

Grey goshawks hunt from a perch in the canopy, so probably require forest with an open structure under the canopy. The precise habitat requirements for foraging are not known, except in blackwood swamp forests where suitable areas have older blackwood and tea-tree with a closed canopy and an open structure under the canopy. Females eat mainly mammals (rodents, ringtail possums, rabbits) and birds such as rosellas, herons and currawongs. The smaller male catches mainly small birds, rodents and insects. Carrion is sometimes eaten.

### **Management Objectives for Production Forest Areas**

- Identify, manage and protect priority breeding habitat.
- Protect known nest sites.
- Identify and maintain networks of foraging habitat.

### **Reading**

Brereton, R. and Mooney, N.J. (1994). Conservation of the nesting habitat of the grey goshawk *Accipiter novaehollandiae* in Tasmanian State forests. *Tasforests* 6: 79-91.

Mooney, N. and Holdsworth, M. (1988). Observations on the use of habitat by the grey goshawk in Tasmania. *Tasmanian Bird Report* 17: 1-12.

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## **DRAFT FOR COMMENT ONLY 2002**

### **MASKED OWL**

#### ***Tyto novaehollandiae castenops***

#### **Status**

ENDANGERED (Tasmanian *Threatened Species Protection Act 1995*), due to the small population size and ongoing habitat loss.

#### **Description**

A large owl, weighing up to 1260g, with a wingspan of up to 129cm. Females are larger (43-57cm), than males (35-42cm) and considerably darker. The upperparts of this species are dark brown to light chestnut with white speckling. The prominent facial disc is buff to chestnut coloured with a darker margin and chestnut shading around the eyes. The legs are fully feathered and the feet powerful with long talons (Higgins 1999).

The masked owl is a secretive, relatively silent and strictly nocturnal species, which feeds predominately on introduced rodents and rabbits (on agricultural land) and marsupials and native birds in less disturbed habitats.

Masked owls form monogamous pairs, nesting in tree hollows with decaying debris. The female is fed by the male and incubates 2-4 eggs, which hatch in about 42 days. Young are covered in white down, then a creamy down, and are fledged in 10-12 weeks. Fledged masked owls have only traces of down and remain in the nest vicinity for several weeks. Breeding is seasonal in Tasmania with most egg laying in late October to early November (Higgins 1999).

#### **Distribution and Habitat**

*T. n. castenops* is endemic to Tasmania and has been recorded from all areas apart from the southwest. Most records are from lowland, dry sclerophyll forest in the south east and central north of the state, although the masked owl has been recorded in wet eucalypt forest, non-eucalypt dominated forest, scrub and urban environments. The preferred habitat is close to the forest edge where there is a complex mosaic of understorey components. Home range is large and may be in excess of 1000ha (Bell *et al.* 1997).



Eucalypt forests and woodland containing old growth trees or isolated old-growth trees containing large hollows are essential for breeding. Roost sites are usually in trees (among dense foliage or in tree hollows), cliffs (overhangs, potholes and caves) and occasionally human-made structures such as farm sheds and open buildings (Bell *et al.* 1997).

### **Important Locations**

The east coast between St Marys and Hobart, the Huon and Derwent Valleys, mid north coast and small fragmented patches in the Tamar Valley and the northeast coast have been identified as important for breeding (Bell *et al.* 1997).

### **Threats, Limiting Factors and Management Issues**

There is some evidence that indicates a decline in masked owl numbers may have occurred since European settlement. The preferred habitat of the masked owl is dry forest and woodland on the coastal and sub-coastal lowlands in the north, north-east, east and south-east. These vegetation communities have been extensively cleared in the past for agriculture, forestry and residential development.

This habitat is also poorly reserved, less than 10% of the masked owls' preferred habitat is in dedicated reserves (Bell *et al.* 1997).

A significant threat to the masked owl is ongoing loss of old growth eucalypt forest, nesting habitat, from commercial timber harvesting, land clearance, tree felling for firewood and natural attrition of old growth trees. Competition for nest hollows by feral honeybees, introduced kookaburras, and increasing numbers of brushtail possums may contribute to the decline in breeding success (Bell *et al.* 1997).

Deaths from collisions with vehicles, fences or power poles and electrocution on powerlines may also be a significant source of mortality for this subspecies (Bell *et al.* 1997).

### **Conservation Assessment**

#### **Historical Distribution**

The Tasmanian masked owl has been recorded from throughout northern, eastern and north-western Tasmania, including Maria and Bruny Islands.

### **Population Estimate**

The number of masked owls present in Tasmania based on estimates of home range size and the area of suitable owl habitat is estimated at 1300 mature individuals (Bell *et al.* 1997).

### **Assessment Criteria**

*T. n. castenops* meets the criteria for listing as Endangered on the *Threatened Species Protection Act 1995* because the population is less than 2500 individuals and there is an ongoing loss of habitat.

### **Recovery Program**

#### **Objectives**

- Maintain the size of the existing population of the masked owl and to improve the quantity and quality of habitat.

#### **Actions Needed**

- Undertake surveys throughout preferred habitat, including production forest on private and public land, to identify distribution, density, nest sites, assess home range size and habitat utilisation.
- Protect known nesting, roosting and priority foraging habitat from clearing, particularly old growth forest.
- Place all Masked Owl known nesting sites that are on public land under secure conservation management.
- Control and reduce firewood collection from areas occupied by masked owls.
- Undertake a public information and education.
- Promote revegetation and land reclamation that recreates woodland habitat with a full complement of biodiversity, including the owl.
- Investigate changes in prey abundance resulting from habitat fragmentation and forestry operations in the core range of the species.
- Prepare and implement a recovery plan for the species.

#### **Management Objectives in Production Forest Areas**

- Maintain nesting habitat in areas considered to be important for this species.
- Maintain a network of foraging and nesting habitat throughout the range of the masked owl.



- Standardised surveys for masked owls and suitable nesting habitat should be undertaken prior to logging within the species' preferred range (i.e. old-growth lowland dry sclerophyll forest and woodlands in the southeast, east, northeast and north) to identify the species' presence and locality of nest sites.

## Reading

- Bell, P., Mooney, N, and Wiersma, J. (1997). Predicting the essential habitat for forest owls in Tasmania. Australasian Raptor Association Report to the RFA Environment and Heritage Technical Committee, Hobart.
- Bell, P.J. and Mooney, N. (2002). Distribution, habitat and abundance of masked owls (*Tyto novaehollandiae*) in Tasmania. Pp. 120-132 in *Ecology and Conservation of Owls*. Eds Newton, I., Kavanagh, R., Olsen, J. and Taylor, I.
- Green, R. and McGarvie, A.M. (1971) The birds of King Island. Rec. Queen Vic. Museum 40:1-42.
- Garnet S.T. and Crowley, G.M. (2000) The action plan for Australian birds 2000. Environment Australia, Canberra.
- Higgins, P.J. (ed) (1999) Handbook of Australian, New Zealand and Antarctic Birds. Vol. 4. Oxford University Press, Melbourne.
- Mooney, N. (1993) Diet of the Masked Owl in Tasmania: past and present. Pp. 160-174 in *Australian Raptor Studies*. P. Olsen (ed.). Australasian Raptor Association, RAOU, Melbourne.
- Mooney, N. (1997) Habitat and seasonality of nesting Masked Owls in Tasmania. Australasian Raptor Studies Pp. 34-39 in *Australian Raptor Studies II*. G. Czechura and S. Debus (eds). Birds Australia Monograph 3. Birds Australia, Melbourne.
- Regional Forest Agreements, Tasmania (1996) Environment and Heritage Report – Appendix 1: Life history and population summaries (Birds – part 2).
- Schodde, R. and Mason, I.J. (1997) Aves (Columbidae to Coraciidae). Zoological Catalogue of Australia. Vol. 37.2. W.W.K. Houston and A. Wells (eds). CSIRO Publishing, Melbourne.
- Thomas, D. (1979) Tasmanian bird atlas. Fauna of Tasmania Committee, Hobart.
- Watts, D. (1999) Field Guide to Tasmanian Birds. New Holland Publishers (Australia), Sydney.

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## **QUOLL SPECIES**

*Dasyurus viverrinus* (eastern quoll)

*Dasyurus maculatus maculatus* (spotted-tailed quoll)

### **Status**

#### **Spotted-tailed quoll**

VULNERABLE (Commonwealth *Endangered Species Protection Act 1992*), due to habitat loss, predation and persecution. While it occurs throughout Tasmania, the spotted-tailed quoll is uncommon and naturally occurs at very low densities.

#### **Eastern quoll**

The eastern quoll has been listed in the Regional Forest Agreement as a Priority Species Requiring Consideration (Attachment 2 Part B), due to due to habitat loss, and persecution. While it occurs throughout Tasmania, the eastern quoll is uncommon and naturally occurs at very low densities.

### **Description**

#### **Spotted-tailed quoll**

The spotted-tailed quoll is a medium-sized carnivore, weighing between 1.6-5.0 kg. The thick, short fur is golden to red to dark chocolate brown on the back and pale cream on the belly. There are distinct white spots of varying size over the back, head and along the long tail. The Tasmanian spotted-tailed quoll is genetically distinct from the mainland species and therefore needs to be managed as a separate entity.

#### **Eastern quoll**

The eastern quoll is smaller (0.7-2.0 kg) and more finely built than the spotted-tailed quoll. Fur colour is either grey to brown or a jet black with both colour types having white spots covering the head and body, but not the tail.



## **Distribution and Habitat**

### **Spotted-tailed quoll**

Spotted-tailed quolls occur throughout Tasmania and also in eastern Australia from Queensland to Victoria. On mainland Australia, they have declined dramatically and now Tasmania remains their stronghold. The spotted-tailed quoll is primarily a forest-dwelling species, most abundant in higher rainfall areas containing rainforest, wet forest and blackwood swamp forest. They are known to utilise regrowth forest. The spotted-tailed quoll is solitary and territorial with a large home range.

The area of highest probability of occurrence is a broad band across northern Tasmania from the northwest corner to the Waterhouse area, north of the escarpment of the Central Plateau. This area correlates with high seasonality of rainfall (i.e. the species appears dependent on the most productive environments).

Important habitat components appear to be structurally complex forest, old growth forest with tree hollows and coastal scrub (such areas provide opportunities for arboreal hunting and avoidance of Tasmanian devils which compete for prey). Spotted-tailed quolls appear to disappear in highly fragmented environments and where canopy cover is reduced by over 50%.

Home ranges (non-mating season) are large (in the order of 20 square kilometres for males and 10 square kilometres for females) and female ranges virtually exclusive for large parts of the year. These two attributes contribute to low natural population densities and natural rarity. This means this species is vulnerable to population decline.

The following areas are regarded as key sites for the species: forested areas of the north bounded by Wynyard, Gladstone and the central and northeastern highlands; northwest wet forests, encompassing the entire catchments of the Arthur and Montagu Rivers; dry eucalypt forests in the central north coast area bounded by the Tamar, Devonport and the Western Tiers (Dazzler Range, Wurra Wurra Hills); patches between the King River and Strahan; the Gordon River and Huon River catchments; and the coastal strip from Strahan to Temma.



## **Eastern quoll**

Eastern quolls became extinct on mainland Australia by the mid 1960s but remain 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. The species has a patchy distribution across Tasmania but is more predominant in the eastern half of the State in areas of lower mean annual rainfall. They particularly flourish in agricultural areas where there is a bush-pasture interface, coming onto pastures at night to hunt for rodents and insects. Eastern quolls do use wetter forests but mainly for denning. Cover is probably important for predator protection, especially in juveniles. "Hot" spots include the Huon, Cygnet, Cradoc area, the Buckland, Triabunna, Lake Leake area, and the northeast around Scottsdale and Ringarooma.

The eastern quoll is solitary and non-territorial with a home range varying from 50 ha on agricultural land to several square kilometres.

### **Management Objectives for Production Forest Areas**

#### **Spotted-tailed quoll**

One of the key threats for the species is widespread native vegetation clearance, especially clearfelling and conversion to plantation leading to loss of high quality, structurally complex old growth forest. This can eliminate den sites and the diversity of prey items. Regeneration forest and plantations are not likely to provide high quality habitat. The species may be susceptible to secondary poisoning from small 1080 poisoned carcasses (e.g. rabbits, small possums).

Retention of some high quality habitat requirements has been achieved on public land through the Regional Forest Agreement and current Forest Practices Code provisions for State forest.

Conservation requirements need to be addressed at the landscape level due to the low population densities and large home range requirements. Regional management planning should be developed for both species to ensure that large corridors, on the scale of 100 square kilometres (e.g. biodiversity spines) of suitable native forest habitat are retained across the landscape, particularly in key sites.



The network of contiguous informal reserves (i.e. wildlife habitat strips, wildlife habitat clumps, streamside reserves and goshawk habitat reserves) throughout these areas should provide some habitat for this species.

Areas with a natural diversity of refuge sites such as fallen logs, dense understorey and rocks represent suitable habitat. Such areas can be retained in a network of contiguous informal reserves (e.g. wildlife habitat strips, wildlife habitat clumps, streamside reserves).

### **Eastern quoll**

One of the key threats for the eastern quoll is widespread native vegetation clearance, especially clearfelling and the conversion of pasture to plantation. This can eliminate den sites and the diversity of prey items. Road deaths in areas of high densities can also have a significant effect.

The principle management for these species should be to ensure that large corridors (on the scale of 100 square kilometres) of suitable native forest habitat are retained across the landscape, particularly in key sites.

In addition areas with a natural diversity of refuge sites such as fallen logs, dense understorey, rocks and wombat burrows should be protected or left undisturbed. Such areas can be retained in a network of contiguous informal reserves (i.e. wildlife habitat strips, wildlife habitat clumps, streamside reserves).

### **Reading**

Jones, M.E. and Rose, R.K. (1996). *Preliminary assessment of distribution and habitat associations of the spotted-tailed quoll (Dasyurus maculatus maculatus) and eastern quoll (D. viverrinus) in Tasmania to determine conservation and reservation status*. Report to the Tasmanian RFA Environment and Heritage Technical Committee.

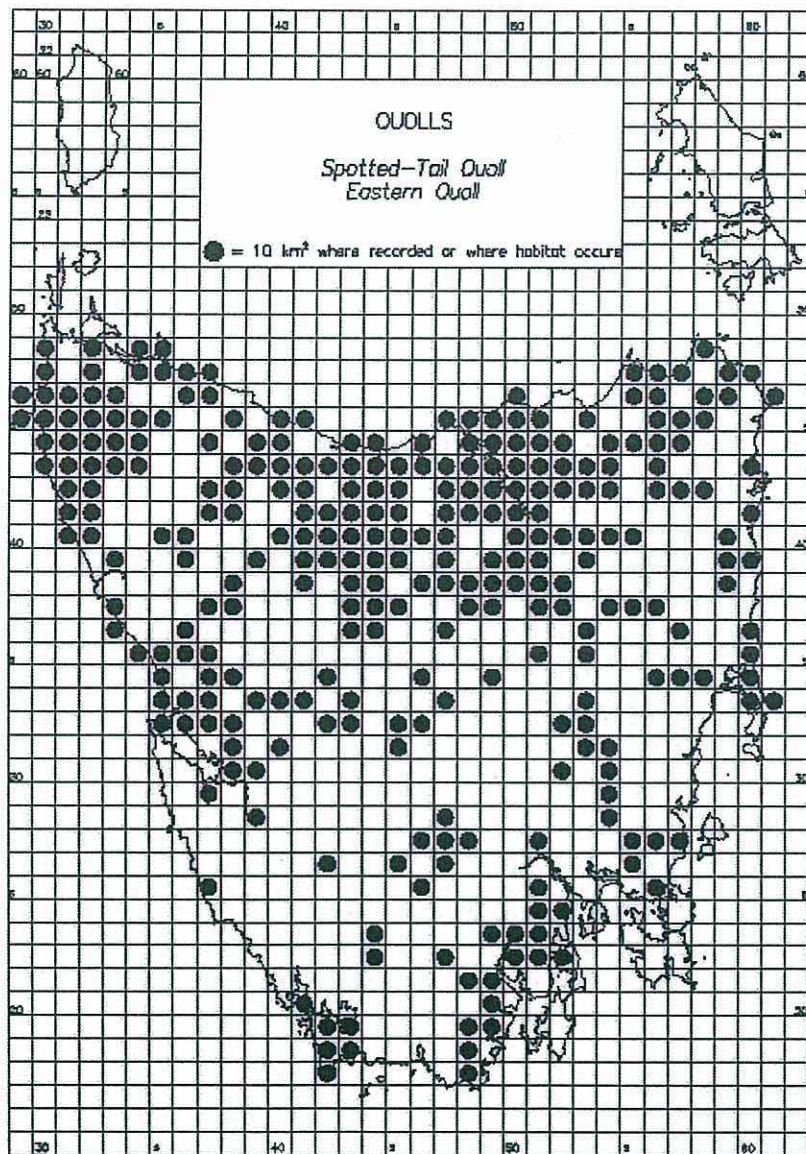
Watts, D. (1993). *Tasmanian Mammals*. Revised edition. Peregrine Press, Kettering, Tasmania.

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Source: Bryant & Jackson 1999

## **DRAFT FOR COMMENT ONLY**

### **TUSSOCK GRASS SKINK**

*Pseudemoia pagenstecheri*

#### **Status**

ENDANGERED (Tasmanian *Threatened Species Protection Act 1995*), due to the severely fragmented population, low number of individuals and habitat loss and degradation.

#### **Description**

A smooth scaled skink with rather short legs and paired frontoparietal shields. Males have a head and body length of up to 55mm and females up to 68mm. This species pale grey, grey-brown to olive dorsally without metallic lustre. A narrow, but distinct vertebral line is always present, with an additional pair of narrow dark lines on each side of the back in some specimens. There is also a narrow straw coloured-white dorsolateral line which forms the upper margin of a dark brown upper lateral zone, which fades ventrally to be edged by an off-white (orange in males) midlateral line which lacks a distinct dark lower edge. The underside is white to pale yellow (Hutchinson *et al* 2001).

*P. pagenstecheri* mates in late summer to autumn and gives birth to 3-11 live young (Hutchinson *et al.* 2001).

#### **Distribution and Habitat**

*P. pagenstecheri* is known from NSW, Victoria and Tasmania. In Tasmania it is known from only 7 remnant grassland areas in the midlands, from a single population on the Hobart Domain, and a single population on private property near Ellendale.

*P. pagenstecheri* is restricted to lowland *Poa* tussock grassy woodland and open grassland, where there is a good cover of medium to tall tussocks. It shelters inside the bases of tussocks and basks inconspicuously in the spaces between them (Hutchinson *et al.* 2001).

#### **Important Locations**

- Australian Defence Force Small Arms Range Complex, Pontville.
- Lake Dulverton, Oatlands.



- Township Lagoon, Tunbridge.
- "Fosterville" Ross.

### **Threats, Limiting Factors and Management Issues**

Degradation of Tasmania's native grasslands appears to be the primary cause of decline in this species. Many native grasslands have been destroyed or severely degraded since European settlement and most of those grasslands that remain are on private land and are subject to heavy grazing pressure (Kirkpatrick 1999). Trampling and grazing of tussocks by sheep and cattle has the effect of shortening the grasses between the tussocks and may lead to loss of habitat and increase risk of predation of this species due to the lack of cover. Some very small remnants do survive clearance on soils too rocky to plough. However, even these remnants can be severely degraded by fertilising and sowing with preferred species such as clover, inappropriate fire regimes and invasion by introduced weeds such as gorse.

There is only one known reserved population of *P. pagenstecheri* in the Tunbridge Township Nature Reserve, a 16 hectare area of native grassland including an ephemeral lagoon.

In addition, *P. pagenstecheri* appears to have disappeared from areas where it previously occurred; 2 of the 11 populations present in 1983 could not be relocated during surveys in 1999 (Redburn 1999), suggesting that there is a continuing decline in this species.

### **Conservation Assessment**

#### **Historical Distribution**

Unknown.

#### **Population Estimate**

There are currently nine known populations containing an unknown number of individuals.

#### **Assessment Criteria**

*P. pagenstecheri* meets the criteria for listing as Endangered on the *Threatened Species Protection Act 1995* given that the population is severely fragmented, contains a low number of individuals and the remaining pockets of suitable habitat are vulnerable to clearing and degradation.

## **Recovery Program**

### **Objectives**

- Protect existing populations.
- Locate further populations.

### **Actions Needed**

- Manage, protect and secure remaining habitat.
- Determine the current distribution, abundance and threats.
- Measure population size and trends.

## **Management Objectives in Production Forest Areas**

- To protect all known existing sub-populations and adjacent areas of suitable habitat.

## **Reading**

- Hutchinson, M.N. and Donnellan, S.C. (1992) Taxonomy and genetic variation in the Australian lizards of the genus *Pseudemoia* (Scincidae: Lygosominae). *Journal of Natural History* 26:215-264.
- Hutchinson, M.N. and Donnellan, S.C. (1990) Biochemical and morphological variation in the geographically widespread lizard *Leiopisma entrecasteauxii* (Lacertilia: Scincidae) *Herpetologica* 46, 149-159.
- Hutchinson, M.N. and Donnellan, S.C. (1988). A new species of scinciid lizard related to the *Leiopisma entrecasteauxii*, from south eastern Australia. *Transactions of the Royal Society of South Australia* 112:143-151.
- Hutchinson, M., Swain, R. and Driessen, M. (2001) Snakes and Lizards of Tasmania. *Fauna of Tasmania Handbook no.9*. Nature Conservation Branch, DPIWE, Hobart.
- Kirkpatrick, J.B. (1999) Grassy vegetation and subalpine eucalypt communities. In: *Vegetation of Tasmania* (eds Reid, J.B., Hill, R.S., Brown, M.J. and Hovenden, M.J.). Pp. 265-285. Monotone Art Printers, Tasmania.
- Redburn, K. (1999) Life History and Habitat of the Tussock Skink *Pseudemoia pagenstecheri* in Tasmania. Honours Thesis, University of Tasmania.
- Rousevell, D., Brereton, R. and Hutchinson, M. (1996) The reptiles of northeast Tasmania with new records and a key to the species of grass skinks, genus *Pseudemoia*. *Records of the Queen Victoria Museum*. 103;193-2000.



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## **WEDGE-TAILED EAGLE**

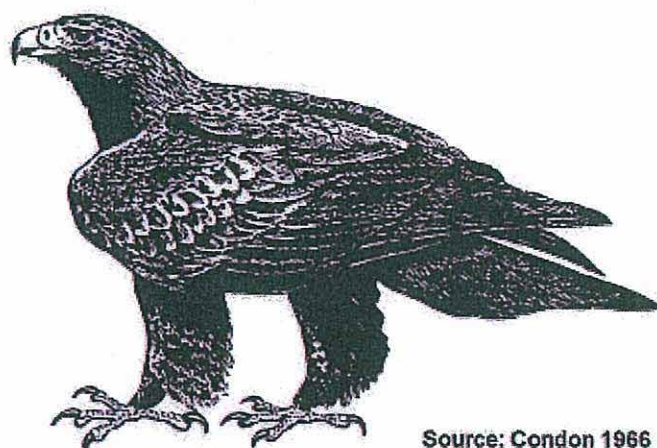
### ***Aquila audax fleayi***

#### **Status**

VULNERABLE (Tasmanian *Threatened Species Protection Act 1995*), ENDANGERED (Commonwealth *Endangered Species Protection Act 1992*), due to a low number of successful breeding pairs (about 95), loss and disturbance of breeding habitat and high mortality due to persecution and human-related accidents.

#### **Description**

A large, powerful bird of prey. Almost black when mature, with legs feathered to the feet and a long, wedge-shaped tail. Wingspan is about 2 m. Females are larger than males.



Source: Condon 1966

#### **Distribution and Habitat**

This subspecies is found only in Tasmania, and occurs throughout the State including large offshore islands. It hunts over a wide range of habitats, but nests only in old-growth trees in native forests. Densities range from one pair per 400 km<sup>2</sup> or more to one pair per 60 km<sup>2</sup>, with distances of 5-20 km between active nests in adjacent territories. Densities are highest in areas with mosaics of forest, farmland, grassland, wetlands and rivers. The eagles feed mainly on rabbits, hares, wallabies, possums, birds such as native hens and ravens and carrion.

Nests are usually in tall eucalypt trees in large tracts (more than 10 ha) of old-growth eucalypt or mixed forest. Nest trees are amongst the largest in a locality. They are in sheltered positions on leeward slopes, between the lower and mid slopes and with the top of the tree usually lower than the ground level of the top of the ridge. Nests are not constructed close to sources of disturbance such as quarries or houses. Nests are traditional, with some having been used for at least 50 years. More than one nest may occur within a territory but only one is used in any one year. Breeding failure often promotes a change of nest in the next year.



Wedge-tailed eagles are very timid nesters and are likely to desert a nest if logging or roading occurs nearby. The breeding season occurs between August and January inclusive with eagles being particularly sensitive to disturbance early in this period. If a nest is deserted due to forestry disturbance, the eagles will usually build another nest nearby, adding to management problems. Thus, it is important to keep them where they were first found. With proper conservation disturbed nests may be reused in later years.

### **Management Objectives for Production Forest Areas**

- Identify potential nesting habitat and conduct nest surveys.
- Protect known nest sites, through application of a viable reserve.
- Protect breeding birds from disturbance.

### **Reading**

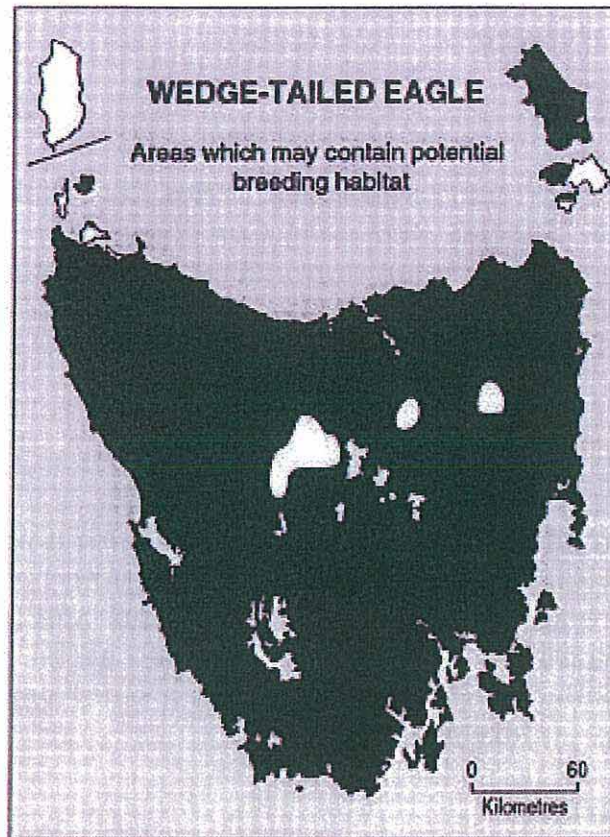
Mooney, N.J. (1998). A method for prioritising coupes for searches of wedge-tailed eagle nests. FPB Technical Note No. 1.

Mooney, N.J. and Holdsworth, M. (1991). The effects of disturbance on nesting wedge-tailed eagles (*Aquila audax fleayi*) in Tasmania. *Tasforests* 3: 15-31.

Mooney, N.J. and Taylor, R.J. (1996). Value of nest site protection in ameliorating the effects of forestry operations on wedge-tailed eagles in Tasmania. Ch. 26 in D.M. Bird, D.E. Varland and J.J. Negro (eds) *Raptors in Human Landscapes*. Academic Press, London.

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## **WHITE-BELLIED SEA EAGLE**

### ***Haliaeetus leucogaster***

#### **Status**

The white-bellied sea eagle has been listed in the Regional Forest Agreement as a Priority Species Requiring Consideration (Attachment 2 Part B) and has been nominated for listing under the Tasmanian *Threatened Species Protection Act 1995* due to a low number of successful breeding pairs and loss and disturbance of breeding habitat.

#### **Description**

Adult white-bellied sea eagles are black and white with a white belly and grey over the wings. Wingspan may exceed 2 m and weight is up to 4.5 kg. Immature birds are mottled pale brown and take five years to reach adult plumage. A juvenile sea eagle can be confused with a wedge-tailed eagle but the sea eagle has a short white tail and strongly patterned underwing.

#### **Distribution and Habitat**

The white-bellied sea eagle is widely distributed from India to Australia. Key sites in Tasmania include the Tamar River estuary, Tasman Peninsula and the Bass Strait Islands. They nest and forage mainly near the coast but will also live near large rivers and lakes inland, often moving on a seasonal basis. The nest of the white-bellied sea eagle is similar in construction to the wedge-tailed eagle and when resources are limited, competition for nest sites between the two species can occur.

As with the wedge-tailed eagle, the white-bellied sea eagle nests are traditional. More than one nest may occur within a territory, but only one is used in any one year. They are very timid nesters and are likely to desert a nest if logging or roading occurs nearby. The breeding season occurs between August and January inclusive with eagles being particularly sensitive to disturbance early in this period. If a nest is deserted due to forestry disturbance, the eagles will usually build another nest nearby, adding to management problems. Thus, it is important to keep them where they were first found. With proper conservation disturbed nests may be reused in later years.

## **Management Objectives for Production Forest Areas**

- Identify potential nesting habitat and conduct nest surveys.
- Protect known nest sites, through application of a viable reserve.
- Protect breeding birds from disturbance.

## **Reading**

Green, R.H. (1995). *The Fauna of Tasmania: Birds*. Potoroo Publishing, Tasmania.

Olsen, P. (1998). *Australia's raptors: diurnal birds of prey and owls*. Conservation Statement No. 2. Birds Australia, Hawthorn East, Victoria.

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