

# 5 THREATENED SPECIES PROFILES

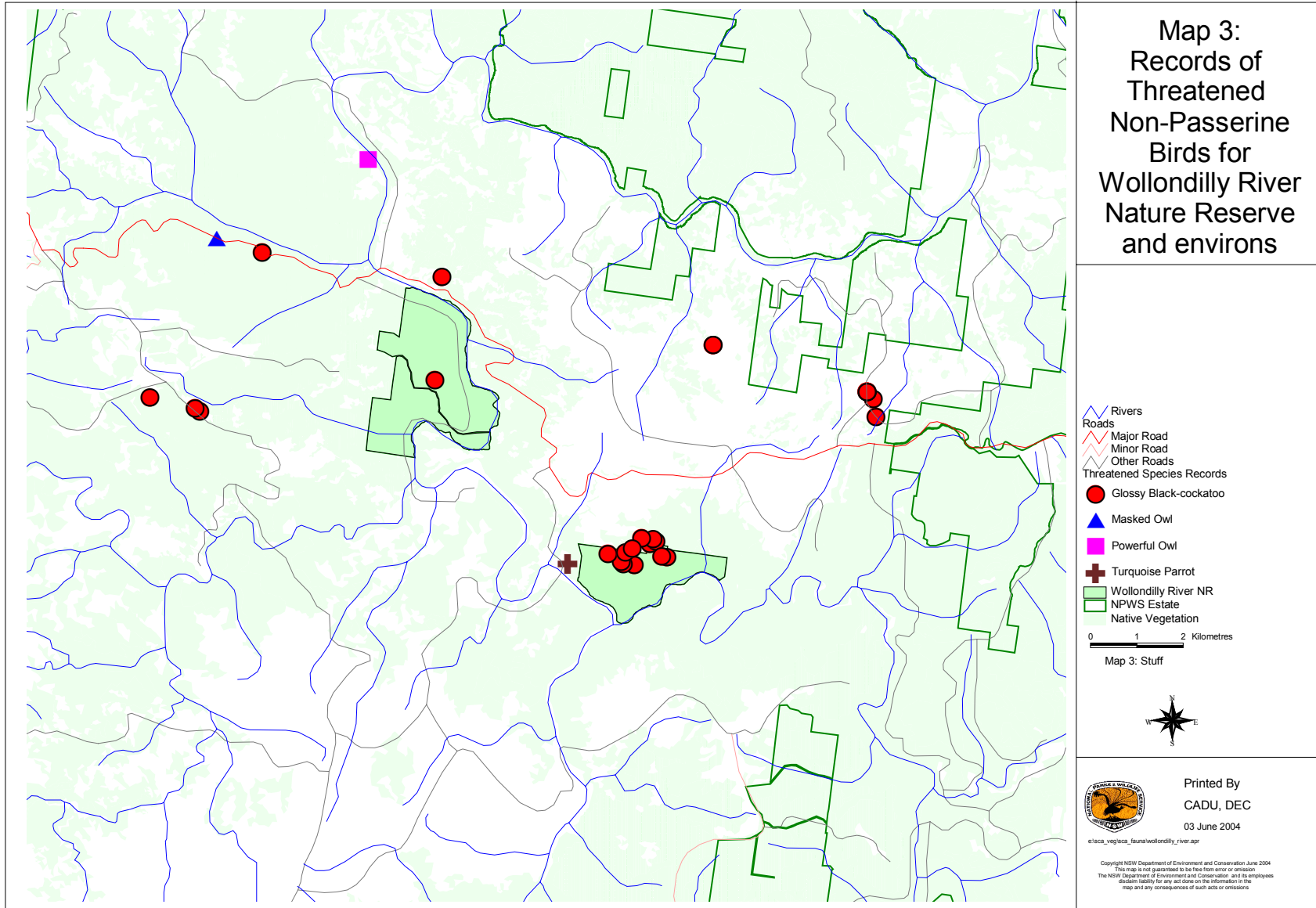
This section provides a profile of each of the threatened fauna species that are known to occur within Wollondilly River NR, together with a few additional threatened species that are considered highly likely to occur. The aim of these profiles is to provide:

- A background on the species biology.
- A summary of threats to the species.
- An assessment of the species' distribution in the Sydney Basin and South Eastern Highlands Bioregions.
- A map of known records of the species in the park and the surrounding five kilometres.
- An appraisal of the distribution and status of the species in Wollondilly River NR and the surrounding area.

Table 3 presents all of the threatened species listed on the Atlas of NSW Wildlife within five kilometres of reserve. During these surveys four threatened bird species and one threatened mammal species were recorded within the Wollondilly River NR. One other species (Squirrel Glider) had been previously recorded in the reserve but was not recorded during the surveys. A further three of both threatened bird and mammal species were recorded outside the reserve in these surveys, while two other threatened bird species have been previously recorded in close proximity but were not during these surveys. The Yellow-bellied Glider has been recorded in Joadja NR (Mills 2002) but as it is unlikely to occur in Wollondilly River NR, no profile has been written (though records are included in Map 5). A profile has been included for Brush-tailed Rock-wallaby, though no records are in the Atlas at this stage.

**Table 3: Threatened Species recorded in and around Wollondilly River NR.**

Scientific Name	Common Name	Profile	Conservation Status	Within Nature Reserve		Outside, but within 5 km, of Nature Reserve	
				Current Survey	Other sources	Current Survey	Other sources
<i>Calyptorhynchus lathami</i>	Glossy Black-cockatoo	Yes	V	9	0	13	4
<i>Neophema pulchella</i>	Turquoise Parrot	Yes	V	0	0	0	1
<i>Ninox strenua</i>	Powerful Owl	Yes	V	0	0	1	0
<i>Tyto novaehollandiae</i>	Masked Owl	Yes	V	0	0	1	0
<i>Climacteris picumnus victoriae</i>	Brown Treecreeper (eastern subsp.)	Yes	V	1	0	0	3
<i>Pyrrholaemus sagittatus</i>	Speckled Warbler	Yes	V	0	0	1	1
<i>Xanthomyza phrygia</i>	Regent Honeyeater	Yes	E1	0	0	0	5
<i>Melanodryas cucullata cucullata</i>	Hooded Robin (south-eastern subsp.)	Yes	V	2	0	0	3
<i>Stagonopleura guttata</i>	Diamond Firetail	Yes	V	3	0	1	4
<i>Phascolarctos cinereus</i>	Koala	Yes	V	1	0	2	0
<i>Petaurus australis</i>	Yellow-bellied Glider	No	V	0	0	3	0
<i>Petaurus norfolcensis</i>	Squirrel Glider	Yes	V	0	1	0	0
<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby	No	E1	0	0	0	0
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	Yes	V	0	0	3	0
<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	Yes	V	0	0	1	0
<i>Myotis adversus</i>	Large-footed Myotis	Yes	V	0	0	1	0



## GLOSSY BLACK-COCKATOO

### *Species Profile*

The Glossy Black-cockatoo (*Calyptorhynchus lathami*) is a medium-sized black cockatoo, which has a diagnostic black-brown head, with yellow patches in the female, and red tail panels. Usually seen in pairs or trios (with dependant young) in eucalypt woodland or forest, where they nest in hollows. Feeds almost exclusively on She-oak (*Allocasuarina* species including *A. verticillata*, *A. torulosa* and *A. littoralis*) (Higgins 1999). Two subspecies are restricted to eastern Australia between Queensland (Eungella) and eastern Victoria, with the nominate *lathami* found in NSW, and a third, isolated, endangered subspecies on Kangaroo Island (South Australia) (Higgins 1999).



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### *Threats*

Habitat destruction for agriculture or residential development appears to be one of the main threats, due to both removal of nesting and feeding sites, and also from competition from more open habitat species such as Galahs (*Eolophus roseicapillus*). Because many *Allocasuarina* species are fire sensitive, inappropriate burning regimes may effect food supplies. Illegal trapping for aviculture may be a localised, minor threat (Garnett and Crowley 2000).

### *Local and Regional Conservation Status*

The Glossy Black-cockatoo is listed as Vulnerable on the NSW TSC Act (1995). Relatively large areas of the Sydney Basin provide suitable habitat for Glossy Black-cockatoos and there are a large number of records for this species throughout the Bioregion. Records of the species are much more scattered over the South Eastern Highlands Bioregion, with records in Kanangra-Boyd National Park and the western margins of Morton National Park (DEC 2004a). It has been found to be widespread throughout the Warragamba Special Area (DEC in prep.).

Interestingly enough, the most frequent opportunistically recorded bird during these surveys was the Glossy Black-cockatoo. This is not indicative however, of the number of birds in the area. Many of the recorded sightings of Glossy Black-Cockatoos were chewed *Allocasuarina* cones, which indicates that the bird is in the area, but gives little idea of the number of animals present. Drooping She-oak (*Allocasuarina verticillata*) was the most common feed tree species recorded and it would be expected that wherever this species is recorded, particularly within the Devonian Red Gum-Box Woodlands, Glossy Black-cockatoos can be expected. One pair was observed feeding in these trees, within the northern boundary of the eastern portion of the reserve. Other birds were seen on either side of Goodmans Ford on the Wombeyan Caves Road. Birds Australia had also recorded this species in the Bullio region prior to the DEC surveys. Map 3 indicates the location of all records of this species in and around Wollondilly River Nature Reserve. The habitat protected in the reserve complements the habitat protected in Joadja Nature Reserve and Nattai National Park.

## TURQUOISE PARROT

### *Species Profile*

The Turquoise Parrot (*Neophema pulchella*) is a small, brightly coloured parrot, distinguished by its bright green upper parts, yellow under parts and blue face and shoulder patch. The male is considerably brighter than the female, and also has a red shoulder band. Usually occurs in pairs or small family parties in eucalypt woodlands and open forests that have a ground cover of grasses. It nests in tree hollows, and has a usual clutch size of two to five eggs (Higgins 1999). It is restricted to eastern Australia, where its range has contracted by over 50 percent since the 1890s (Garnett and Crowley 2000).

### *Threats*

Garnett and Crowley (2000) summarise the main threats as: past clearing for agriculture, which has greatly reduced the overall distribution; predation by cats and foxes; loss of hollows that are used for nesting in managed forests; and inappropriate burning regimes that may favour a shrubby rather than a grassy understorey.

### *Local and Regional Conservation Status*

The Turquoise Parrot is listed as Vulnerable on the NSW TSC Act (1995). There are only scattered records of this species within the South Eastern Highlands Bioregion, although it is more widely recorded across the adjoining Sydney Basin and NSW South West Slopes Bioregions. Records from within NPWS estate in the South Eastern Highlands are also rare with only Gardens of Stone and Woomagama National Parks including this species (DEC 2004a).

No sightings have been made of this species inside the reserve and none were recorded in adjoining country during these surveys. The sole record, shown on Map 3, for the area is a record from the Birds Australia Atlas recorded at the River Island Nature Retreat immediately west of the eastern portion of Wollondilly River Nature Reserve in April 2000. The species has been recorded further down the Burratorang Valley, particularly in the Jooriland area of Warragamba Special Area (DEC in prep.). Turquoise Parrots may exist in small numbers around Wollondilly River Nature Reserve, particularly in Devonian Red Gum-Box Woodlands.



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## POWERFUL OWL

### *Species Profile*

The Powerful Owl (*Ninox strenua*) is the largest owl in Australia and is distinguished by its relatively small, round head and long tail. It is dark brown above with prominent off-white barring, and paler underneath with diagnostic dark chevrons. It inhabits various forest habitats, though usually breeds and roosts in closed forest, including rainforest and wet sclerophyll. It hunts in more open forests, where it feeds mainly on arboreal mammals, particularly Common Ringtail Possums and Greater Gliders. Usually nests in a hollow in a eucalypt within or below the canopy, and usually lays two eggs. They usually maintain a territory of between 300 and 1500 hectares, with size dependent on habitat quality and prey density. It is endemic to eastern Australia, being recorded between Eungella (Queensland) to near the South Australia-Victoria border (Higgins 1999).



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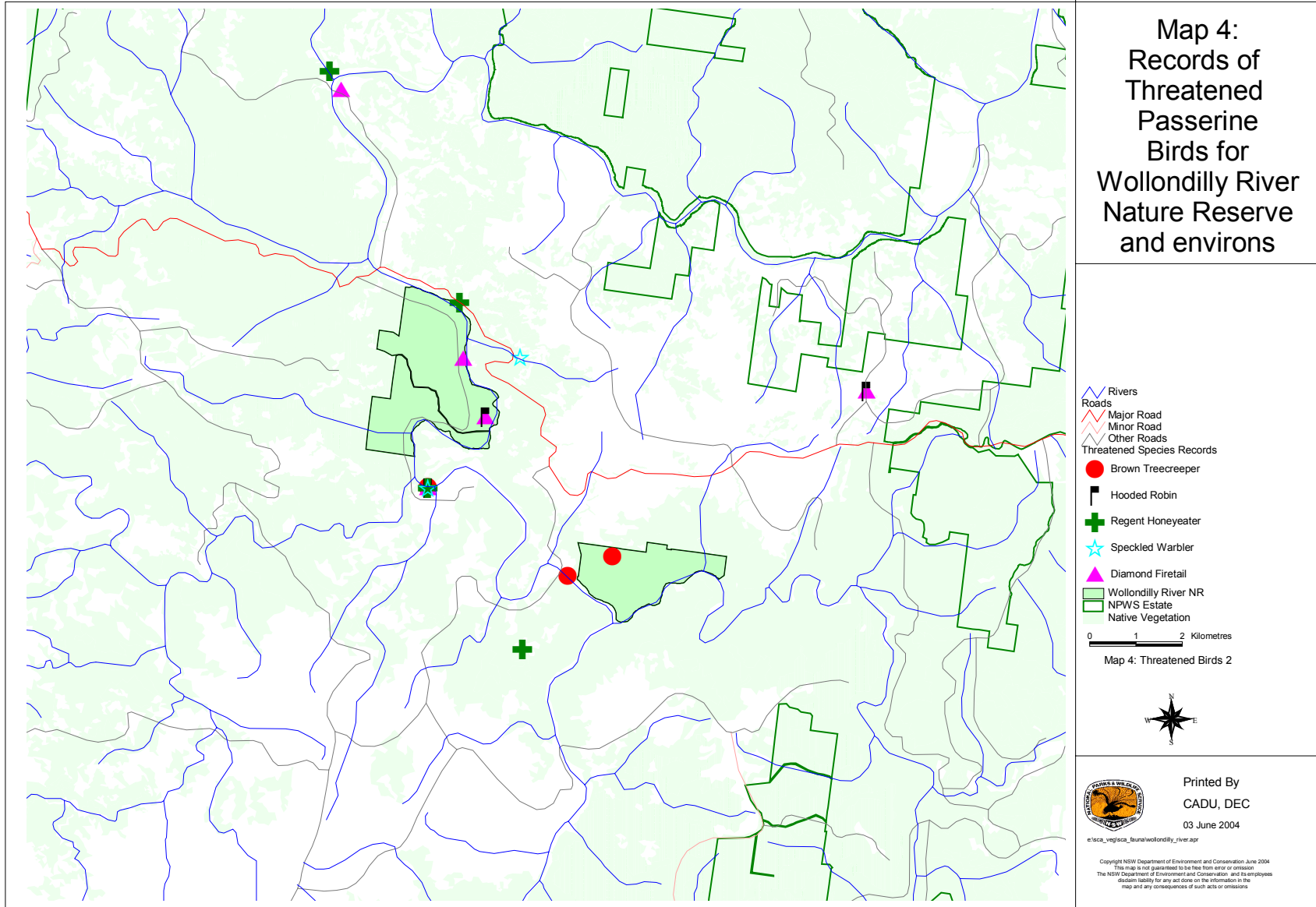
### *Threats*

Past land clearance for agriculture has reduced the area of habitat available for the Powerful Owl (Garnett and Crowley 2000), particularly the availability of roost sites. It can, however, manage to survive in areas with some levels of disturbance, such as in selectively logged forests (Kavanagh 1997) and it is also still recorded in suburban areas of Brisbane, Sydney and Melbourne (Garnett and Crowley 2000, DEC 2004c). Two of the determining factors for the species persistence in disturbed areas is the presence and suitable abundance of prey species (Chafer 1992) and nesting/roosting sites (Debus and Chafer 1994).

### *Local and Regional Conservation Status*

The Powerful Owl is listed as Vulnerable on the NSW TSC Act (1995). It is found throughout the Sydney Basin Bioregion extending west from the rural-urban fringes of Sydney Metropolitan area into the Central Tablelands. Most reserves of the region support known territories of this species. The species is less widespread in the South Eastern Highlands Bioregion, with concentrations of records immediately west of the Sydney Basin (Central Tablelands), around Tallaganda and in western Kosciuszko National Park. A number of reserves in this Bioregion, however, do contain records of this species, including Turon, Kanangra-Boyd, Gourock and Woomargama National Parks (DEC 2004a).

One individual was recorded on the western side of the Wollondilly River approximately two and a half kilometres downstream from Goodmans Ford during the fauna surveys. Potential prey species were located in the Tallygang area, however this species was not detected here. Powerful Owls probably occur at low densities (possibly even only one pair) in the vicinity of Wollondilly River Nature Reserve, particularly in the taller forest types in moister areas.



## MASKED OWL

### *Species Profile*

The Masked Owl (*Tyto novaehollandiae*) is a large 'barn' owl, which has three colour morphs (with intermediates), but is distinguished from the similar Barn Owl (*T. alba*) by its larger size, more thickset and hunchbacked appearance, fully feathered legs and larger feet. It inhabits a wide range of woodland habitats with large hollows for roosting and open areas for hunting. It feeds mainly on ground-dwelling mammals, such as Rats (*Rattus* spp.) and Antechinus (*Antechinus* spp.). It nests in hollow trees, usually eucalypts, where two to three eggs are the normal clutch (Higgins 1999). The nominate subspecies *novaehollandiae* was formerly found around the southern coast of Australia between Fraser Island (Queensland) and Carnarvon (Western Australia), though its range has contracted, particularly in Western Australia (Garnett and Crowley 2000). Other subspecies occur in Tasmania, northern Australia and extraliminally in New Guinea and adjoining islands, some of which are sometimes considered separate species (Higgins 1999).

### *Threats*

Clearance of native forest for agriculture and urban development, and the resulting fragmentation of habitat, has negatively affected the abundance of Masked Owls (Kavanagh 2002, Garnett and Crowley 2000). The species does not persist within fragments of forest less than 200 hectares (Kavanagh 2002). The species may be affected by logging, through removal of hollows or reduction in foraging habitat due to vigorous regrowth (Garnett and Crowley 2000), though it has been suggested that modern mosaic logging operations do not cause major changes to the abundance of the species (Kavanagh 2002).

### *Local and Regional Conservation Status*

The Masked Owl is listed as Vulnerable on the NSW TSC Act (1995). Most records for the species in NSW are located in the NSW North Coast, Sydney Basin and South East Corner Bioregions, with a few scattered records west of the Divide. Records of the species in South Eastern Highlands are restricted to the eastern extremity of the Bioregion including Blue Mountains and Morton National Parks and Bungonia State Conservation Area (DEC 2004a).

One individual has been recorded during this survey, within five kilometres of the Nature Reserve boundary. This animal was heard during a nocturnal call playback survey on the Wombeyan Caves Road west of Goodmans Ford (Map 3). The surrounding vegetation on this site was largely Devonian Red Gum-Yellow Box Woodland complex. This sighting was the first recorded for this animal in the area, though it has also been recorded at a number of new locations throughout the Warragamba Special Area and Nattai National Park (DEC 2004b, DEC in prep.). Further survey work may find that this species is sparsely populated throughout the various woodlands in the Southern Highlands area.

## BROWN TREECREEPER

### *Species Profile*

The Brown Treecreeper (*Climacteris picumnus*) is a medium-sized brown bird that is superficially similar in appearance to the Red-browed (*C. erythrops*) and White-throated (*Cormobates leucophaeus*) Treecreepers. It is distinguished from both by its slightly larger size, distinctive pale supercilium (eyebrow stripe) and by call. Typically a bird of Eucalypt woodlands with a grassy or open shrub understorey, and abundant fallen timber and/or dead trees. Unlike most treecreepers, they spend approximately half of the time on the ground where they feed on insects, particularly ants and beetles, taken from live and dead trees, fallen branches and off the ground. Occurs in pairs or small groups in permanent territories where tree hollows are utilised for breeding (Higgins *et al.* 2001). The subspecies (*victoriae*) occurs along the coast and ranges in Victoria, New South Wales and south-east Queensland, with the other two subspecies occurring either west (*picumnus*) or north (*melanotus*) (Schodde and Mason 1999).

### *Threats*

The eastern subspecies of the Brown Treecreeper is one of a suite of woodland birds that have declined throughout their range due to habitat clearance (Reid 1999). Traill and Duncan (2000) stated that the population was estimated to have declined by at least twenty percent in the last fifteen years. Studies have shown that populations can not persist in habitat fragments smaller than 300 hectares, mostly because females either disperse or suffer from preferential mortality. As with most treecreepers, once extinction occurs in a remnant, natural recolonisation is unlikely (Garnett and Crowley 2000). The lack of hollows may also be a limiting factor as they are known to compete with introduced species like the Common Starling (*Sturnus vulgaris*) (Higgins *et al.* 2001) and European Honeybees (*Apis mellifera*) (NSW Scientific Committee 2001a). Grazing also has impacts by decreasing the diversity of ground-dwelling invertebrates which reduces the levels of food availability (NSW Scientific Committee 2001a).

### *Local and Regional Conservation Status*

The eastern subspecies of the Brown Treecreeper is listed as Vulnerable on the NSW TSC Act (1995). Though it is found through all the eastern Bioregions in New South Wales, it is least common in the South East Coast and Australian Alps, and has declined significantly within the Sydney Basin and NSW North Coast. Similarly, within the South Eastern Highlands Bioregion, there are records scattered throughout, though it appears to have declined in the north and east. Reserves that have records in this Bioregion include Gardens of Stone and Woomargama National Parks, and Coornartha and Mundoonen Nature Reserves (DEC 2004a).

During the current surveys, one individual was heard within the northern boundary of the eastern section of Wollondilly River Nature Reserve. Previous records from the Birds Australia Atlas exist for the areas surrounding both portions of the reserve. The two localities for these records are at the River Island Nature Retreat adjoining the eastern portion, and on a property near the junction of Wollondilly River and Guineacor Creek (Murphys Flat), south of the western portion. These records are plotted in Map 4. The preferred habitat of this species, both around Wollondilly River Nature Reserve and further down the Wollondilly River in the Warragamba Special Area (DEC in prep.) appears to be the Devonian Red Gum-Box Woodlands.



## SPECKLED WARBLER

### *Species Profile*

The Speckled Warbler (*Pyrrholaemus sagittata*) is a small, ground-dwelling scrubwren-like bird. It is similar in size and shape to the Buff-rumped Thornbill (*Acanthiza reguloides*) but can be identified by its boldly streaked underbody, distinctive facial pattern and noticeably longer tail. The female differs from the male by having a chestnut, rather than black, streak in the eyebrow. Usually occurs in grassy understorey of dry sclerophyll forests and woodlands dominated by eucalypts, often with scattered shrubs. They feed on insects and seeds with most foraging occurring on the ground. Pairs, and occasionally trios, live permanently in large (up to twelve hectare) territories where a well concealed domed nest is built on the ground in grass tussocks. Two to four (usually three) eggs are laid, though breeding success can be low. The Speckled Warbler is endemic to south eastern Australia, being found between Maryborough (Queensland) and the Grampians (Victoria) (Higgins and Peter 2002).

### *Threats*

The Speckled Warbler is one of a number of woodland birds that has declined in density throughout its range due mainly to agricultural land clearing (Reid 1999). Speckled Warbler populations are estimated to have declined by at least twenty percent in the last fifteen years (Traill and Duncan 2000). Small patches may result in local extinction due to natural fluctuations (Garnett and Crowley 2000) with extinction occurring in areas in patches smaller than 100 hectares (NSW Scientific Committee 2001b). Weed invasion, nest predation by exotic mammalian predators and a loss of ground cover by grazing by stock, kangaroos and rabbits are other notable threats (NSW Scientific Committee 2001b, Garnett and Crowley 2000).

### *Local and Regional Conservation Status*

The Speckled Warbler is listed as Vulnerable on the NSW TSC Act (1995). It is widespread in the eastern Bioregions of the state, extending as far west as the Cobar Peneplain, but is scarce or absent from the South East Coast and Australian Alps. Within the South Eastern Highlands Bioregion most records are from the far north (around Winburndale Nature Reserve) and around Canberra, with scattered records elsewhere and few records from around the Oberon area. It is not well recorded in reserves, but is listed for Kosciuszko National Park, Barton Nature Reserve and Yerranderie SCA (DEC 2004a).

During the current surveys, one individual was observed in Horse Creek, on the Wombeyan Caves Road east of Goodmans Ford. Birds Australia have another record from a property near the junction of Wollondilly River and Guineacor Creek (Murphys Flat) in 2001. These records are shown in Map 4. This species has been more regularly reported further downstream in the Burragorang Valley (DEC in prep.). Once again, this species appears to be linked with Devonian Red Gum-Box Woodlands, and so may be expected to occur within Wollondilly River Nature Reserve, particularly along gullies where the shrub layer is denser.

## REGENT HONEYEATER

### *Species Profile*

The Regent Honeyeater (*Xanthomyza phrygia*) is a medium-sized honeyeater with a striking black and yellow plumage. It typically favours box-ironbark woodland, though it also utilises River Oak (*Casuarina cunninghamiana* subsp. *cunninghamiana*) Forests and coastal habitats such as Swamp Mahogany (*Eucalyptus robusta*) or Spotted Gum (*Corymbia maculata*). The population seems to undertake complex movements, generally dependent on where flowering food trees are available. It feeds mainly on nectar, and nests in the crowns of Eucalypts where it usually lays two or three eggs. It is endemic to south eastern Australia, formerly between Rockhampton (Queensland) and Adelaide, though it is now rare in Queensland and probably extinct in South Australia, with a general contraction of range in the other two states (Higgins *et al.* 2001).



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### *Threats*

Land clearance for agriculture has removed about three quarters of the suitable habitat of the Regent Honeyeater. The remaining vegetation is fragmented, and is still being affected by the removal of larger trees. Habitat alteration may also advantage more aggressive honeyeaters, such as miners (*Manorina* spp.) and friarbirds (*Philemon* spp.) with resulting competition. The population is estimated to be no more than 1500 individuals (Garnett and Crowley 2000, Higgins *et al.* 2001).

### *Local and Regional Conservation Status*

The Regent Honeyeater is listed as Endangered on the NSW TSC Act (1995) and as Endangered on the Commonwealth EPBC Act (1999). There are scattered records across the entire eastern third of New South Wales, with many records within the Sydney Basin Bioregion. It has been regularly recorded within the South Eastern Highlands Bioregion, but there are few records south of the Australian Capital Territory. Occasional sightings have been made in NPWS estate including Morton and Gardens of Stone National Parks, Copperhanna Nature Reserve and Bungonia State Conservation Area (DEC 2004a).

Compiling records was one of the priorities of the Draft Regent Honeyeater Recovery Plan (Menkhorst *et al.* 1999) and so a number of records are included in the Atlas of NSW Wildlife, though the accuracy of these records is often low. These are shown in Map 4. Two records from the 1970s are from the Wollondilly River upstream of Goodmans Ford, while a third record from 1989 is simply noted as "Wollondilly River, Wombeyan Caves Road." All these records may have been within Wollondilly River Nature Reserve. The most recent records are from the Birds Australia Atlas of up to eight birds present for at least a week at "Riverview" which is situated between the two portions of the reserve on the Wollondilly River. None were recorded during the current surveys. As most of these records are linked with the Wollondilly River and the fact that White Box (*Eucalyptus albens*) is rare this far upstream, the Regent Honeyeater is probably linked to flowering mistletoe (*Amyema cambagei*) within the Tablelands River Oak Forest in the vicinity of Wollondilly River Nature Reserve.

## HOODED ROBIN

### *Species Profile*

The Hooded Robin (*Melanodryas cucullata*) is a medium-sized bird that usually occurs in eucalypt woodland or *Acacia* shrubland. The adult male is distinctive and has a black hood and upper body with a white stripe on the shoulder. The adult female is mostly grey with a dark-brown wing. Both sexes have a white wing stripe and underparts and a prominent white side-panel on the tail, which along with their larger size, distinguish this species from the Jacky Winter (*Microeca fascinans*) and female *Petroica* Robins. They utilise dead or fallen timber as perches when foraging, where it feeds mainly on insects. Usually occurs as pairs, though cooperative breeding is also common, with normally two or three eggs laid in a cup-shaped nest placed in a horizontal fork (Higgins and Peter 2002). There are four subspecies covering most of Australia, with the two subspecies in New South Wales being *picata*, which extends from north western NSW through to the Kimberleys in Western Australia, and the nominate (*cucullata*) which is south and east of this subspecies (between Queensland and South Australia) (Schodde and Mason 1999).

### *Threats*

The south-eastern subspecies of the Hooded Robin has been identified as one of a number of birds that have declined significantly in range and population in the sheep-wheat belt of central west NSW due to degradation and fragmentation of woodland habitats (Reid 1999). Populations do not appear to persist even in large fragments of remaining habitat although the precise reason for this is as yet unknown (Garnett and Crowley 2000). Habitat modification and reduction of food availability through grazing by stock and weed invasion may also be a threat (NSW Scientific Committee 2001c). Eggs and young have been known to be predated by native avian predators and possibly by Foxes (*Vulpes vulpes*) (Higgins and Peter 2002).

### *Local and Regional Conservation Status*

The south eastern subspecies of the Hooded Robin is listed as Vulnerable on the NSW TSC Act (1995). It has been recorded in most subcoastal areas of New South Wales, though is rare in the Australian Alps Bioregion. Within the South Eastern Highlands, it has a patchy distribution in the north, east and around the Australian Capital Territory, appearing to avoid the higher areas around Oberon and west of Kosciuszko National Park. Very few of the records from the South Eastern Highlands are within DEC reserves, although there is a record from Copperhanna Nature Reserve (DEC 2004a).

Within Wollondilly River Nature Reserve the Hooded Robin was only recorded around "Bowmans Hill" Hut where an adult male was first seen in June 2003. In January 2004, a pair and at least one juvenile were seen at the same location, utilising the exotic trees within the garden for feeding and roosting. There were also records from the Birds Australia Atlas at Bullio and from a property near the junction of Wollondilly River and Guineacor Creek (Murphys Flat) that had been recorded prior to the DEC surveys. These locations are shown on Map 4. This species was more regularly recorded further down the Wollondilly in the Jooriland area of Warragamba Special Area (DEC in prep.). It is likely to be found in small numbers throughout the Devonian Red Gum-Box Woodlands of the area, particularly in areas with dead trees adjoining cleared lands.

## DIAMOND FIRETAIL

### *Species Profile*

The Diamond Firetail (*Stagonopleura guttata*) is an attractive finch, which is distinguished by its bold black breastband and white-spotted black flanks. The eye, beak and rump are red, with the latter contrasting strongly with the black tail in flight (Pizzey and Knight 1997). It is most frequently encountered in Eucalypt dominated communities that have a grassy understorey, where it feeds mainly on grass seeds (Garnett and Crowley 2000). Usually encountered as pairs, though sometimes forms small flocks in autumn and winter. They nest in trees or sometimes mistletoe, building bottle-shaped nests and usually produce four to six eggs (Pizzey and Knight 1997). It is endemic to south-eastern Australia, with records extending from Rockhampton (Queensland) to the Eyre Peninsula and Kangaroo Island (South Australia) (Pizzey and Knight 1997).

### *Threats*

The Diamond Firetail has been historically recorded in all types of timbered country (Smith *et al.* 1995) but much of its habitat has been cleared and it is therefore numbered in the suite of woodland birds that have declined in south-eastern Australia (Reid 1999). They appear to be unable to survive in areas with no remnants larger than 200 hectares (NSW Scientific Committee 2001d). Clearing and habitat degradation by over-grazing and the spread of exotic grasses may also result in the loss of key food plants and possibly competition from flock-foraging Red-browed Finches (*Neochmia temporalis*) (Garnett and Crowley 2000). Predation by foxes and cats may be another threat (Smith *et al.* 1995).

### *Local and Regional Conservation Status*

The Diamond Firetail is listed as Vulnerable on the NSW TSC Act (1995). It is widely recorded in the eastern two thirds of the state, with scattered records in the far west, although it is less widely recorded in the three coastal Bioregions and in the high country of the Australian Alps. It is also broadly recorded in the South Eastern Highlands Bioregion, though it is sparse or absent in the higher areas around Oberon and south of the Australian Capital Territory. Records within conservation reserves within this Bioregion, however, are sparse, with sightings in Copperhanna and Winburndale Nature Reserves (DEC 2004a).

This species has been recorded widely in and around Wollondilly River Nature Reserve. It was recorded on two different occasions around the Bowman's Hill Hut and on the Horse Flat access trail within the reserve. The latter site included juvenile birds indicating that breeding is likely to be occurring within the reserve. It was also recorded near the Wollondilly River near Five Hundred Acre Flat during current surveys. Birds Australia had records from a property near the junction of the Wollondilly River and Guineacor Creek (Murphys Flat) and the Bullio area which are also shown in Map 4. This is another species recorded more widely downstream in the Jooriland area of Warragamba Special Area (DEC in prep.). The Diamond Firetail is also likely to be found in patches of Devonian Red Gum-Box Woodlands in the drier areas of the Warragamba Special Area.

## KOALA

### *Species Profile*

The Koala (*Phascolarctos cinereus*) is a distinctive, iconic arboreal mammal of eucalypt forest and woodland. It feeds on a wide range of eucalypt and other tree species, though in a local area a few species will be preferred almost exclusively. Individuals spend most of the day resting in the forks of trees, and are most active following sunset (NPWS 1999a). They generally move about a home range, the size of which varies depending on density of food trees and population size, though individuals, particularly dispersing juveniles, are known to travel up to 50 kilometres (Martin & Handasyde 1995, NPWS 1999a). Three subspecies occur between north Queensland and the Eyre Peninsula in South Australia, however, the distribution is now fragmented and introductions, such as to Phillip Island, have possibly reduced the genetic diversity of many of the populations (Martin & Handasyde 1995).

### *Threats*

NPWS (2003d) summarises the threats to the Koala as follows: destruction of habitat by clearing for urban development, agriculture and mining; degradation of habitat through fragmentation and disturbance such as fire or weed invasion; direct mortality from dogs and motor vehicles; death and injury and the reduction of feeding habitat caused by fire, and infection by *Chlamydia* which causes keratoconjunctivitis (an infection of the eyes) and infertility. The latter appears to occur naturally in Koalas in NSW, and symptoms are displayed when animals are stressed (NPWS 2003d). In Victoria, populations that have been transferred from Phillip Island appear to have lost their immunity and rates can be high, but it does not appear to be a major threat (Menkhorst 1995). Throughout its entire range, loss, fragmentation and degradation of habitat is its greatest threat (NPWS 2003d). Reed *et al.* (1990) reported on a survey in 1986-87 that found that the Koala had disappeared from 50 to 75 percent of its known range in NSW and populations had been lost from many localities, particularly on the southern and western edges of their distribution.

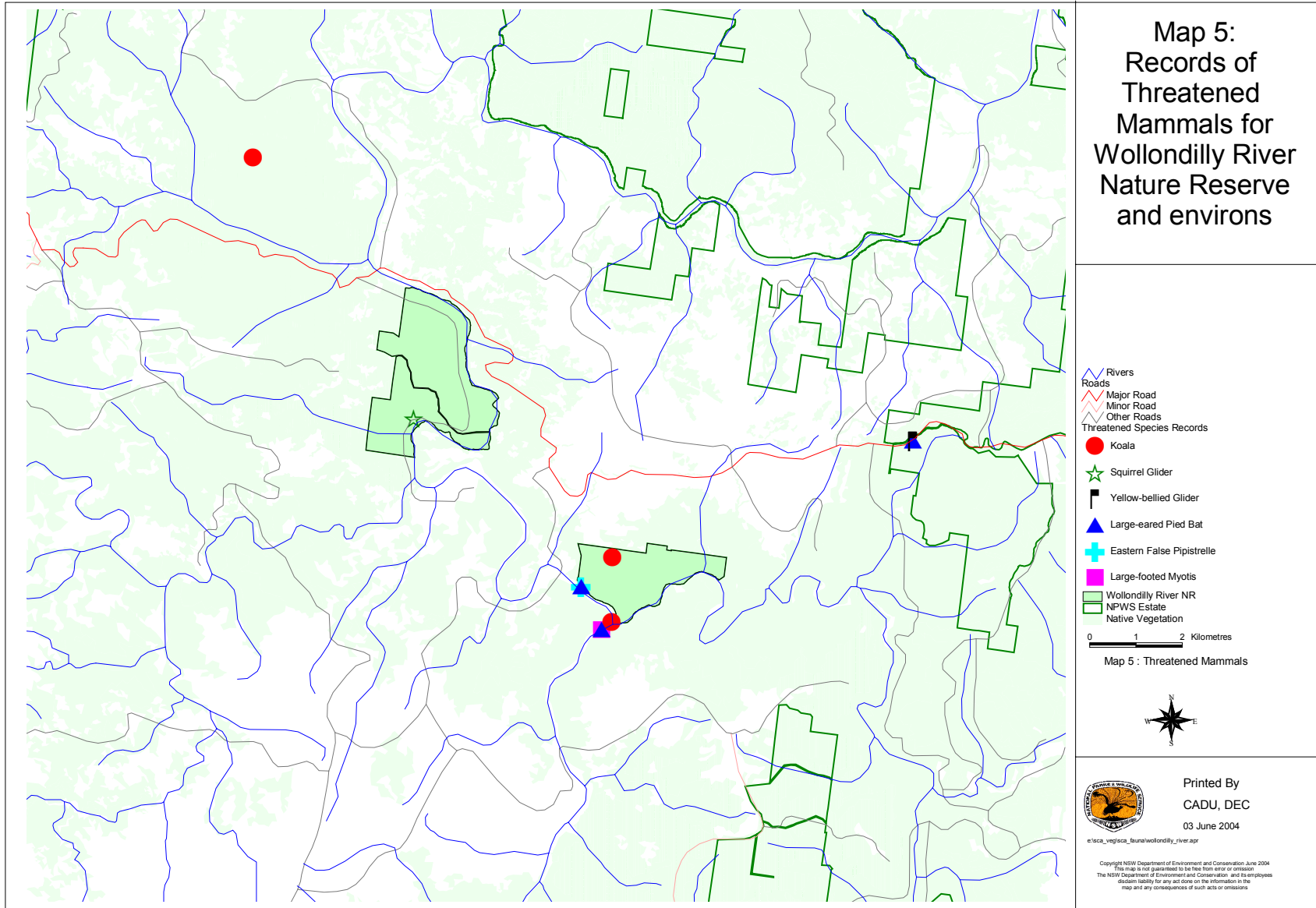
### *Local and Regional Conservation Status*

The Koala is listed as Vulnerable on the NSW TSC Act (1995). Numerous records occur in the north east quarter of the state and also along the southern coast and ranges. Further west, the records appear more sporadic. Records appear throughout the South Eastern Highlands Bioregion, with greater densities in the east. There are a number of records within Bungonia State Conservation Area and Morton National Park within the Bioregion, and other scattered reserves including South East Forest National Park and Freemantle Nature Reserve (DEC 2004a). The recent discovery of a colony in Nattai National Park (DEC 2004b) shows the value of systematic survey in detecting this species, and suggests that other populations may remain undiscovered in the area.

Individual Koalas were recorded on two consecutive nights during surveys of the eastern portion. The first was spotted near the northern boundary, while the second was heard near the junction of the Wollondilly and Wingecarribee Rivers. It is extremely unlikely that these sightings were of the same individual due to the large distance (approximately 1.5 kilometres) one individual would have had to move in one night. Another had been heard calling near Lord's Mountains (to the north west of the reserve) during vegetation surveys. These records are included in Map 5. These records confirm the anecdotal records from landholders within the Burragorang Valley and Tallygang Mountain areas. Koalas probably occur at low abundance throughout the Southern Highlands particularly in areas where favoured food trees like Forest Red Gum (*Eucalyptus tereticornis*) and Grey Gum (*E. punctata*) are present.



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## SQUIRREL GLIDER

### *Species Profile*

The Squirrel Glider (*Petaurus norfolcensis*) is a nocturnal mammal that inhabits dry sclerophyll forests and woodlands and builds leaf-lined nests in tree hollows. It is very similar in appearance to the smaller and more common Sugar Glider (*Petaurus breviceps*). However, the Squirrel Glider has a longer more pointed face, longer and narrower ears and a bushier tail and also lacks the persistent yapping call of the smaller species. It has a varied diet, including insects, nectar, pollen, seeds, *Acacia* gum and sap from Eucalypts (Suckling 1995). Usually occurs in family groups of up to ten, consisting of one male, one or more females and their dependant young. Home ranges are thought to vary between 0.65 and 8.55 hectares, depending on habitat quality, and individuals have been known to move up to 500 metres in one night. It is sparsely distributed along the east coast and inland slopes of between north Queensland and Victoria (NPWS 1999b).

### *Threats*

NPWS (1999b) lists the following threats to the Squirrel Glider. They are known to be greatly affected by the loss of nesting resources when the availability of hollow bearing trees are lost through clearing, fragmentation or timber extraction. Predation by cats and foxes are also thought to contribute to the species vulnerability. Impacts of fire regimes are poorly understood although the availability of food resources may be reduced or lost after fire.

### *Local and Regional Conservation Status*

The Squirrel Glider is listed as a vulnerable species on the NSW TSC Act (1995). The records within the Atlas of NSW Wildlife are scattered along the coast and west of the Divide, with the greatest concentration of records in the Sydney Basin and NSW North Coast Bioregions. Within the South Eastern Highlands it is restricted mainly to the extreme north east and the far south west near the Victorian border. Records are also from a few reserves scattered throughout the Bioregion, including Turon and Woomargama National Parks and Winburndale Nature Reserve (DEC 2004a).

In Wollondilly River Nature Reserve one individual has been spotted to the west of "Bowmans Hill" Hut in 2002. This record is shown on Map 5. No other records exist for the surrounding areas. None were recorded during these surveys and even Sugar Gliders were found to be at low densities in the area. Even within the Warragamba Special Area the Squirrel Glider has been found at only a few isolated locations (DEC 2004b). As this species prefers grassy woodlands, it is possible that the Squirrel Glider occurs at extremely low densities in the Devonian Red Gum-Box Woodlands of the Wollondilly River area, particularly where *Acacia* species are at suitable densities to provide gum when nectar is unavailable.



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## BRUSH-TAILED ROCK-WALLABY

### *Species Profile*

The Brush-tailed Rock-wallaby (*Petrogale penicillata*) is a medium sized macropod, characterised by its distinctive facial markings, black paws and high levels of agility (NSW Scientific Committee 2003). The tail is often used to aid identification, being long and thickly furred with a distinctive brush-like appearance near its tip (NPWS 2002). Habitats occupied by this species tend to take one of three forms: loose piles of large boulders containing a maze of subterranean holes and passageways; cliffs (usually over fifteen metres high with many mid level ledges covered by overhangs; or isolated rock stacks, usually sheer sided and often girdled with fallen boulders (NPWS 2002). Vegetation forms a vital component of the habitat, especially as refugia near major rock outcrops. The species typically exhibits low migration rates between colonies, impeding persistence and recovery of populations affected by threatening processes. Its range formerly extended between south east Queensland to the Victoria, but it was thought to be extinct in the latter state until small populations were rediscovered in the Grampians and near the Snowy River (Eldridge and Close 1995)



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### *Threats*

Historical decline of the Brush-tailed Rock-wallaby is attributed to three factors: hunting for bounty and fur; predation by introduced predators; and competition with introduced herbivores (feral Goat (*Capra hircus*), Rabbit (*Oryctolagus cuniculus*) and stock) (NSW Scientific Committee 2003). The major threats continuing to impact on the species include ongoing predation and competition with feral species such as Fox (*Vulpes vulpes*) and wild Dogs (*Canis lupus familiaris*), habitat modification by fire, vegetation clearing, disease transmission (toxoplasmosis and hydatosis) by feral carnivores (NSW Scientific Committee 2003) and inbreeding (Environment ACT 1999).

### *Local and Regional Conservation Status*

Brush-tailed Rock-wallabies are listed as endangered on the NSW TSC Act (1995) and as Vulnerable on the Commonwealth EPBC Act (1999). The Rock-wallabies were probably once widespread in the South Eastern Highlands, but are now restricted to the north eastern boundary. Known locations within the South Eastern Highlands and Sydney Basin Bioregions include Kangaroo Valley, Broke in the Hunter Valley and Morton National Park with an introduced population at Jenolan Caves (DEC 2004a). Recently, during DEC fauna surveys, a colony of Brush-tailed Rock-wallabies was discovered further downstream along the Wollondilly River within Nattai National Park, contributing significantly to the conservation and management of the species (DEC 2004b). These locations fall within the most fragile metapopulation of Brush-tailed Rock-wallabies in NSW, and consequently are all of very high conservation significance (NSW Scientific Committee 2003c).

The Brush-tailed Rock-wallaby has not been recorded within the study area. This endangered species was formerly known from around Wombeyan Caves, though the last known individual from this population was captured and taken to Jenolan Caves in 1995 (R. Humphries pers. comm.). Anecdotal records from this area persist in the vicinity of Guineacor Creek and Top of the World, though these have not been confirmed (D. Ashton pers. comm.). Recent searches on the steep slopes above Russell and Rac-a-rock Glens on the Wombeyan Caves Road have discovered old scats and suitable habitat, but no animals were sighted (R. Pedroza pers. comm.).

The discovery of the Nattai population indicates that this species can often be difficult to detect and may still remain in areas of suitable habitat. Targeted surveys, particularly along the steep slopes below Tallygang Mountain, are required to determine whether Brush-tailed Rock-wallabies do still occur within the study area. Reduction in goat numbers may also increase the chances of any populations of increasing, by reducing competition for food. Given the conservation significance of this species, any sites discovered should have management and monitoring undertaken in close consultation with the Statewide recovery plan for the species.



## LARGE-EARED PIED BAT

### *Species Profile*

The Large-eared Pied Bat (*Chalinolobus dwyeri*) is readily recognisable from other members of its genus by the combination of large ears and overall black colour, with bands of white fur along the sides of the body, that join to form a V-shape (Parnaby 1992b, Churchill 1998). The call is an alternate pattern made at a low frequency, which is readily distinguishable from all other species (Reinhold *et al.* 2001). Originally described from Copeton in 1966, it has been recorded from a number of scattered locations on either side of the Great Dividing Range between Rockhampton (Queensland) and Bungonia (New South Wales) (Hoye and Dwyer 1995). It has been found in a wide range of habitats, including wet and dry eucalypt forest, Cypress (*Callitris*) forest and sub-alpine woodland (Duncan *et al.* 1999). It is a cave-roosting species, though it has also been detected roosting in disused mine shafts, overhangs and once in an abandoned Fairy Martin (*Petrochelidon ariel*) nest (Churchill 1998). It seems to prefer the 'twilight' areas of caves, and may be dependent on sandstone outcrops (Duncan *et al.* 1999, Hoye and Dwyer 1995).



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### *Threats*

The only confirmed threat to this species is the destruction or interference of roost sites. Other potential threats include mining induced subsidence (particularly coal-mining in sandstone areas) which may destroy roost sites, habitat destruction for agriculture and urban development, and predation by feral animals (Duncan *et al.* 1999).

### *Local and Regional Conservation Status*

The Large-eared Pied Bat is listed as Vulnerable on the NSW TSC Act (1995) and also as Vulnerable on the Commonwealth EPBC Act (1999). The Sydney Basin appears to support a significant proportion of the Large-eared Pied Bat population in NSW, with scattered records occurring in the Bioregions to the north and west. Within the South Eastern Highlands Bioregion, the species is restricted to the north and east, with Jenolan Karst Conservation Reserve and Kanangra-Boyd National Park forming the western boundary of the species' known distribution. Most records from NPWS estate in this Bioregion are from reserves that straddle the boundary with Sydney Basin, including Blue Mountains, Gardens of Stone and Morton National Parks (DEC 2004a).

The Large-eared Pied Bat has been recorded at three locations surrounding Wollondilly River Nature Reserve all derived from Anabat call analysis (Map 5). It appears, based on existing records, that Wollondilly River Nature Reserve is at the western limit of the species' distribution. Definite calls were identified south of the Wollondilly River and at Joadja Nature Reserve (Mills 2002), while another call was recorded at another location south of the eastern portion of the reserve, though the identification was only to the level of probable. It was more widely recorded in the Warragamba Special Area, which has many more typical sandstone habitats (DEC in prep.). Roosting may occur within the vicinity of the reserve as it is unknown how far this species travels while foraging. Rock overhangs in the area may be worth investigating, and undertaking further bat survey may gather further knowledge on the distribution of this species.

## EASTERN FALSE PIPISTRELLE

### *Species Profile*

The Eastern False Pipistrelle (*Falsistrellus tasmaniensis*) is a relatively large (up to 70 millimetres) bat that is similar to the Greater Broad-nosed Bat (*Scoteanax rueppellii*), though it has two pairs of upper incisors, a gap between the incisors and the canines, and larger ears (Parnaby 1992b, Churchill 1998). Its calls can be confused with various species of *Scotorepens* and the Greater Broad-nosed Bat, though good quality calls can be separated using ultrasound analysis (Reinhold *et al.* 2001). It is found in small numbers throughout its range in south eastern Australia, between south east Queensland and western Victoria, and Tasmania. It seems to prefer wet habitats, particularly riparian or high rainfall areas, with large trees (greater than 20 metres) (Menkhorst and Lumsden 1995). It may be more common at high elevations (Phillips 1995), though it has been recorded between sea level and 1500 metres in Victoria (Menkhorst and Lumsden 1995). It usually roosts in hollows in *Eucalyptus*, though it has been recorded in caves (Churchill 1998). It may hibernate over winter and has been known to travel at least twelve kilometres from its roost site (Churchill 1998).



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### *Threats*

The main threat would appear to be destruction of roosting sites, through land clearance and logging (Gilmore and Parnaby 1994).

### *Local and Regional Conservation Status*

The Eastern False Pipistrelle is listed as Vulnerable on the NSW TSC Act (1995). Records for the species are scattered across both the Sydney Basin and South East Highlands Bioregion. Within the latter Bioregion it is known from quite a few reserves including Gardens of Stone, Blue Mountains, Abercrombie River, Tallaganda and Woomargama National Parks (DEC 2004a).

This species was only identified from call analysis, using Anabat at a site to the south of the eastern portion of Wollondilly River Nature Reserve. This location is indicated on Map 5. Unfortunately, it could only be identified to the level of probable. However, given its wide distribution within the South Eastern Highlands Bioregion it is highly likely that further survey work, particularly in the moister habitats, would detect this species as occurring within the reserve.

## LARGE-FOOTED MYOTIS

### *Species Profile*

The Large-footed Myotis (*Myotis adversus*) is another bat species for which the taxonomy is currently undergoing review. The Australian specimens are now considered to consist of two or three species. The southern species (*M. macropus*) is recorded coastally and along the Murray River from south eastern South Australia to south east Queensland. However, the northern limit of this species and the area of overlap with *M. moluccarum* are poorly known (Duncan *et al.* 1999, Churchill 1998). Even though it can be recorded from up to 20 metres using Anabat, it can be difficult to identify from *Nyctophilus* species (Reinhold *et al.* 2001). It is easily distinguished from other species by its disproportionately large feet, which it uses to



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rake its prey of insects and small fish from the surface of water (Churchill 1998). It occurs in a wide variety of habitats as long as water is nearby. It normally roosts in caves, though will also use tree hollows, vegetation, and man-made structures, such as bridges and mines (Churchill 1998).

### *Threats*

The threats to this species are poorly known, but it is probably most sensitive to changes in water quality. These may be sedimentation (from vegetation clearing and logging), eutrophication (sewage and fertiliser run-off), pollution and altered flow regimes (Duncan *et al.* 1999). Roosting sites may be susceptible to disturbance by such activities as recreational caving or roadworks (Duncan *et al.* 1999, Gilmore and Parnaby 1994).

### *Local and Regional Conservation Status*

The Large-footed Myotis is listed as Vulnerable on the NSW TSC Act (1995). This species is most likely to be recorded within the three coastal Bioregions within NSW, though there are scattered records on and west of the Divide. Within the South Eastern Highlands Bioregion it has only been recorded at a few locations. This may indicate that this species is difficult to detect, because at some known roosting sites within the Bioregion, such as the caves at Wee Jasper, it appears to be reasonably common. Reserves with records are also few, but they include Blue Mountains and Tarlo River National Parks and Wee Jasper Nature Reserve (DEC 2004a).

This species was detected using Anabat at one location, to the south of the eastern portion of Wollondilly River Nature Reserve (Map 5). This record was confirmed as a definite recording of this species. As this species is usually only caught in traps placed immediately over water this species can be difficult to catch in harp traps (N. Williams pers. comm.). Further survey work would probably show that this species utilises the Wollondilly River as a feeding site quite regularly, though it would be difficult to confirm whether any roosting sites are in the reserve.