PART 7
CONSERVATION OF BIODIVERSITY

SUMMARY

- This section provides recommendations for conservation of biodiversity in the park.
- Activities and proposed developments throughout the entire park should be assessed for their potential impact on marine and terrestrial biodiversity, and measures taken to minimise or eliminate any negative effects.
- Selected areas of land and sea should be set aside as *Sanctuary Zones* where people are allowed access, but nothing may be taken, either living or dead, and activities are strictly controlled. The aim will be to retain biodiversity in as natural a state as possible in these important areas. In addition, there will be *Preservation Zones* which are closed except for monitoring.
- Certain endangered, rare and key species should be protected from exploitation and disturbance throughout the entire park. The list includes reefs corals, turtles, marine mammals, birds, timber and mangrove trees.
- Measures should be put in place to eliminate or reduce the risks of pollution and ensure that the environment remains healthy.

Figure 75. Giant clams need to be protected in the park so that populations can recover.

Figure 76. Green turtles occasionally nest on Mantabuan and both the adults and nest sites need to be protected. [photo taken at Pulau Sipadan]

7.1. INTRODUCTION

Biodiversity describes the diversity and variability within and between species, habitats and ecosystems. Apart from its intrinsic value as part of the world's natural heritage, biodiversity is important for many other reasons. In particular, it plays a vital role in maintaining life support systems and ecological processes. It also has economic, educational, cultural and aesthetic values. There is alarm at the scale of loss of biodiversity around the world, and the impact this will have on the way ecosystems function and ultimately on the future health and well-being of the human population.

Figure 77. Coral head (*Porites*) colonised by branching corals, featherstars and starfish.

Figure 78. Red breasted wrasse in the Bodgaya lagoon

For all these reasons, conservation of biodiversity needs to be at the forefront of any development plan. It is particularly important for the Semporna Islands Park because there is so much at stake. The high biodiversity at this site has been acknowledged for many years and confirmed during studies carried out under the Semporna Islands Project. Threats to biodiversity have also been identified.

A major objective for the park is to retain the high biodiversity that makes the area worthy of conservation action in the first place. This means formulating strategies that will ensure habitats, communities, species diversity and rare species are protected, and natural systems continue to function healthily at all levels.

Management strategies also need to try and provide the best possible conditions for recovery and recolonisation of sites within the park that have been disturbed or degraded.

Whilst conservation of biodiversity is discussed here as a specific objective, this does not imply that it should be treated in isolation from the other objectives. It is important to look at the area holistically, and integrate conservation with sustainable use.

Different islands and reefs in the park have different attributes and management needs. The opportunities, constraints and best options for conservation of biodiversity within the park are discussed in the following pages, and recommendations for action made.

7.2. MARINE HABITATS AND COMMUNITIES

Objectives

- To ensure that key habitats and communities are fully protected and that conservation of marine biodiversity is a priority throughout the rest of the park.

Opportunities

a) Marine sites throughout the park are of high conservation value. There are excellent opportunities for retaining and enhancing these qualities provided that action is taken to manage the system as a whole.

b) The park includes a wide range of marine habitats and communities. It is feasible given the size of the park to ensure that representative areas are fully protected.

Constraints and threats

a) Parts of many reefs have been damaged by use of explosives for fishing, causing loss of biodiversity. Recovery (to some degree, over time) should occur if fish blasting ceases.

b) Over-exploitation of marine resources has occurred on all reefs but recovery is possible if appropriate steps are taken.

c) Proposed tourism development of reef-based activities such as diving could have impacts on marine biodiversity unless properly managed.

d) Some damage has (and continues to be) inflicted by crown-of-thorns starfish, which prey on living coral.

e) There has been some damage and change to reefs due to bleaching and subsequent coral mortality as a result of warm-water events caused by global climate change. This is affecting biodiversity but is not possible to control it at a local level.

Recommended actions

a) Selected, sensitive areas of high conservation value will be maintained in their natural state, undisturbed by human activities. These will be no-take, no-entry areas, except for scientific research, and will serve as 'control' sites to monitor the condition of the park and its resources in the absence of any pressure from people. These will be called ***Preservation Zones***.

For regulations that apply to Preservation Zones see section 10.4.

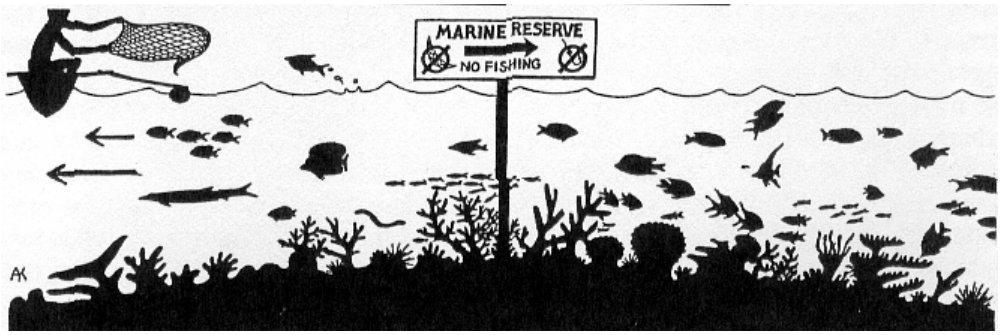
The Preservation Zones will cover less than 1.5 % of the total sea area of the park. The following are recommended as Preservation Zones:

- Eastern end of lagoon ribbon reef and adjacent Bodgaya lagoon fringing reef
- Northern end of Mantabuan reef
- West side of Mantabuan Bank

b) A range of representative, rare, vulnerable and/or key marine habitats will be open to sustainable, non-extractive uses, but fully protected from all forms of fishing and harvesting. These ***Sanctuary Zones*** will not only benefit conservation of biodiversity, but will also in the long term help fishermen who use the other zones in the park. The reasons for this are explained in Part 8.2 of this plan.

Regulations for Sanctuary Zones are provided in section 10.4.
The Sanctuary Zones will cover about 20% of the total sea area of the park. The following are recommended:

- Mantabuan Reef, Mantabuan Bank and Kapikan Reef
- Bodgaya Lagoon and a sector of the Southern Rim Reef to include Dead End Channel
- Church Reef and Sibuan Reef



Cartoon by Rox Lee from *Save our Coral Reefs* (McAllister & Ansula, 1993)

Figure 79. The 'no fishing' Preservation and Sanctuary Zones for the Semporna Islands Park should conserve biodiveristy and indirectly improve catches for fishermen.

c) Conservation of marine biodiversity in the rest of the park (***General Use Zone*** and ***Pelagic Use/Buffer Zone***) will be promoted by ensuring that activities and proposed developments have minimal negative impacts (see Part 8 for details of these zones). The level of fishing and harvesting of marine resources will also be reduced, and only certain methods will be permitted.

d) Considering the other stresses that the reefs are subjected to, it may be advisable to try and control some of the severe outbreaks of crown-of-thorns starfish. The animals should be removed from the reef by trained snorkellers or divers (further information about crown-thorns-starfish is in details are in section 5.3. and in *Semporna Islands Project: Reef Assessment and Monitoring* (Wood, *et. al.* 2001).

7.3. TERRESTRIAL HABITATS AND COMMUNITIES

Objectives

- To ensure that representative habitats and communities are fully protected and that conservation of terrestrial biodiversity is promoted throughout the rest of the park.

Opportunities

a) Highest biodiversity is associated with the two main islands – Bodgaya and Boheydulang. These islands support habitats and communities which are of high conservation value.

b) Habitat recovery following disturbance on Pulau Tetagan is good, and natural biodiversity could be regained if the area is protected.

c) Most of the other islands have isolated small patches of natural vegetation worthy of protection. Benefits of re-introducing native island flora could be investigated.

Constraints and threats

a) Some loss of biodiversity has already occurred on Bodgaya and Boheydulang due to settlements, cultivation, and removal of mangrove.

b) Proposed tourism development and island-based activities on these central islands could have impacts on biodiversity unless properly managed.

c) On Tetagan, most of the island vegetation has been disturbed in the past from felling of trees and clearance of natural vegetation for cultivation.

d) Sebangkat has poor soil and biodiversity is lower than on the central islands.

e) Most of the natural vegetation communities on Selakan have been cleared for cultivation and growing of fruit trees.

f) Natural vegetation communities on Maiga, Sibuan and Mantabuan have been almost entirely cleared for coconut plantations. Biodiversity is also naturally much lower than on the other islands.

Recommended actions

a) Selected, sensitive areas of high conservation value will be preserved in their natural state, completely undisturbed by human activities. These ***Preservation Zones*** will be no-take, no-entry areas except for scientific research, and will serve as 'control' sites to monitor the condition of the park and its resources in the absence of any pressure from people. For regulations that apply to Preservation Zones see section 10.4. This zone will cover about 12% of the total land area of the park.

   The following is recommended as *Preservation Zone*:
   - Eastern end of Pu Bodgaya, with the exception of Kg Tag Hawaian and the lowland area taken up by crops and fruit trees.

b) Areas supporting a range of representative, rare, vulnerable and/or key terrestrial habitats will be established as ***Sanctuary Zones***. This zone allows for limited sustainable use, but prohibits collection or removal of any natural resource.

The following are recommended as *Sanctuary Zones:*

- All areas of forest and scrub on Bodgaya and Boheydulang which lie outside the villages and gardens. More surveys and discussions will be needed to precisely locate the boundaries.
- All of Tetagan, Sibuan and Mantabuan, but with the proviso that those people with legitimate customary rights may take fruits and coconuts.

c) Activities and proposed developments throughout the park should be assessed for their potential impact on terrestrial biodiversity, and measures taken to minimise or eliminate any negative effects.

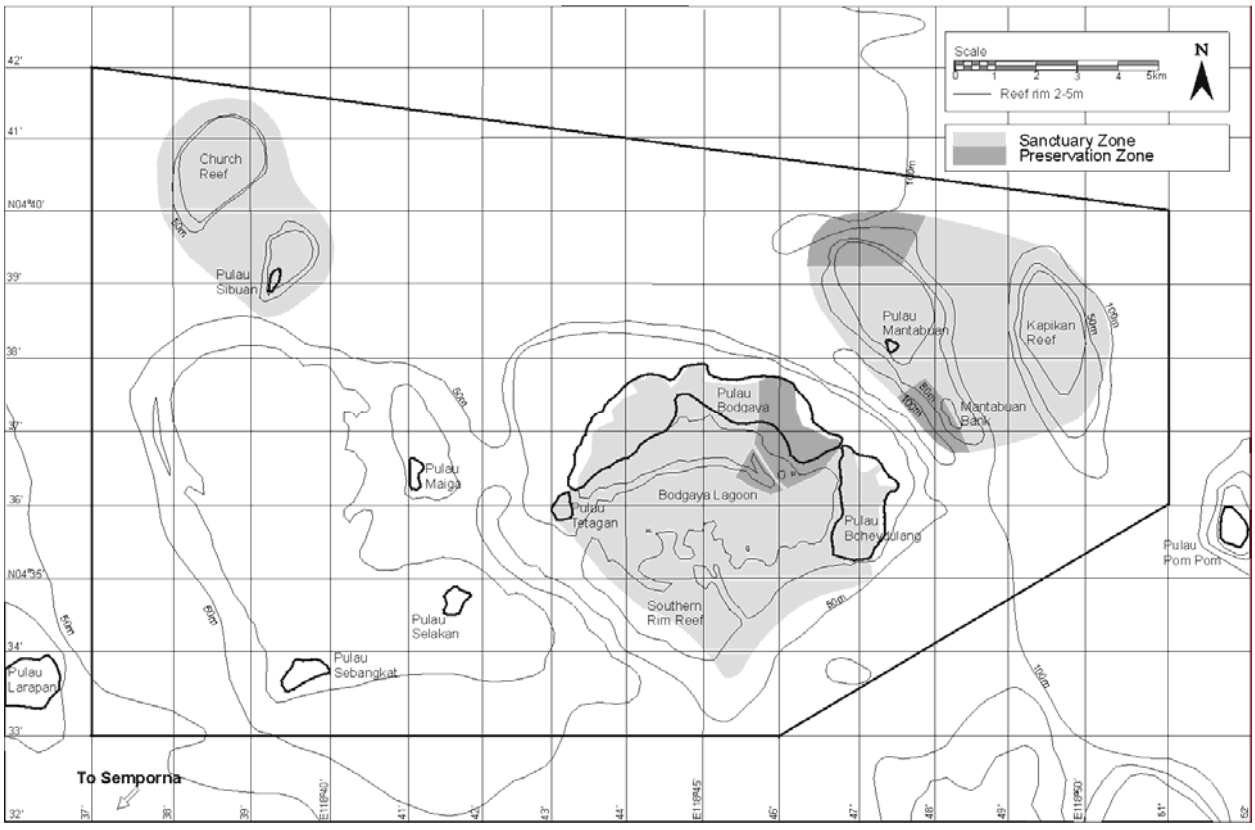


Figure 80. Map of the proposed Semporna Islands Park showing the Preservation and Sanctuary Zones covering both marine and terrestrial areas.

7.4. PROTECTION OF MARINE SPECIES

Objectives

- To ensure that rare, endangered, endemic, and/or key species are protected and managed.

Opportunities

a) Species of high conservation value occur throughout the area, from shallow to deep water. They range from rare corals and sponges to giant clams, sea snakes and turtles.

b) There are excellent opportunities for protection of these species within the legislative framework of the park.

Constraints and threats

a) Over-exploitation of certain important marine species has occurred – e.g. giant clams, but recovery is possible if appropriate steps are taken.

b) Many other species of conservation value are not specifically targeted, but populations of some may have been affected as a result of habitat loss or degradation.

c) Some of the species of particular interest are structurally delicate and thus vulnerable to physical damage (e.g. by divers or fishing gear).

Recommended actions

a) All species will be completely protected in the Preservation and Sanctuary Zones, where nothing may be removed.

b) In the General Use and Buffer Zones, limited extraction of living resources will be allowed under permit, but some species will require complete protection throughout the park. It is recommended in the first instance that all reef corals, black corals, giant clams, marine turtles, sea snakes, marine mammals and the giant triton *Charonia tritonis* are put on the protected list. Further vulnerable species may be added later.

7.5. PROTECTION OF TERRESTRIAL AND AVIAN SPECIES

Objectives

- To ensure that rare, endangered, endemic, and/or key species are protected and managed.

Opportunities

a) Many plant species of high conservation interest are present on Bodgaya and Boheydulang. These include species new to science and others previously unrecorded for Sabah or Malaysia.

b) Megapodes, hornbills and otters are amongst the larger unusual animals present.

c) A fruit bat colony is present on Maiga.

d) Several species of interest are associated with the small remnants of beach forest on Sibuan and Mantabuan.

e) Turtles have been reported to nest on Mantabuan and possibly Sibuan.

Constraints and threats

a) Populations of some species on the central high islands have already been affected by past human activities. For example:

- several species of orchid previously present on the islands are believed to have been exterminated through collecting.
- Timber trees have been selectively removed.
- Bearded pig and sambur deer have been hunted to extinction.

b) The outlying islands have been significantly altered, and there is continuing disturbance from human settlements, cultivation and use of resources.

Recommended actions

a) All species will be completely protected in the Preservation and Sanctuary Zones, where nothing may be removed. This arrangement ensures that most of the critical species are protected.

b) It is recommended that removal of any wild animals or birds in the other zones is prohibited (currently little or no hunting is done).

c) Limited removal of plant species in the other zones will be allowed under permit. However, some species will require complete protection throughout the park. It is recommended in the first instance that all mangrove trees are put on the protected list. Further vulnerable species may be added later.

7.6. MAINTAINING A HEALTHY ENVIRONMENT

Biodiversity is influenced by many factors, including changes in water quality, availability of ground water and so on. The measures outlined in the previous pages will succeed only if the health and quality of the environment is maintained. Research to date indicates that the marine and terrestrial areas of the park are currently unpolluted, but if this situation is reversed then negative impacts on biodiversity are likely.

Objective

- To maintain a healthy and unpolluted environment within the Semporna Islands Park.

Constraints and threats

a) Developments within the park could lead to pollution of the land and sea.

b) The semi-enclosed Bodgaya lagoon is especially vulnerable to sediment run-off from the central high islands.

c) The park's marine areas could be affected by pollution coming from the mainland coast of Sabah (e.g. via rivers or direct run-off from the land).

d) There is limited fresh water supply on the islands. Over-exploitation of ground water could have an impact on natural vegetation.

e) Currently there is no proper disposal of sewage and rubbish.

f) Rubbish is being carried into the area from outside. Some of this washes up on beaches, or becomes entangled on the reefs.

Recommended actions

a) Plan a monitoring programme to assess trends in water quality around the islands.

b) Identify sources of marine pollution should they occur, and work with relevant Semporna District authorities to minimise outputs.

c) Work with local island communities to improve disposal and re-cycling of wastes including sewage.

d) Devise water procurement schemes (e.g. desalination; collection of rainwater) that will reduce the pressure on freshwater sources from the islands. Phase out the use of wells on the outlying islands.

e) Ensure any developments within the park adhere to strict anti-pollution measures both during the construction and operational phases.

f) Reduce sediment discharge and nutrient input into the lagoon and other areas of the park by managing the catchment areas. This applies especially to the central high islands and the land under cultivation.

g) Carry out a comprehensive clean-up on the islands, and set up a programme for the future. The area around the Pearl Farm on Boheydulang is particularly in need of this, both on the land and underwater. There are numerous items discarded by the old farm, and added to this is a significant amount of domestic rubbish including cans, bottles and plastic items.

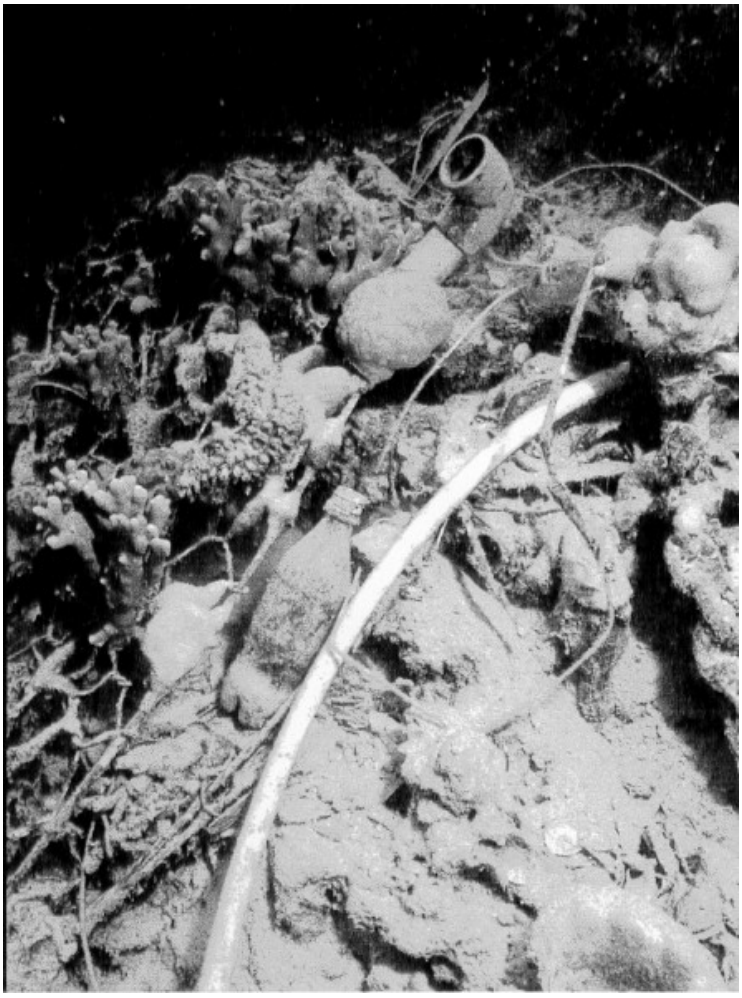


Figure 81. Some of the accumulated rubbish on the reef close to the jetty and beach on Boheydulang by the old Pearl Farm.