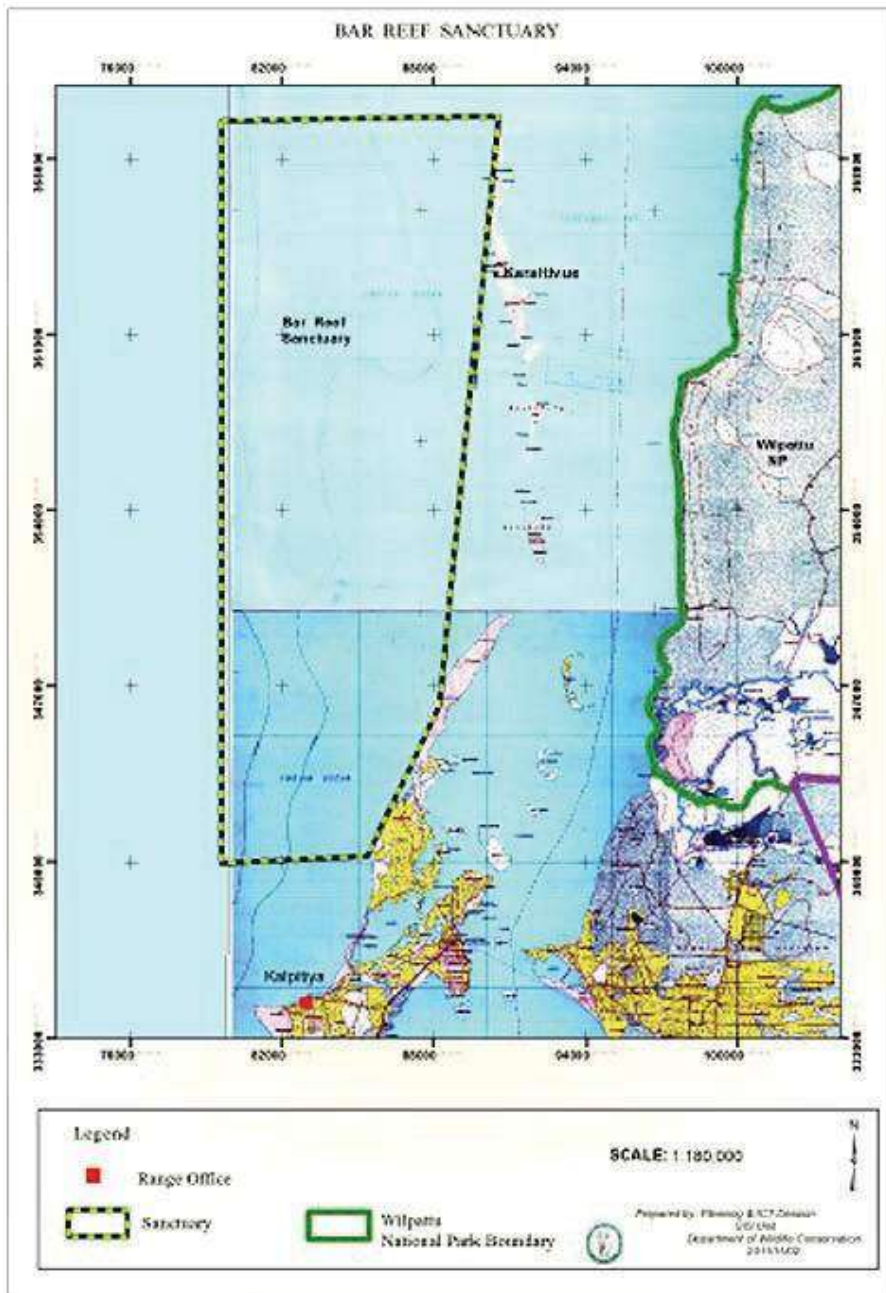
The area was declared as a Marine Sanctuary on account of its rich species diversity and extensive coral reefs. It is the only MPA within the country that covers a considerably large area and encompasses multiple habitat types. Despite the effects of coral bleaching, Bar Reef remains one of the most biologically diverse coral reefs in Sri Lanka. It has also shown strong signs of natural recovery from coral bleaching compared to many other reefs in the country.

The reef is located offshore with the nearest coral patches situated approximately 2 km from the shore. The coral reef is found at depths of 1-10 m, while the major sandstone habitats are located between 18-30 m. Coral patches within the shallow coral reef vary in size from a few meters to hundreds of meters across. The coral reef area is composed mainly of branching and tabulate corals although large coral domes are found at around 10



Map prepared by Samangi Alawattegama

m depth. The deeper reefs are mainly sandstone substrates with corals growing on them. They are characterized by rocks, small hills, and flat plateau like structures with holes and crevices. The reef is subjected to strong winds and currents during the southwest monsoon between May to October, which often results in decreased underwater visibility. Northerly surface currents during the southwest monsoon bring turbid water from the nearby Puttalam estuary and several small river outlets, such as the Aruvi Aru, Kal Aru, Modaragam Aru, and Kala Oya.

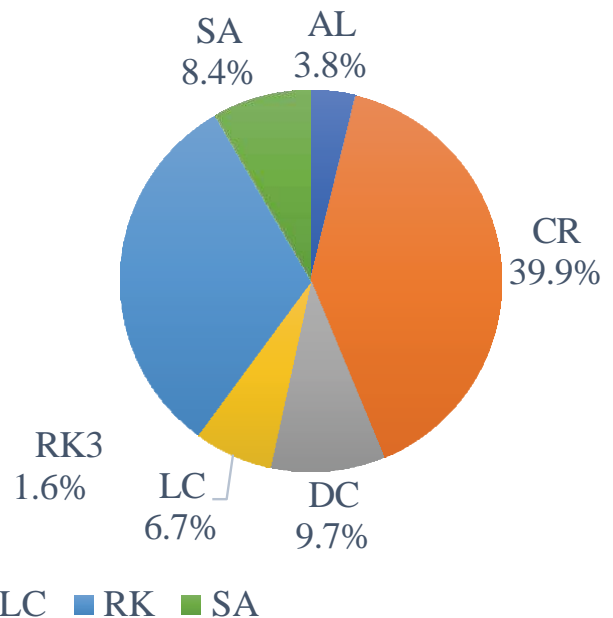


DWC – Bar Reef Sanctuary Management Plan, 2019

RESULTS OF A RECENT (2017) SURVEY OF THE BAR REEF

Average percentage substrate cover at Bar Reef in March 2017. (AL=Algae; CR=Coral Rubble; DC=Dead Coral; LC=Live Hard Coral; RK=Rock; SA=Sand).

Source: Arachchige, G; Perera, N (2017) Report on Systematic Surveying of Bar Reef Sanctuary 2017.



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1. Department of Wildlife Conservation, Bar reef Sanctuary Management Plan: 2019 – 2023.
2. Arachchige, G., Perera, N., 2017. Report on Systematic Surveying of Bar Reef Sanctuary 2017. <http://env.gov.lk/web/images/>

14

ROCKY ISLETS SANCTUARY AMBALANGODA

Declared in 1940, this is a small offshore island, 1 hectare in extent, off the coast of Ambalangoda (6° 14' 12" N, 80° 2' 38" E). It had been declared a sanctuary, together with Pigeon Islands in Nilaveli and the Hikkaduwa Rocky Island, as a protected area for birds, particularly sea birds (pers. comm. Arjan Rajasuriya). As far as we know, the surrounding sea area is not protected—and listing this site as a Marine Sanctuary may not be justified. However, we are including it here under Criterion 4, based on the following :-

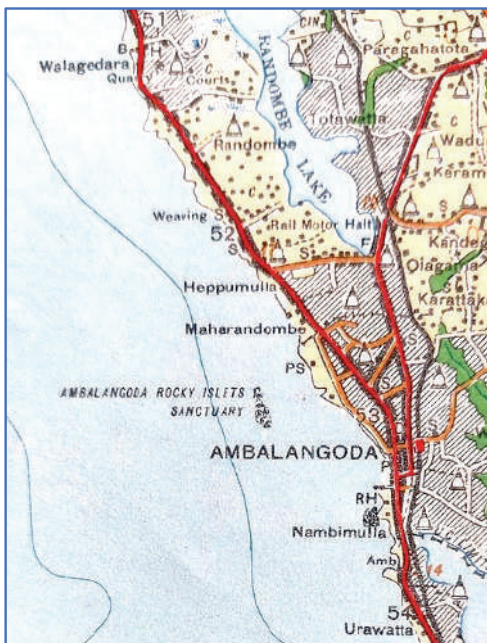
The only information available on the internet is a personal experience related on a travel site (*Tripadvisor*) by W. H. Chaminda of Esher, United Kingdom, in 2015 ...

“

The Rocky Islands Sanctuaries - Ambalangoda's coral reef's vegetation is dominated by some Montipora, Faviidae, Mussidae and Poritidae species dominate the coral reef around the rocky island. Areas with soft corals such as Sinularia, Lobophyton, and Sarcophyton can also be observed. The coral reef harbors many Vertebrates and Invertebrates. Many of the species of corals and coral reef fishes recorded around the area are found in the Rocky island sanctuaries.

Moorish Idol, oriental sweet lips, Parrot fish, snapper, trigger fish can be seen effortlessly & also many Oysters & clams in this unspoiled rock island.

”



Ceylon - One Inch Survey Map - 1943

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1. https://www.tripadvisor.com/ShowUserReviews-g612378-d9455361-r331135886-Rock_Islands_Santuaries-Ambalangoda_Galle_District_Southern_Province.html

15

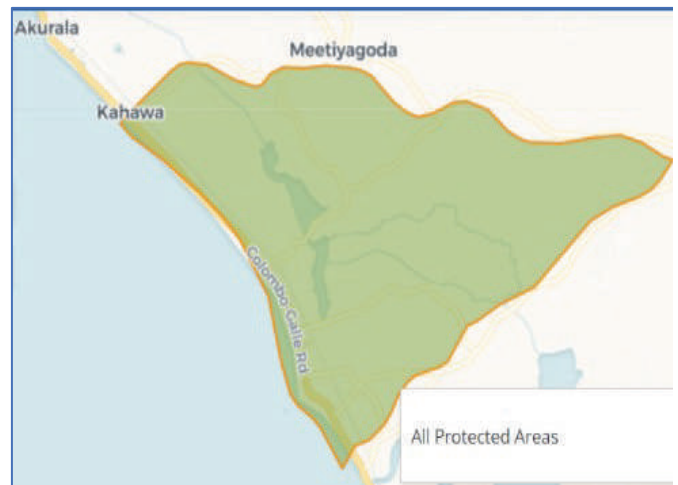
TELWATTE SANCTUARY

This sanctuary, 1,425 hectares in extent, was declared in 1938. We have not located any recent publications relating to this sanctuary. The map at right is downloaded from the internet site of the Digital Observatory of Protected Areas of the European Commission. Further information has been gathered by examining Google Earth.

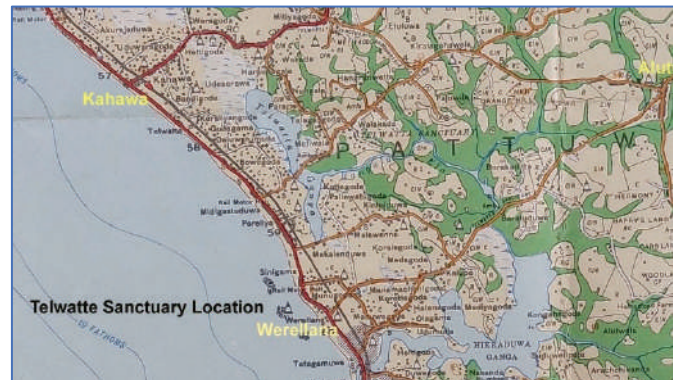
The sanctuary occupies a large triangle with its apex near a road junction that has not been identified. The base of the triangle to the west lies along the coast and appears to include the beach and some of the water, particularly to the south, up to a point short of the mouth of the Hikkaduwa Ganga. Included within the sanctuary is the Telwatte Ganga and two associated water bodies.

The beach area included in the southern part of the sanctuary is likely to be a turtle nesting site, as there is a "Sea Turtle Hatchery and Rescue Centre" just north of the mouth of the Telwatte Ganga (Internet maps). To the south, along the coast, lies Hikkaduwa.

The Telwatte Sanctuary is marked on the 1 inch to the mile survey map of 1943, reprinted in 1965. Its credentials for inclusion as a Marine Sanctuary should be verified.



Telwatte Sanctuary
Source - DOPA



Ceylon - One Inch Survey Map - 1943

References

1. Digital Observatory for Protected Areas (DOPA) Explorer, European Commission, available at: <https://dopa-explorer.jrc.ec.europa.eu/wdpa/2461>.

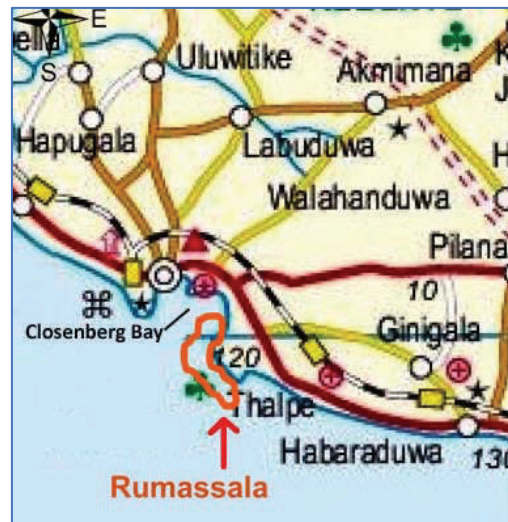
16

RUMASSALA SANCTUARY

The Rumassala Marine Sanctuary was established in 2003 under the FFPO, covering an area of 1,707 ha. It is located around the base of the Rumassala hill in the sheltered waters of Galle Bay, south of Cloisenberg Bay, on the northern side of the wide, hilly headland with Unawatuna Bay on the southern side.

Rumassala Sanctuary encompasses a small near-shore coral reef named Buona Vista growing on hard substrate around the base of the Rumassala hill. Rumassala Sanctuary is different from other MPAs established in the country, due to its specific locality. That is, the rocky shore is surrounded by the hilly headland named Rumassala hill (average height 20m) with a large number of endemic, endangered and medicinally important indigenous trees. The area has been declared as a reserved forest (20 ha) that is managed by the Department of Wildlife conservation. The hilly headland is steep towards the Buona Vista coral reef with an intertidal rocky shore intervening. Therefore, the shore area is referred to as “Jungle beach” in folklore, due to relative isolation of the site.

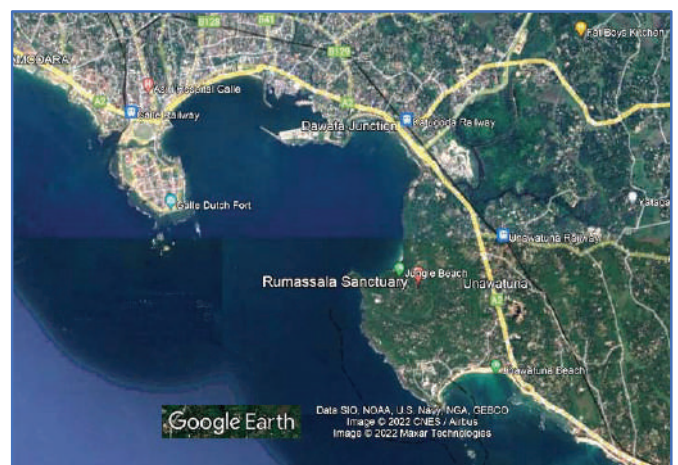
The reef is sheltered from rough seas by a rocky headland, and unlike most fringing reefs along the southern coast, does not have a shallow reef crest and reef lagoon. Coral communities occur on old limestone and rock habitats along the seafloor. Coral patches varying in size from a few meters to over 30 m across are located a few meters away from the shore and extend around 200 m towards the sea to a depth of around 8 m. Some spur and



Map prepared by Samangi Alawattagama

groove formations are found in deeper areas. Shallower areas contain large stands of hard coral, while deeper areas contain rocky habitats with scattered colonies of hard and soft corals.

Despite its small size, the reef is known for its rich biodiversity and is an important habitat for many

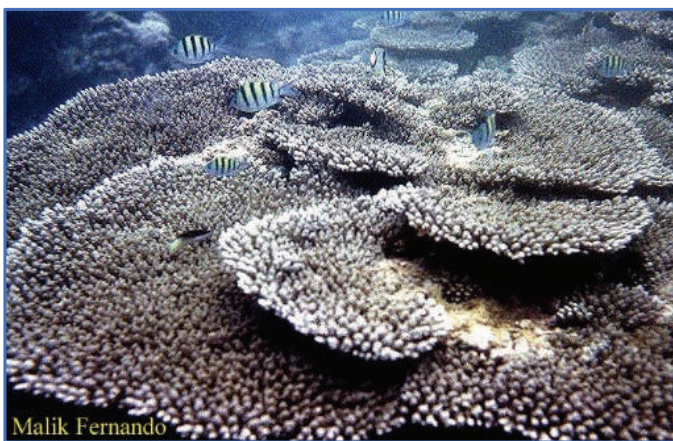
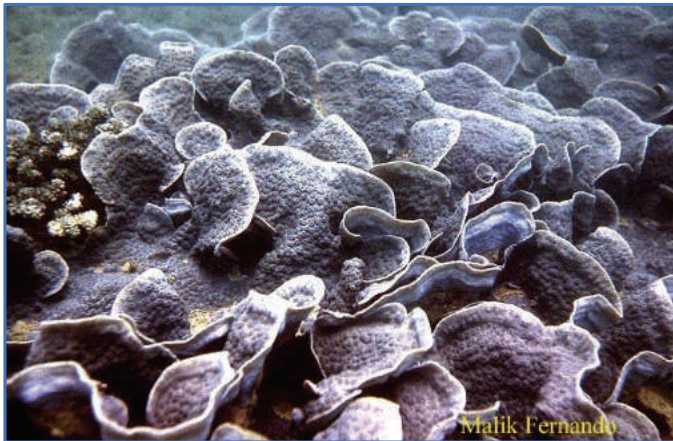


Galle Bay, Rumassala Sanctuary, Unawatuna Bay

marine species. It is important for small-scale fisheries, collection of ornamental fish and tourism. The reef has been degraded by the use of dynamite for fishing, and by coral bleaching. It is reported that there is no implementation of regulations.

The Rumassala Sanctuary is situated near the entrance to the Naval base nearby, and as a result,

is within the naval security zone. Therefore, human access is limited to the intertidal area in Rumassala Sanctuary. (This statement needs verifying. There are reports (verbal) of a coral replanting programme being implemented.)



RUMASSALA CORALS IN 1995

Echinopora lamellosa, *Symphyllia*
sp., *tabular Acropora*, clockwise

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1. IUCN, 2022. Conservation Sri Lanka, <http://iucnsrilanka.org/conservation-sri-lanka/marine-protected-areas/>
2. CEA, 2013. National Wetland Directory of Sri Lanka, <http://203.115.26.10/wetland/more-details.php?id=72&action=edit> [Karunaratne and Weerakkody (1998); NARA/CORDIO/IUCN/GCRMN/SLSAC (2005); Rajasuriya et al. (1995); Rajasuriya et al. (2006) These references have not been consulted]

17 REKAWA SANCTUARY

The Rekawa Sanctuary was established in 2006 as a Sea Turtle Sanctuary by the Department of Wildlife Conservation as a direct result of the Turtle Conservation Project's (TCP) conservation efforts and campaigns. It is 3.5 km in length and lies between 6° 2' 36.0" N to 6° 2' 39.5" N and 80° 49' 53.7" E to 80° 51' 33.0" E and includes the turtle nesting beach and adjacent water—the yellow pins mark two corners of this area on the accompanying Google Earth image.

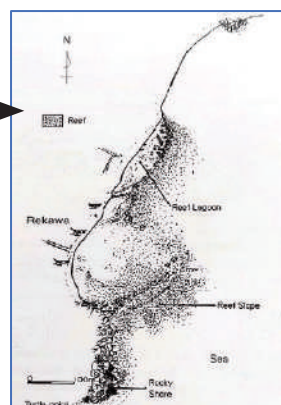


The Green turtle (*Chelonia mydas*), Leatherback turtle (*Dermochelys coriacea*), Olive ridley turtle (*Lepidochelys olivacea*), Loggerhead turtle (*Caretta caretta*) and the Hawksbill turtle (*Eretmochelys imbricata*) come ashore to nest on the beach at Rekawa (Kapurusinghe, 2000). The TCP has an ongoing project at this site with community participation to protect the nesting turtles and their eggs.

Perera & Weerakkody (2004) have described the intertidal and subtidal habitats at Rekawa; these lie outside the Protected Area.

THE REKAWA LAGOON

The Rekawa Lagoon is not within a protected area, but it is a coastal lagoon and wetland that has seen deterioration of its habitats as a result of infrastructure development in the vicinity. As it is adjacent to the protected area, it is being included here for the sake of record. The lagoon has been studied by many scientists and the account below is based on their publications.



Map of Rekawa Coastline

From Perera and Weerakkody, 2004, showing the rocky shore and submerged reef habitats, from Turtle Point to Oruwella. This is outside the PA. The Google Earth image (left) shows the same area. t

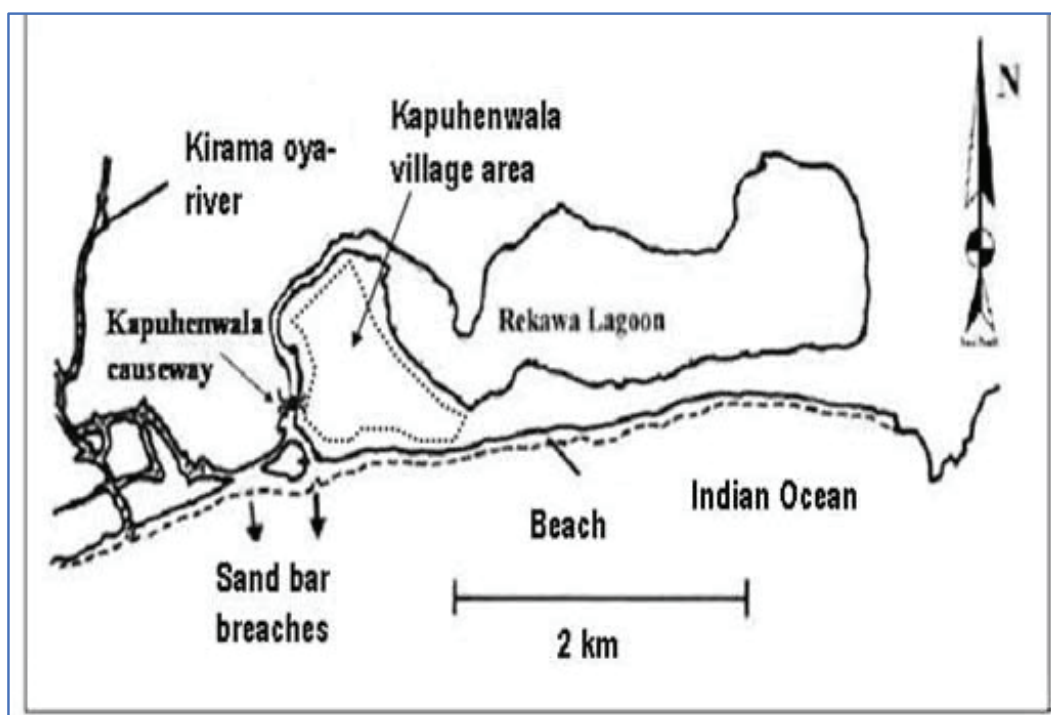
The Rekawa Lagoon is a comparatively small coastal lagoon with a water surface area of 2.4 km² (240 ha). The lagoon is connected to the Indian Ocean with a 3 km long, narrow inland waterway. The lagoon is shallow with an average depth of 1.4 m. Most parts of the lagoon are encircled with a mangrove belt. Kirama oya or Tangalu oya that enters the lagoon at the seaward end of the inlet canal is the main freshwater supply. Apart from the main freshwater inflow, there are two small freshwater streams that function only during the rainy season providing surface runoff (Jayakody & Jayasinghe, 1992; Priyadarshana, 1998; Dayarathne et al, 2015).

Shrimp fishery has been one of the main livelihoods among the lagoonal community. However, this supports the people only during the shrimp fishery season which extends from October to April. The most abundant shrimp species in Rekawa lagoon, and the most commercially important, is *Penaeus indicus* (white shrimp) (Rathnaweera, 2005).

Many mangrove species, including *Lumnitzera racemosa*, *Aegiceras corniculatum*, *Bruguiera gymnorhiza*, *Excoecaria agallocha*, *Rhizophora*

mucronata, *Avicennia marina*, and *Avicennia officinalis* are found around the lagoon. In addition to its ecological benefits (e.g., providing shrimp and fish habitats), the Rekawa inhabitants have traditionally used mangroves for the benefit of the local community; but the increasing population has led to an increasingly non-sustainable abuse of the resources. Mangroves have been exploited for timber for building dwellings and boats and domestic fuelwood in the area. Recent research has shown that, even small scale cutting of trees could affect the age composition and reproductive capacity of the mangrove forests in Rekawa lagoon (Dayarathne & Kumara, 2015).

As stated earlier, the Kirama or Tangalu oya that enters the lagoon at the seaward end of the canal that drains the lagoon is also its main freshwater supply, serving to flush it at intervals. In 1984 the Road Development Authority of Tangalle built a causeway called Kapuhenwela across the outlet canal, greatly reducing the volume and speed of water entering and leaving the lagoon system. This impediment has prevented flushing of the lagoon by natural water flow, causing continuous sedimentation. In 1999 and 2005 modifications



By Gayandream - Own work, CC BY-SA 4.0, <https://commons.wikimedia.org/w/index.php?curid=59580937>

were made to the design of the causeway in attempts to improve the water flow; on the second occasion to repair minor damage caused by the 2004 tsunami. The constructions have resulted in a drop of 71% of the effective cross section for the flow of water. The causeway itself, and its modifications, have provoked concern among local resource users and environmentalists as the lagoon hydrology (e.g., reduced flushing), salinity and thereby the ecology (e.g., reduction in shrimp catch), showed drastic changes and variations (Rathnaweera, 2005; Gunaratne et al, 2013).

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18

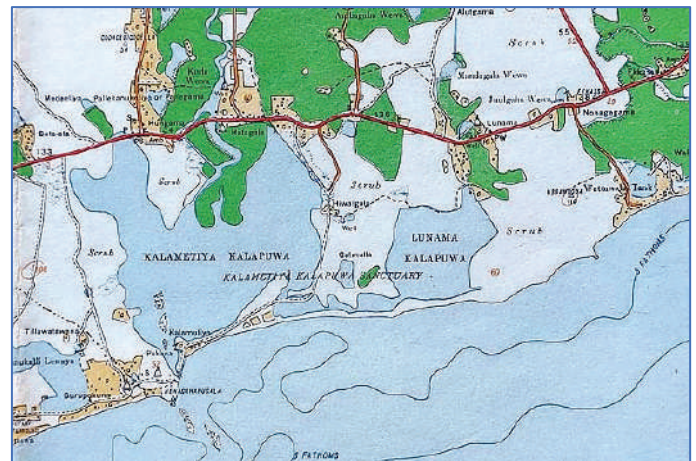
KALAMETIYA - LUNAMA SANCTUARY

The Kalametiya and Lunama lagoons are located on the south-western coast of Sri Lanka, in the Hambantota District, 20 km west of Hambantota. The Kalametiya lagoon covers about 606 ha and the smaller Lunama lagoon 192 ha; they are interconnected.

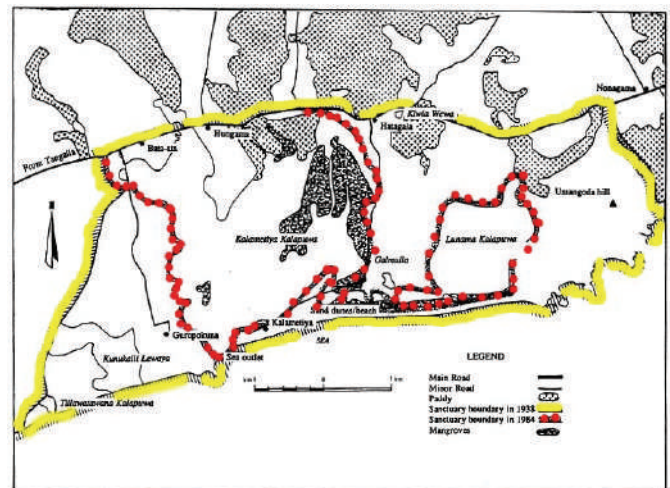
The sanctuary lies within the coordinates $6^{\circ} 5' - 6^{\circ} 6' N$, $80^{\circ} 56' - 80^{\circ} 59' E$. It had first been established in 1940 and de-gazetted in 1946 because of opposition from the local people. It was subsequently re-gazetted in 1984 after a prolonged campaign by conservation bodies (Green, 1990).

In recognition of the importance of Kalametiya and Lunama lagoons as wildlife habitats, an area of 712 ha was declared a Sanctuary under the Fauna and Flora Protection Ordinance in 1984, under the administration of the Department of Wildlife Conservation. This area was included under the Hambantota Integrated Coastal Zone Management Project (HICZMP), implemented by the Coast Conservation Department (Ekanayake et al, 2005). [The status as of 2022 vis-à-vis the HICZMP is not known. See Katupotha, 2000 report. The commencement of the project appears to have been in 1997.] The shallow marine belt bordering Kalametiya-Lunama area contains a coral reef as well as a sandstone reef. Five species of globally threatened turtles nest in the nearby beaches (Amarasooriya, 2000).

This sanctuary and the constituent lagoons have seen many changes since they were declared



Map showing the Kalametiya & Lunama Lagoons
Ceylon: One Inch - Ambalantota, Survey Dept: 1955



Map of the Lunama-Kalametiya area
Source CEA/Euroconsult (1995)
Adapted from Ekanayake (2005)

Sanctuary border:
1984 - 
1994 - 



protected, due to the development of the surrounding area and

those lands further inland. The area declared in 1984 (yellow outline – map below) was a large one that included two smaller lagoons to the west and extending towards Rumassala to the east. The borders in 1994 (red outline) show smaller areas that include just the lagoons, extending to the main road in the case of the Kalametiya lagoon. Documentation of the events between 1984 and 1994 are yet to be located.

An account of the historical status can be found in Green, 1990. Relevant passages are quoted below.

“The wetland comprises two coastal lagoons west of the mouth of the Walawe Ganga. Lunama Kalapuwa is a brackish lagoon with extensive mangrove swamps; Kalametiya Kalapuwa is a permanent, slightly brackish lagoon with abundant vegetation and a mangrove fringe. Both are fed by several small streams and have maximum depths of 2-3m. The vegetation includes mangrove swamps at both lagoons, and reed beds and abundant submerged vegetation at Kalametiya Kalapuwa. The mangrove vegetation at Kalametiya is in good condition, with a full range of successional stages. There are rice paddies, other cultivated land, grassland, scrub, and coconut plantations in surrounding areas.”

“Both Kalametiya Kalapuwa, in particular, and Lunama Kalapuwa are important wetlands for both

resident and migratory waterfowl. Activities include fishing, especially for prawns, shifting cultivation, rice cultivation and excavation of shells in adjacent areas. The lagoons formerly supported important prawn fisheries, but these have declined in recent years.” – Green, 1990

More recent studies—but still 20 years old—give a different picture of the sanctuary, as described in the following passages.

The Kalametiya lagoon opens to the sea by a narrow man-made outlet and is connected to the Lunama lagoon through a shallow, 2 km man-made channel. These two shallow lagoons, with a mean depth of less than 1 m, are fed by the Kuchchigal Ara, and are surrounded by fringes of marsh and mangrove vegetation (Ekanayake et al, 2005 (CEA/ Euroconsult)).

According to some non-scholarly reports, Kalametiya lagoon, formerly 8.9 km² (890 ha), now 7.5 km² (750 ha) had been a moderately or high salinity water body and a very important centre of prawn fishery until the late 1960s. Most of the lagoon area had remained open water until then. An upstream irrigation project, the Udawalawe irrigation scheme, came into operation in 1967, increasing the freshwater inflow to the lagoon. The flora, fauna and water quality of the lagoon was reported to have changed since then. The lagoon now is a shallow coastal water body with low salinity water. There is no commercially important



Lunama Lagoon - 2009

Bulrushes or narrow-leaf cattails Typha angustifolia

Photo: Malik Fernando

fishery in the lagoon (Jayatissa et al, 2002).

Silt brought in has filled up at least 40% of the Kalametiya lagoon

within the last 15 years (Ekanayake et al, 2005).

Consequently, the lagoon cover has decreased, and



Sonneratia caseolaris – trees and fruit
Mawella Lagoon, near Tangalle

Photo: Malik Fernando

the filled area has been invaded by a monoculture of *Sonneratia caseolaris* that now dominates Kalametiya. The reedbeds adjoining the lagoons are dominated by *Typha angustifolia*. The grasslands consist of species such as *Cynodon dactylon* and *Panicum repens*. The frequently inundated areas of the lagoon consist of salt marsh communities, dominated by salt-tolerant species such as *Halosarcia indica*.

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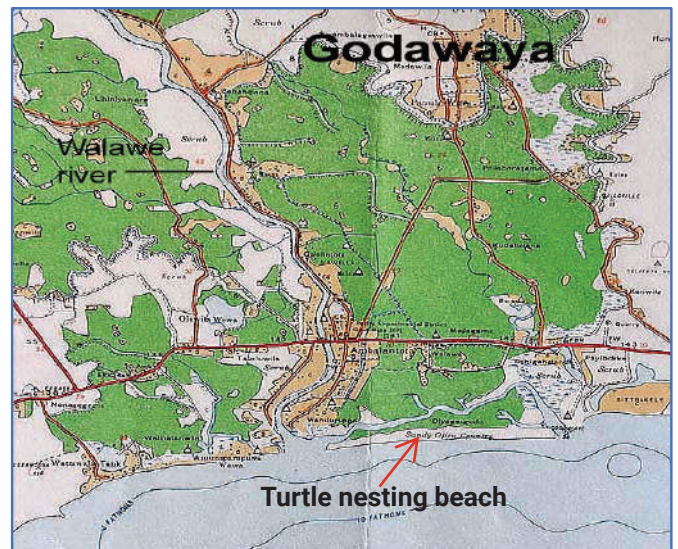
19

GODAWAYA SANCTUARY

The Godawaya Sanctuary was declared in 2006 to protect an important sea turtle nesting beach. It consists of a 3.85 km stretch of beach (6° 6' 19.6" N to 6° 6' 36.0" N, 81° 1' 36.1" E to 81° 3' 11.9" E), extending 500 m into the sea and 100 m from the high tide level onto the land. The seaward limit includes the turtles' aquatic habitat (mainly coral reefs where they forage and rest) while the land limit includes their nesting habitat.

Godawaya is a small fishing hamlet located at the mouth of the Walawe river, between Ambalantota and Hambantota. The original harbour town was an entrepot on the maritime silk route from at least the 2nd century CE. The area is of archaeological importance, not least on account of the discovery by divers of an ancient shipwreck that has been dated to c. 2nd century CE.

Godawaya is home to five of the seven globally endangered marine turtle species—hawksbill, leatherback, green, loggerhead and olive ridley turtles. Godawaya beach is possibly the best leatherback nesting beach in the Island with the largest nesting population.



Ceylon: One Inch – Ambalantota, Survey Department: 1955

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20

GREAT BASSES & LITTLE BASSES MARINE SANCTUARY

The Great Basses Ridge and the Little Basses Ridge are located off the south-eastern coastline of Sri Lanka. They are two long sandstone and limestone reefs that abound with marine life. In two places they break the surface, and the rocky islets so formed are surmounted by two lighthouses—the Great Basses and the Little Basses Lighthouses respectively. The lighthouses were built in the nineteenth century, as the shallow reefs were deemed a hazard to shipping, many ships having foundered on the shallowest parts. The two Basses lighthouses are among the most famous offshore lighthouses of Asia (Wikipedia).

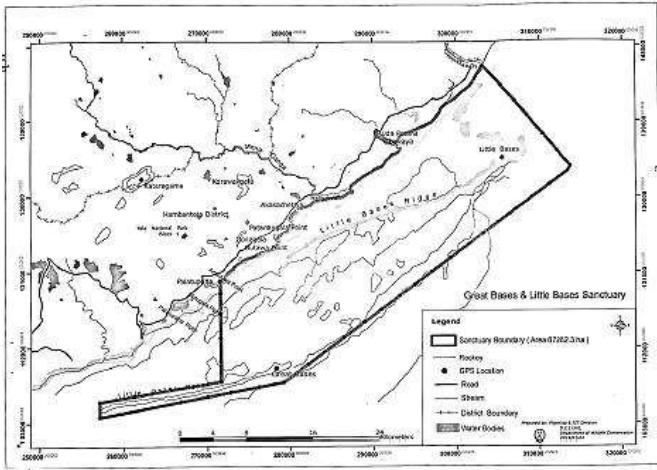
The area of sea between the ridges and the coastline were declared a Fishery Management Zone many years previously. The sanctuary was declared in 2019 to protect the reefs and its biodiversity, covering an area of 67, 282.3 ha. The

inshore area is a chank collecting site, the chank population here being the bulkier species *Turbinella rapa*, the Great Indian Chank. The reef itself is a popular site for collectors supplying the ornamental aquarium trade. The reef around the Great Basses lighthouse is a divers' paradise, noted for the remarkable sculpturing of the rocks into futuristic designs with caves, overhangs, and passages. Besides the fishes, the site also boasts shipwrecks. The Little Basses Lighthouse also has a shipwreck.



Map prepared by Samangi Alawattagama





Basses Sanctuary boundary
 Source: Gazette No. 2144/60 of 11.10.2019

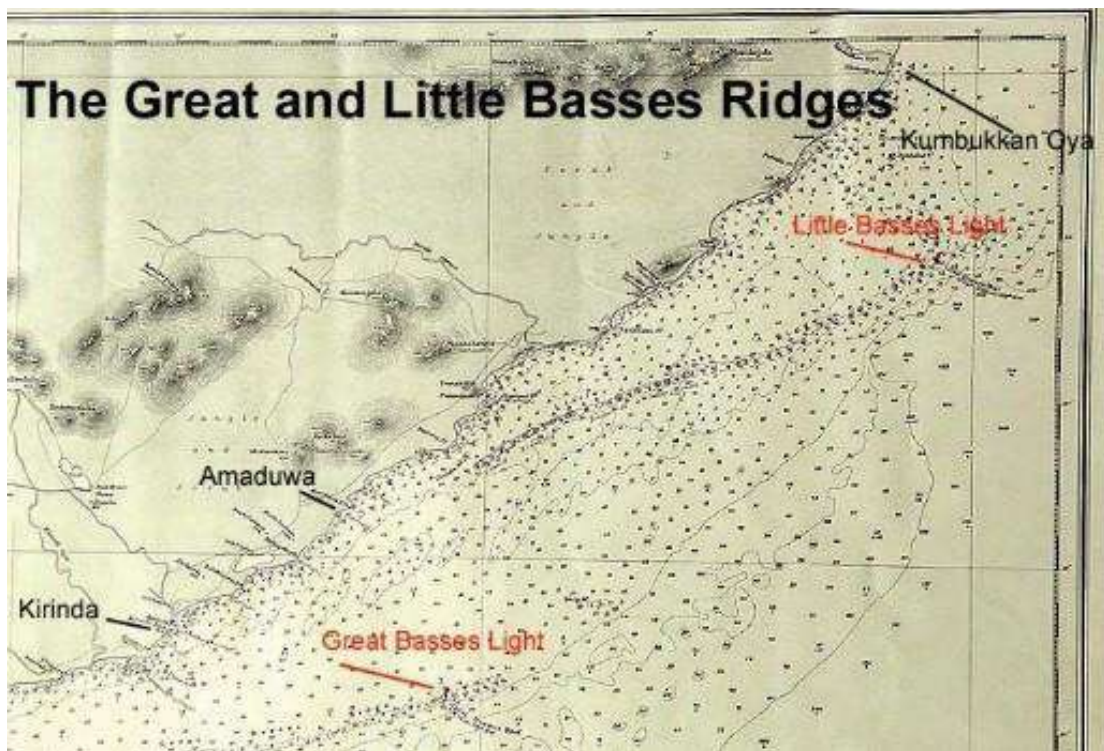


Above: Great Bases Lighthouse; Below: Little Bases Lighthouse.

Photography – Malik Fernando

Below:

A portion of Chart No. 3265, British Admiralty, surveyed 1908-9, republished 1960. The reefs extend from south of Kirinda, to south of the Kumbukkan Oya. The Great Bases Lighthouse is south of Amaduwa. The Little Bases Lighthouse is south of the mouth of the Kumbukkan Oya.



The Great Bases Underwater
Photography: Manjula Wijeyaratne



© 2018 - Manjula Wijeyaratne
Great Bases, Mirinda, Sri Lanka



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© Manjula Wijeyaratne
Great Bases, Mirinda, Sri Lanka



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PANAMA-KUDIMBIGALA SANCTUARY

This sanctuary was declared in 2006, and is 6,533.9 hectares in extent. It is contiguous with the Kumana National Park that lies to the south-west (map at right), and together with the Ruhunu National Park (Yala) forms a complex of protected areas along the south-west coast of the Island. There are a number of lagoons that border the sanctuary along its coast: the Panakala, Solamba, Kunukala and Helawe Lagoons, and the Panama wewa inland (map below, right).

Nineteen-thousand and eleven hectares (19,011ha) of land falling within both PAA were declared a Ramsar Site in 2010 as the *Kumana Wetland Cluster*, Site number 1,931.

The Kumana Wetland Cluster Ramsar site consists of a diversity of coastal wetland habitats, including lagoons, estuaries, irrigation reservoirs, mangroves, and salt marshes, interspersed with sand dunes, scrubland, and forest vegetation. The site provides excellent feeding and resting habitats for many threatened wetland species, including three turtle species such as the Green Turtle (*Chelonia mydas*), Loggerhead Turtle (*Caretta caretta*), and the Olive Ridley Turtle (*Lepidochelys olivacea*). The productive coastal wetlands support a thriving near-shore fishery that includes commercially important crustaceans such as *Penaeus spp.*, and *Macrobrachium spp.*, and offer refuge for their juvenile stages. Locals engage in lagoon fishing and rice cultivation and depend on seasonal non-timber forest products such as Wood apple fruits.

There are interesting archaeological sites within the area, such as the Kudumbigala monastery complex, Balumgala vantage point, and the Murugan Kovil, north of Okanda.

Threats to the site include disturbance by increasing visitor numbers, increased siltation around lagoons due to cattle grazing while surrounding areas face the problem of illegal logging, poaching and excessive use of chemicals for agriculture.

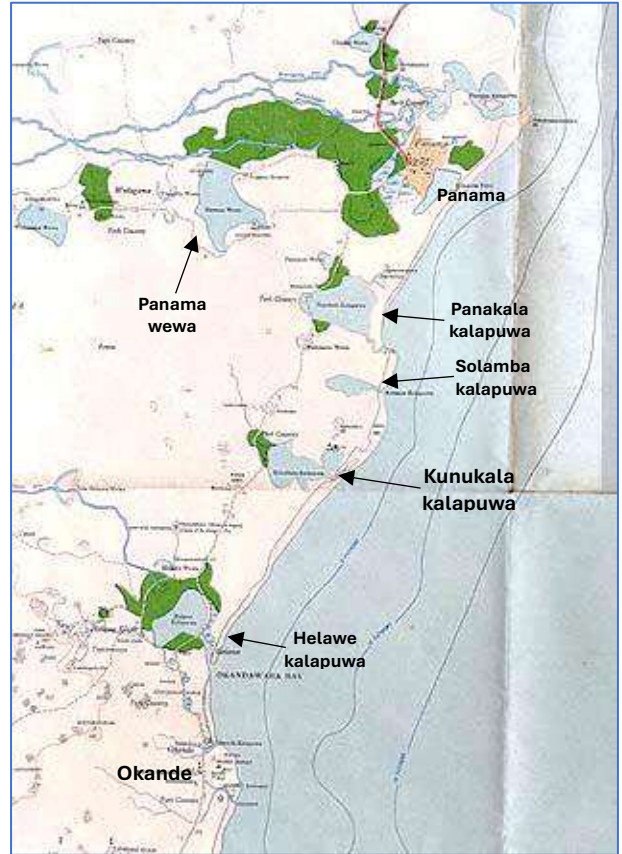
- Ramsar Sites Information Service -



Map prepared by Samangi Alawattagama



Kumana National Park (black area), and the **Panama-Kudumbigala Sanctuary** (green area).



Panama-Kudumbigala Sanctuary
Locations of lagoons
Ceylon: One Inch, Panama – 1965

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KAYANKERNI MARINE SANCTUARY

The offshore reef at Kayankerni—known locally as the Irrachchal reef—is an extensive complex of reefs and shoals that span the Thennadi Bay, extending north of Vanderloos Bay (8° 0' 1.86" N 81° 30' 44.25" E; 7° 59' 48.29" N 81° 32' 46.27" E; 7° 58' 50.53" N 81° 33' 33.75" E) (Weerakkody et al, 2012). It was known to collectors supplying the ornamental aquarium trade on account of the high abundance and diversity of fish and invertebrates, but otherwise unknown. Following a survey in 2011 and 2012 where its marine biodiversity was surveyed, a large area, including some of the land and the reef, was declared a sanctuary in 2019, covering an area of 953 hectares.

Kayankerni is now popular with recreational divers because of the presence of two historic shipwreck sites located seaward of the reef. The SS British Sergeant, an armed merchant vessel accompanying the aircraft carrier HMS Hermes during World War II, sank after being bombed by



Left - A diver holds a specimen of the uncommon green alga *Valonia ventricosa* collected from the Irrachchal reef. This consists of a single-celled vesicle that may grow up to 10 cm high. Found on the east coast reefs, in sunny or shady locations.

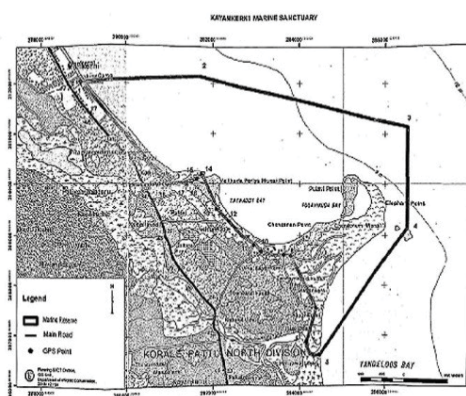


The Irrachchal Reef

Underwater photo by Manjula Wijeyaratne, July 2018

Japanese aircraft in 1942; the SS Lady McCallum was a cargo ship which ran aground in 1926 during a storm (Jayawardena, 2016).

A Management Plan for this sanctuary is being prepared (pers. comm. Nishan Perera).



Kayankerni Marine Sanctuary

Reproduced from Gazette No. 2118/59 of 4.11.2019

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23

SERUVILA-ALLAI SANCTUARY

The Seruvila-Allai Sanctuary, in extent 15,540 ha, was declared in 1970. It is listed under this name in Green (1990) and also in the IUCN list of Marine Protected Areas (2020), attributing the information to the DWC (2018). The sanctuary is located 25 km south-east of Trincomalee, near the town of Thoppur; this puts it south of Foul Point that guards the entrance to Koddiyar Bay (map below).

Green, 1990, upon which this narration is based, refers to the “brackish coastal lagoon, known as



Allai Tank & Ullackalie Lagoon
Ceylon: One Inch, Trincomalee – 1952



Map prepared by Samangi Alawattagama

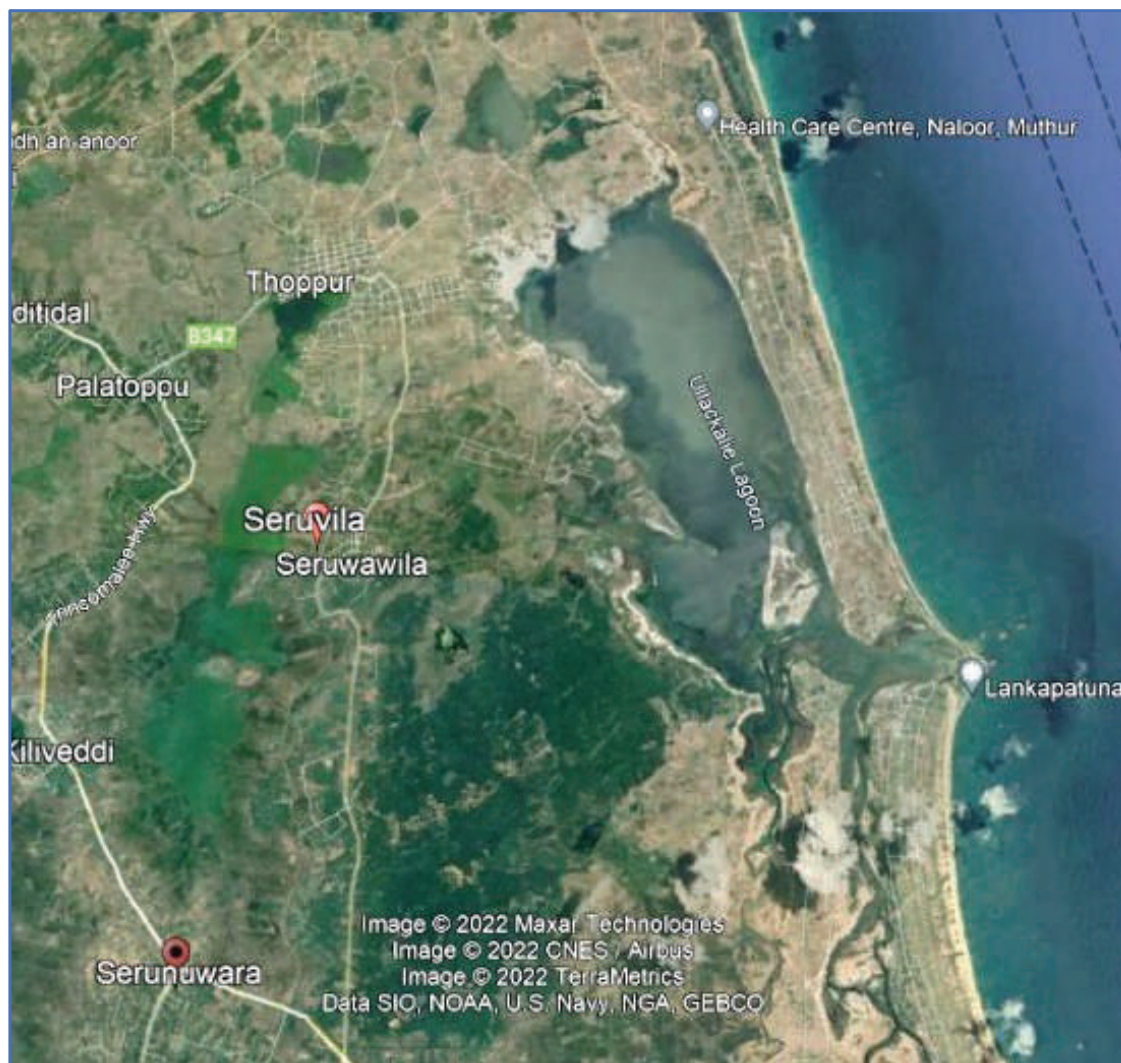
Ullackalie, (that) lies within the sanctuary.” This lagoon is seen clearly in the two maps above. However, the Allai Tank that is clear in the old map of 1952 appears to have been encroached upon, partially re-claimed, and covered with floating weeds, in the 2022 Google Earth image (next page). This is clear when viewed on screen.

The brackish coastal lagoon Ullackalie, lies partially within the sanctuary. There are extensive mangroves on the shores of the lagoon and at its southern end. The lagoon is permanent and up to 2m deep; it is fed by several small streams and is seasonally tidal. During the rainy season, the lagoon is connected to the Verugal River to the south by

a seasonal channel, the Uppu Aru. The lagoon provides habitat for large waterbirds, migratory ducks, and shorebirds. Seasonal floods along the Uppu Aru at the south end of the lagoon are particularly important for migratory waterbirds and supports a small fishery.

- Green, 1990 -

The town of Lankapatuna is at the end of the strip of land that forms the eastern border of the lagoon, north of the lagoon mouth (map below).



Allai Tank & Ullackalie Lagoon in 2022

Google Earth downloaded on 6.8.2022

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24 & 25

THE GREAT AND LITTLE SOBER ISLANDS SANCTUARY

Sober Island was first occupied by the French Admiral Jacob Blaquet de la Haye in 1672 and then by Admiral Suffren in 1782. It was named *Isle du Soleil* (Island of the sun) by the French. The British took over the island after the Treaty of Paris in 1784 and later developed it for their military requirements, re-naming it *Sober* in memory of one of their young officers; it was essentially a military establishment. It is presently under the control of the Sri Lanka Navy who run a Guest House on Great Sober Island, from where they run their diving tours for visitors – usually to the sunken ships and

aircraft in the harbour. There are corals and fish-life to be seen off the Minden Cove side of the large island, and elsewhere; the northern side is sandy, with pen shells (*Atrina vexillum*) and large ark shells (*Anadara oceanica*) on the sand bottom in the immediate vicinity of the shore. The Great Sober Island has many remnants of its past, in the form of French graves, WW II gun positions, underground ammunition storage complexes and many more relics of the British occupation.

- Internet-



Ceylon: One Inch, Trincomalee – Survey Department, 1962

The Great and the Little Sober Islands are two islands in Trincomalee, north of Clappenburg Bay, between the Trincomalee Inner Harbour and Koddiyar Bay. They were declared sanctuaries under the Fauna and Flora Protection Ordinance in 1963. They are listed under “Marine Protected Areas” in some compilations, but they appear to have been declared as such for historical and archaeological reasons, rather than to protect marine biodiversity. The protected area is the land within the shoreline of the two islands, but Perera and de Vos (2007) refer to the presence of coral reefs in the surrounding waters.

SCHEDULE

I. GREAT SOBER ISLAND AND LITTLE SOBER ISLAND SANCTUARY

All that area of land comprising the Great Sober Island and the Little Sober Island, situated in the Inner Harbour Trincomalee in Trincomalee Town and Graveta Division of Trincomalee District, in the Eastern Province and containing in extent $\frac{1}{2}$ square mile and $\frac{1}{10}$ square mile respectively, each such island being bounded by its shores.

The text of the schedule relating to the Great and Little Sober Islands published in the Ceylon Government Gazette of June 21, 1963.



References

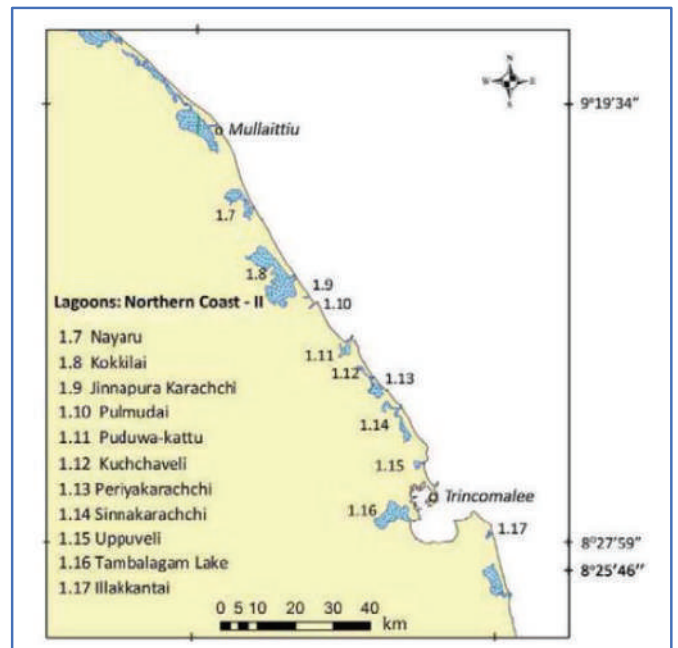
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26

KOKKILAI SANCTUARY

The Kokkilai Lagoon, situated south of the Nayar Lagoon, is a large estuarine lagoon. The lagoon and the surrounding area was designated as a bird sanctuary in 1951. The Integrated Strategic Environment Assessment of the Northern Province report (Mallawatantri et al, 2014) proposed to upgrade the Kokkilai Sanctuary (1995 ha in extent) as a National Park as it included highly significant waterbird habitats; but this has not been done.

This Lagoon contains seagrass beds, oyster beds, mangrove swamps, deltas, and mudflats. The western and southern shores in particular are bounded by cultivated lands, scrub forest and some open forest patches. The lagoon is always busy



Map reproduced from E.I.L. Silva et al, 2013, from an IWMI publication.

with mundane fishing activities. The source of this information is not recorded—the only contemporary information from newspaper reports is that there has been much illegal clearing of land in the vicinity.

The following summary is based on the 1990 IUCN Directory of South Asian Protected Areas (Green, Ed., 1990).

Kokkilai is a large estuarine lagoon with extensive seagrass beds and some small patches of mangrove swamp and mudflats, particularly along the western and southern shores. The lagoon is fed by several small streams and is linked to the sea by a narrow, seasonally tidal channel. For much of the year the channel is blocked by a sand bar. The



Map prepared by Samangi Alawattagama

maximum depth near the mouth of the channel is about four metres. The water is brackish, the salinity increasing seasonally.

The lagoon was said to be inhabited by many species of waterfowl and had been famous as a wintering area for “large numbers of greater

flamingos *Phoenicopterus ruber*.” The lagoon was reported as being situated in a densely populated region with many small villages, the population indulging in prawn fishing, rice cultivation and some shifting cultivation.

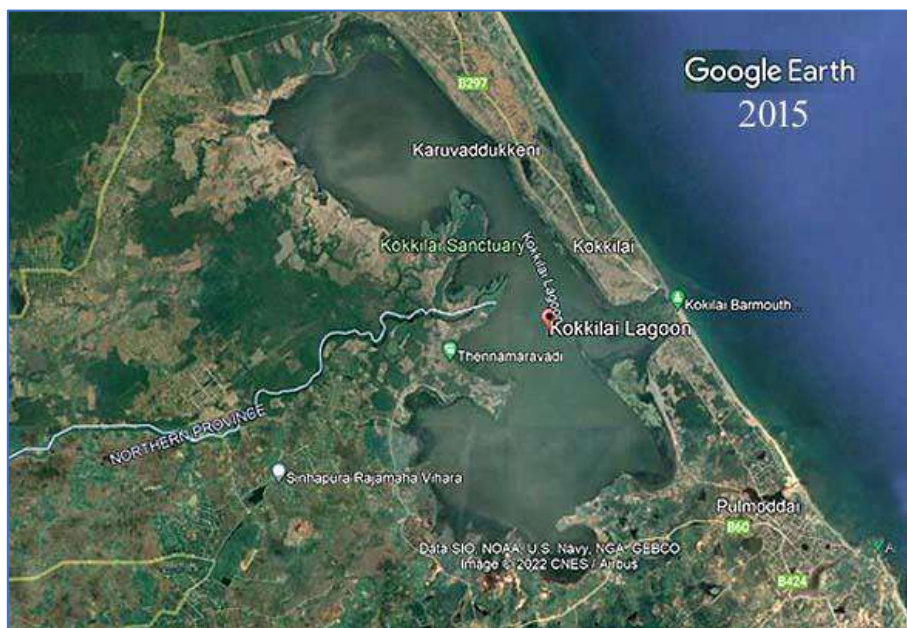
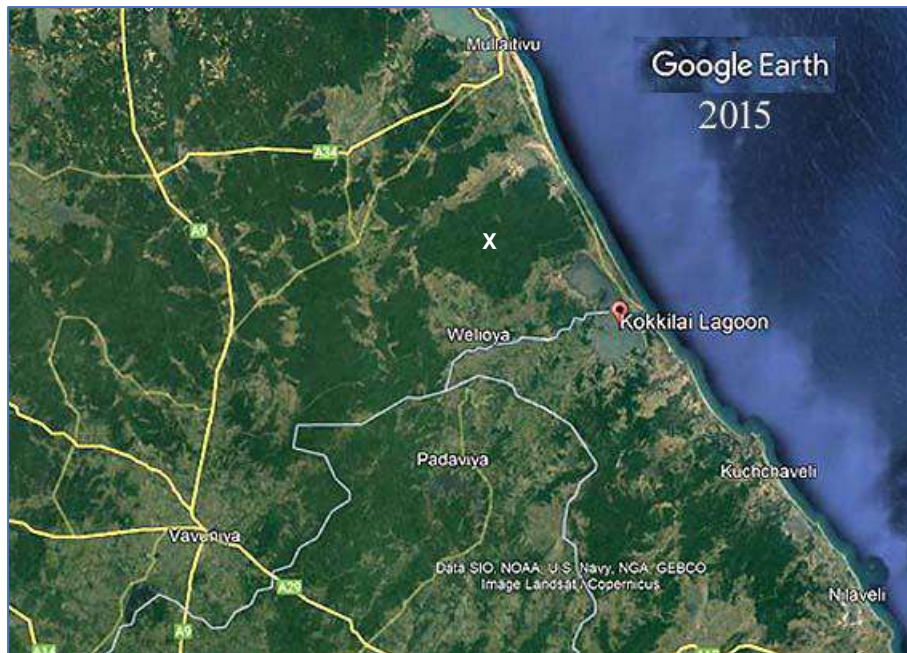
The article comments that the degree of protection was reportedly very low. Pointing out that the lagoon supports a major prawn fishery, it goes on to say that in some years the mouth of the lagoon remains permanently blocked by the sand bar, preventing recruitment of post-larval prawns. It also mentions that parts of the lagoon are used for aquaculture and that nearby forests are being cleared for cultivation.

The area at full supply level was said to be approximately 2,995 ha.’ - Green, 1990

[Google Earth maps next page]

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Google Earth images, at two different magnifications, showing the ground situation in 2015. The large green patch to the north of the lagoon (upper image marked 'X') is a forested area. Does this still exist? The dark green areas rimming the lagoon (in the enlarged image below) are probably mangroves.

NATIONAL PARKS WITH MARINE COMPONENTS

The three National Parks with marine and wetland components are described in this section. The individual protected areas are large. The “marine” components, as recorded in a DWC table, range from 0.1% to 18% of the total area and consist of coastal habitats, lagoons, and other inland aquatic habitats, mostly brackish.

-
- 27. Ruhuna (Yala) National Park, 241,864.47 ha.
 - 28. Kumana National Park, 88, 129.49 ha.
 - 29. Bundala National Park, 9,137.98 ha.

27

RUHUNA (YALA) NATIONAL PARK

The Ruhuna National Park, 97,881 ha in extent, lies 24 km north-east of Tissamaharama on the south-east coast of Sri Lanka. It is at the centre of one of the largest agglomerations of protected areas in Sri Lanka. The Yala Strict Natural Reserve, 28,904 ha in extent, is an integral part of the Ruhuna NP, which is contiguous with the Kumana NP that was formerly known as Yala East National Park but changed to its present name on 5 September 2006. The Ruhuna NP is commonly called “Yala” and consists of a number of Blocks that were added over the years, as the park expanded (coloured map).

Block I of Ruhuna NP (14,101 ha) was established on 25 February 1938, having previously been a

Resident Sportsmen’s Shooting Reserve since 1900. Block II (9,931 ha), originally proclaimed as the Yala Sanctuary in 1900, was established on 3 September 1954; Block III (40,775 ha) on 28 April 1967; Block IV (26,418 ha) on 9 October 1969, and Block V (6,656 ha) on 5 October 1973. The Yala Strict Natural Reserve was created on 1 March 1938. Three Sanctuaries (Kataragama, Katagamuwa and Nimalawa) are contiguous with the Ruhuna National Park; Lunugamvehera NP adjoins the western border of Block 5.

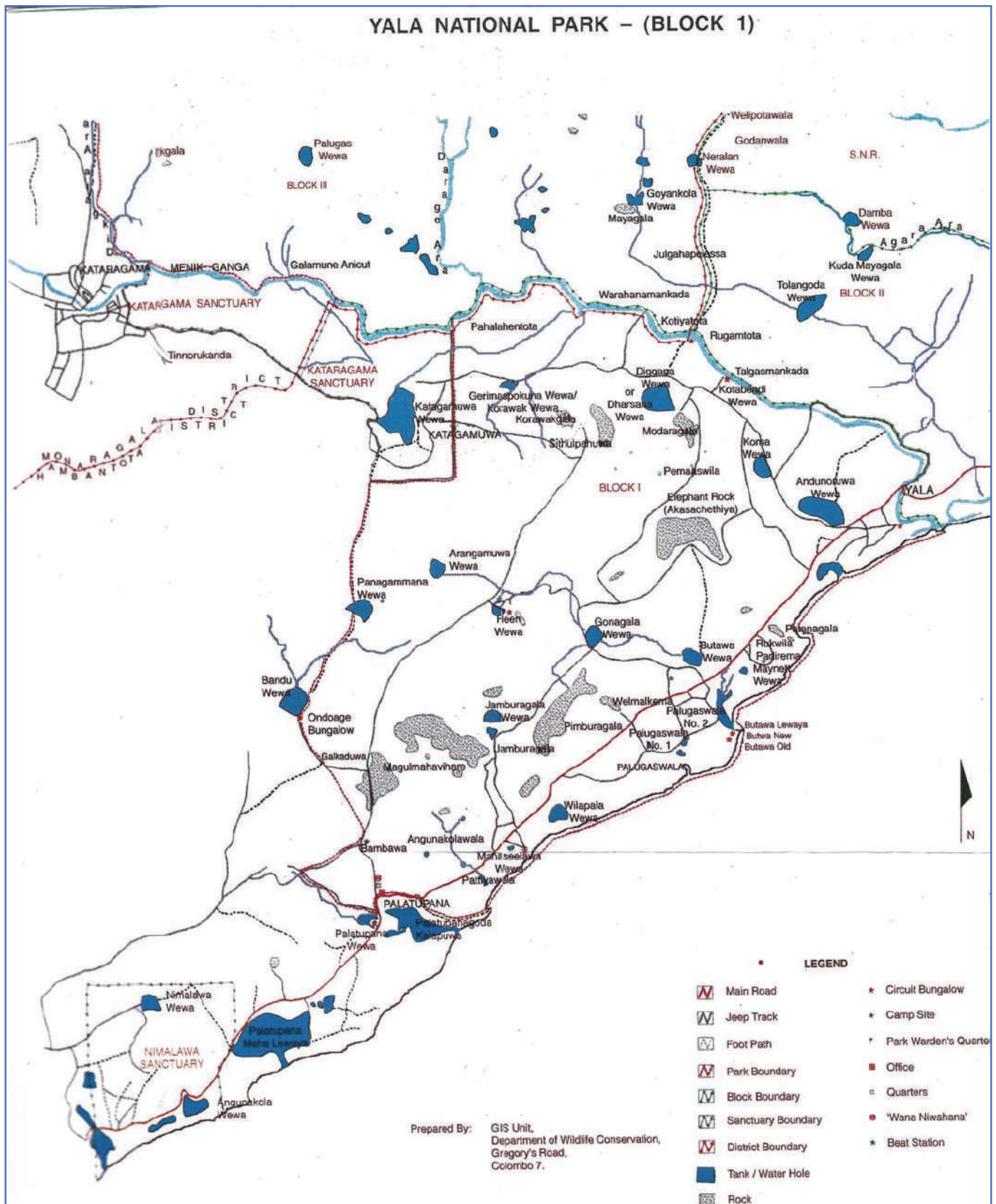
The park comprises of a coastal plain with a number of scattered inselbergs (rock outcrops), associated with which are a number of caves



Source: Internet

and rock pools termed 'kema' and a complex of freshwater and brackish water wetlands including seasonal freshwater ponds, large and small abandoned tanks, waterholes, rivers and seasonal streams, coastal lagoons, estuaries, small patches

of mangroves and marshes which are spread out within the park (mainly within Blocks I and II). Amongst the largest tanks are the Yodha Wewa (480 ha) and Bandu Wewa near Block I.



Map of Yala Block 1. The inselbergs (rock outcrops) are in grey, the tanks and lagoons in blue. Source: A Guide to National Parks of Sri Lanka, Dept. of Wildlife Conservation, 2001

The area is rich in biodiversity and important for elephant and water bird conservation. Mangrove vegetation is widespread in the estuaries of Menik Ganga and Kumbukkan Oya. Some of the important lagoons within the area are Buttuwa, Udapothana, Mahirawa, Etiliu and Udagajaba. Mangroves in Block II, with a total extent of 100 ha, are mainly distributed around the Menik Ganga estuary. They are also found in the lagoon areas of Pilinnewa, Mahapothana, and Pahalapothana. The main mangrove species are *Rhizophora mucronata*, *Sonneratia caseolaris*, *Avicennia* spp. and *Aegiceras corniculatum*.

The lagoon fauna includes various species of prawns, crabs, and fishes (Scott, 1989). The beach adjoining the National Park is a nesting ground for all five species of globally endangered marine

turtles that visit Sri Lanka, including the green turtle (*Chelonia mydas*), olive ridley (*Lepidochelys olivacea*), and leatherback (*Dermochelys coriacea*), for which the Yala coastline is a major nesting ground (Hewavisenthi, 1990). Sri Lanka and the Andaman and Nicobar islands are the only areas in South Asia to have nesting populations of leatherback turtles. They nest mainly on beaches located in the dry zone of the southern coast (seaturtlesofindia.org).

Patanangala, on the coast of Block I, is used as a base by migrant fishermen to fish around the coastal stretch of Patanangala from late September to early April, with permits issued by the DWC.

- Green, 1990; National Wetland Directory, 2006 -

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28

KUMANA NATIONAL PARK

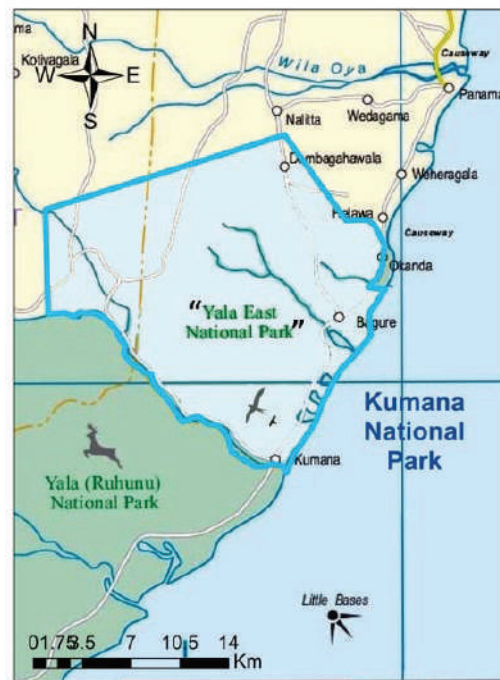
The Kumana National Park, established in December 1969 as 'Yala East', is one of the most important nesting and breeding grounds for birds in Sri Lanka. It is famed for its large flocks of migratory waterfowl and other water birds. The park is 391 kilometres (243 mi) southeast of Colombo on Sri Lanka's south-eastern coast. Kumana is contiguous with the Yala National Park. Formerly known as the Yala East National Park, it was changed to its present name on 5 September 2006. The Panama-Kudumbigala Sanctuary abuts it to the north-east.

The Kumbukkan Oya forms the southern boundary of the national park, and its south-eastern boundary is the coastline up to Okanda. Some 20 lagoons and tanks support the extensive birdlife of the national park. The lagoons are shallow with depths less than 2 metres (6.6 ft). Kumana villu is subject to occasional inundation with seawater. On

account of its importance as a breeding ground for migratory water birds, part of the area, together with adjoining protected habitats, was declared a Ramsar site in 2010 as the **Kumana Wetland Cluster**. (Wikipedia, 16.7.2022 and assorted internet sources.)

The Kumana Wetland Cluster

This Ramsar Site (19,011 ha; 6°37'N, 81°44'E), designated in 2010, falls within two existing protected areas, Kumana National Park, and the Panama-Kudumbigala Sanctuary. Located South-east of Sri Lanka in the Ampara District, this site



Map prepared by Samangi Alawattagama

consists of a diversity of coastal wetland habitats, including lagoons, estuaries, irrigation reservoirs, mangroves, and salt marshes, interspersed with sand dunes, scrubland and forest vegetation. The site provides excellent feeding and resting habitats for a large number of threatened wetland species, including three turtle species: the Green Turtle (*Chelonia mydas*), Loggerhead Turtle (*Caretta caretta*), and the Olive Ridley Turtle (*Lepidochelys olivacea*). Other threatened species include the globally vulnerable Mugger Crocodile (*Crocodylus palustris*), bird species like the vulnerable Lesser Adjutant (*Leptoptilus javanicus*), and mammals such as the endangered Fishing Cat (*Prionailurus viverrinus*). The productive coastal wetlands support a thriving near-shore fishery that includes

commercially important crustaceans such as *Penaeus* spp., and *Macrobrachium* spp. (see box below), and also offer refuge for their juvenile stages.

Threats to the site include disturbance by increasing visitor numbers, increased siltation around lagoons due to cattle grazing while

surrounding areas face the problem of illegal logging, poaching and excessive use of chemicals for agriculture. The Department of Wildlife Conservation, under the Fauna and Flora Protection Ordinance of Sri Lanka is directly responsible for managing this diverse and culturally rich wetland. (Ramsar Site Information Sheet: 29.10.2010)

RAMSAR SITES IN SRI LANKA

RAMSAR has accredited seven sites in Sri Lanka as wetland sites: Vankalai Sanctuary, Wilpattu Ramsar Wetland Cluster, Anawilundawa Tanks Sanctuary, Madu ganga, Bundala and Kumana Wetland Cluster, and the most recent, the Colombo Wetland City, in October 2018.

The latter site includes the following wetlands:

Baddagana wetland, Diyasaru wetland, Heen ela wetland, Kolonnawa wetland, Kotte wetland, Maddinnagoda wetland, Mulleriyawa wetland, and the Thalangama wetland.

- Environment Foundation (Guarantee) Limited, 2018 -



Photo: Nilmi Rodrigo, Kandalama

GIANT FRESHWATER PRAWN

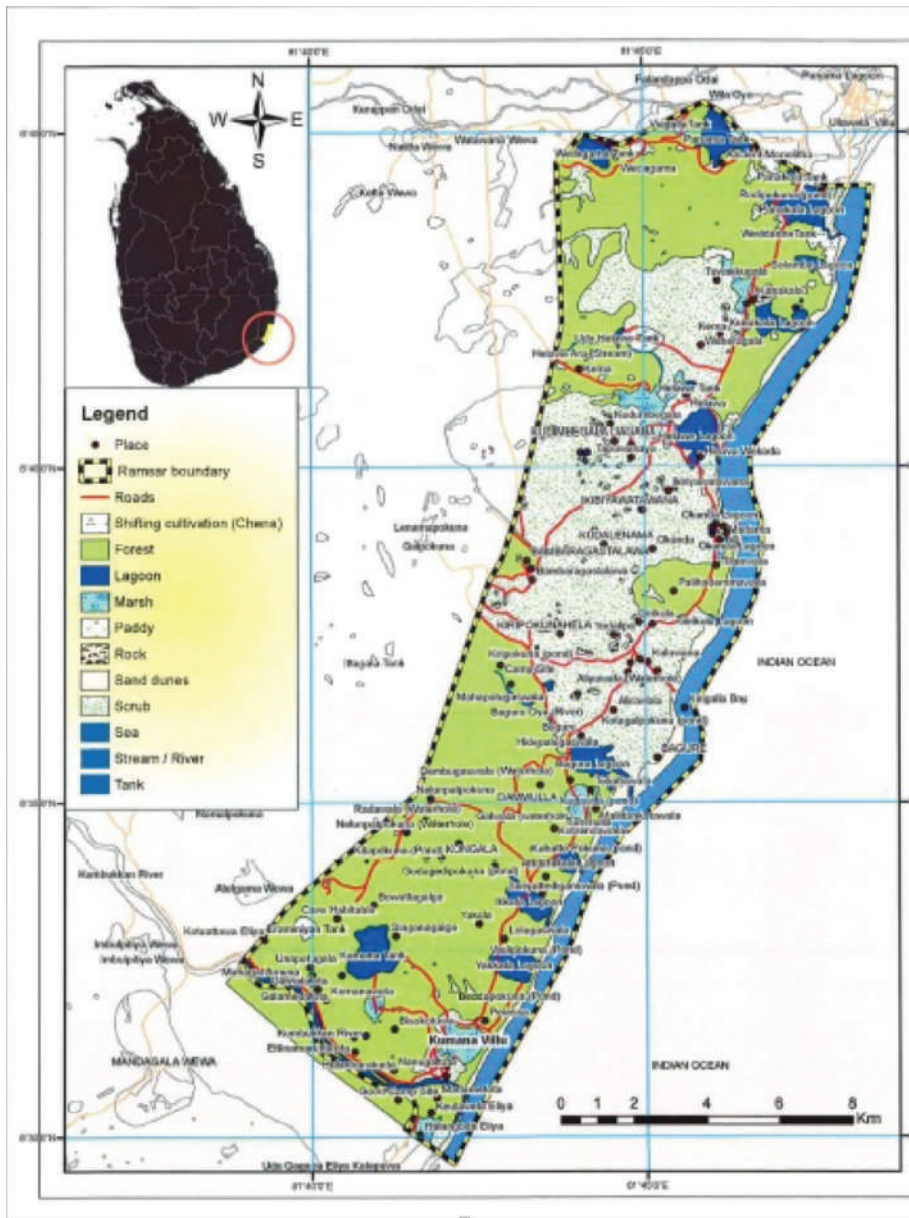
'Andu issa' (S)

"M. rosenbergii is one of the most economically important freshwater prawn species due to its taste and premium market value, which makes it as one of the fittest species for extensive culture" – New et al, 2010 cited by Rajeevan et al, 2021.

Seven *Macrobrachium* species were identified from the southern part of Sri Lanka during a study by Keizo Obuchi (2008). These prawns live in estuaries and rivers. Larvae which hatch in freshwater will die unless they reach brackish water within a few days. After metamorphosing into post-larvae they become mainly crawling rather than free-swimming animals, able to tolerate a wide range of salinities. They migrate into freshwater conditions within one or two weeks. They are omnivorous feeders.

They are cultured in inland waters by seeding with post-larvae.

- FAO: Farming freshwater prawns -



MAP OF THE KUMANA WETLAND CLUSTER

Map downloaded from Ramsar Site Information Service – 16.7.2022

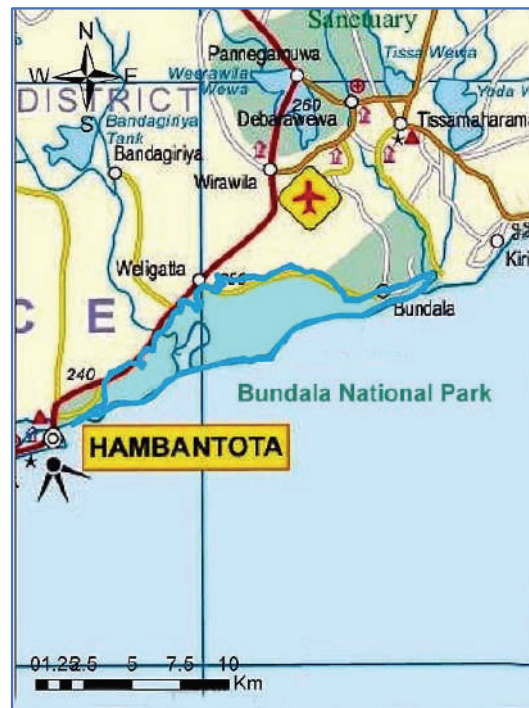
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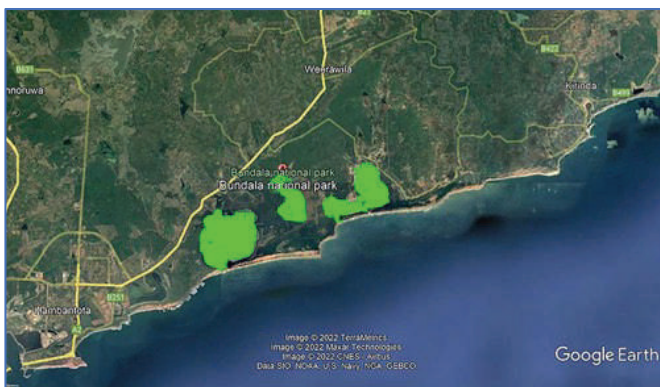
29

BUNDALA NATIONAL PARK

The Bundala National Park is located about 250 km southeast of Colombo in the Hambantota District of the Southern Province. A 2018 table provided by the DWC and quoted in the IUCN, Marine Protected Areas website in 2022 gives the total area as 9,137.98 ha of which 18% (1,706.2 ha) consists of marine and brackish water habitats. The figures are somewhat different in the 2006 IWMI report of the Bundala Wetland Cluster, where the total area of the National Park is given as “3,698.010 ha; of which 1,990 ha are wetlands.”



Map prepared by Samangi Alawattagama



Location of the three lagoons of Bundala NP

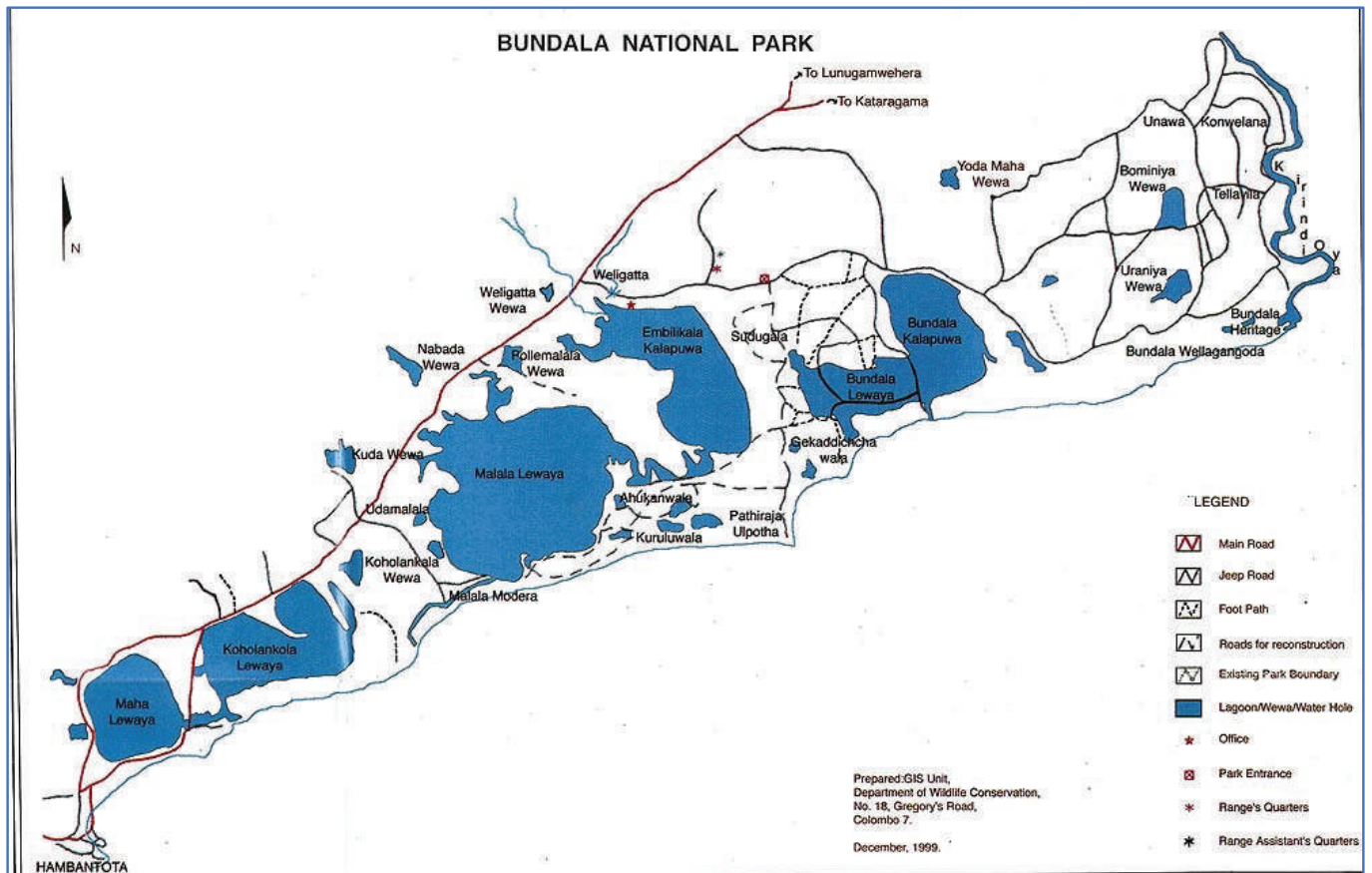
Bundala was first named as a wildlife sanctuary on 5th December 1969. Later, it was designated as a wetland of international importance at the time of Sri Lanka’s ratification of the Ramsar Convention on 15th October 1990, making it the first Ramsar site in Sri Lanka. The state then redesignated it to a National Park on 4th January 1993. However, the park was re-gazetted in 2004 and the original park area was reduced from 6,210 ha to 3,698.010 ha. Having been acclaimed for its rich diversity of bird

and plant species, Bundala was nominated as a biosphere reserve by UNESCO in 2005, the fourth Man and Biosphere Reserve in Sri Lanka.

In 1993 a wetland site report and conservation management plan were developed by the CEA under the Wetland Conservation Project. The DWC prepared a detailed management plan for Bundala in 1997, under a GEF project. The recommendations of this plan are gradually being implemented. The DWC has also initiated several conservation projects in Bundala, including a turtle conservation programme, and an invasive alien species eradication programme targeting the removal of *Prosopis juliflora* and *Opuntia dillennii*. In June 2006, an area adjoining Bundala National Park

covering an area of 3,339.38 ha was declared as the Wilmanna Sanctuary (see map below.)

- IWMI, 2006; EFL/DWC, 2021; Wikipedia, 11.7.2022.



Source: A Guide to National Parks of Sri Lanka, Dept. of Wildlife Conservation. 2001

covering an area of 3,339.38 ha was declared as the Wilmanna Sanctuary (see map below.)

- IWMI, 2006; EFL/DWC, 2021; Wikipedia, 11.7.2022.

The Park consists of several major terrestrial vegetation/habitat types (dry thorny scrubland, arid zone forests, sand dune vegetation, gentle seashore vegetation, arid zone maritime grasslands/pastures, riverine forests, anomalous Mesquite scrublands, and six wetland types (salt marsh, mangrove, brackish water lagoons, sandy and rocky seashore, seasonal water holes and tanks, salterns). A total of 383 plant species have been documented from these habitats, with dry thorny shrubs and herbs being the predominant plant life in Bundala. A very small and degraded patch of mangrove can be found at the Bundala lagoon outlet area, consisting of *Lumnitzera racemosa*.

zones: beach and sand dune area; immediate inland coastal plain including the lagoon area; and



Opuntia dillenii

The area can be divided into three main relief

hinterland of the eroded peneplain forming the undulating country of low hills and wide valleys. The low country dry zone climate prevails in the area, with an average annual rainfall of 1,074 mm.

The Bundala Lagoons

Bundala (520 ha) is a brackish water lagoon with an average depth of less than 1 m, separated from the sea by a natural sandbar. Part of the Bundala lagoon has been converted into a saltern. Embilikala (430 ha) is a low saline lagoon immediately west of the Bundala Lagoon. Malala (650 ha) is similar to Embilikala and is connected to it by a narrow channel. It receives freshwater from the Malala Oya. The westernmost lagoon,

Koholankala (390 ha) has been developed for salt production and is subjected to widely fluctuating water levels. Salinity levels exceed 30 ppt during dry periods.

- IWMI, 2006; 2011-2014.

Conservation activity

EFL has partnered with the Department of Wildlife Conservation to adopt 600 acres of land, that was once affected by invasive plant species – *Prosopis juliflora* and *Opuntia dillenii*.

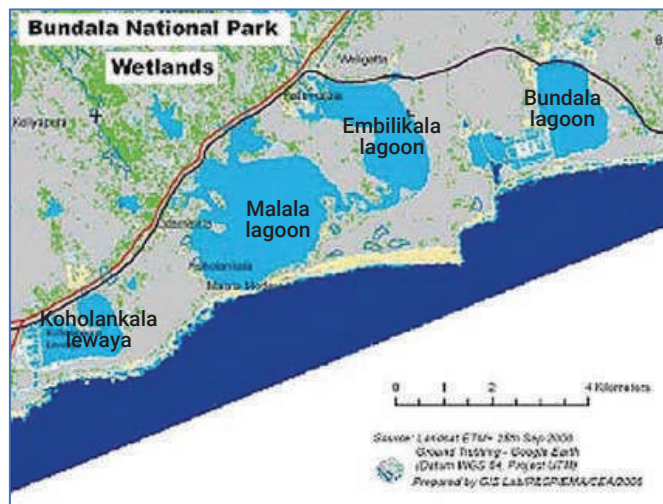
Over the next five years, EFL will work to plant 125,000 trees to increase forest cover to revive the park's natural habitat and ecosystem.

- from a 2021 website: reference No. 6

It has not been possible, at the date of writing (16.2.2023), to confirm this, or obtain information regarding the effectiveness of the programme.

Turtle nesting

The coast is a breeding ground for endangered sea turtles. All five species of endangered sea turtles nest here.



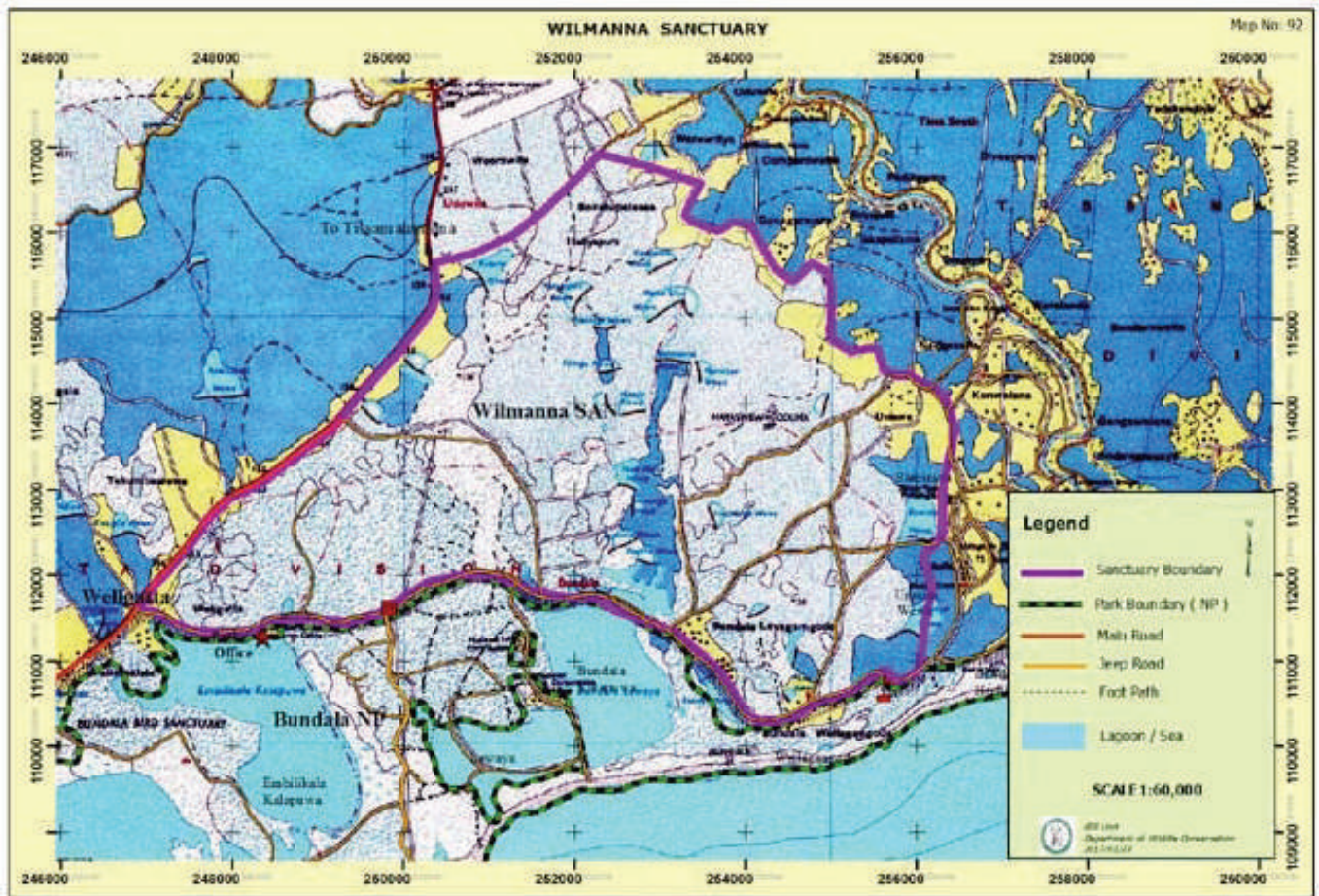
Source: IWMI, 2006

UPDATE 2.2.2023

The spread of *Prosopis juliflora* and *Opuntia dillenii* have been controlled by regular uprooting of the plants. It has been observed that encouraging the growth of indigenous species by regularly destroying emerging *Prosopis* plantlets contributes to reducing the re-establishment of *Prosopis*, that otherwise shows re-growth by the third year. – pers. comm. Channa Suraweera.

- Edirisinghe et al, 2018; Ratnayake et al, 2019. -

WILMANNA SANCTUARY



Source - DWC

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UPDATE ON BUNDALA NP INVASIVE SPECIES – October 2024

Based on the Sri Lanka Natural History Society publication Natural History Snippet No.22- *Bundala National Park and its troublesome invasives*, downloaded from <https://www.sltnhs.lk/snippets.php>

Prosopis juliflora (Sw.) DC [mesquite, katu andara], has become an invasive weed in many countries where it has been introduced. It was planted in Hambantota in the 1950s as a shade and erosion control tree, dry and arid conditions being its natural habitats in its native Mexico, South America and the Caribbean. It soon invaded the grasslands in and around

Hambantota and the Bundala National Park. It can now be seen in the Puttalam area too. In the Bundala NP its spread has been at the expense of the pre-existing natural flora. Eradication programmes have shown that physical removal of mature trees should be followed up by removal of emerging plants and replanting with native flora.



1. Mesquite forest between Bundala and Hambantota, seen from the road



2. A young *Prosopis* plant. 3. An older tree showing the low spreading canopy.



4. Foliage. 5. Inflorescence. 6. *Prosopis* eradication activity within the park.

UPDATE ON BUNDALA NP INVASIVE SPECIES – October 2024 continued

Opuntia dillenii (Ker Gawler) Haworth and the Cochineal scale insect.

O. dillenii, the prickly pear, belongs to the family Cactaceae and is native to the Caribbean Islands and North and South America. It was introduced to Sri Lanka as an ornamental plant in the 19th century and subsequently became an invasive species along the coastal stretch between Hambantota and the Ruhuna National Park, including the Bundala National Park, where it became a serious pest. Physical eradication was difficult owing to the nature of the plant, it being difficult to handle because of the long, sharp spines.

It is said that the insect was introduced to Bundala NP from elsewhere in the country, but Galappaththi et al (2021) suggest that the Cochineal insect has been around on *Opuntia* for a long time—perhaps it was



introduced along with the cactus in the first place.

Dactylopius opuntiae (Cockerell, 1929) is the species of cochineal identified from Bundala cacti. All species of the family Dactylopiidae have females with an oval-shaped body that is purple-red in colour and covered in a white, cotton-like wax. This wax protects the

body of the cochineal from heat, cold, and predators. Adult females are sessile and form colonies of up to a few thousand individuals of mixed age, creating conspicuous clusters of white wax all over the plant. The males are winged and seldom seen.



Cottonwool clumps of *Dactylopius opuntiae* on the pads of *Opuntia dillenii* seen by the roadside at the Bundala lagoon. One such clump macerated on a finger released the carmine dye. Careful parting of the waxy filaments might have shown the insects inside.

The prickly pear cactus is still found in the Bundala National Park, but in small patches. The cochineal scale insect has been able to keep it in check. The mesquite *Prosopis* is also still found in the National Park, but nowhere as extensive as it had been in the past. However, there are dense forests of it outside the Park, visible from the road to Hambantota. Physical eradication continues in the Park.

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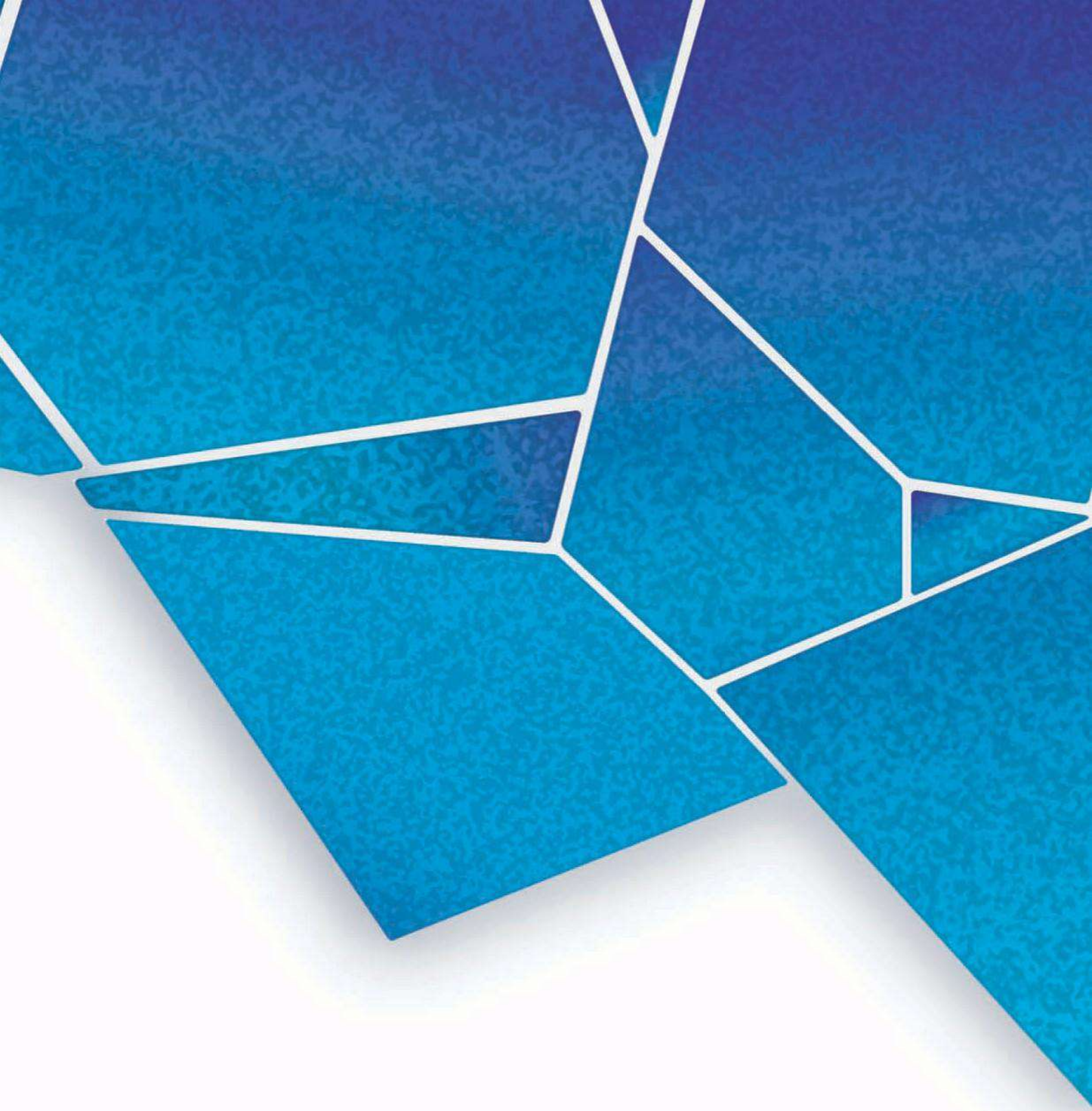
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