

3. BIODIVERSITY

3.1 INTRODUCTION

Definition

Biodiversity may be defined as the variety of life forms (plants, animals and other organisms), the genes they contain and the ecosystems and ecological processes of which they form a part. In Australia it is usually taken to mean those plants, animals and micro-organisms which were present prior to European Settlement or have since colonised without being physically translocated by human beings.

Importance of Biodiversity

“Biodiversity is essential in the maintenance of all life on Earth” (EPA 1999b). It underpins the life support systems on which we as humans ultimately depend. In addition to providing direct benefits to humans such as maintaining viable agricultural soils, food, many medicines and industrial materials, the Earth’s biodiversity is important to us culturally and emotionally. This generation has a duty to pass on to the next the biodiversity that was passed on from previous generations.

Over and above this human centric view of the world is the recognition that, the Earth’s biodiversity has its own right to exist regardless of its value to human beings (i.e. all life has its own intrinsic value).

Legislative Requirements to Protect Biodiversity

There are a number of Commonwealth and State Government Acts and International Treaties which offer a measure of protection to Queensland’s biodiversity which are relevant to Noosa Shire.

International Conventions and Agreements (EPA 1999)

- Convention on Biological Diversity;
- Convention on International Trade in Endangered Species (CITES);
- Agreement between the Government of Australia and the Government of Japan for the Protection of Migratory Birds in Danger of Extinction and their Environment (JAMBA 1981);
- Agreement between the Government of Australia and the Government of the People’s Republic of China for the Protection of Migratory Birds in Danger of Extinction and their Environment (CAMBA 1989);
- The Convention on the Conservation of Migratory Species of Wild Animals (The Bonn Convention);
- Convention on Conservation of Nature in the South Pacific (Apia Convention); and
- Convention on the Regulation of Whaling.

Commonwealth Government

- *Environment Protection and Biodiversity Conservation Act 1999* and the attached list of threatened species, ecological communities and key threatening process;
- National Strategy for the Conservation of Australia’s Biological Diversity;
- National Strategy for Ecologically Sustainable Development;
- Intergovernmental Agreement on the Environment.

State Government

- *Environmental Protection Act 1994* and related policies and Regulations;
- *Nature Conservation Act 1992* (which includes migratory birds listed under JAMBA and CAMBA);
- *Nature Conservation (Wildlife) Regulation 1994*;
- *Nature Conservation (Protected Areas) Regulation 1994*;
- *Vegetation Management Act 1999* and *Vegetation Management Regulation 2000*;

- Fisheries Act 1994 (which regulates the removal of mangroves and all other marine plants);
- South-East Queensland Regional Forest Agreement; and
- Water Resources Act 1989 (which controls the removal of native vegetation in creeks and rivers).

3.2 ISSUES & PRESSURES

3.2.1 Ecosystem Functioning

Indicator: Area of Remnant Native Vegetation.

Prior to European Settlement Noosa Shire, like most of South-east Queensland, would have supported an almost continuous native vegetation cover as shown in Figure 3.1 (Catterall and Kingston 1993; Queensland Herbarium and Department of Environment and Heritage 1998). Large areas of this vegetation would have been managed by the aborigines using deliberately set, frequent, cool fires (Bowden 1999). This resulted in a mosaic of burnt and unburnt vegetation, at various stages of recovery. Recently burnt areas provided green pick for fauna such as wallabies and hunting opportunities for their predators whilst unburnt areas provided habitat for ground dwelling fauna.

Along much of the coastline on the coastal dunes, swales, beaches north of Noosa Heads were a patchwork of vegetation types including: open forests and woodlands dominated by various species of eucalypts/corymbias (*Eucalyptus pilularis*; *Eucalyptus racemosa*; *Corymbia intermedia*); and Wallum banksia woodland with eucalypts. A substantial area of wet and dry heath was restricted to the area south of Noosa Head and the North Shore within the Shire.

There were also extensive freshwater bodies including Lake Cooloola and wetland communities including:

- Swamp She-Oak (*Casuarina glauca*) open forest, paperbark swamp (with or without swamp mahogany, blue gum/swamp box);
- Wet heaths dominated by *Leptospermum* spp, Epacrids, *Empodisma minus*, *Sprengelia sprengelioides*; and
- Scattered thin strips of mangrove forests around Lakes Cootharaba, Doonella and Cooribah and along the Noosa River.

Within lakes Cootharaba, Doonella, Weyba (and in the nearby channel) and in the Noosa River between Goat Island and the North Shore extensive areas of seagrass beds of Sea Wrack (*Halophila ovalis*) and Eelgrass (*Zostera capricorni*) occur.

Further inland on the alluvial flood plains were extensive areas of blue gum (*Eucalyptus tereticornis*) woodland with or without grey ironbark (*E. siderophloia*) interspersed with a variety of open forest and woodland communities on the coastal sand plains. Towards the west of the Shire on the basalts and phyllite shales of the Wahpunga, Woondum, Beenham and Wolvi Ranges were extensive areas of closed vine forest such as the Kin Kin scrub (Araucarian notophyll and notophyll/microphyll) and tall open forests of flooded gum/tallow wood/brush box. Brackish water bodies included lakes Cootharaba, Cooribah, Weyba and Doonella.

The extent of the vegetation across the Shire would have allowed relatively unfettered movement of fauna across the landscape as dispersive juveniles, or in response to annual and seasonal variations in rainfall patterns and food availability. There would have been almost continuous forest cover from the Wahpunga, Woondum, Beenham and Wolvi Ranges to the coast for fauna such as some species of raptors and frugivorous pigeons which undertake seasonal altitudinal migrations (Marchant and Higgins 1993; Recher et al 1995). There would also have been a continuous cover of the lowland eucalypt forests supporting such fauna as koalas and allowing young animals to disperse across the landscape in search of new territories. However, vegetation patterns and the distribution of various fauna species would have been dynamic – expanding and contracting in responses to changes in climate, sea level, droughts, floods and fire.

Since European settlement, agriculture, plantation forestry, and urban development have resulted in the clearing of substantial areas of native vegetation particularly west of Lake Cootharaba. This has left a patchwork of isolated fragments of the original native vegetation within a predominantly cleared landscape. Most of the Araucarian notophyll and notophyll/microphyll vine forest of the Kin Kin Scrub has been cleared along with much of the blue gum (*Eucalyptus tereticornis*) woodlands (Olsen et al 1995, EPA 1999, Drane and Whitehead 1995). [A degree of connectivity remains between the coast and the ranges north of Lake Cooribah.] The relatively small pocket of dry heath has been significantly reduced by housing development along the coast line.

Overall 40,456ha (50%) of the original 80,240ha (approximately) of terrestrial native vegetation remains as of the year 2000. The total area of native vegetation has been calculated as part of Noosa Shire's Vegetation Loss/Gain Analysis Report (Burrows 2000).

Figure 3.1 on page 16 shows the pre-clearing extent of land form/geology and general vegetation types.

Limited conversion of forest and woodlands to pasture may be of some benefit to some species such as Eastern Grey Kangaroo (*Macropus giganteus*), Pacific Baza (*Aviceda subcristata*), and Collared Sparrowhawk (*Accipiter cirrhocephalus*) by providing feeding or hunting opportunities. However, conversion of native forest to radiata pine plantation results in far fewer species of native fauna (Law 2000). The impact on biodiversity is reduced if native vegetation is retained within the plantation. Few species however will tolerate the total conversion of forest and woodlands to urbanisation or open paddocks and those that do may eventually displace the less tolerant species in the remaining bushland remnants.

Forest destruction leads to a decrease in abundance and distribution of forest dependent flora and fauna. Clearing of forests on hills and lowlands decreases winter feeding areas for fauna such as frugivorous pigeons and some raptor (bird of prey) species. It also increases water runoff rates and erosion during periods of high rainfall.

Fragmentation of forest habitat leads to loss of plant and animal dispersal routes and opportunities to recolonise habitat which becomes available (Catterall 1994). It also leads to changes in fire patterns and the microclimate within each fragment and increases susceptibility to weed invasion and predation of the fauna within it. If fragments are too small they may be unable to support some species of fauna with narrow environmental tolerances or which require a large resource base to survive.

Clearing of riparian forest and wetlands decreases the area available for drought and bushfire refuge and species dependent on these ecosystems. It also may affect stream water quality through increased siltation and changes to light levels, nutrient loads and water temperature.

The coastal and wetland communities on the eastern side of the Shire have fared rather better and remain in an almost continuous band from the northern to the southern boundary, much of this vegetation being protected in National Park. This approximately 8,000ha area, termed the "Noosa-Maroochy Wallum Area", has recently been included on the Register of the National Estate because of its diversity of remnant coastal habitats, high diversity of flora and fauna (including many rare and threatened species and species at the northern or southern limit of their range) and because it contains good examples of a variety of landforms. It is also important for the movement of wildlife because it provides a continuity of habitats in an otherwise fragmented landscape.

Fire regimes within native vegetation have also changed since European settlement with frequent, hot fires, which engulf entire remnants becoming the norm, particularly close to urban areas. Invasion of exotic species such as *Lantana camara* (Lantana) and *Melinis minutiflora* (Molasses Grass) have altered the fire regime within areas of native vegetation. In other remnants fire may be excluded altogether changing species composition and density. These fire regimes may not be optimal for biodiversity, and have largely evolved out of the perception of threat to life and property. An appropriate fire management strategy should be a high priority for natural resource management.