RAPID BIODIVERSITY ASSESSMENT (BIORAP) NAURU

JUNE 2013

SYNTHESIS REPORT

KEY FINDINGS AND RECOMMENDATIONS

SPREP
Secretariat of the Pacific Regional Environment Programme

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Pacific Islands

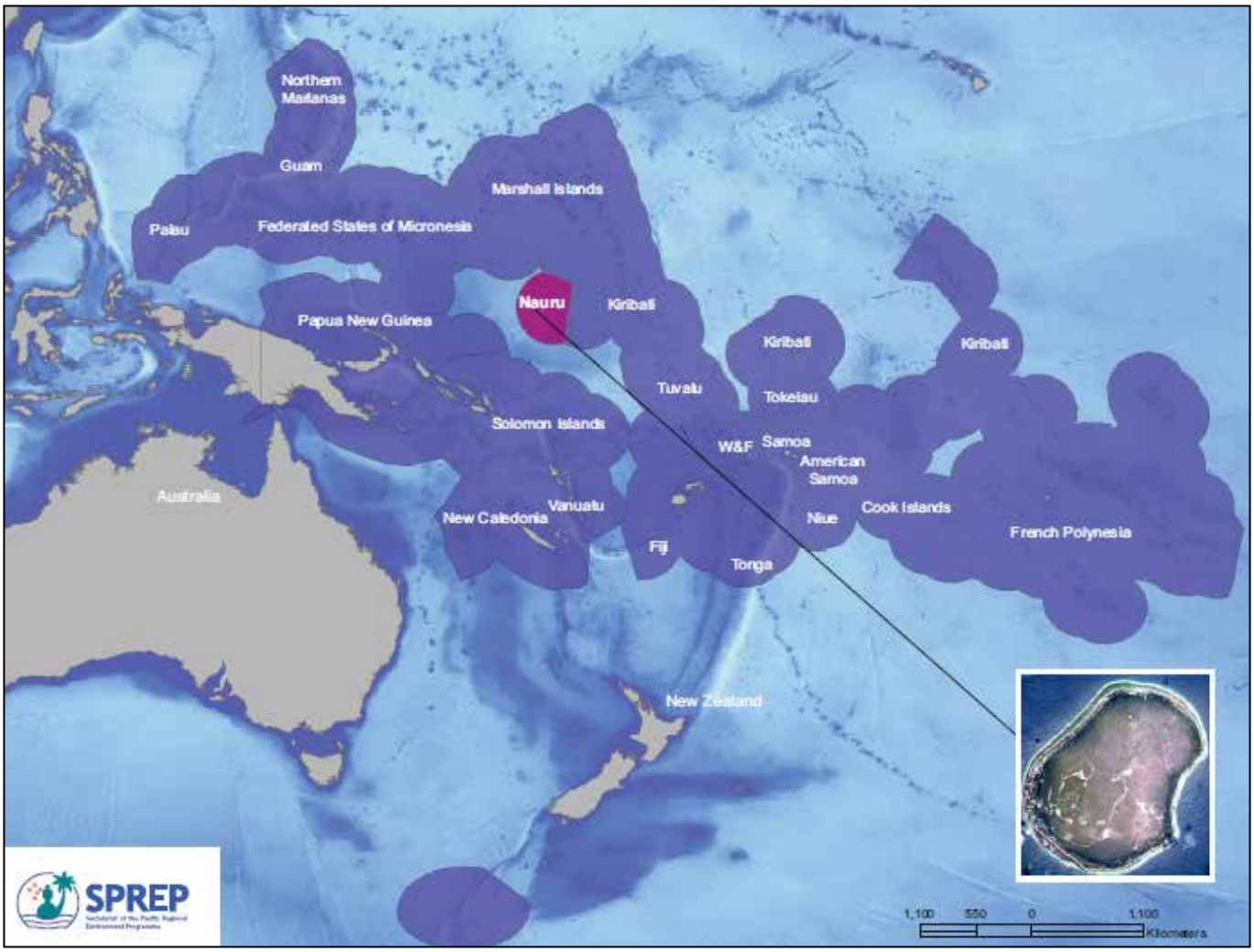

Figure 1. Location of Nauru within the Pacific islands region.

SPREP
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The BIORAP

What

A BIORAP is a biological inventory programme undertaken in marine and terrestrial environments, and is designed to rapidly assess the biodiversity of highly diverse areas. Options to manage threats and protect some remaining examples of indigenous biodiversity of national or international significance are recommended to governing communities.

Where and When

The BIORAP took place in selected terrestrial and marine areas of the Republic of Nauru during 17–27 June, 2013.

Who

The Secretariat of the Pacific Regional Environment Programme (SPREP) recruited a team of 19 conservation specialists from a diverse range of international institutions to work in partnership with Nauru Government staff and civil society participants, including customary resource owners, to participate in the survey.

Nauru Snapshot

The Republic of Nauru, located 50 kilometres south of the equator, is one of the world's smallest independent nations, and one of the most unique by being a single raised phosphatic limestone island with a maximum elevation of 71 metres.

The island is six kilometres long by four kilometres wide. The total land area is 21 square kilometres, of which 70% has been mined for phosphate. Nauru has a growing population of more than 10,000 people (2011 Bureau of Statistics). Limited land for urban development and a very restricted ground water supply are serious issues for the people and biodiversity of Nauru.

Why

The information gathered provides a scientific basis for empowering communities, relevant government departments, and other partners to make informed conservation management and planning decisions to ensure the long-term conservation of biodiversity, and the essential ecological services it provides.

During the BIORAP, community involvement and participation in conservation management was strengthened and local staff and scientists were trained in biodiversity survey techniques.

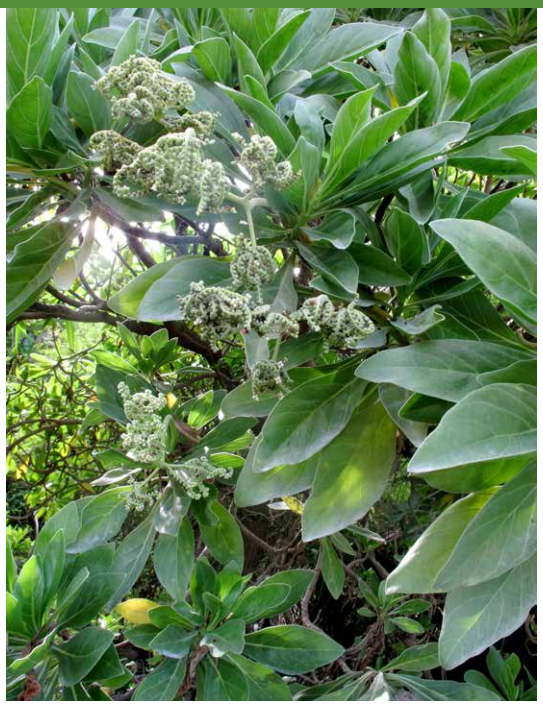
KEY FINDINGS

ECOSYSTEMS

- Nauru is an isolated seamount. Its terrestrial ecosystems have relatively small numbers of species across different groups as a result of the country's remoteness and rare geology. Its marine ecosystems also have limited diversity but the survey revealed the presence of globally rare species.

PLANTS

- Almost no native forest remains in Nauru. However, 42 native plant species were recorded during the survey and most of these are of critical importance ecologically and culturally.
- Many of the most culturally valuable species are found in settled areas and include food plants, such as coconut, breadfruit, pandanus and banana cultivars, many of which are endangered and are pivotal to food and livelihood security on Nauru.



Coastal strand tree *Tournefortia argentea*. Photo E. Edwards.

INSECTS

- This was the first broad survey of Nauru's insect fauna. New records of moths, land snails and ants were reported, adding a second endemic insect species (a new moth) to the already known endemic Nauru tidal rock bug (*Corallocoris nauruensis*).

REPTILES

- The reptile community appears intact despite major habitat alteration. Four species of gecko, three skinks and a snake were recorded, including a new skink considered endemic to Nauru.

BIRDS

- Nauru contains only a moderate number of bird species, but these include significant populations of seabirds that are important from a biodiversity perspective, and also culturally as a traditional food.
- A total of 36 bird species were recorded including two new seabirds found for the first time in Nauru.
- The Micronesian pigeon (*Ducula oceanica*) exists on Nauru in very small numbers. Surveys of the black (*Anous minutus*) and brown noddy (*A. stolidus*) indicate that they are being harvested faster than they can breed.

REEFS

- Nauru has many reefs with among the highest percentage cover by corals on the planet. The reefs in Nauru are exceptionally healthy.
- The reefs contain globally significant species threatened with extinction including the humphead wrasse (*Cheilinus undulatus*) and many coral, fish and sea turtle species.
- One endangered coral *Pocillopora fungiformis* was found that was previously only known from Madagascar.

MARINE INVERTEBRATES

- Two giant clams (*Tridacna maxima*), known locally as "earinbawo", which are listed as internationally vulnerable, were found during the survey. This was an important rediscovery as the species had previously been thought to be locally extinct as they had not been recorded since the 1980s.

Nauru endemic tidal rock bug *Corallocoris nauruensis* rediscovered at Anibare Bay. Photo D. Roscoe.

A new skink, *Emoia spp.*, which appears to be endemic to Nauru. Photo R. Stirnemann.

Humphead wrasse, *Cheilinus undulatus*, is a threatened species on the IUCN Red List. Photo S. Jupiter/Marine Photobank.

FISH

- Although the abundance of reef fish is high relative to other nations, there were significant signs of overfishing, including a lack of larger sized fish like large groupers and snappers.

Some of the rare plants of Nauru

Aidia racemosa (**enga**) – limestone forest tree, close to extinction.

Bruguiera gymnorrhiza (**etõm or etam**) – mangrove tree that purifies the water around the anchialine (ponds) where it grows.

Cerbera manghas (**dereiyongo**) – important coastal tree, which is now found only in a few locations in the main settled areas.

Cordia subcordata (**eongo**) – forest tree, probably rare because of the loss of coastal habitat on the island. The timber is highly valued.

Erythrina variegata (**eora**)—forest tree. Rare due to past removal and loss of forest habitat.

Hernandia nymphaeifolia (**etiu**)—coastal forest tree. Timber was prized for canoe hulls in the past.

Ochrosia elliptica (**eoerara**) – attractive small tree with bright red fruit. Good shade tree.

Pisonia grandis (**yangis**) – A forest tree which is the main rookery species for noddy birds and found mainly along the upper escarpment.

Thespesia populnea (**itira**) – forest tree. Considered the best wood for construction and carving. Also one of the best trees for coastal replanting activities.

Tournefortia argentea (**deren**) – important tree for coastal and beach protection and one of the most important medicinal and multipurpose plants on Nauru.

Rare, threatened or endangered terrestrial animals of Nauru

Birds – Frigate bird (*Fregata* spp.) and noddy species are both in global decline but Nauru could be a stronghold for these species. The endemic Nauru reed warbler (*Acrocephalus rehsei*) known locally as 'itsirir' is another rare species.

Skinks – endemic Micronesian black (*Emoia arnoensis nauru*) and a new undescribed species.

Insects – Nauru tidal rock bug (*Corallocoris nauruensis)* and newly discovered micro-moth leaf miner.

Rare, threatened or endangered marine species of Nauru:

Giant clams, corals, sea turtles – these globally threatened species are all found in Nauru.

Fishes – humphead wrasse (*Cheilinus undulatus*) and white tip reef shark (*Triaenodon obesus*) are IUCN Red Listed but many others are less common than expected.

RECOMMENDATIONS

LIFE IN NAURU SUPPORTED BY NATURE – ACT NOW TO SECURE THE FUTURE

Focussing on the conservation of Nauru's plant and animal resources would have enormous benefits for long-term food security, health and the economy of Nauru. There are a range of actions that are recommended as priorities to be addressed by stakeholders and communities.

INVASIVE SPECIES

- **Develop a National Invasive Species Strategy and Action Plan**, in line with the *Guidelines for Invasive Species Management in the Pacific*, including a prioritised list of species for targeted control within priority conservation areas, as well as listing threats for future incursions. An invasive plant species that is a priority for management is the red-bead tree (*Adenanthera pavonina*) which dominates vegetation growth. Further quantitative surveys for marine invasive species are highly recommended for the districts of Aiwo, Meneng and Anibare.
- **Develop and implement a national border biosecurity programme to protect Nauru** from the introduction of invasive plants and animals. Elsewhere, this has proven to be of enormous benefit for biodiversity, food production, the economy and health.
- **Immediately take action to eradicate/and or manage the yellow crazy ant (*Anoplolepis gracilipes*) which is a serious pest species recently detected at the port**. To address this incursion it is strongly recommended that a targeted survey for this species be carried out by experts and control options identified.

SPECIES AND HABITAT PROTECTION

- **Develop and implement a range of conservation interventions, strategies, management plans and programmes targeting rare and endangered species** including community management programmes, species monitoring, habitat protection for terrestrial and marine protected areas, and harvesting management as appropriate. Examples of recommended actions highlighted in the BIORAP report include:
  - Engage with the Nauru Fisheries Department for integrated planning of future projects and programmes focussing on the marine environment.
  - Implement an agroforestry programme for replanting the rare and endangered plant species most of which are culturally-useful tree species, which provide coastal protection and serve as a basis for food and livelihood security.
  - Ensure replanting includes tree species such as *Pisonia* used by nesting seabirds, such as noddies that contribute to biodiversity conservation, culture, food security and improved soil quality.
  - Negotiate conservation of the Command Ridge site through mining and landowner stewardship.
  - Establish conservation strategies for the two endemic Nauru skinks; Micronesian black skink and a new undescribed species.
  - Raise community awareness of noddy population dynamics to reduce harvesting in order to ensure the populations' survival for future generations.
  - Conduct a study of the basic biology of the vulnerable endemic Nauru reed warbler.
  - Undertake regular monitoring of rare or endangered species every few years.
  - Implement seasonal or temporary closures in sites known for fish spawning or nurseries, and bird breeding, during the relevant time period.
  - Reduce night time light pollution from industrial sites which negatively impact the seabird and insect populations.
- **Integrate use and protection for culturally important areas, and for threatened species through the following activities:**
  - Conduct a marine and terrestrial spatial planning exercise, with a ridge to reef approach, with all stakeholders to identify key areas for protection.
  - Set up marine managed/protected areas as a matter of urgency, including no-take areas in consultation with all local stakeholders, targeting fish breeding and spawning sites.
  - Establish a framework of terrestrial management areas with the overarching goal to retain and enhance a suite of representative ecosystems and species together with marine linkages.
  - Drive these actions from the bottom up with the goal of enhancing national identity and sustaining cultural associations.
  - Establish a system of village reserves and nurseries, including household gardens as part of the integrated protected areas network.
- **Establish regular monitoring and assessment of plant, animal and marine resources:**
  - Efficiently monitor size trends of finfish and catches of targeted fish species; and monitor roosting noddies and other seabirds together with the numbers harvested.
  - Undertake targeted surveys for IUCN Red List species including sea turtles, seabirds, whales and dolphins around Nauru to confirm presence and population status.
  - Help individual communities to monitor their natural resources including fishes, noddies, vegetation types, intertidal reef flats and fringing reef.

Black noddy. Photo R. Stirnemann.

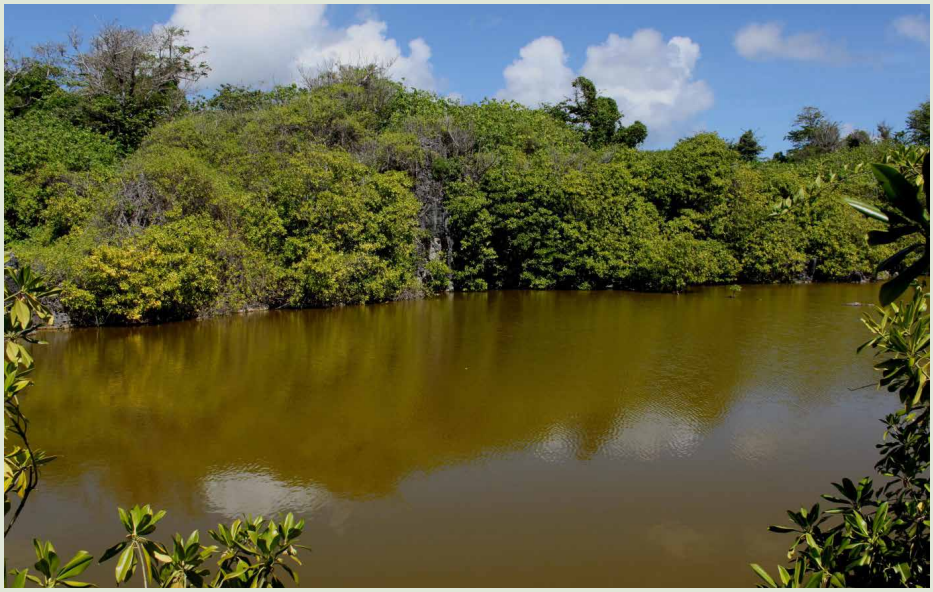
GOVERNANCE

- **Seek legislative protection for the rare and endangered plant and animal species.**
- **Reduce fishing pressure and encourage best practices by establishing regulations to:**
  - Restrict or regulate fishing gear.
  - Set minimum size limits for some fish landings.
- **Consider signing international conventions** including the *Convention on International Trade in Endangered Species of Wild Flora and Fauna* (CITES) and the *Convention on Migratory Species* (CMS).
- **Establish a community culture, as well as legislation, to manage and sustainably utilise the marine and terrestrial resources of Nauru.** A draft *Marine Conservation Bill* that already exists could be updated, vetted by the public and re-submitted to become law by parliament. An equivalent Bill for terrestrial biodiversity should be developed. It may be important to explore how resource ownership is defined in local culture and the legal framework, and how that could inform quotas, share of catch or harvesting permits.
- **Ensure compliance with new regulations and laws –** Raise awareness, and enforce consequences for non-compliance.

AWARENESS, EDUCATION AND TRADITIONAL KNOWLEDGE

It is important to work with local communities, especially those having ownership over land or marine resources, as well as developing constructive relationships with other land managers including the mining company and immigration centre.

- **Provide training to improve knowledge on conservation issues and effective strategies to protect key resources** that are crucial to biodiversity. This may include:
  - Border biosecurity at the port and airport and highlighting the risks and impacts of introducing invasive species.
  - Notifying landowners of the presence of important native plants and encourage them to protect and rehabilitate these species.
  - Development of curriculum materials on Nauru's important plants, animals and ecosystem.
- **Rejuvenate and strengthen traditional environmental knowledge systems that were once an integral part of Nauruan's connection to the land and sea.**
- **Develop a public awareness campaign on the importance of healthy ecosystems.** Nauru has acute water and soil challenges and addressing these through ecosystem management will bring many benefits to the community.



Nauru mangrove forest around an anchialine pond. Photo: A. Whistler.

KEY SITES FOR PROTECTING NAURU'S BIODIVERSITY

Priority sites for protection and management should be those showing the least disturbance, the highest species richness, the greatest numbers of rare or endangered species, and the most value as wildlife habitat.

Particular emphasis is placed on sites and species that are important as a food source including fish and other marine species, and noddy rookeries. Special consideration should also be given to those areas containing culturally important and useful plants such as coconut and pandanus groves, the remaining coastal strand and escarpment forest, and mangroves. It is also important that local communities (resource users and owners) are involved in the planning, implementation, monitoring, planting and maintenance of these areas.

While many areas on and around Nauru retain indigenous natural values, a total of eight areas and a scatter of near extinct coastal trees are being recommended as priorities for conservation action (see map). These include five terrestrial areas (Proposed Conservation Areas – PCAs) and three marine areas (Proposed Marine Management Areas – PMMAs). Local knowledge, historical reports and the findings from this BIORAP, underpin the recommendations for key conservation and management areas. The proposed areas are:

- possibly the minimum that is required to sustain very ancient but presently depleted and declining marine and terrestrial ecosystems;
- intended to compliment each other;
- intended to be inclusive of originally representative species patterns and habitats that define Nauru as distinct from other island ecosystems;
- designed to integrate habitat sequences and to be able to sustain coral, plant or animal populations within their boundaries.

They also:

- recognise that many birds, fishes and marine species travel vast distances and depend on these areas. This is a defining ecosystem feature for Nauru;
- have multiple use areas and are sometimes where people may live or use them regularly. This will continue but with the insight that these areas have a special character and set of resources that are currently threatened and need to be sustained for future generations.

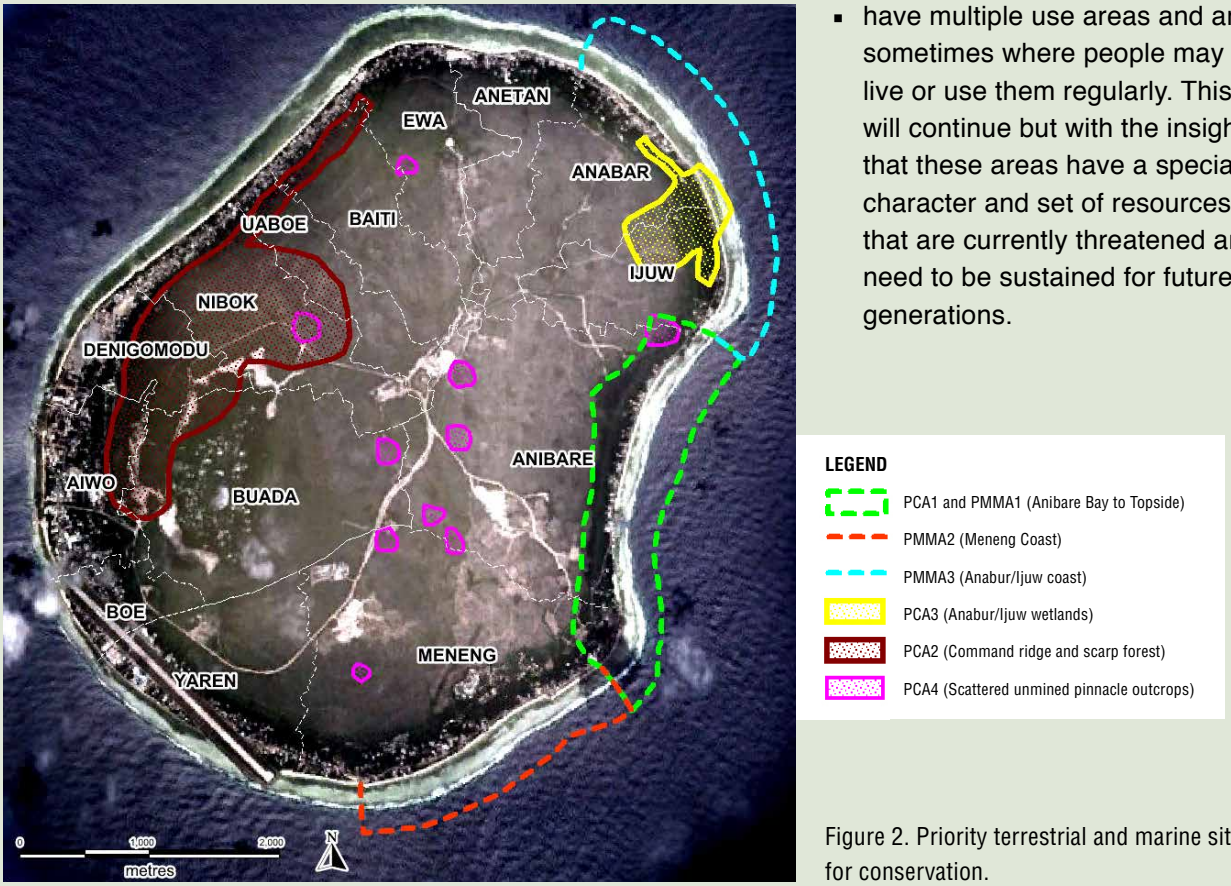


Figure 2. Priority terrestrial and marine sites for conservation.

Anibare Bay dolomatised limestone pinnacles in the tide. A spectacular landform and habitat for Nauru's endemic tidal rock bug *Corallocoris nauruensis.* Photo. E. Edwards.

Proposed Conservation Area 1 (PCA1) Anibare Bay

The landward part of a highly representative ocean to 'Topside' sequence. This includes coastal plain pinnacles and forests where rare trees and a newly discovered micro-moth are found. The Anibare escarpment bluffs are important for taller vegetation and bird roosts. On the 'Topside' margin are rare areas of un-mined shallow phosphate soils and original un-mined pinnacles that are critical for seabird breeding and undisturbed deeper soil ecosystems. A suite of lizard, Micronesian pigeon and Itsirir (Nauru reed warbler) habitats are also incorporated.

Proposed Marine Management Area 1 (PMMA1) Anibare Bay

The reef flat here is where the 're-discovered' giant clam is found and the emerging pinnacles are habitat for Nauru's endemic bug. Although there were signs of heavy fish harvesting, the fish community was better balanced at this site. All marine areas recommended should encompass the beach to the open ocean to a minimum of 100 metres beyond the reef edge.

(PMMA2) Meneng reef flats and ocean front

This site combines with, and complements, the near shore environments of the adjacent Anibare Bay and northern Ijuw/Anabar marine areas. In addition to the reef flat, this area includes a comparatively high number of coral and fish species observed on the fringing reef in the Meneng District.

Protected Areas protect people

'Protected Areas' in the Pacific are usually sustainable-use areas. Protected Area management has at its core national and local circumstances with a view to conserving and managing biodiversity to support livelihoods and protect island heritage.

(PMMA3) Ijuw and Anabar reef flats and ocean front

This marine area complements PMMA1 and 2. This continuous area captures 40% of the coastline of Nauru and forms a vital marine management area. The area is away from negative effects from the airport runway and port development activities. The combined area is valued for marine invertebrates – snails, clams, sea cucumbers and crustaceans on the reef flat and coral slope. These are thought to be less heavily harvested at this site. PMMA3 has not yet been affected by any damage from sea protection works on the shore and it links inland to wetlands, forests and the pinnacles of PCA3.

(PCA2) Command Ridge – including Buada basin forest, Topside western scarp forests and Topside railway zone

This area contains the most advanced natural forest regeneration within a mined site. The area provides habitat for most of the reptile species due to the mix of exposed habitat and vegetation cover, and may become a key landbird stronghold. The west coast escarpment forests and Buada basin forests are also proposed for conservation because they contain important indigenous trees. PCA2 includes the most noddy rookeries and some un-mined pinnacle outcrops in the northern part. Historic mining, railway and track networks are features that could be developed into a sustainable tourism site.

(PCA3) Ijuw – Anabar wetlands and forests

This site contains the most valuable brackish open water habitats for birdlife, significant areas of mangroves and supports the richest vegetation mosaic of the coastal plain. It also has high scenic values and holds endemic vascular plants. Aligned with PMMA3 it provides significant habitat for invertebrates, lizards and birds due to the absence of sea protection works, the uniqueness of the ponds and the inclusion of the coastal plain rubble forest and rocky scarp.

Command Ridge and railway on the ‘topside’ of Nauru. With the mining finished a long time ago, this historic site is set amongst the most advanced vegetation regeneration found on the mined pinnacles of Nauru. Photo E. Edwards.

(PCA4) Topside un-mined pinnacle outcrops

These original elements of the landscape have no value for phosphate but retain pockets of vegetation and soils with lizard and invertebrate life. The vegetation will provide propagules to colonise the surrounding mined-out lands.

(PCA5) Coastal littoral trees

This is not a single area but identifies that it is important to conserve and increase the numbers of these endangered tree species that are largely confined to the coastal zone (refer to Figure 3). This zone within 50 metres of the mean high tide mark should be protected immediately and, where possible, enriched with the planting of appropriate species, including collecting the seeds and regenerating the species. Conserving these trees will restore formerly powerful cultural associations and uses of both indigenous and introduced plants.

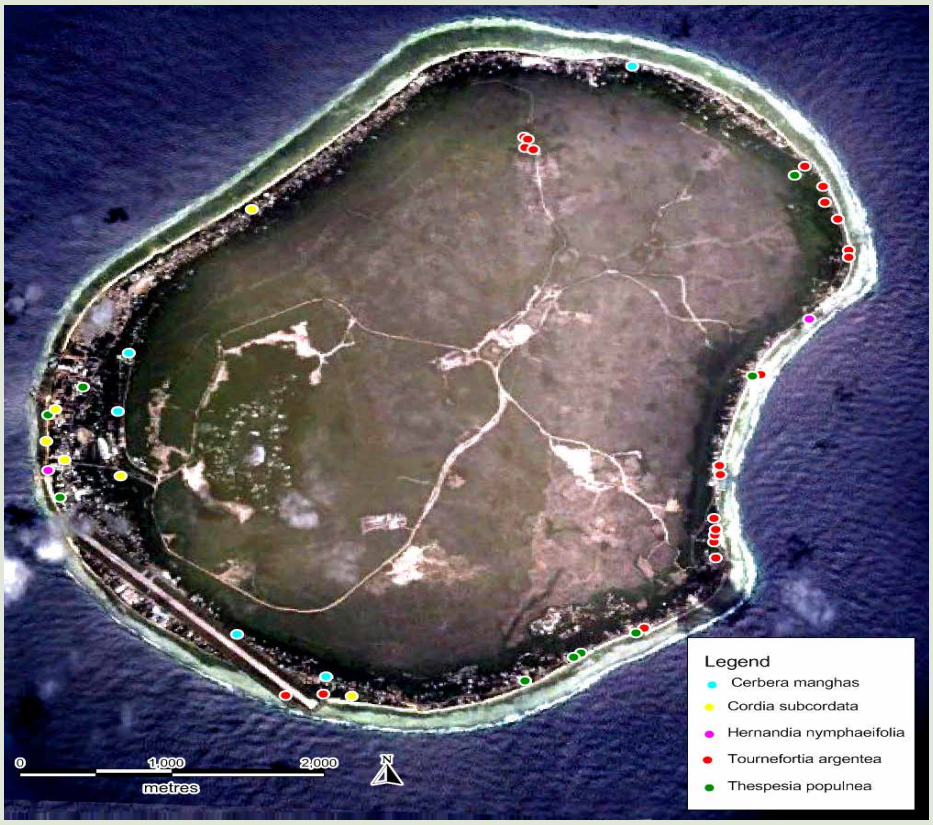


Figure 3. Proposed Conservation Area 5 (PCA5) is represented by the occurrence of five endangered trees species.

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Synthesis compiled by R&D Environmental Ltd.

For detailed information and results please refer to the full BIORAP report *Rapid Biodiversity Assessment of Nauru*.

For more information on the methods refer to the *Guidelines for Undertaking Rapid Biodiversity Assessments in Terrestrial and Marine Environments in the Pacific* (SPREP & Wildlands, 2014).

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Front cover images: Anabare Bay limestone pinnacles (E.Edwards); Frigate bird (R.Stirnemann); Survey planning in Nauru (E.Edwards).

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The Pacific environment, sustaining our livelihoods and natural heritage in harmony with our cultures.