



A Guide to Warringah's Flora and Fauna

**A summary of the results of
the Warringah Natural Areas Survey**

Introduction

Australia is home to a variety of unique plants and animals, many of which are found nowhere else in the world. However since 1788, 125 plant and animal species have become extinct and many species are now listed as threatened.

Within the Warringah Local Government area, there are currently over 70 species of plants and animals threatened nationally or within NSW. Our flora and fauna is under threat from a number of factors including clearing and fragmentation of native vegetation, competition and predation by feral animals (such as cats and foxes) and from the invasion of weeds.

Warringah Council is committed to protecting its flora and fauna and recently completed a **Natural Area Survey**. This survey provides Council with a record of all our flora and fauna identified with Warringah and is

an important tool to effectively manage Warringah's natural environment.

Warringah Council's Natural Areas Survey recorded 407 species of native animals, 855 native plants and 37 different vegetation communities within Warringah. These results highlight that the Warringah area supports a diverse range of biodiversity. However, many of the species recorded are threatened species and must be protected to ensure their future survival.

This booklet highlights some of the important flora, fauna and vegetation communities found in Warringah.

If you would like more information about the Survey or its findings, please contact Warringah Council's Conservation and Land Management Team on 9942 2579 or visit us online at www.warringah.nsw.gov.au



Why conserve biodiversity?

Biodiversity is the variety of life on earth, including different plants and animals, and the ecosystems in which they live.

Warringah is home to a wide range of plants and animals. This is largely due to the variety of landscapes within the local area.

From the hilltops of Terry Hills to the coastline of Dee Why, changes in topography, geology and soil lead to variations in plant species and vegetation structure and as a result different animals choose to live in these areas.

Biodiversity offers many values from providing food to performing important functions to support human life, such as the regulation of climate, water and nutrient cycles and the breakdown of pollution. Warringah is valued for its diverse natural environment with over 6,000 hectares of bushland in public ownership, 75 hectares of coastline, nine beaches and four lagoons.

Warringah's Natural Area Survey will be used as a tool to help conserve biodiversity, by identifying the different plants, animals and ecosystems present to ensure they are managed correctly and that our valuable resources are not lost from inappropriate use.



What is a Threatened Species?

Warringah's biodiversity is threatened by clearing of native vegetation, changes to fire frequency, predation by feral animals and invasion of weeds. A **threatened species** is a species that is likely to become extinct if threats to it continue.

The words **endangered** and **vulnerable** are used to describe how close the species is to extinction. For example, an **endangered species** is a species likely to become extinct in the near future if threats to it continue. A **vulnerable species** is one that is likely to become endangered if threats continue.



Warringah's Vegetation

A **Vegetation Community** is a particular group of plants that make up a vegetation type. There are 37 different vegetation communities in Warringah. Each community contains different flora species and provides potential habitat for a range of fauna. These vegetation communities are broadly grouped into 12 main vegetation classes.

Almost half (41%) of Warringah's native vegetation has been lost since 1750. The impact of clearing has been very uneven, with some vegetation communities far more affected than others in areas where land has become suitable for urban development. For example, very little of Warringah's native vegetation now remains within four kilometres of the coast, where significant development has taken place. As a result, vegetation communities found in this area have been greatly reduced in size. Some of the Warringah vegetation communities are now so rare that they are listed as "endangered" under the NSW **Threatened Species Conservation Act 1995** (TSC Act).

As the native vegetation of Warringah becomes more and more fragmented, it is increasingly important to maintain and re-establish vegetation links between the larger areas of remnant bushland. These links are called 'Wildlife Corridors' and allow native animals to move between the small pockets of bush that remain.

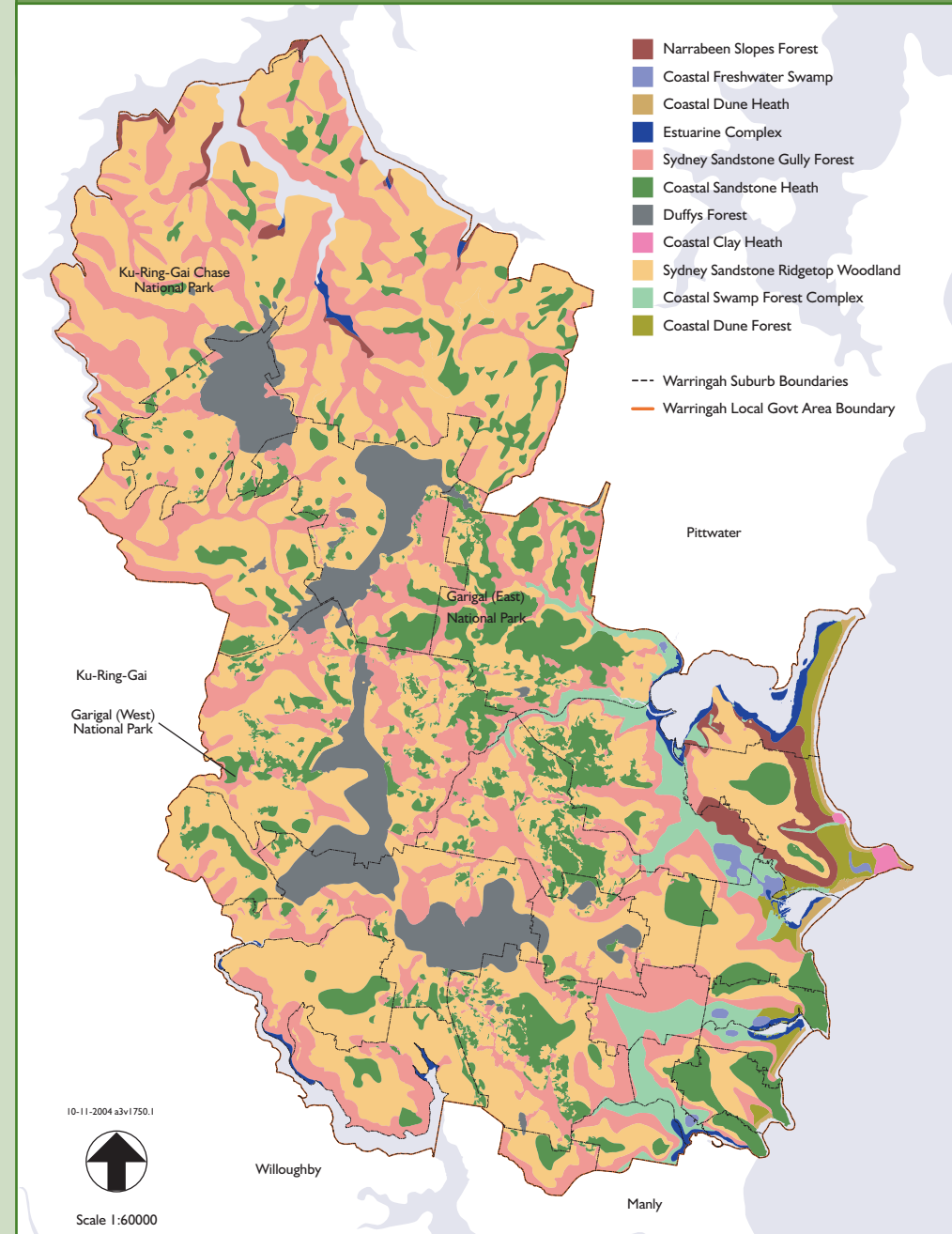


Photo courtesy G. Dabb



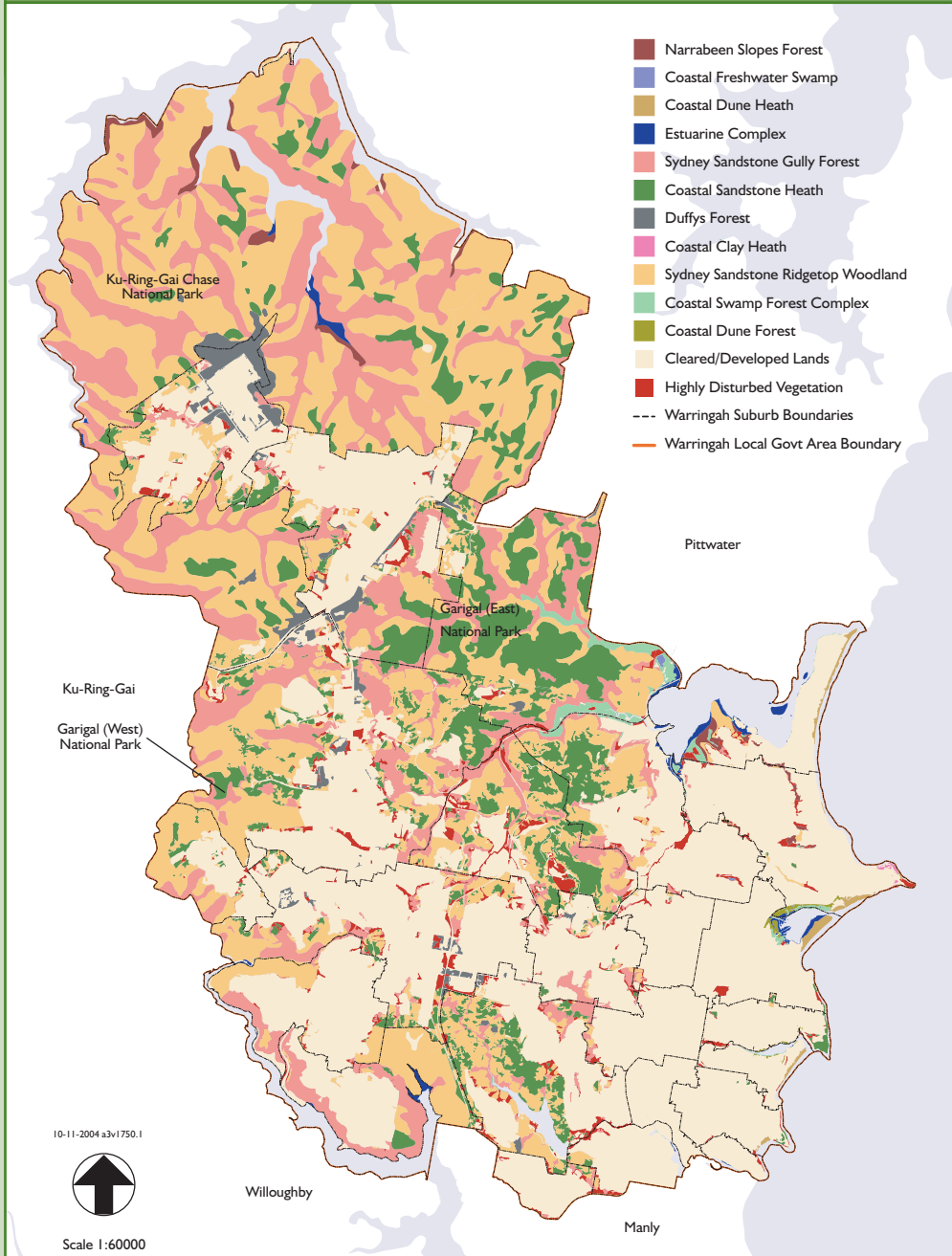
The map of Warringah's vegetation in the year 2000 compare with the map from 1750 clearly shows that a large amount of vegetation has been lost and that there are now many fragmented pieces of bushland in Warringah. It is important that the local community continues to preserve bushland wherever possible, but particularly in areas where there are limited examples remaining of a particular type of vegetation.

Map of Warringah's Vegetation 1750



Warringah's Vegetation Classes

Map of Warringah's Vegetation 2000



1. Coastal Saltmarsh

Coastal Saltmarsh is a class of vegetation that occurs in estuarine (salt) water conditions particularly around Dee Why and Narrabeen Lagoons. Soil in these areas is waterlogged and plants have adapted to these conditions. Within this class, there are four vegetation communities, **Mangrove Forest**, **Swamp Oak Floodplain Forest**, **Saltmarsh** and **Seagrass Beds**. Seagrass Beds play an important role in estuaries as they provide food, shelter and nursery grounds for many aquatic animals.

2. Coastal Clay Heath

Coastal Clay Heath grows on exposed coastal headlands on the soil type Narrabeen Group shale, which is the soil layer that lies below the Hawkesbury Sandstone. This vegetation class makes up only 0.08% of all bushland in Warringah and is restricted to Long Reef Headland. Within this class, there are three vegetation communities, **Coastal Banksia-Teatree Scrub**, **Themeda Grassland** and **Lomandra Sedgeland**.

3. Narrabeen Slopes Forest

Narrabeen Slopes Forest occurs on the soil type Narrabeen Group shale. In comparison to the sandy, infertile soils of Hawkesbury Sandstone, shale is a clay-rich soil, which has a fine texture and is more fertile. Narrabeen Slopes Forest is made up of tall trees and moist understorey species and is found in sheltered locations at Cottage Point, Jamieson Park and Anzac Avenue, Reserve. This vegetation is rare because it only occurs in areas where Narrabeen shale outcrops occur, which doesn't happen very often in Warringah. There are three vegetation communities within this class, **Rough-barked Apple-Forest**, **Oak Forest**, **Bangalay Slopes Forest** and **Narrabeen Escarpment Scrub**.



Bangalay Slopes Forest



Blackbutt-Turpentine Forest

4. Duffys Forest

Duffys Forest is an endangered ecological community listed under the TSC Act. Duffys Forest is very rare and makes up only 4% of Warringah's bushland. The soil of Duffys Forest vegetation is slightly more fertile than the soil of other types of sandstone vegetation resulting in generally taller trees and grassier understorey.

Duffys Forest is the habitat for many threatened plants including the endangered shrub, *Grevillea caleyi*. Warringah contains most of the remaining Duffys Forest and *Grevillea caleyi* in the whole of Sydney. There are four vegetation communities within this class, **Silvertop Ash-Brown Stringybark Forest**, **Blackbutt-Turpentine Forest**, **Angophora-White Mahogany Forest** and **Yellow Bloodwood-Grey Gum Forest**.

5. Coastal Dune Forest

This vegetation class is found growing on sand dunes along coastal beaches. In Warringah, only 7% of the original extent of this vegetation now remains along the western side of Dee Why Lagoon and a small area around Curl Curl Lagoon. There is one vegetation community within this class called the **Bangalay Sand Forest**. Two important species found within this vegetation, *Banksia integrifolia* (Coast Banksia) and *Eucalyptus robusta* (Swamp Mahogany), are major winter food sources for nectar-feeding fauna, including the threatened Regent Honeyeater and Swift Parrot.



Swift Parrot *Lathamus*



Forest Oak Forest



Glossy-Black Cockatoo
Calyptorhynchus lathami

6. Coastal Dune Heath

Coastal Dune Heath is widespread along the coastline and makes up 0.9% of Warringah's bushland. There are two vegetation communities within this class, Spinifex Grassland and Coastal Wattle Heath. Both communities occur on sand dunes with Spinifex Grasslands growing on the seaward edge of the dune, and Coastal Wattle Heath growing on the landward side.

7. Sydney Sandstone Gully Forest

Sydney Sandstone Gully Forest makes up about 20% of bushland in Warringah. It is common throughout the entire area and occurs on sandy soils made from Hawkesbury Sandstone. Sandstone Gully Forest usually grows in tall forest-like formation within gullies and on sheltered slopes where the soils are deeper and richer. There are three different vegetation communities within this class and all three have different dominant species. They are **Peppermint-Angophora Forest**, **Coachwood Rainforest** and the **Forest Oak Forest**. The Forest Oak community is a major food

source for the threatened Glossy Black Cockatoo. There is only one example of Forest Oak Forest in Warringah at Allenby Park, Brookvale. The Coachwood Rainforest provides habitat for the magnificent but threatened Powerful Owl and the Red Crowned Toadlet.

8. Sydney Sandstone Ridgetop Woodland

Sydney Sandstone Ridgetop Woodland grows on sandy soils made from Hawkesbury Sandstone and is found on plateaus and ridges. This class makes up over 41% of all bushland and is the most common type of bushland found in Warringah. There are three different vegetation communities within this class and all three have different dominant species. They are **Bloodwood-Scribbly Gum Woodland**, **Narrow-leaved Scribbly Gum Woodland** and **Angophora Woodland**. Angophora Woodland is a particularly important vegetation community as it provides habitat for many threatened plant and animal species including Glossy Black-Cockatoo and Powerful Owl.



The cliffs of Freshwater Beach and McKillop Park are covered with Sandstone Headland heath vegetation.



Manly Dam



Freshwater Lagoon Swamp

9. Coastal Sandstone Heath

This vegetation class occurs on the sandy soils of Hawkesbury Sandstone geology. Plant species growing on this soil type have adapted to shallow, infertile and dry soil conditions. Vegetation communities growing on sandstone geology are known to have a very high level of species diversity and are habitat for a number of threatened plants and animals. This vegetation class makes up over 21% of all bushland and is one of the most common types of bushland found in Warringah. There are five different vegetation communities within this class, **Sandstone Heath**, **Sandstone Swamp**, **Sandstone Headland Heath**, **Yellow-top Ash Mallee** and **Heart-leaved Stringybark Mallee**.

10. Swamp Sclerophyll Forest on Coastal Floodplains

This vegetation class is an endangered ecological community listed under the TSC

Act. This vegetation makes up only 1.8% of all bushland found in Warringah. As the name suggests, it is found around swampy, saline and waterlogged areas, particularly around the margins of estuaries and coastal lagoons such as Narrabeen and Dee Why.

There are six vegetation communities within this class, **Estuarine Reedland**, **Estuarine Paperbark Scrub**, **Swamp Mahogany Forest**, **Bangalay Alluvial Forest**, **Palm Woodland** and **Water Fern Swamp**. These vegetation communities are extremely rare within Warringah and many are not protected within National Parks. They not only contain many threatened plants species but are also important habitat for many threatened fauna species such as the



Spotted-tailed Quoll
Dasuyurus maculatus

Australasian Bittern, **Osprey**, **Black Bittern**, **Swift Parrot**, **Regent Honeyeater**, **Spotted-tailed Quoll** and **Greater Broad-nosed Bat**.

11. Freshwater Reed Swamps

Freshwater Reed Swamps is made up of dense strands of reeds, sedges and other water plants. It is found in shallow waters around freshwater lagoons. In Warringah, this vegetation class is restricted to artificial water bodies and was probably absent from the area before European settlement. Today, it is mainly found around Manly Dam. This vegetation provides potential habitat for wetland fauna, including the threatened **Australasian Bittern** and the **Green and Golden Bell Frog**. There is one vegetation community within this class called **Freshwater Lagoon Swamp**.

12. Coastal Freshwater Swamp

Coastal Freshwater Swamp is also called Sydney Freshwater Wetlands and is an endangered ecological community listed under the TSC Act. This vegetation class is made up of dense strands of reeds, sedges and other wetland plants, surrounded by low trees and shrubs. There are two vegetation communities within this class, **Coastal Freshwater Lagoon Swamp** and **Coastal Dune Swamp**. Both types of vegetation are rare in Warringah and in the Sydney region generally. In Warringah, Coastal Freshwater Lagoon Swamp is only found at one small lagoon on the floodplain of Deep Creek, and Coastal Dune Swamp is only found on the western side of Dee Why Lagoon. Both communities provide potential habitat for threatened fauna species including **Black Bittern** and the **Green and Golden Bell Frog**.

Warringah's Flora

A total of 855 native plant species, subspecies, varieties and forms were recorded within the Warringah Local Government Area (LGA) during the Natural Area Survey. Of these species, 140 (16%) have not been recorded in either Ku-ring-gai Chase or Garigal National Parks.

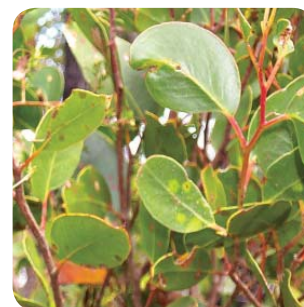
Warringah has many plant species that are of particular conservation value including 15 species threatened within NSW or nationally, 15 rare or poorly known species, 176 species threatened in northern Sydney, 17 species threatened in Warringah, and 26 biogeographically significant species. A **biogeographically significant species** is a species that is not necessarily threatened, but its Warringah populations are important in terms of distribution.

Threatened species require special care because they are already low in numbers and in danger of being lost. Some of Warringah's important native plants are:



Grevillea caleyi

This species is an endangered plant species and is protected under the TSC Act. This plant grows on ridge tops in ironstone soils and forms part of the vegetation community Duffys Forest. This plant is only found within a six kilometre radius surrounding Terrey Hills. It is a medium sized shrub that grows to four metres in height. Its branches, leaves and flower stalks are all covered in soft hairs and the dark burgundy-red coloured flowers are shaped like a toothbrush.



Heart-leaved Stringybark

Eucalyptus camfieldii is listed as nationally vulnerable. This plant is only found in two locations within Warringah and in only one small pocket of local National Park.



Black-eyed Susan

Tetratheca glandulosa is listed as nationally vulnerable. It is a small pink/purple flowered herb which grows on ridges within Warringah and is vulnerable due to fragmentation and urban development.



Thyme Honey-myrtle

Melaleuca thymifolia is threatened in northern Sydney as it is poorly represented in local National Parks. It has purple flowers and grows in boggy heathland.



Yellow-top Ash

Eucalyptus leuhmanniana is not listed as threatened but is considered rare. It grows on sandstone ridges with poor drainage. It has a restricted range and is therefore of important conservation value.



Swamp Mahogany

Eucalyptus robusta is threatened in northern Sydney as it is poorly represented in local National Parks. The flowers are also an important food source for a number of threatened fauna species.

Warringah's Fauna

The Warringah Local Government Area (LGA) outside of National Parks is home to over 407 species of native animals including frogs, reptiles, birds and mammals. Of these, 144 species (35%) have not been recorded within National Parks.

Marine mammals comprise 17% of Warringah's fauna including turtles, sea snakes, seabirds, seals, whales, dolphins and dugong. Warringah has 75 hectares of coastline and its clean waters provide habitat for threatened marine species including the **Grey Nurse Shark** and the **Loggerhead, Green and Leatherly turtles**.



Frogs

Warringah's wetlands, ponds and watercourse provide habitat for 16 species of frog. Warringah has two common frog species; the Common Eastern Froglet and Striped Marsh Frog. There are also three species of frog listed as threatened, the **Giant Burrowing Frog**, **Green and Golden Bell Frog** and **Red-crowned Toadlet**.



Reptiles

There are 45 reptile species recorded in Warringah. Reptiles live in a range of environments from urban to sandstone outcrops and bushland areas. The **Broad-tailed Gecko**, **Eastern Blue-tongue Lizard** and **Garden Sun Skink** are common reptiles found in our backyards. The **Eastern Water Dragon**, **Eastern Water Skink** and **Red-bellied Black Snake** are frequently sighted along the streams and creeks of bushland areas. Species such as the **Diamond Python**, **Green Tree Snake** and **Marsh Snake** are found in areas of forest, woodland and heath.

Due to the loss and destruction of bushland, reptiles that require large areas of bushland to live have declined in numbers. The **Heath Monitor** is an extremely rare reptile in Sydney and is listed as threatened under the TSC Act. Warringah is lucky to have a few populations of **Heath Monitors** living and breeding in its bushland reserves. Another species, the **Red-naped Snake** has not been recorded for over 40 years in Warringah and now appears to be locally extinct.



Birds

Warringah's broad array of vegetation communities, from hilltop woodland to coastal scrub and lagoons, provide habitat for up to 303 bird species. Some of the frequently seen birds in our urban environments include the **Crested Pigeon**, **Sulphur-crested Cockatoo**, **Galah**, **Australian King Parrot**, **Crimson and Eastern Rosella** and **Rainbow Lorikeet**. Species found in wetland areas include the **Dusky Moorhen**, **Purple Swamphen**, **Masked Lapwing**, **Silver Gull** and **Crested Tern**. The **Tawny Frogmouth** and **Southern Boobook** are nocturnal species and can be heard and seen during the night.

Destruction of habitat, decline in food resources and introduced species has caused a decline in bird populations in Warringah. Currently 10 bird species are listed as threatened nationally including the **Blue Petrel**, **Swift Parrot**, **Northern and Southern Giant-Petrel**, **Fairy Prion**, **Regent Honeyeater** and four species of **Albatross**.



Mammals

Warringah has recorded 43 mammal species, which are under threat due to loss of habitat, destruction of bushland and attack from introduced species such as cats and foxes. In some areas of bushland, only introduced species now exist as the bushland has become too small for native wildlife to live and breed.

Six species of mammal are listed as threatened nationally including the **Spot-tailed Quoll**, **Southern Brown Bandicoot**, **Southern Right Whale**, **Humpback Whale**, **Southern Elephant Seal** and the **Grey-headed Flying Fox**. The vulnerable **Eastern Pygmy Possum** is another important species that was recently recorded in Warringah.



How can you assist in protecting our local native flora and fauna?

- ✓ Plant local Australian native species in your garden
- ✓ Remove all noxious and environment weeds from your garden
- ✓ Don't feed native wildlife
- ✓ Stay on tracks during bushwalks
- ✓ Don't pick native plants from the bush
- ✓ Encourage wildlife into your backyard by creating a wildlife friendly garden
- ✓ Keep your cat indoors at night and attach bells to your cat collars
- ✓ Keep your dog and cat out of Wildlife Protection Areas
- ✓ Join the 'Warringah Friends of the Bush' volunteer program
- ✓ Log on to Council's website and visit the Wildlife Watch Program to report sightings of all wildlife!

For more information on Warringah's Natural Areas Survey please contact Warringah Council on 9942 2579 or visit our website at www.warringah.nsw.gov.au