



Listed Migratory Birds

Species listed as migratory are protected under the *Environment Protection and Biodiversity Conservation Act 1999*. They include species listed in: appendices to the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals) for which Australia is a Range State under the Convention; the Agreement between the Government of Australia and the Government of the Peoples Republic of China for the Protection of Migratory Birds and their Environment (CAMBA); and the Agreement between the Government of Japan and the Government of Australia for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment (JAMBA).

SHORT-TAILED SHEARWATER

Puffinus tenuirostris

The Short-tailed shearwater is a fully trans-equatorial migratory species, with extensive movement around the Pacific Ocean and some movement to the north-eastern Indian Ocean (Marchant & Higgins 1998). Adults leave the breeding colonies around mid-April (non-breeding birds leave as early as February) and return to the southern Australian coastline around mid-September. This species is also a regular non-breeding summer visitor to Antarctica, and most birds from Tasmania probably travel to this location during the pre-laying period from 3-5 November to 24-25 November. The Short-tailed shearwater primarily breeds in burrows on islands off the coast of New South Wales through to Western Australia, including the Tasmanian coastline (Marchant & Higgins 1998). The total breeding population is estimated to be 23 million birds (Skira *et al.* 1996). Colonies of this species occur at many locations around Bruny Island (see Map 1), and there is a public viewing site at The Bruny Island Neck Game Reserve.



Photo: Nigel Brothers

SOOTY SHEARWATER *Puffinus griseus*

This species closely resembles the Short-tailed shearwater. A trans-equatorial migrant from breeding grounds around New Zealand, southern Australia and southern South America to the Bering Sea and north Atlantic (Marchant & Higgins 1998). Most adults depart breeding islands by the second week of April and return during the last two weeks of September, and migrate in huge flocks, which may contain other shearwaters including the Short-tailed shearwater (Marchant & Higgins 1998). Sooty shearwaters occur in a mixed colony with Short-tailed shearwaters at Courts Island near the Cape Bruny lighthouse (see Map 1).

BAR-TAILED GODWIT* *Limosa lapponica

In Australasia, this species is mainly coastal, occurring on large intertidal sandflats, spits and banks, and less often on estuaries, mudflats, inlets, harbours, coastal lagoons and bays, often around seagrass beds (Higgins & Davies 1996). This species breeds in Scandinavia, Russia and north-western Alaska. Non-breeding birds migrate around the coasts of the Indian Ocean and through north-eastern Asia, also migrating to Europe, Africa and the Pacific islands eastwards through Micronesia and around the Australian and New Zealand coastlines (Marchant & Higgins 1998). This species has also been recorded from several scattered records around the Tasmanian coastline and on King Island and the Furneaux Group, with most records between Orford and Southport Lagoon in the south-east. Individuals usually arrive in Tasmania between August and November, and leave between the end of February and mid-April (Marchant & Higgins 1998). Non-breeding individuals are occasionally seen at several locations around Bruny Island during the summer months, including the sand spit in Cloudy Bay Lagoon, Little Taylors Bay and Great Bay (Bryant 2002: see Map 1).

CASPIAN TERN* *Sterna caspia

This species breeds at widely scattered sites in North America, Europe, Africa, Asia and Australasia. It is a widespread species around the coastline of Tasmania, including King Island and the Furneaux Group. The Caspian tern is a partly resident, partly dispersive and possibly partly migratory species, and data suggests that there is some movement out of Tasmania during the winter months (Higgins & Davies 1996). This species is seen quite commonly foraging near the shoreline at several locations around Bruny Island, including Jetty Beach, Little Taylor's Bay and other localities in the D'Entrecasteaux Channel.

RED-NECKED STINT* *Calidrus ruficollis

In Australasia, this species is mostly coastal, occurring in sheltered inlets, bays, lagoons and estuaries with intertidal mudflats, often near spits, islets and banks (Higgins & Davies 1996), and occasionally on exposed or ocean beaches or rocky shores, and salt marshes and shallow wetlands. Red-necked stints breed in north-eastern Siberia and northern and western Alaska and move to non-breeding areas in south-east Asia and Australasia. They usually arrive in Tasmania between September (adults) and October-November (juveniles: Newman *et al.* 1985), and leave in March and April, concentrating at particular sites such as Barilla Bay before their migration (Patterson 1982). This species occurs infrequently in small groups of up to 30 birds at localities such as Cloudy Bay beach on Bruny Island (see Map 1) during the summer months.



Photo: Dave James

Species of High Conservation Significance

This section includes species that are not listed as threatened species under the Tasmanian *Threatened Species Protection Act 1995* or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* but are considered to be of high conservation significance. Many are protected under the *Nature Conservation Act 2002*. This Act makes provision for the conservation and protection of the fauna, flora and geological diversity in Tasmania, irrespective of specific threatened species status. Through appropriate management of these species in the present, the possibility of them being listed under the *Tasmanian Threatened Species Protection Act 1995* in the future may be avoided.



MAMMALS

Of high conservation significance

EASTERN QUOLL *Dasyurus viverrinus*

Description and distribution:

The Eastern quoll became extinct on the Australian mainland in the 1960s but remains locally abundant in a wide range of habitats in Tasmania. They are most common in the dry eastern half of Tasmania at low to medium altitudes. This species flourishes in areas where there is a mixture of pasture and forest, and comes out onto the pasture at night to hunt for rodents and insects, especially cockchafer and corbie grubs (Bryant & Jackson 1999). Eastern quolls are commonly found on Bruny Island, particularly in the drier northern part, where two colour morphs (black with white spots and fawn with white spots) can be found. They are usually solitary and territorial with a large home range. However, high densities can occur in suitable habitat where the range of individual animals can overlap. Eastern quolls become sexually mature in their first year and breed at approximately 11 months of age. Their life span is approximately four to five years in the wild. Breeding begins in late May-early June and up to six young are born about one month later. They remain in the pouch for approximately two months and are then transferred to a well-hidden den, becoming independent around November (Bryant & Jackson 1999).

Key habitat:

Areas where there is a mixture of pasture and forest in drier parts of Tasmania.

Key threats to the species:

- Widespread removal of native vegetation which eliminates den sites and diversity of food.
- Road deaths.
- Deliberate persecution by shooting, trapping and poisoning.
- Predation by feral and domestic cats and dogs.

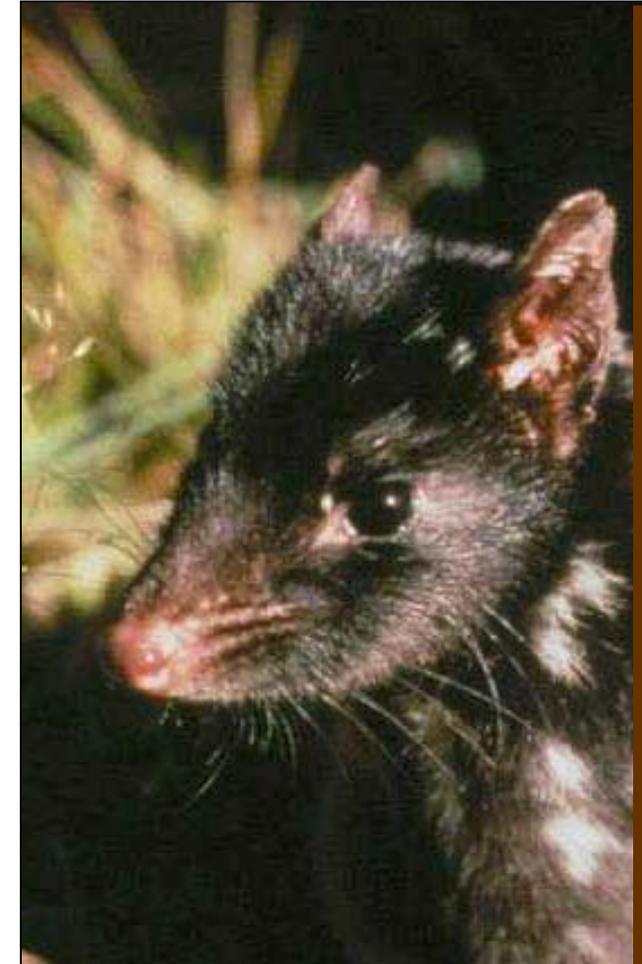


Photo : Michael Driessen

Management:

- Retain large areas of undisturbed native bush, especially in areas with fallen logs, a dense understorey, rocks and burrows for refuge sites.
- Consider some form of long-term protection of areas suitable for quolls (eg. management agreement or covenant).
- Restrict poisoning and, wherever possible, use alternative methods such as fencing and shooting to reduce browsing pressure of species such as wallaby and possum.
- Reduce the use of pesticides and toxic chemicals (quolls are very good at controlling pasture pests, mice and rats and may do the job for you).
- Protect domestic poultry by penning or fencing.
- Control cats and dogs to prevent them roaming at night.
- Reduce speed when driving at night.
- New roadworks should implement measures to reduce roadkills (contact DPIWE for further advice).

LITTLE PYGMY-POSSUM *Cercartetus lepidus***Description and distribution:**

This species is uncommon on Bruny Island. It occurs in most forest types, but favours dry sclerophyll forest. In 2001 this species was sighted by the author within rainforest on southern Bruny Island. This is an unusual sighting, as the species is not thought to occur in rainforest habitats (Watts 1993). Little pygmy possums spend most of their time close to the ground or in dense scrub to avoid attacks from owls. Individuals undergo periods of torpidity, particularly in winter when food is scarce (Watts 1993). Food consists of insects, spiders and small lizards as well as nectar, blossoms and fruit (Watts 1993). This species builds bark-lined nests, usually in small hollows in trees. Up to four young are born between September and January, and become independent at about three months of age.

Key habitat:

Favours dry sclerophyll forest and requires small hollows in trees for nesting.

Key threats to the species:

- Extensive clearing of sclerophyll forests (regrowth forest is unlikely to provide suitable nesting sites).

Management:

- Retain suitable habitat (wet and dry sclerophyll forest) for feeding and breeding.



Photo: Dave Watts

LONG-NOSED POTOROO *Potorous tridactylus***Description and distribution:**

This species occurs relatively commonly at various localities around Bruny Island. It is widespread in most forest types and heathland which provides a thick network of cover through which the potoroo forms runways, preferring areas with light, sandy soils (Watts, 1993). Food consists mainly of underground fungi, with some soil invertebrates and tubers. The potoroo has two breeding seasons (winter/early spring and late summer), during which a single young is produced. Its status is insufficiently known and requires surveys (Bryant & Jackson 1999).

Key habitat:

Most forest types and heathland which provides a thick network of cover, preferring areas with light, sandy soils (Watts 1993).

Key threats to the species:

- Widespread clearing of suitable habitat.
- Predation by feral and domestic cats and dogs.
- Road deaths.

Management:

- Retain suitable habitat (wet and dry sclerophyll forest and heathland) for feeding and breeding.
- Control cats and dogs to prevent them roaming at night.
- Reduce speed when driving at night.
- New roadworks should implement measures to reduce roadkills (contact DPIWE for further advice).



Photo: W. E. Brown

SOUTHERN BROWN BANDICOOT *Isodon obesulus***Description and distribution:**

The Southern brown bandicoot is rare on Bruny Island, however it is quite common in suitable habitat in Tasmania. It prefers scrub or areas of low ground cover which are periodically burnt (Watts 1993). Food consists of soil invertebrates, particularly earthworms and insects and their larvae. This species constructs a well-concealed nest of grass and other plant material and breeds between June and February, usually producing two litters of one to four young per year (Watts 1993).

Key habitat:

Scrub or areas of low ground cover which are periodically burnt (Watts 1993).

Key threats to the species:

- Widespread clearing of suitable habitat.
- Predation by feral and domestic cats and dogs.
- Road deaths.

Management:

- Retain suitable habitat (wet and dry sclerophyll forest) for feeding and breeding.
- Control cats and dogs to prevent them roaming at night.
- Reduce speed when driving at night.
- New roadworks should implement measures to reduce roadkills (contact DPIWE for further advice).



Photo: Christo Baars

TASMANIAN BETTONG *Bettongia gaimardi***Description and distribution:**

This species has a widespread but patchy distribution in eastern Tasmania in dry sclerophyll forest and woodland, and prefers poor, gravelly soils with an open understorey (Bryant & Jackson 1999). Food consists primarily of the fruiting bodies of underground fungi, but also includes seeds, insects and gum from wattle shrubs (Watts 1993). The Tasmanian bettong has been recorded on both north Bruny Island and on the western side of south Bruny Island (Driessen *et al.* 1990). The nest of this species is woven from dry grass and bark under a fallen tree or among bushes, and breeding occurs all year round with up to three litters of one young per litter (Watts 1993). It is listed as a priority species on the Tasmanian Regional Forest Agreement.

Key habitat:

Open forest and woodland on poor, gravelly soils (Bryant & Jackson 1999).

Key threats to the species:

- Widespread clearing of suitable habitat.
- Predation by feral and domestic cats and dogs.
- Road deaths.

Management:

- Retain suitable habitat (wet and dry sclerophyll forest) for feeding and breeding.
- Control cats and dogs to prevent them roaming at night.
- Reduce speed when driving at night.
- New roadworks should implement measures to reduce roadkills (contact DPIWE for further advice).



Photo: Dave Watts

LEOPARD SEAL *Hydrurga leptonyx*

Description and Distribution:

Leopard seals are distributed throughout the Southern Ocean, breeding in the Antarctic pack-ice. Each year leopard seals are recorded in southeastern Australia, especially on Tasmanian coasts, including Bruny Island. Most leopard seals visit these shores during the winter months, and most animals are sub adults.

Leopard seals are 2-3 meters long, weighing 200 – 350 kg as adults. They have a long slender spotted body, with a massive flat head. When alarmed they respond with a wide and impressive gape. These seals are unlikely to chase or attack, unless unduly provoked.

Key Habitats:

Southern Ocean, as well shores of sub antarctic islands, and occasionally, se Australia.

Key threats to the species:

- Deliberate persecution
- Interactions with fishing operations, including entanglement and drowning in fishing gear.
- Human disturbances when hauled out, including tourism and research impacts.
- Marine pollution, including marine debris.
- Marine pollution, including oil and chemical contaminants.
- Depletion of food stocks through fisheries operations, especially potentially unsustainable harvests of krill.

Management:

- Reduce levels of marine pollution, including fishing equipment and plastics
- Minimise human disturbance when seals are ashore
- Mitigate interactions of seals with fishing operations and equipment.



Photo: Nature Conservation Branch

AUSTRALIAN FUR SEAL *Arctocephalus pusillus*

Description and distribution:

Australian fur seals are the most commonly seen species of seal in Tasmanian waters. They also occur along the coasts of New South Wales and Victoria. They haulout on rocky islands and exposed reefs and forage widely over seas on the continental shelf. Key breeding sites are Reid Rocks, Tenth Island ("Barrenjoey"), Judgement Rocks, Moriarty Rocks and West Moncoeur in Bass Strait (Bryant & Jackson 1999). Haul-out sites on Bruny Island include The Friars and Cape Queen Elizabeth (see Map 1). The Friars are part of the National Park and the seal colony provides a spectacular viewing opportunity for tourism, with nearly 1000 seals using this haul-out.

Key habitat:

Rocky islands and exposed reefs.

Key threats to the species:

- Deliberate persecution, especially shooting.
- Entanglement and drowning in trawl and gill nets, bait box straps and other fisheries related material.
- Marine pollution, including oil spills and chemical contaminants which cause death or disease.
- Death from ingestion of marine debris, especially plastics.
- Human disturbance to breeding colonies.
- Direct interactions with fishing operations, including trawl fisheries and fish farms.

Management:

- Stop litter (especially fishing nets or plastics) from going into the sea.
- Reduce toxic waste or chemical pollution entering marine waters.
- Do not approach within 200m of haul-outs if circumnavigating or anchor within 100m of haul-outs between mid-October and mid-January (100m and 50m respectively for the remainder of the year). Do not walk on or swim near haul-outs.
- Develop and implement effective mitigation measures to eliminate seal bycatch in fisheries operations, especially trawl and aquaculture fisheries.
- Continue assessment of population numbers and trends.
- Develop and implement appropriate measures to minimise the direct interactions between fur seals and fin-fish aquaculture operators (eg. Effective barriers at farms).



Photo: Nature Conservation Branch

BIRDS

Of high conservation significance

Photo: Tom Ulrich

LITTLE PENGUIN *Eudyptula minor***Description and distribution:**

Little penguins breed in colonies around the coastline of southern Australia and New Zealand. Most colonies are found on sandy or rocky islands, shores, coastal slopes, promontories, bases of cliffs, and sand dunes (Marchant & Higgins 1998). Colonies mostly occur in well-sheltered sites near the sea in sand dunes, grasslands and herfields with a good depth of soil for burrowing (Marchant & Higgins 1998); they can also occur in rock crevices and caves. Good growth of native vegetation around burrows probably helps to maintain protection against extremes of weather (Marchant & Higgins 1998). Little penguins prefer sandy beaches for landing but also use rocky shores and are able to jump onto rock ledges in ocean swell. Populations have declined or disappeared in areas where human habitation has altered breeding areas (Marchant & Higgins 1998). Food consists mainly of small shoaling fish, cephalopods and sometimes crustaceans, and is caught by pursuit diving using the wings for propulsion and tail for guidance. This species usually dives to about 30m in search of prey, but depths of up to 69m have been recorded. Little penguins are sometimes associated with other seabirds such as shearwaters (Marchant & Higgins 1998). A mixed colony of Little penguins and Short-tailed shearwaters occurs at the Bruny Island Neck Game Reserve (see Map 1), which is listed as one of the 'hot spots' for this species (Bryant & Jackson, 1999). They nest in burrows lined with vegetation and feathers, which can be located up to hundreds of metres inland. Artificial nest boxes are readily accepted, and the species has been recorded nesting underneath houses, rock fill, in culverts and drains (Marchant & Higgins 1998). Breeding generally occurs from August to March, and adults return to their burrows at dusk after feeding at sea during the day. Colonies of this species occur at a few locations around Bruny Island, and there is a public viewing site at The Bruny Island Neck Game Reserve.

Key habitat:

Sandy or rocky islands, shores, coastal slopes, promontories, bases of cliffs, and sand dunes (Marchant & Higgins 1998).



Photo: Nigel Brothers

Key threats to the species:

- Coastal development and agricultural activities adjacent to breeding colonies that can cause disturbance at breeding sites, trampling by stock, weed invasion, fire and increased erosion and run-off.
- Entanglement in fishing lines and nets, especially gill nets.
- Disturbance at breeding sites by people wishing to view Little penguins (excessive use of light and beach activity).
- Predation of adults, chicks and eggs by introduced rats, cats (both domestic and feral) and dogs.

Management:

- Protection of burrows from damage due to grazing stock, vehicles and human trampling.
- Restrict and manage activities at viewing sites to minimise disturbance, particularly during the breeding season (September-February), and keep well away from burrows and tracks used by penguins to reach their burrows.
- Prohibit the setting of nets in the vicinity Little penguin colonies.
- Eradication of feral cats.
- Population monitoring to assess trends in numbers of breeding pairs.

HOODED PLOVER *Thinornis rubricollis***Description and distribution:**

The Hooded plover occurs on sandy oceanic beaches throughout south-eastern and western Australia. Pairs maintain territories up to 100m apart along the beach, and 2-3 eggs are laid in a well-camouflaged, simple scrape in the sand or ground above the high tide mark or in dunes (Bryant & Jackson 1999, Bryant 2002). In Tasmania, they breed between August and March. Their main food source is small invertebrates living beneath rotting seaweed or driftwood. Chicks feed with parents along the tidal line and will 'freeze' or crouch when threatened with danger, thus making them susceptible to trampling and predation (Bryant & Jackson 1999). Hooded plovers breed at a number of beaches on Bruny Island, including Adventure Bay, Cloudy Bay and Neck Beach (Map 1), and it appears that population numbers have markedly decreased at these sites since the early 1980s (Eric Woehler, personal communication). Interpretive signs highlighting the importance of not disturbing nesting shorebirds particularly Hooded plovers have been placed at the entrance to several beaches around Bruny Island. These outline the main threats to this species and give suggestions how the general public can help to protect them.

Key habitat:

Sandy oceanic beaches, especially estuaries. Breeding occurs in dunes and shingle banks on beaches and spits

Key threats and Management:

see shorebird summary as follows.



Photo: Tom Ulrich

PIED OYSTERCATCHER Haematopus ostralegus***Description and distribution:***

The Pied oystercatcher is widespread in coastal areas of Tasmania, with the state hosting approximately one quarter of the total Australian population of the species (Bryant 2002). Key areas include the Derwent Estuary, Moulting Lagoon, Flinders Island, King Island and the far northwest coast. The species is relatively sedentary, but may congregate in large winter flocks (Watts 1999). Breeding occurs from September to January, with 2-3 eggs in shallow scrapes on or near beaches. Clear declines have been recorded in Pied oystercatcher populations, and the species may qualify for listing under the *Threatened Species Protection Act 1995* (Bryant 2002).

Key habitat:

Sandy beaches and inter-tidal mudflats, including spits and low dunes. Breeding occurs on sand or shingle above the high water mark close to such areas, including sandbars and estuaries (Bryant 2002).

Key threats and Management:

see shorebird summary as follows.

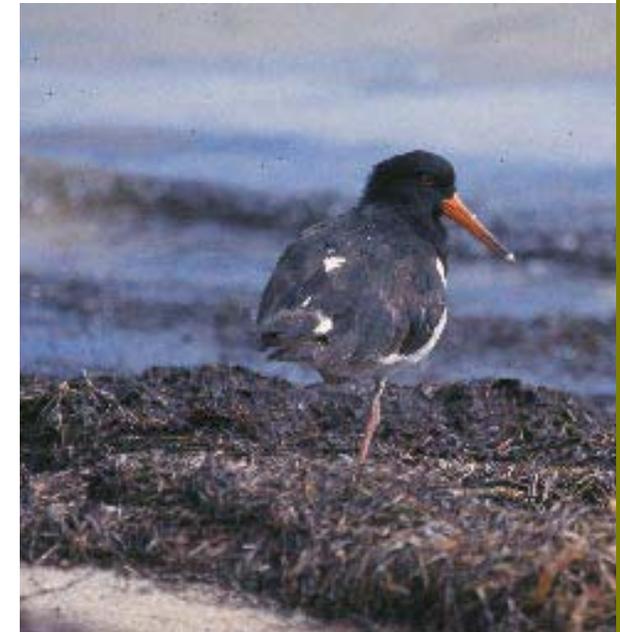


Photo: Dave James

SOOTY OYSTERCATCHER Haematopus fuliginosus**Description and distribution:**

The Sooty oystercatcher is widespread in coastal areas of Tasmania. Tasmania hosts approximately half of the estimated Australian population of the species, although these estimates need to be confirmed (Bryant 2002). Key areas include the Furneaux Islands, the northwest coast, Cape Portland, and the Tamar and Derwent estuaries (Bryant 2002). As with the Pied oystercatcher, the species is relatively sedentary but may congregate in winter flocks, often alongside the Pied oystercatcher (Watts 1999, Bryant 2002). Breeding occurs from October to January, with 2-3 eggs in scrapes among rocks, shingle, pigface or seaweed (Watts 1999). Declining populations on heavily used beaches in the northeast, east and southeast of Tasmania may lead to the listing of the species under the *Threatened Species Protection Act 1995* (Bryant 2002).

Key habitat:

Rocky islands, coastlines, reefs and headlands, retreating to sheltered bays in rougher weather. Breeding occurs on secluded rocky shores, headlands and shingle beaches above the high water mark.

Key threats and Management:

see shorebird summary as follows.

SHOREBIRDS (SUMMARY)

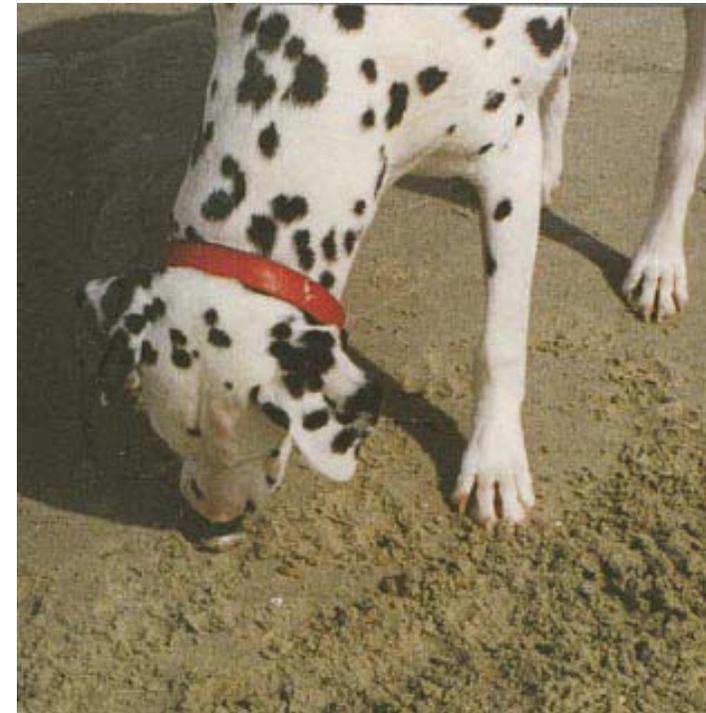
Hooded plover, Pied oystercatcher, Sooty oystercatcher – as per preceding descriptions.

Key threats to the species:

- Low breeding success due to disturbance and destruction of nests and nesting habitat, especially through trampling by vehicles, quad bikes, people, dogs and horses.
- Introduction and spread of exotic weed species such as *Euphorbia paralias* (sea spurge), and the extensive use of Marram grass (*Ammophila arenaria*) for dune stabilisation which make dunes and the upper sections of beaches high and steep and therefore unsuitable for nesting.
- Disturbance of birds on nests which may cause loss of eggs through predation, cold or over-heating.
- Continued disturbance to chicks while feeding, which causes them to hide for long periods and starve.
- Predation of adults, chicks and eggs by introduced rats, cats and dogs.
- Harvesting of seaweed which depletes key food sources.

Management:

- Rehabilitation of coastal areas using naturally occurring coastal species.
- Prevent the planting of Marram grass to stabilise dunes or change their natural configuration. Dune systems naturally change over time and shorebirds have adapted their nesting behaviour accordingly.
- Prevent access to dunes and beaches by stock to reduce trampling of nests.
- Protect high priority sites during the breeding season.
- Reduce disturbance of nest sites and dunes or upper beach area by people, vehicles, dogs and horses, especially during the breeding season (see appropriate periods under individual species descriptions).
- Always keep dogs on a leash on beaches and walk them near the water, and respect beach areas which specify 'no dogs'.
- Do not pick up eggs or chicks on the beach, even though they appear to be deserted. Try to avoid walking between adults and chicks, and stop and wait until the birds move away.
- Keep cats under control and away from coastal areas, especially at night when they can predate on roosting birds.
- Restrict the amount of seaweed collected from beaches. Where allowed, please take small quantities at irregular intervals and respect areas that don't allow collection.
- Undertake or assist in surveys along rocky coasts, suitable locations and known breeding sites.



Photos: Threatened Species Unit

A circular cross-section of a tree trunk, showing the characteristic growth rings. The outer edge is a dark brown, textured bark. The inner part consists of numerous concentric rings of varying widths and colors, ranging from light tan to dark brown, indicating annual growth cycles. The center of the trunk is a lighter, more uniform color.

INVERTEBRATES

Of high conservation significance

MOLLUSCS

MAY'S CHITON *Ischnochiton mayi*

Description and distribution:

This small chiton (10-15mm in length) is an endemic Tasmanian species that inhabits the undersides of rocks at their insertion line with the substrate in the intertidal zone in low-energy, shallow bays throughout Tasmania. This species broods its young in the branchial (gill) cavity until metamorphosis is complete and the young emerge as tiny miniatures of the adult (Cochran 1993). As a result, the dispersal of this species is extremely limited and it may satisfy the criteria for nomination for listing under the Tasmanian *Threatened Species Protection Act 1995*. The exact distribution and abundance of this species is unknown, and a survey of the species is required. It is known to occur at several localities on Bruny Island including Grundys Point, Daniels Bay at Lunawanna, Sadgrove Point and Ford Bay (Tonia Cochran, personal observation: see Map 1). This species formerly occurred at the ferry terminal at Kettering (personal observation), but is now believed to have disappeared from that location as a result of foreshore development and construction of marina and car park in that area.

Key habitat:

Rocks in the intertidal zone in low-energy, shallow bays.

Key threats:

- Removal of rocks and suitable substrates from the shore and intertidal zone.
- Decreasing water quality and increasing nutrients (eutrophication) from sewage and fertiliser run-off and seepage from outlets into the intertidal zone.
- Sedimentation and increased siltation.
- Coastal development.
- Competition and displacement from the introduced seastars *Pateriella regularis* (from New Zealand) and *Asterias amurensis* (the Northern Pacific seastar).



Photo: Tonia Cochran

Management:

- Any proposed coastal development within the range of this species should undertake a detailed environmental impact assessment. Such developments would include jetties, boat sheds, and fish farms, or any other developments which would cause increased turbidity of the water, or input of sewage or other pollutants (eg. from boat motors, generators or buildings).
- Ensure continuation and participation in education programs such as Waterwatch which aims to increase awareness and provide information on stopping pollutants such as detergents, oils, pesticides or fertilisers from reaching storm water drains that flow into the sea.
- Promote awareness of its threatened species status so that specimens are not collected for aquaria (private or commercial).
- Control pests such as the Northern Pacific seastar which competes with and displaces these species and other marine life.



DICOTYLEDONS

Of high conservation
significance

FLORA

ENDEMIC TASMANIAN PLANT SPECIES

The endemic Tasmanian species of flora found on Bruny Island are listed in Appendix 4. Measures should be taken to ensure that no threats to the population sizes occur in the long term because of their restricted distribution within Tasmania.

MYRTACEAE**HEART-LEAVED SILVER GUM *Eucalyptus cordata*****Description and distribution:**

The Heart-leaved silver gum is a regional endemic confined to the south-east of Tasmania, where its distribution closely follows the limits of the south-eastern glacial refuge (Wiltshire *et al.* 1992). Its distribution is patchy and the scattered nature of many of the small, insular populations is suggestive of a relict distributional pattern (Wiltshire *et al.* 1992). This species is planted widely as an ornamental and the blue-grey heart-shaped juvenile foliage is a distinctive feature of the species. Twenty-nine populations of this species have been located. Populations range in size from single individuals to over 5000 individuals, but only 3 populations exceed 500 individuals (Wiltshire *et al.* 1992). Nearly 50% of the populations occur on private land and the rest occur in State Reserves or on Crown land. *Eucalyptus cordata* has been recorded at Cape Queen Elizabeth and Penguin Island on Bruny Island (see Map 2); the Cape Queen Elizabeth population consists of approximately 1000 individuals, while about 200 individuals occur on Penguin Island (Wiltshire *et al.* 1992). Penguin Island is also the type locality of this species (the place of collection of the original specimen from which the species was named), and so is also of historical significance (Wiltshire *et al.* 1992). *Eucalyptus cordata* is usually found growing with other eucalypt species and the four exceptions where this species grows as a pure stand include the two Bruny Island populations (Wiltshire *et al.* 1992).

Key habitat:

Dry coastal scrub

Key threats to the species:

- High fire frequency

Management:

- Specific biological management of this species is not recommended, although relatively low fire frequency should be maintained where possible. Do not undertake burning without advice from DPIWE or Parks and Wildlife Service.
- Managers of the two areas where this species occurs on Bruny Island (Cape Queen Elizabeth and Penguin Island) should be aware of the exact locations of these populations and the health of the populations should be monitored.



Photo: Paul Black

SCROPHULARIACEAE**EYEBRIGHT *Euphrasia collina* aff. subspecies *diemenica*****Description and distribution:**

The *Euphrasia collina* aff. subspecies *diemenica* is highly variable and is represented by at least 10 different variants (Barker 1982, Potts 1997). It is intermediate in appearance between *E. collina* subspecies *collina* and *E. collina* subspecies *diemenica*. It can be distinguished from *E. collina* subspecies *collina* by branching at ground level and from *E. collina* subspecies *diemenica* by an elongated bud cluster above the first open flowers.

Past records indicate that this subspecies was previously widespread in the north-eastern coastal heathlands though attempts to verify these records since 1996 have been unsuccessful, perhaps due to successive droughts. It is possible that populations will emerge from soil-stored seed following fire or a succession of wetter growing seasons. There are only three verified populations, two in the north-east (Saunders Marsh and Dukes Marsh) and the other at Mount Midway on Bruny Island (Wendy Potts, personal communication). See Map 2 for the location of this species on Bruny Island.

There are only a total of approximately 200-500 individuals. The Mount Midway population consists of 80-150 mature plants. They occur on the edge of Lockleys Road through wet sclerophyll to rainforest vegetation. The roadside is slashed occasionally, and is favoured by *Euphrasia* as it is open, allowing seed to germinate and the habitat is moist in spring, allowing seedlings to establish. Continual recruitment from seed is necessary for population persistence as the plants are relatively short-lived (up to 3-5 years: Wendy Potts, personal communication). Unfortunately there is a Spanish heath population extending the full extent of the Eyebright population. Eradication of this weed poses a problem as the Eyebright appears to be parasitising the heath (via root attachments). Cut and herbicide paste trials killed every Eyebright within 60cm so that the heath will require removal in patches with subsequent reseedling. It will take several years to eradicate the heath. In the meantime, the heath is being slashed to minimise seed output. A potential source of seed of lupin and gorse from further upslope has been removed (Wendy Potts, personal communication). This taxon is covered by the lowland *Euphrasia* Recovery Plan (Potts 2000) although it is not yet listed as a threatened subspecies.



Photo: Wendy Potts

Key habitat:

Sandy and peaty heaths, rocky hillsides.

Key threats to the species:

- Shading due to growth of surrounding vegetation through lack of disturbance such as fire.

Management:

- Protect populations from future changes in land use in suitable habitat for this species.
- Maintain openness of sites by introduction of regular small-scale disturbance (such as slashing) to promote persistence of the species.
- Recover suitable populations by fire. Do not undertake burning without advice from DPIWE or Parks and Wildlife Service.
- Development of a mechanism to ensure management intervention when required.
- Long-term management of suitable areas through formal protection and assessment of the species against listing criteria.

Threatened Plant Communities

The Comprehensive, Adequate and Representative (CAR) Reserve System for Tasmania's forests was established as a result of the Regional Forest Agreement (RFA) to protect examples of the 50 different forest types found in Tasmania. This is important because many of these forest types are found nowhere else in the world. These forests provide habitat for a diverse range of plants and animals, including rare and threatened species. Some of these forest types are protected on public land (such as in State Reserves and National Parks). However, other forest types occur only (or mainly) on private land, particularly in the drier areas of the State. The Private Forest Reserves Program was set up to protect those forests and plant communities that are not well protected on public land, as well as forest areas that provide important habitat for rare and threatened plants and animals. Through the voluntary participation of landowners in the program, the aim is to establish legally binding agreements on private land across Tasmania to protect these communities in perpetuity. The Strategic Plan for the private land component of the CAR Reserve system contains further information on this scheme (DPIWE 1998).



Photo: Ray Brereton

Over 20 forest communities have been identified as being poorly represented in public reserves. These include the forest types found on Bruny Island listed in Table 6. The locations of these forests are shown on Map 3 (appendix 9).

Table 6 RFA priority forest communities on Bruny Island

| Forest Community |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Black gum/white gum (<i>Eucalyptus ovata</i> / <i>Eucalyptus viminalis</i>) shrubby forest |
| Black peppermint (<i>Eucalyptus amygdalina</i>) forest on sandstone |
| Grassy blue gum (<i>Eucalyptus globulus</i>) forest |
| Blackwood (<i>Acacia melanoxylon</i>) on flats |
| Sheoak (<i>Allocasuarina verticillata</i>) forest |
| Swamp paperbark (<i>Melaleuca ericifolia</i>) forest |
| White gum (<i>Eucalyptus viminalis</i>) - blue gum (<i>Eucalyptus globulus</i>) forest on coastal sands |
| White gum (<i>Eucalyptus viminalis</i>) grassy forest |
| White peppermint (<i>Eucalyptus pulchella</i>), blue gum (<i>Eucalyptus globulus</i>) and white gum (<i>Eucalyptus viminalis</i>) grassy/shrubby forest (old growth only) |

In addition, TasVeg 2000 priority vegetation forest and non-forest communities have also been identified on Bruny Island and are shown on Map 4 (Appendix 10). Additional information is available in the "Vegetation Management Strategy for Tasmania - guidelines for determining Bushcare priorities within a proposed new set of interim biogeographic regions" prepared by the Tasmanian Vegetation Management Strategy (DPIWE and Environment Australia, December 1998, August 1999 update). DPIWE is currently undertaking further work updating nature conservation priorities for Tasmania's native non-forest.

Threatened & Significant Species and their Habitats

Table 7 summarises the principal habitat types (including corresponding TasVeg 2000 mapping units) found on Bruny Island together with the principal threatening processes that occur within these vegetation types. Also listed are the threatened and significant species (animal and plant) that are likely to occur within these communities, and the threatening processes relevant to each species. Further information on these threatening processes and the ways that they can be managed can be found following this table.



Photo: Niall Doran

Table 7 Habitats, threatened and significant species, and threats

| Habitat type | Threats | Threatened and significant species | Threats |
|-------------------------------|-----------------------------------------------------------------------------------------------|------------------------------------|----------------------------------------------------------------------------------------|
| Wet forest | Land clearing, forestry, fire (hot, frequent) | Wedge-tailed eagle | Habitat loss, fire, disturbance, persecution, electrocution, poisoning |
| | | White-bellied sea eagle | Habitat loss, fire, disturbance, persecution, electrocution, poisoning |
| | | Grey goshawk | Habitat loss, fire, disturbance, persecution, electrocution, poisoning |
| | | Eastern quoll | Habitat loss, fire, persecution, roadkills |
| | | Long-nosed potoroo | Habitat loss, fire, roadkills |
| | | Southern brown bandicoot | Habitat loss, fire, roadkills |
| | | Mt Mangana stag beetle | Habitat loss, fire |
| | | Duncan's sheoak | Land clearing, frequent burning |
| | | Gristle fern | Land clearing, fire |
| Grassy/heathy forest/woodland | Land clearing, forestry, firewood collection, fire, <i>Phytophthora</i> , weeds, over grazing | Masked owl | Habitat loss, firewood collection, competition, persecution, electrocution |
| | | Swift parrot (nesting and feeding) | Habitat loss, firewood collection |
| | | Forty spotted pardalote | Habitat loss, firewood collection |
| | | Eastern quoll | Habitat loss, fire, persecution, roadkills |
| | | Little pygmy possum | Habitat loss, firewood collection |
| | | Southern brown bandicoot | Habitat loss, fire, roadkills |
| | | Tasmanian bettong | Habitat loss, fire, roadkills |
| | | Pretty heath | Land clearing, grazing, fire (over-burning, under-burning), weeds, <i>Phytophthora</i> |
| | | Variable smoke bush | <i>Phytophthora</i> , land clearance |
| | | Juniper wattle | Land clearing, frequent burning |
| | | Leafy groundsel | Land clearing, frequent burning |
| | | Heart-leaved silver gum | Frequent burning |
| | | Rayless starwort | Land clearing |
| | | Spur velleia | Grazing, inappropriate fire regime |

| Habitat type | Threats | Threatened and significant species | Threats |
|-------------------------|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | Forest germander Plum orchid | Grazing Shading (lack of burning) |
| Grassland (native) | Over grazing, inappropriate fire frequencies | Eastern quoll Spur velleia Rough spear-grass | Habitat loss, fire, persecution, roadkills Grazing, inappropriate fire regime Land clearing, disturbance |
| Heathland (coastal) | Clearing, fire, <i>Phytophthora</i> , grazing | Long-nosed potoroo Southern brown bandicoot Springy peppergrass Juniper wattle Shy eyebright Variable smoke-bush Shade pellitory Mountain sedge Sticky sword-sedge Plum orchid Heath bent-grass Island purple grass | Habitat loss, fire, roadkills Habitat loss, fire, roadkills Land clearing Land clearing, frequent burning Shading (requires open areas through disturbance) <i>Phytophthora</i> Grazing Clearing, weeds Land clearing, stock-trampling, over-burning Shading (lack of burning) Land clearing, frequent burning Land clearing, grazing |
| Heathland (wet) | Land clearing, fire | Yellow onion orchid Chestnut leek orchid Heath bent grass | Drainage of habitat, under-burning Inappropriate firing regimes Land clearing, frequent burning |
| Scrub | Land clearing, fire | Long-nosed potoroo Southern brown bandicoot | Habitat loss, fire, roadkills Habitat loss, fire, roadkills |
| Saltmarsh | Clearing, drainage, grazing | Sea lavender | Clearing, grazing/trampling by stock |
| Coastal (sandy beaches) | Disturbance weeds, pollution | Hooded plover Fairy tern | Disturbance, weeds, pollution, predation (cats, dogs) Disturbance, weeds, pollution, predation (cats, dogs) |

| Habitat type | Threats | Threatened and significant species | Threats |
|---------------------------|---------------------------------------------------|-------------------------------------------|--------------------------------------------------------------------------|
| | | Caspian tern | Disturbance, predation (cats, dogs) |
| | | Red-necked stint | Disturbance, predation (cats, dogs) |
| | | Little penguin | Disturbance, pollution, predation (cats, dogs) |
| | | Pied oyster catcher | Disturbance, predation (cats, dogs) |
| | | Sooty oyster catcher | Disturbance, predation (cats, dogs) |
| | | Musky crassula | Erosion, weeds |
| Coastal (rocky) | Disturbance, pollution | Little penguin | Disturbance, pollution, predation (cats, dogs) |
| | | New Zealand fur seal | Persecution, pollution, disturbance |
| | | Australian fur seal | Persecution, pollution, disturbance |
| Coastal (vegetated dunes) | Disturbance weeds, pollution, grazing | Short-tailed shearwater | Disturbance, predation (cats, dogs) |
| | | Sooty shearwater | Disturbance, predation (cats, dogs) |
| | | Little penguin | Disturbance, pollution, predation (cats, dogs) |
| Coastal (estuaries) | Disturbance weeds, pollution | Bar-tailed godwit | Disturbance, predation (cats, dogs) |
| | | Red-necked stint | Disturbance, predation (cats, dogs) |
| Coastal (inter-tidal) | Coastal development, disturbance, pollution | May's chiton | Coastal development, pollution, competition, illegal collection |
| Coastal (marine) (W) | fishing activities, pollution, introduced species | Spotted handfish | Dredging, net-fishing, anchors, pollution, predation, illegal collection |
| | | Live-bearing seastar | Coastal development, pollution, competition, illegal collection |
| | | Seastar (<i>Smilasterias tasmaniae</i>) | Coastal development, pollution, competition, illegal collection |
| Oceanic | fishing activities, pollution, | Southern right whale | Fishing activities, pollution, disturbance |
| | | Humpback whale | Fishing activities, pollution, disturbance |
| | | Great white shark | Persecution, fishing activities |