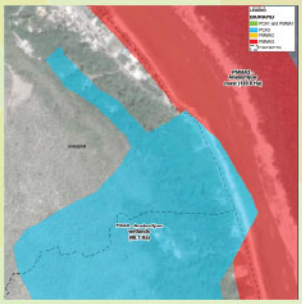
Integrated Island Biodiversity

Technical Series

Management Plan for the Ijuw/Anabar Wetlands Proposed Conservation Area

Republic of Nauru



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Our vision: A resilient Pacific environment sustaining our livelihoods and natural heritage in harmony with our cultures.

MANAGEMENT PLAN FOR THE IJUW/ ANABAR WETLANDS PROPOSED CONSERVATION AREA (PCA)

Prepared by

The Secretariat of the Pacific Regional Environment Programme
(SPREP)

for

The Department of Commerce, Industry and Environment
(DCIE)

CONTENTS

1. INTRODUCTION

1.1Purpose

The management plan describes the priority strategies for the Ijuw/Anabar wetlands Proposed Conservation Area (PCA) that will best maintain and improve the key conservation values in this area by reducing the impact of threats, including from climate change.

1.2 Rationale

The Ijuw/Anabar wetlands are 1 of 8 sites recommended for conservation action through a recent Rapid Biodiversity Assessment (BIORAP) for Nauru completed in June 2013. The Nauru GEFPAS Integrated Island Biodiversity (IIB) project had provided a timely opportunity to develop a management plan for this site to facilitate its rehabilitation, protection and conservation.

1.3 Structure

The structure of the management plan is consistent with wetland management planning guidance provided by the Ramsar Convention on Wetlands. The structure was refined based on suggestions received from participants at a national stakeholder's workshop of the GEFPAS Integrated Island Biodiversity Project (IIB) project, held on 22-23 October 2015.

Ijuw/Anabar wetlands. Photo: SPREP 2016

2. LEGISLATIVE AND POLICY CONTEXT

2.1 Core National Legislation And Policy

There is currently no specific national legislation covering the conservation of rare, threatened or endangered biodiversity and threatened ecosystems in Nauru. An Environment Act (1984) exists but is still in draft form. A draft Environmental Management Bill[1] was submitted for parliamentary approval in 2011, but it has still not been enacted. The Nauru Fisheries Act 1997 which repeals the Marine Resources Act 1978 makes provision for the management, development, protection and conservation of the fisheries and living marine resources of Nauru. A Coastal Fisheries Bill (2007 draft) exists and adequately covers inshore fisheries but needs further refinement and integration into the Fisheries Act, as it currently has stand-alone status.

The Ijuw/Anabar Wetlands PCA is currently not protected under any national legislation.

The Republic of Nauru National Sustainable Development Strategy (NSDS) 2005-2025, revised in 2009 is particularly relevant to the management plan, including through links with the following goal and strategies of the NSDS:

Goal:

"Environment: Sustainable use and management of the environment and natural resources for present and future generations".

Strategies:

"Establish a regulatory framework for the sustainable use and management of the environment and natural resources"

"Enhance development and management of biodiversity and ecosystem services to provide sustainable livelihoods while maintaining the biodiversity and ecosystems"

"Enhance resilience to climate change impacts"

The Republic of Nauru Framework for Climate Change Adaptation and Disaster Risk Reduction (RONAdapt, 2015) has as one of its priority strategies "to designate areas for conservation of Biodiversity" two relevant activities have been prioritized under this strategy:

"Land use planning to identify and protect areas of high biodiversity value"

"Establish conservation areas in partnership with the community"

[1] ADB, 2014. Solid Waste Management in the Pacific: Nauru Country Snapshot

2.2 The Ramsar Convention

The Convention on Wetlands is an intergovernmental treaty adopted on 2th February 1971 in the Iranian city of Ramsar, on the southern shore of the Caspian Sea. Though the convention is commonly known as the Ramsar Convention or Convention on Wetlands, the official treaty is called *The Convention on Wetlands of International Importance especially as Waterfowl Habitat*. This reflects the original emphasis upon conservation and wise use of wetlands primarily for the habitat for water birds. However, over the years, the convention has broadened its scope to cover all aspects of wetland conservation and wise use, recognizing wetlands as ecosystems that are extremely important for biodiversity conservation and especially for the well-being of human communities.

Nauru began its preparations for joining the Ramsar Convention in 2013 and upon becoming a Ramsar signatory, they would be expected to implement the following articles of the Convention:

Article 2.1 of the Ramsar Convention requires Parties to designate at least one wetland at the time of accession for inclusion in the List of Wetlands of International Importance (the "Ramsar List") and to promote its conservation.

Article 2.1 requires parties to continue to "designate suitable wetlands within its territory" for the List.

Article 3.1 is a general obligation under the Convention for Contracting Parties to include wetland conservation considerations in their national land-use planning. Under this Article, they have committed themselves to formulate and implement this planning so as to promote, as far as possible, **"the wise use of wetlands in their territory".**

In Article 3.2, the Parties have committed themselves "to arrange to be informed at the earliest possible time if the ecological character of any wetland in its territory and included in the List has changed, is changing or is likely to change as the result of technological developments, pollution or other human interference. The information on such changes shall be passed "without delay" to the Ramsar Secretariat.

Under Article 4, Contracting Parties undertake to establish nature reserves in wetlands, whether or not they are considered to be internationally important and included in the Ramsar List, and they also endeavor to promote training in the fields of wetland research, management and wardening.
Under Article 5, Contracting Parties agree to consult with other Contracting Parties about implementation of the Convention, especially in regard to trans-boundary wetlands, shared water systems, and shared species.

2.3 Other Relevant Legislation, Policies And Conventions

2.3.1 Legislation:

- Nauruan Antiquities Ordinance, 1935
- Wild Birds Preservation Ordinance, 1937
- Public Health Ordinance, 1925, amended 1967
- Lands Act, 1976
- Marine Resource Act, 1978
- Animals Act, 1982
- Litter Prohibition Act, 1983
- Agriculture and Quarantine Act, 1999
- Education Act, 2011

2.3.3 Policy Documents & plans:

- Disaster Risk Management Plan, 2008
- National Health Strategic Plan, 2010
- Water, sanitation and hygiene policy, 2012
- Solid Waste Policy, 2013 (draft)
- National Biodiversity Strategy & Action Plan (NBSAP, 2014 - revised draft)
- Republic of Nauru Framework for Climate Change Adaptation and Disaster Risk Reduction. (RONAdapt), 2015

2.3.4 Multi-lateral Environment Agreements International Conventions:

- The International Plant Protection Convention, 1951
- Treaty on the Non-Proliferation of Nuclear Weapons, 1970
- Convention on the Prevention of Marine Pollution by dumping of Waste and other Matter, 1972
- United Nations Convention on the Law of the Sea, 1982
- Convention for the Protection of the Ozone Layer, 1985
- Convention for the Protection of the Natural Resources and Environment of the South Pacific Region, 1987
- United Nations Framework Convention on Climate Change, 1992
- Convention on Conservation of Biological Diversity, 1992

2.3.5 Regional Conventions

- Convention on the Conservation of Nature in the South Pacific (Apia Convention) 1976
- South Pacific Forum Fisheries Agency Convention, 1979
- South Pacific Nuclear Free Zone Treaty, 1985
- Protocol for the Prevention of Pollution of the South Pacific Region by Dumping, 1986
- Protocol Concerning Cooperation in Combating Pollution Emergencies in the South Pacific Region, 1987
- Convention for the Prohibition of Fishing and Long Driftnets in the South Pacific, 1989
- Convention for the Protection of the Natural Resources and Environment of the South Pacific Region (SPREP/Noumea Convention), 1990
- Convention to Ban the Importation into Forum Island Countries of Hazardous and Radioactive Wastes and to control the Trans boundary Movement and Management of Hazardous Wastes in the South Pacific Region, 1995

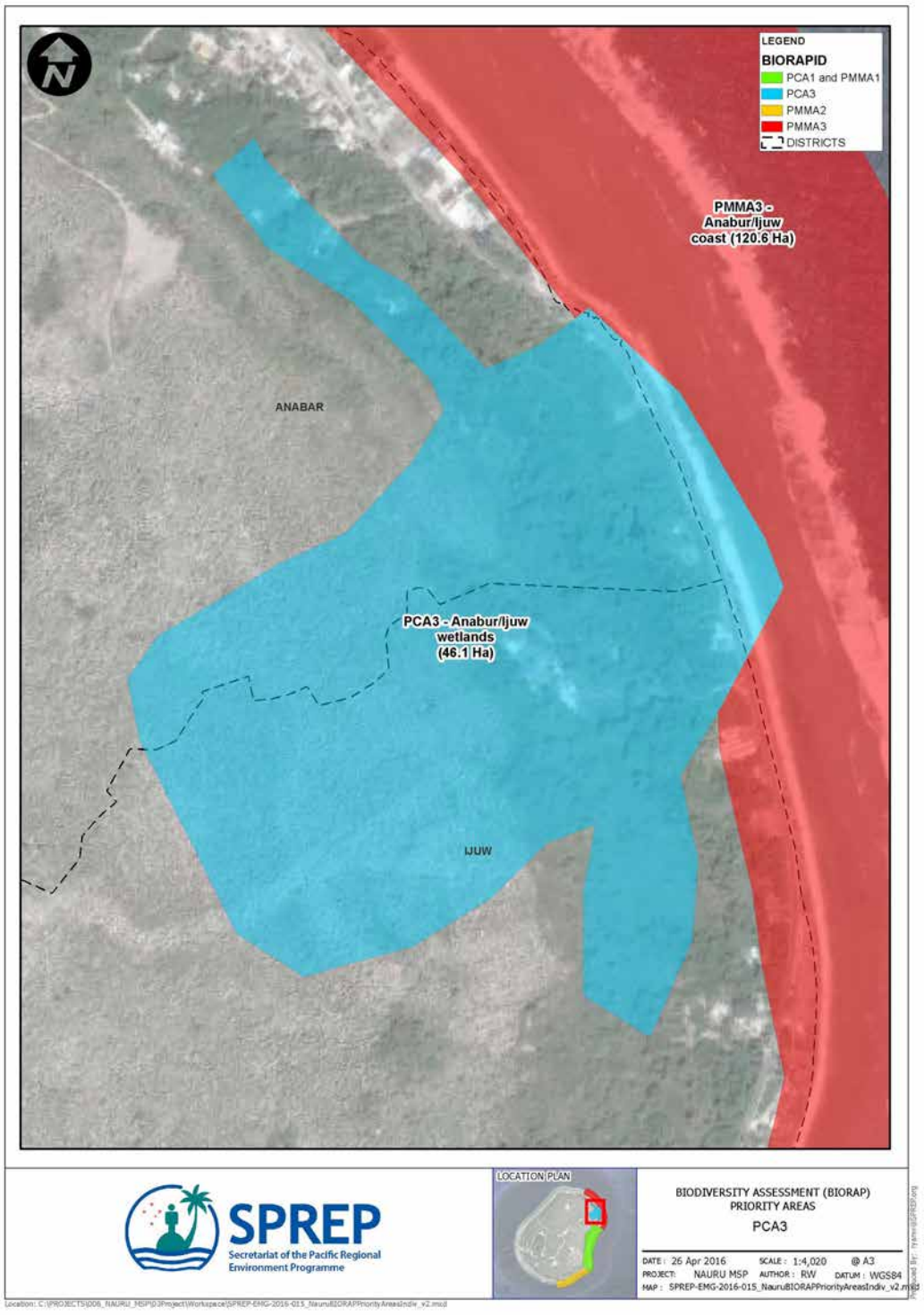
3. SITE DESCRIPTION

3.1 Physical Profile

3.1.1 General Description

The Ijuw/Anabar wetlands PCA consist of landlocked anchialine ponds that lie on the north-east of the island and cover an area of approximately 46.1 hectares. The site falls within the districts of Anabar and Ijuw. Figure 1 below (in blue colour) shows the location and proposed boundaries of the PCA.

Figure 1 - Map of Ijuw/Anabar wetlands PCA (Source: SPREP, 2016)



The PCA is accessed by a number of short trails from the side of the main road and behind residential areas in both districts.

3.1.2 Geology & Soil

Nauru is a small oval shaped uplifted atoll island located close to the equator at 166°56' E longitude. Its 300km west of Kiribati's Banaba island, 2000 km east-northeast of Papua New Guinea, 4450 km south-southeast of the Philippines[2] and about equal distances to Hawaii in the northeast and Australia in the southwest[3] . Geological studies demonstrated a raised atoll capping a volcanic seamount rising from the ocean floor depth of 4300m which formed from about the mid-Eocene to the late Miocene periods[4].

The land area is about 21.3 square km with a coast line circumference of 30km long. The landscape is comprised of a narrow coastal plain about 50 to 300m wide, encircling an upraised central plateau of limestone escarpment which cover about 80% of the total dry land of some 30m in elevation to a highest point of 70m . There are no rivers or surface freshwater bodies but an inland brackish water lake, the Buada Lagoon, on a fertile depression at the southwest; a few anchialine ponds on the north eastern and an underground lake at a Moqua Cave in the southeast coastal portions of the island .

The coastal soils of Nauru in general are of thin layers and very poor in the essential minerals for healthy plant growth and agricultural development. Soil fertility therefore depends highly on organic matter from shrub and forest vegetation cover, for nutrients and water retention. The soils of the Ijuw/Anabar wetlands PCA are waterlogged, dark, rich in organic matter and low in oxygen concentration.

3.1.3 Biodiversity

The Nauru Rapid Biodiversity Assessment (BIORAP) of 2013 identified the site as having the most valuable brackish open water habitats for birdlife, significant areas of mangroves (both *Bruguiera* and *Rhizophora* spp.) and supports the richest mix of vegetation of the coastal plain. The PCA also has high scenic values, is important for terrestrial reptiles, holds native vascular plants and supports some seabird species found in Nauru.

The BIORAP confirmed that the PCA contained stands of the oriental mangrove (*Bruguiera gymnorrhiza*) and this species was recommended by the BIORAP for conservation because of its ecological contribution to the productivity of the wetlands through the production of leaf litter and its role in purifying water. Other woody tree species commonly associated with *Bruguiera gymnorrhiza* and present within the site include *Thespesia populnea* (Portia tree, itira) and the shrubby *Clerodendrum inerme* (eamwije). Species less common in the site include the vine *Derris trifolia*, the shrub *Vitex trifolia* (derris, dagaidu), and the sedge *Mariscus javanicus* (reyenbangabang?). The associated species are typical littoral strand and freshwater marsh species. The spotted mangrove (*Rhizophora stylosa*) was recorded at the site by Thaman et. al. (2009)[5], however, was not seen during the BIORAP survey.

There is currently no record of invasive flora found within the wetlands and so remains an information gap to be addressed for the site. Invasive fauna that occur within the site is the *Mozambique tilapia* (Orechromus mozambicus), which was introduced to the wetlands in the 1960s and has since multiplied there.

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[2] Mckenna, S. et. Al Nauru's Rapid Biodiversity Assessment Report, 2015

[3] Ibid

[4] Australian Journal of Earth Sciences: Structure and Evolution of Nauru Island, central Pacific Ocean, Vol. 36, Issue 3, 1989 and Government of Nauru, Nauru's National Biodiversity Strategy and Action Plan, 2013

[5] Thaman, R.R. et. al. 2009. Plants of Nauru. SPC, Suva Fiji.

3.2 Climate

3.2.1 Current climate

Air temperatures in Nauru are fairly constant throughout the year and so are closely related to sea-surface temperatures. The wet season usually start in November and continues to April of the next calendar year. Drier conditions occur during the months of May to October while rainfall is affected by both the Inter-tropical Convergence Zone and the South Pacific Convergence Zone. The main influence on inter-annual climate variability in Nauru is the El Nino-Southern Oscillation. The sea level rise near Nauru measured by satellite altimeters since 1993 is about 5 mm per year. The main climate extreme experienced by Nauru is drought, which can last as long as three years. Nauru does not experience tropical cyclones.

3.2.2 Climate Projections

The following represents the expected climate future for Nauru[6]:

- Surface air temperatures and sea surface temperatures are projected to continue to increase (very high confidence)
- Annual and seasonal mean rainfall is projected to increase (high confidence)
- The intensity and frequency of days of extreme heat are projected to increase (very high confidence)
- The intensity and frequency of days of extreme rainfall are projected to increase (high confidence)
- The incidence of drought is projected to decrease (moderate confidence)
- Ocean acidification is projected to continue (very high confidence)
- Mean seal level rise is projected to continue (very high confidence)

3.3 Socioeconomy

3.3.1 Cultural Significance

There are no known myths or legends associated with the site. In addition, the site has no known archaeological values and no related assessments have been carried out at the site.

However, the site supports species that are known to have traditional medicinal value and importance for cultural practices. Thespesia populnea (Portia tree, itira) is considered the best wood for traditional house construction, woodcarving, furniture and canoe outriggers and the fragrant flowers of the shrubby Clerodendrum inerme (eamwije) are used in garlands and its leaves are reportedly pounded and used as a cure for leprosy in the past.

The oriental mangrove (Bruguiera gymnorrhiza) provides strong wood excellent for house construction and the skin of its seeds is used to prepare a black dye for traditional skirts (ridi)[7].

[6] Australian Government, (Australian Bureau of Meteorology & CSIRO) Pacific Climate Change Science Programme, 2013

[7] Thaman, R.R. et. al. 2009. Plants of Nauru. SPC, Suva Fiji.

3.3.2 - Population and Livelihoods

The Ijuw/Anabar wetlands PCA is falls across 2 districts with a total population of 630[8] people spread across 28 villages - likely to be the main local beneficiaries and targets of the management plan.

The 12 neighboring districts may also have an impact on the site as there is currently open access to the public, especially those parts of the site near the main road. Although the site has been virtually unused by the locals in the past, there is now evidence of human impact on the area with anecdotal reports and visual evidence confirming that parts of the PCA have been used for the illegal dumping of solid waste and raw sewage.

The farming of milkfish (*Chanos chanos*) in the PCA was a source of livelihoods and contributed to food security of both districts in the past. Mozambique Tilapia (*Oreochromis mossambicus*) was introduced in about the 1960s to control mosquito larvae and rapidly multiplied in the wetlands[9] leading to the decline and eventual disappearance of milkfish from the wetlands.

***Chanos chanos* (Photo: Ramon F. Velasquez, Wiki Commons)**

***Oreochromis mossambicus* (Photo: Greg Hume, Wiki Commons)**

[8] 2011 Census. Nauru Bureau of Statistics, Government of Nauru. 2011

[9] Ranoemihardjo. 1981. Eradication of Tilapia from fresh- and brackish water lagoons and ponds with a view to promoting Milkfish culture. Report prepared for the Tilapia Eradication Project. Field Document FEDP/NAU/78/001. FAO, Rome, Italy.

4. SITE MANAGEMENT

4.1 Vision Statement

"Protect, preserve and promote the unique biological, geophysical and cultural values of the Anabar-Ijuw wetlands, through sustainable management and partnerships"

4.2 Site Targets

These targets represent key species, species groups, ecosystems or ecosystem services that the management plan will focus on. Together, these targets represent the important biological characteristics of the site that are most worthy of conservation.

Table 1 - Site Targets

Target	Details And Status
Native species, with emphasis on culturally important species	The PCA support species that are known to have traditional medicinal and cultural value - the Portia tree (Thespesia populnaea) and the Indian Privet (Clerodendrum inerme)
Native vegetation, with emphasis on ecologically important species	The site contains the most diverse vegetation mix of the coastal plain. There is some intact vegetation to be found at the site with evidence of threat from clearance for land development. Although mangrove forests are a minor community type on Nauru, the site-specific ecological functions and services provided by the Oriental Mangrove (Bruguiera gymnorrhiza) are considered to be significant.
Hydrological values	This includes consideration of the water quality of the site. A future designation as a Ramsar Site under the Ramsar Convention on Wetlands means that the water quality issues of the PCA need to be carefully monitored and managed.

4.3 Key Threats

This section summarises the specific key threats to the site targets, categorised into threat ratings based on feedback from participants during the GEF-PAS IIB national stakeholders' workshop (22-23 October, 2015). A discussion of whether the impact of these threats would be exacerbated with climate change is reflected in table 3 below. The following social drivers are considered the main agents of biodiversity change in Nauru[10]:

- Phosphate Mining and Limestone Industry
- Unstainable Population Growth
- Climate Change Impacts
- Over-exploitation of land and marine resources
- Introductions of Invasive Species
- In-effective Pollution Control and Solid Waste Management
- Loss of Traditional Knowledge

[10] Nauru's Fifth National report to the Convention on Biological Diversity (CBD), Government of Nauru. March 2014

Table 2 - Threats to Site Objectives

Rating	Threat Details, Including Climate Change (Cc)	Impact
HIGH	Pollution from solid & liquid waste disposal	↑ impact under CC.
	Land clearance from development	↑ impact under CC.
	Lack of knowledge & ignorance	unchanged
	Land Tenure	unchanged
MEDIUM	Invasive species/introduced species	↑ impact under CC.
	Drought	↑ impact under CC.
LOW	Loss of traditional knowledge	unchanged

These ratings have been established based on available information and perceptions of participants during the IIB stakeholders' workshop. There are a range of uncertainties that should be considered in terms of both gaps in biodiversity and climate information.

4.4 - Management Objectives

Objective details:

1. Reduce the impact of land clearance to protect biodiversity and cultural values

2. Reduce the population of invasive species for the conservation of native, culturally important species

3.Reduce the impact of solid and liquid waste on water quality and hydrological values

4. Reduce negative follow on effects of potential income generating activities (eg - ecotourism)

5. Management Strategies

5.1 Core Strategies For Threat Reduction

The following set of strategies is proposed for the site to address what were judged to be the key threats to the site objectives.

Table 3 - Management Strategies

Strategy	Link To Objectives 1	2	3	4
A - Enforce existing and enact new legislation: the evidence of illegal solid and liquid waste dumping in the PCA suggests that enforcement action may be warranted on site, subject to deliberations within DCIE.	✓	✓	✓	✓
B - Raising awareness of biodiversity conservation, climate and ecosystem services: Development of a community awareness program that discusses biodiversity conservation, climate and ecosystem services in ways which are meaningful and useful to local communities.	✓	✓	✓	✓
C - Monitoring program for water quality: More intense rainfall events coupled with an extended dry season may have a serious impact on water quality, so an ecological monitoring program will be established to determine whether any remedial activities are required.	✓		✓	
D - Rehabilitation of forest: Appropriate application of ecological restoration techniques are a central element of this management plan. This will involve establishment of an appropriate guide, training on propagation and seedling development, restoration planning, maintenance and monitoring.	✓	✓		
E - Invasive species control: Knowledge of management techniques for invasive pests will greatly improve the capacity of both DCIE staff and landowners, with a particular focus on Mozambique Tilapia.	✓	✓		✓
F - Promote utilisation of community development tools in the local area: The use of the P3DM (participatory 3-dimensional modelling) approach to be promoted together with a range of other participatory tools.	✓	✓	✓	✓
H - Establishment of buffer zones around the boundaries: The presence of a buffer around the site is to be explored, offering an opportunity to better protect the site from intrusion and invasion.	✓	✓	✓	

6. Monitoring and Evaluation

Tracking progress of strategies in reaching site objectives is an essential element of management planning. Through gathering a targeted set of performance information, DCIE will be able to make key adjustments in the implementation of the plan.

In this plan, monitoring refers to the ongoing collection of performance indicators against key site objectives, and evaluation refers to event-based activities that seek to answer broader questions of performance.

The following table describes the key indicators for the plan, and the methods for data collection.

Table 4 - Monitoring Programme

Indicator	Frequency	Method
Control of invasive species (Ha per species)	Annual	Through direct measurement of area covered.
Restoration of damaged areas according to ecological restoration techniques (Ha)	Annual	Through direct measurement of area covered. It is important to note that the location and composition of the restoration activities.
Participation in community awareness and capacity building programmes	Quarterly	Use of attendance sheets (as appropriate) as an 'output' indicator.
Number of community members adopting sustainable techniques	Annual	This will require annual surveys of participating communities.
Number of community members participating in conservation activities	Annual	This will require annual surveys of participating communities.
Water quality, growth of dominant native tree species	Monthly	As per the ecological monitoring program

7. Workplan, Timetable and Budget

This section describes the key elements in the implementation of the strategies described above and a preliminary budget. Note that this budget reflects the potential role of the Ijuw/Anabar wetlands as a demonstration site for conservation and sustainable use, and the expanded potential for future ecotourism.

Year 1

STRATEGY	KEY ACTIVITIES	BUDGET(AUD)
A – Enforcement	DCIE to take internal decisions on the scale and scope of enforcement activities	N/A
C – Monitoring Program	○ Design of ecological monitoring program for water and dominant trees ○ Includes designation of sites for monitoring, including permanent tree plots.	40,000

D & E (Invasives and Restoration)	○ Preparation of an ecological restoration plan for the site covering:
	  ○ Selection of restoration method
	  ○ Identification of species
	  ○ Identification of priority sites
	  ○ Control of invasive species
	○ Capacity building in DCIE (and core partners) on ecological restoration techniques
		80,000

G - Ecotourism	Feasibility study on ecotourism in the site, including options for local regulation	30,000
H – Buffer Zones	Conduct initial consultation into the feasibility of establishing a buffer zone around the site	10,000
TOTAL BUDGET YEAR 1		180,000

Year 2

STRATEGY	KEY ACTIVITIES	BUDGET(AUD)
A – Enforcement	As per DCIE recommendations from year 1.	5,000

B & F – Awareness and community tools program	○ Confirmation of demand for specified topics with local communities.
	○ Preparation of a local language capacity building program that covers:
	  ○ Important biodiversity in the site
	  ○ Ecosystem services of the site
	  ○ Likely climate change impacts
	  ○ Issues with surrounding infrastructure/development
	  ○ Invasive species eradication
	  ○ Ecological restoration
	  ○ Community decision-making tools, (incl. P3DM)
		50,000

C – Monitoring program	Implementation as per monitoring program	10,000
D & E (Invasives and Restoration)	Implementation as per ecological restoration plan	30,000
Total Budget		135,000

Year 3

STRATEGY	KEY ACTIVITIES	BUDGET(AUD)
A – Enforcement	As per DCIE recommendations from year 1	5,000
B & F – Awareness program and community tools	Implement the community awareness program for the two districts (Anabar, Ijuw)	20,000
C – Monitoring program	Implementation as per monitoring program	10,000
D & E (Invasives and Restoration)	Implementation as per ecological restoration plan	30,000
Independent mid-term evaluation	○ Preparation of Terms of Reference (TOR) based on management objectives of site. ○ Contracting of consultant ○ Delivery of report to DCIE for consideration and decision	10,000
TOTAL BUDGET YEAR 3		105,000

Year 4

STRATEGY	KEY ACTIVITIES	BUDGET(AUD)
A – Enforcement	As per DCIE recommendations from year 1	5,000
B & F – Awareness program and community tools	Implement the community awareness program in surrounding districts	20,000
C – Monitoring program	Implementation as per monitoring program	10,000
D & E (Invasives and Restoration)	Implementation as per ecological restoration plan	30,000
TOTAL BUDGET YEAR 4		75,000

Year 5

STRATEGY	KEY ACTIVITIES	BUDGET(AUD)
A – Enforcement	As per DCIE recommendations from year 1	5,000
C – Monitoring program	Implementation as per monitoring program	10,000
D & E (Invasives and Restoration)	Implementation as per ecological restoration plan	30,000
Final independent evaluation	○ Preparation of Terms of Reference (TOR) based on management objectives of site. ○ Contracting of consultant ○ Delivery of report to DCIE for consideration and decision ○ Final evaluation will determine the level of implementation of the mid-term evaluation recommendations	20,000
TOTAL BUDGET YEAR 5		75,000