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ASSESSMENT | PLANNING | MANAGEMENT

Goulburn Mulwaree

Biodiversity Strategy

FINAL DRAFT

Volume 2: APPENDICES

Report prepared for:
Goulburn Mulwaree Shire Council
(Project No. 145-001)

June 2007

ABN 87 096 512 088 | address Suite 4 2-4 Merton Street Sutherland NSW 2232
postal PO Box 12 Sutherland NSW 1499 | phone 02 8536 8600 | fax 02 9542 5622
web www.ecoaus.com.au

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Eco Logical Australia Pty Ltd
Ecological Assessment, GIS, Environmental Management and Planning
Ph - (02) 8536 8600
Fax - (02) 9542 5622

Appendix 1. Wetland of International Importance

Lake Bathurst is listed on the directory of important wetlands which is a directory of wetlands as cited in "A Directory of Important Wetlands in Australia" Third Edition (EA, 2001), plus various additions for wetlands listed after 2001. The criteria for the definition of a wetland used was that adopted by the Ramsar Convention, namely: "areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters."

The criteria met for listing as nationally important were 1, 3 and 6 as follows:

1. It is a good example of a wetland type occurring within a biogeographic region in Australia.

3. It is a wetland which is important as the habitat for animal taxa at a vulnerable stage in their life cycles, or provides a refuge when adverse conditions such as drought prevail.

6. The wetland is of outstanding historical or cultural significance.

Lake Bathurst covers 1350 ha. (including associated wetlands known as the Morass). Lake Bathurst is a large, shallow permanent lake occurring in the southern tablelands at the southernmost extremity of the Nepean-Hawkesbury catchment approximately 1km east of the Mulwaree River (Stricker & Wall, 1994). The maximum depth of Lake Bathurst is 7m and is relatively shallow. Water maintenance is by local run-off, with the lake acting as an internal basin.

This lake provides important refuge habitat for waterbirds during inland droughts. It also provides significant breeding areas when water levels are high and there is sufficient vegetation. A minimum of 64 species of breeding birds has been recorded at the site. Two species which are considered vulnerable at a state level (Sv) that have been recorded at Lake Bathurst (NPWS, 1998b). Furthermore, 16 migratory species have been recorded at this lake (Canberra Ornithologists Group, 1995a; NPWS, 1998b).

This information was taken from the Department of Environment and Heritage Australian Wetland Database website:
http://www.deh.gov.au/cgi-bin/wetlands/report.pl

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Fax - (02) 9542 5622

Appendix 2. Migratory Bird Species

Species name	Data Source
White-Bellied Sea-Eagle (*Haliaeetus leucogaster*)	1.
Ruddy Turnstone (*Arenaria interpres*)	1.
Curlew Sandpiper (*Calidris ferruginea*)	1.
Sharp-tailed Sandpiper (*Calidris acuminata*)	1.
Buff-breasted Sandpiper (*Tryngites subruficollis*)	1.
Bar-tailed Godwit (*Limosa lapponica*)	1.
Little Curlew (*Numenius minutus*)	1.
Eastern Curlew (*Numenius madagascariensis*)	1.
Wood Sandpiper (*Tringa glareola*)	1.
Common Greenshank (*Tringa nebularia)*	1.
Marsh Sandpiper (*Tringa stagnatilis*)	1.
Grey Plover (*Pluvialis squatarola*)	1.
White-winged Black Tern (*Chlidonias leucoptera*)	1.
Great Egret (*Ardea alba*).	1.
Glossy Ibis (*Plegadis falcinellus*)	1.
Latham's Snipe (*Gallinago hardwickii*)	1.
White-throated Needletail *(Hirundapus caudacutus)*	2.
Rainbow Bee-eater *(Merops ornatus)*	2.
Black-faced Monarch*(Monarcha melanopsis)*	2.
Satin Flycatcher *(Myiagra cyanoleuca)*	2.
Rufous Fantail *(Rhipidura rufifrons)*	2.
Regent Honeyeater *(Xanthomyza phrygia)*	2.
Double-banded Plover *(Charadrius bicinctus)*	2.
Latham's Snipe Japanese Snipe *(Gallinago hardwickii)*	2.
Painted Snipe *(Rostratula benghalensis s. lat.)*	2.

Data Source:

1. Birds listed under JAMBA and / or CAMBA which have been recorded at Lake Bathurst include the (Canberra Ornithologists Group, 1995a; NPWS, 1998b).
2. EPBC Matters of National Environmental Significance Report

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Ph - (02) 8536 8600
Fax - (02) 9542 5622

Appendix 3. Threatened Flora and Fauna Species

Threatened Flora Species in Goulbourn Mulwaree LGA as listed in the Threatened Species Conservation Act (1995) (TSC Act) and/or The Commonwealth Environment Protection and Biodiversity Conservation Act (1999) (EPBC Act).

Name	TSC Status	EPBC Status	Source
Bossiaea oligosperma	V	V	1.
Budawangia gnidioides	V	V	3.
Caladenia tesselata	E	V	3.
Dillwynia glaucula	E	-	1.
Diuris aequalis	V	V	1.
Diuris tricolour	V	V	1.
Dodonaea procumbens	V	V	2.
Eucalyptus macarthurii	E	-	1.
Eucalyptus recurva	E	E	1.
Genoplesium plumosum	E	E	2.
Grevillea molyneuxii	V	E	1.
Haloragis exalata subsp. exalata	V	V	3.
Kunzea cambagei	V	V	3.
Leucochrysum albicans var. tricolor	-	E	3.
Melaleuca deanei	V	V	3.
Pomaderris cotoneaster	E	E	1.
Pomaderris delicata	E	-	1.
Pomaderris pallida	V	V	1.
Pomaderris sericea	-	V	3.
Phyllota humifusa	V	V	1.
Prasophyllum petilum	E	E	2.
Pultenaea parrisiae subsp. elusa	E	E	1.
Pultenaea pedunculata	V	-	1.
Rulingia prostrata	E	E	2.
Rutidosis leptorrhynchoides	E	E	2.
Solanum celatum	E	-	1.
Thesium australe	V	V	3.
Zieria murphyi	V	V	1.

Data Source:

1. Atlas of NSW Wildlife report January 2007
2. DEC Threatened Species website: Priority Actions Identified for Goulburn Mulwaree LGA.
3. EPBC Matters of National Environmental Significance Report January 2007

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Fax - (02) 9542 5622

Threatened Fauna Species in Goulburn Mulwaree LGA as listed in the Threatened Species Conservation Act (1995) (TSC Act) and/or The Commonwealth Environment Protection and Biodiversity Conservation Act (1999) (EPBC Act).

Species Type	Name	TSC Status	EPBC Status	Source
Amphibians	Green and Golden Bell Frog (*Litoria aurea*)	E	V	1.
	Little John's Tree Frog *(Litoria littlejohni)*	V	V	2.
	Giant Burrowing Frog (*Heleioporus australiacus)*	V	V	3.
	Stuttering Frog (*Mixophyes balbus)*	E	V	3.
Birds	Speckled Warbler (*Pyrrholaemus sagittatus*)	V	-	1.
	Blue-billed Duck (*Oxyura australis*)	V	-	1.
	Freckled Duck (*Stictonetta naevosa*)	V	-	1.
	Magpie Goose (*Anseranas semipalmata*)	V	-	1.
	Australasian Bittern (*Botaurus poiciloptilus*)	V	-	1.
	Bush Stone Curlew (*Burhinus grallarius)*	V	-	2.
	Gang-gang Cockatoo (*Callocephalon fimbriatum*)	V	-	1.
	Glossy Black-Cockatoo (*Calyptorhynchus lathami*)	V	E	1.
	Black-necked Stork (*Ephippiorhynchus asiaticus*)	E	-	1.
	Brown Treecreeper (*Climacteris picumnus*)	V	-	1.
	Diamond Firetail (*Stagonopleura guttata*)	V	-	1.
	Black-chinned Honeyeater (eastern subspecies) (*Melithreptus gularis gularis*)	V	-	1.
	Regent Honeyeater (*Xanthomyza Phrygia*)	E	E	1.
	Powerful Owl (*Ninox strenua*)	V	-	1.
	Masked Owl (*Tyto novaehollandiae*)	V	-	1.
	Barking Owl *(Ninox connivens)*	E	-	2.
	Australian Painted Snipe (*Rostratula australis*)	-	V	3.
	Superb parrot (*Polytelis swainsonii)*	V	V	3.
	Swift Parrot (*Lathamus discolor)*	E	E	3.
Mammals	Spotted-tailed Quoll (*Dasyurus maculates*)	V	E	1.
	Brush-tailed Rock-wallaby (*Petrogale penicillata*)	E	V	1.
	Eastern Freetail-bat (*Mormopterus norfolkensis*)	V	-	1.
	Yellow-bellied Glider (*Petaurus australis*)	V	-	1.
	Squirrel Glider (*Petaurus norfolcensis*)	V	-	1.
	Koala (*Phascolarctos cinereus*)	V	-	1.
	Large-eared Pied Bat (*Chalinolobus dwyeri*)	V	V	1.
	Eastern False Pipistrelle (*Falsistrellus tasmaniensis*)	V	-	1.
	Southern Brown Bandicoot (*Isoodon obesulus obesulus*)	-	E	3.
	Long nosed Potoroo (SE Mainland) (*Potorous tridactylus tridactylus*)	V	V	3.

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	Eastern Bentwing-bat (*Miniopterus schreibersii oceanensis*)	V	-	1.
	Grey-headed flying fox (*Pteropus poliocephalus*)	V	V	3.
Reptile	Striped Legless Lizard (*Delma impar*)	V	V	1.
	Pink-tailed Worm-lizard (*Aprasia parapulchella*)	-	V	3.
	Broad-headed snake (*Hoplocephalus bungaroides*)	-	V	3.
	Rosenberg's Goanna*(Varanus rosenbergi)*	V	-	2.

Species Type	**Name**	**FMA Status**	**EPBC Status**	**Source**
Fish	Silver Perch (*Bidyanus bidyanus*)	V	-	4.
	Murray Cod (*Maccullochella peelii peelii*)	-	V	3.
	Macquarie Perch (*Macquaria australasica*)	V	E	3.
	Australian Grayling (*Prototroctes maraena*)	-	V	3.

Data Source:

1. Atlas of NSW Wildlife Report January 2007
2. DECC Threatened Species website: Priority Actions Identified for Goulburn Mulwaree LGA.
3. EPBC Matters of National Environmental Significance Report January 2007
4. Bionet Report (December 2006)

Status Codes:

E1/E: Endangered
V: Vulnerable

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Appendix 4. Species of Regional Significance

Species of Regional Significance in Goulburn Mulwaree LGA (Source: Falconer 2005).

Narrow- leaved Black Sallee (Eucalyptus moorei)
Privet- leaved Stringybark (Eucalyptus ligustrina)

Appendix 5. Species of Local Significance

Species of Local Significance in Goulburn Mulwaree LGA (Source: Falconer 2005).

Keys Matchstick Grasshopper (*Keyacris scurra*)

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Appendix 6. Noxious Weeds

The following weeds are declared noxious in the control area of Goulburn Mulwaree Council:

Weed	Class
African boxthorn (*Lycium ferocissimum*)	4
African feathergrass (*Pennisetum macrourum*)	5
African lovegrass (*Eragrostis curvula*)	4
African turnipweed (*Sisymbrium runcinatum*)	5
African turnipweed (*Sisymbrium thellungii*)	5
Alligator weed (*Alternanthera philoxeroides*)	2
Anchored water hyacinth (*Eichhornia azurea*)	1
Annual ragweed (*Ambrosia artemisiifolia*)	5
Arrowhead (*Sagittaria montevidensis*)	5
Artichoke thistle (*Cynara cardunculus*)	5
Athel tree (*Tamarix aphylla*)	5
Bathurst/Noogoora/Californian/cockle burrs (Xanthium species)	4
Bear-skin fescue (*Festuca gautieri*)	5
Black knapweed (*Centaurea nigra*)	1
Blackberry (Rubus fruticosus aggregate species) except cultivars Black satin, Chehalem, Chester Thornless, Dirksen Thornless, Loch Ness, Murrindindi, Silvan, Smoothstem, Thornfree	4
Bridal creeper (*Asparagus asparagoides*)	5
Broomrapes (Orobanche species) Includes all Orobanche species except the native O. cernua variety australiana and O. minor	1
Burr ragweed (*Ambrosia confertiflora*)	5
Cabomba (*Cabomba caroliniana*)	5
Cayenne snakeweed (*Stachytarpheta cayennensis*)	5
Chilean needle grass (*Nassella neesiana*)	4
Chinese violet (*Asystasia gangetica* subspecies *micrantha*)	1
Clockweed (*Gaura lindheimeri*)	5
Clockweed (*Gaura parviflora*)	5
Cockle burrs (Xanthium species)	
Corn sowthistle (*Sonchus arvensis*)	5
Dodder (Cuscuta species) Includes All Cuscuta species except the native species *C. australis, C. tasmanica* and *C. victoriana*	5
East Indian hygrophila (*Hygrophila polysperma*)	1
English broom (*Cytisus scoparius*)	
Espartillo (*Achnatherum brachychaetum*)	5
Eurasian water milfoil (*Myriophyllum spicatum*)	1
Fine-bristled burr grass (*Cenchrus brownii*)	5
Fireweed (*Senecio madagascariensis*)	4
Fountain grass (*Pennisetum setaceum*)	5
Gallon's curse (*Cenchrus biflorus*)	5
Glaucous starthistle (*Carthamus glaucus*)	5
Golden dodder (*Cuscuta campestris*)	4
Golden thistle (*Scolymus hispanicus*)	5
Gorse (*Ulex europaeus*)	3

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Green cestrum (*Cestrum parqui*)	3
Harrisia cactus (Harrisia species)	4
Hawkweed (Hieracium species)	1
Horsetail (Equisetum species)	1
Hymenachne (*Hymenachne amplexicaulis*)	1
Italian bugloss (Echium species)	
Karoo thorn (*Acacia karroo*)	1
Kochia (*Bassia scoparia*) except *Bassia scoparia* subspecies *trichophylla*	1
Lagarosiphon (Lagarosiphon major)	1
Lantana (Lantana species)	5
Long-leaf willow primrose (*Ludwigia longifolia*)	5
Mexican feather grass (*Nassella tenuissima*)	1
Mexican poppy (*Argemone mexicana*)	5
Miconia (Miconia species)	1
Mimosa (Mimosa pigra)	1
Mossman River grass (*Cenchrus echinatus*)	5
Nodding thistle (*Carduus nutans*)	4
Onion grass (Romulea species) Includes all Romulea species and varieties except *R. rosea var. australis*	5
Oxalis (Oxalis species and varieties) Includes all Oxalis species and varieties except the native species *O. chnoodes, O. exilis, O. perennans, O. radicosa, O. rubens,* and *O. thompsoniae*	5
Pampas grass (Cortaderia species)	4
Parthenium weed (*Parthenium hysterophorus*)	1
Paterson's curse, Vipers bugloss, Italian bugloss (Echium species)	4
Pond apple (*Annona glabra*)	1
Prickly acacia (*Acacia nilotica*)	1
Prickly pear (Cylindropuntia species)	4
Prickly pear (Opuntia species except *O. ficus-indica*)	4
Red rice (*Oryza rufipogon*)	5
Rhus tree (*Toxicodendron succedaneum*)	4
Rubbervine (*Cryptostegia grandiflora*)	1
Sagittaria (*Sagittaria platyphylla*)	5
Salvinia (*Salvinia molesta*)	2
Sand oat (*Avena strigosa*)	5
Scotch broom (*Cytisus scoparius*)	4
Scotch thistle,Stemless thistle,Illyrian thistle, Taurian th (Onopordum species)	4
Senegal tea plant (*Gymnocoronis spilanthoides*)	1
Serrated tussock (*Nassella trichotoma*)	4
Siam weed (*Chromolaena odorata*)	1
Sifton bush (*Cassinia arcuata*)	4
Smooth-stemmed turnip (*Brassica barrelieri* subspecies *oxyrrhina*)	5
Soldier thistle (*Picnomon acarna*)	5
Spotted knapweed (*Centaurea maculosa*)	1
St. John's wort (*Hypericum perforatum*)	3
Sweet briar (*Rosa rubiginosa*)	4
Taurian thistle (Onopordum species)	
Texas blueweed (*Helianthus ciliaris*)	5

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Water caltrop (Trapa species)	1
Water hyacinth (*Eichhornia crassipes*)	2
Water lettuce (*Pistia stratiotes*)	1
Water soldier (*Stratiotes aloides*)	1
Wild radish (*Raphanus raphanistrum*)	4
Willows (Salix species) Includes all Salix species except *S. babylonica, S. x reichardtii, S. x calodendron*	5
Witchweed (Striga species) Includes all Striga species except native species and *Striga parviflora*	1
Yellow burrhead (*Limnocharis flava*)	1
Yellow nutgrass (*Cyperus esculentus*)	5

http://www.dpi.nsw.gov.au/agriculture/noxweed/noxious-app?sq_content_src=%252BdXJsPWh0dHAlM0ElMkYlMkZ3d3cuYWdyaWMubnN3Lmdvdi5hdSUyRnRvb2xzJTJGdmlld2NvdW5jaWwuaHRtbCZhbGw9MQ%253D%253D&council_id=44 (11 Jan 07)

Notes to Table
Action and Category definition
1: Notifiable Noxious Weed
A weed of limited distribution or not present in the State but which poses a threat to agriculture, the environment, or the community. Landholders must notify their Local Control Authority within three days of detecting it on their land and also must continuously suppress and destroy the infestation.
2: Noxious Weed
A weed that poses a threat to agriculture, the environment, or the community and that has the ability to spread to other areas. Landholders must continuously suppress and destroy the infestation.
3: Noxious Weed
A weed that poses a threat to agriculture, the environment, or the community and that has the potential to spread to other areas, but is so widespread that total suppression and destruction is impractical. Landholders must prevent the spread and reduce the numbers and distribution of the infestation to the satisfaction of the Local Control Authority.
4: Noxious Weed
A weed that poses a threat to agriculture, the environment, or the community and that has the potential to spread and has a specific action that must be undertaken.
Actions that landholders must undertake for W 4 noxious weeds are:
4a: Shall not be sold, propagated or knowingly distributed. No part of the plant can grow within three metres of the property boundary.
4b: Shall not be sold, propagated or knowingly distributed. Established plantings must be prevented from flowering and fruiting.
4c: Shall not be sold, propagated or knowingly distributed. Occupiers must prevent spread to adjoining property.
4d: The weed:
(a) must not be sold, propagated or knowingly distributed: and
(b) must be fully and continuously suppressed and destroyed unless it is:
• listed on the State Heritage Register under the Heritage Act 1997
• listed for preservation or protection as a heritage item under an Environmental Planning Instrument under the Environmental Planning and Assessment Act 1979
• listed for preservation or protection in a Tree Preservation Order of the council for the Local Government Area
• included for preservation or protection in a Plan of Management for a local government area under section 40 of the Local Government Act 1993, or
• included for preservation or protection in a noxious weed control policy or a noxious weed control program approved by the local control authority for the area for which it is the local control authority.
W 4e: The weed must be fully and continuously suppressed and destroyed. All reasonable precautions must be taken to ensure produce, soil, livestock, equipment and vehicles are free of the weed before sale or movement from an infested area of the property.
4f: Shall not be sold, propagated or knowingly distributed. Occupiers must implement biological control or other control program as directed by the Local Control Authority.
4g: The weed must not be sold, propagated or knowingly distributed.

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Fax - (02) 9542 5622

Appendix 7. Environmental Weeds

GOULBURN MULWAREE COUNCIL – ENVIRONMENTAL WEED LIST.
February 2006.

The State Government is responsible for listing **noxious weeds**. A noxious weed is a plant that either is or has the potential to be particularly troublesome, usually in terms of affecting social or commercial human activities. This list is to be read in conjunction with GMC's noxious weeds list. **If plants are on the noxious list they are not repeated on this environmental weeds list.**

An **environmental weed** is a plant that is not native to an area and that is or has the potential to threaten the ecological integrity of that area. It may do this by successfully competing with or smothering local native plants, by altering the physical structure of an area, by hybridising sith local species or by changing feeding relationships (such as berry bushes and currawongs).

Some of the species listed below can be planted in controlled areas away from native bushland or river corridors. Some species mentioned provide protection for small native birds. Individual situations should be assessed prior to removal to ensure habitat is maintained.

This list is to be read with the explanatory notes located at the end.

The following weeds are declared environmental weeds in the area of Goulburn Mulwaree Council:

SCIENTIFIC NAME	COMMON NAME	LOCATION	DESCTRIPTION	COMMENT
Acacia baileyana	Cootamundra wattle	Wide spread	Large evergreen shrub or small tree	Can out compete local native species
Acer negundo	Box elder	Rivers & damp areas	Medium size deciduous tree	Not currently a problem locally but is in similar areas
Alianthus altissima	Tree of Heaven	Wide spread, favours fences	Medium size deciduous tree	Vigorous growers. Deep green pinnate leaves to 1.0m long.

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SCIENTIFIC NAME	COMMON NAME	LOCATION	DESCTRIPTION	COMMENT
Alnus species	Alder	Near water courses	Evergreen & deciduous trees, v. fast growing	Not yet widely established locally but has is other areas.
Arbutus unedo	Irish strawberry tree.	Rivers	Woody evergreen shrub.	25mm Orange fruit. Occurs near Fitzroy Bridge.
Centaurea calcitrapa	Star Thistle		Thistle	Mainly in native grass land.
Cirsium vulgare	Spear thistle	Wide spread along rivers	Thistle	
Cotoneaster glaucophyllus	Cotoneaster		Small evergreen tree with red berries	Spread by birds, poisonous berries
Crataegus monogyna & hybrid cultivars	Hawthorn	Wide spread	Small evergreen tree with red berries	Spread by birds. Encourages predatory bird species.
Dactylis glomerata	Cocksfoot	Any grassy area, woodlands and native grasslands.	Tall upright grass with broken flower spike circling stem	
Foeniculum vulgare	Fennel	Neglected areas & roadsides	Erect perennial herb to 2.5 m high	A weed of waste spaces in urban areas
Grevillea rosmarinifolia	Rosemary Grevillia	Drier open forests, gardens	Dense prickly leaved shrub to 2.0 m	Red flowers. Readily interbreeds with local species.
Hedera helix	English Ivy		Evergreen climber	
Ligustrum species	Privet, large & small leaved.	Widespread, like moist places	Small evergreen tree, masses of black berries	Difficult to kill, spread by birds
Lonicera japonica	Japanese honeysuckle	Rivers	Rampant climber	
Malus species	Crab apple	Rivers etc	Small deciduous tree.	
Marrubium vulgare	Horehound	Rivers & neglected areas	Bushy perennial herb to 0.75 m	Germinates from seed.
Myrsiphyllum asparagoides	Bridal creeper, Florests smilax	Wet areas	Rampant smothering creeper	
Nassella neesiana	Chilean needle grass	Widely dispersed	Tufty grass	Can be identified by ring (corona) around seed (base of awn)..

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SCIENTIFIC NAME	COMMON NAME	LOCATION	DESCTRIPTION	COMMENT
Olea Species	Olive	Bushland	Evergreen trees	Long lived, strongly allelopathic eg secrets chemicals that restrict growth of other plants
Paspalum dilatatum	Paspalum	Widespread on rivers	Grass	
Phalaris species	Phalaris	Widespread	Tall tough grass	
Poplus alba P. nigra & P nigra 'Italica' Other Poplar species	White or silver poplar Black poplar & Lombardy poplar	Damp places & neglected areas	Tall fast growing deciduous trees	Reproduce by suckers, can form thickets
Prunus species	Plum & Cherry Plum	Widespread in neglected areas.	Small deciduous tree.	
Pyracantha species	Firethorn	Neglected areas	Large evergreen shrub	Red – orange berries spread by birds.
Ranunculus repens	Creeping buttercup	Wet places		Can form dense pure stands replacing other understorey.
Rhamnus alaternus	Italian buckthorn	Riversides and neglected areas	Evergreen woody shrub with black berries	Small leathery leaves.
Salix babylonica Salix calodendron Salix reichardtii	Weeping willow	Riversides	Deciduous trees or large shrubs	Willow species clog rivers. All other species are on the noxious weed list.
Sambucus nigra	Black Elder	Rivers	Small deciduous tree	Not currently a problem locally but is in similar areas
Ulmus procera	Elm	Rivers and neglected areas	Tall deciduous tree, prolific seeders.	Reproduce by suckers, can form thickets
Vinca major & V. minor	Periwinkle also variegated forms.	Creeks & streams Eg Rocky Hill & Mt. Gray	Slender stemmed herbaceous perennials	Groundcovers with purple flowers. Can climb to 3.0 m

Possible future problem weeds

SCIENTIFIC NAME	COMMON NAME	LOCATION	DESCTRIPTION	COMMENT
Equisetum arvense	Common horsetail	Damp places		
Protasparagas plumosus	Climbing asparagus fern	Woodland		

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Environmental Weeds List notes.

Goulburn Mulwaree Council has created a draft Environmental Weeds list. The Council's Environment Committee recognised that there are local weeds that are not included on the noxious weeds list. Council has developed an environmental weeds list as a response to the perceived gap.

The noxious weeds list is governed by State Government legislation and has associated control requirements. If plants are on the noxious weeds list they are not repeated on the Environmental Weeds List.

The intention of the environmental weeds list is to provide advice to landowners and land managers about species that have been found to degrade bushland & or riparian environments. Council does not require that these plants be removed; rather it encourages their control & removal.

The majority of weeds were introduced from other countries, some arrived by accident while others were brought for various reasons. The natural enemies that kept the plants in control in their native countries are not present in Australia and as a consequence their spread has been unrestricted.

Plants become weeds because they have a high level of seed production with easy dispersal and are highly competitive with a lack of natural controls. Plants are weeds if they:

- cause environmental harm
- choke out native vegetation
- harm agricultural production

The aim of weed control is to remove the weed seed reservoir and prevent further replenishment of the seed store. Controlling weed seed is done by stopping the weed from growing and removing vegetative plant parts including roots, stems, branches, stolons, tubers or other plant parts that may allow the plant to grow.

Weed seed can be introduced to a property by:

- seed brought for sowing, stock feed, on stock, machinery, water, wind & garden escapees etc.
- deliberate introduction e.g. willows for bank stabilisation
- land managers' lack of awareness and inability to identify weeds
- poor land management e.g. overgrazing
- herbicide resistance due to over-reliance on one or several chemicals

The effects of poor weed management include:

- loss of native species
- reduced land productivity
- increased control costs as weeds spread
- loss of native habitat for native species
- soil degradation & erosion

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Some species listed provide protection for small native birds. Individual situations should be assessed prior to removal to ensure habitat is maintained.

In situations where considerable areas of weeds are to be removed it may be necessary to prepare a staged removal plan. That is plan the weed removal in a mosaic fashion where smaller areas of weeds are removed and native plants re-established in turn. This will provide habitat and food source for native fauna. It may be necessary to assess the fauna that are using the weed species for protection or food source and ensure that suitable replacements are included in the replanted species.

The advent of herbicides has added a new dimension to weed control. Herbicides are not always the best answer, natural biological control, mulching, grazing, pulling, grubbing, slashing & ploughing are also effective controls with some weeds. Council's weed inspectors can assist with the best methods of control for the various weeds.

Noxious Weeds

Owners are required to control declared noxious weeds on their property. Noxious weeds are those plants that have a detrimental effect or cause serious economic loss to agriculture or the environment. Council is the local weed control authority and has the right to enter and inspect private properties and if required impose notices to carry out control work. Fines may also be applied. The noxious weed list for Goulburn Mulwaree Council can be viewed at www.dpi.nsw.gov.au/agriculture
You can ask Council if there is any outstanding weed notices on a property. Weed inspections by Council are available for a fee

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APPENDIX 8 Metadata for Hawkesbury Nepean Catchment Regional Biodiversity Corridors

NSW NPWS Metadata Proforma

CATEGORY	CORE METADATA ELEMENT	DESCRIPTION
DATASET	**Title:**	Hawkesbury Nepean Catchment Regional Biodiversity Corridors
	Custodian:	NSW DECC
CONTACT ADDRESS	**Contact organisation:**	NSW DECC
	Contact position:	Manager - Information and Assessment, EPRD Metro
	Mail address:	PO Box 1967
	Suburb/place/locality:	Hurstville
	State:	NSW
	Postcode:	2220
	Telephone:	02 9585 6903
	Facsimile:	02 95856442
	Electronic mail address:	julie.ravallion@environment.nsw.gov.au
DESCRIPTION	**Abstract:**	The project aimed to map regional biodiverisity corridors within and connecting to outside of the Hawkesbury Nepean Catchment area. Corridors were identified by recent fauna assessment work conducted in the Greater Southern Sydney Region as well as by using satelite imagery and other environmental layers to connect continuous vegetation between regional landscape features.
	Theme:	Fauna; Vegetation; Geographical Information
	Keywords:	Distribution; Biodiversity; Conservation;
	Project:	Hawkesbury Nepean Catchment Regional Corridor Assessment and Priority Habitats
	Geographic extent:	The area covers the Hawkesbury Nepean Catchment and up to 56 kms outside of the boundary. Hunter Valley to Tallaganda in the South, the coast in the east and west to Abercrombie River. Regional corridors
	Bounding coordinates:	Zone 56: 375830E 6409591N 147701E 6077099N
	Type of feature:	Polygon data
DATASET CURRENCY	**Beginning date:**	Sep-05
	Ending date:	Oct-05

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DATASET STATUS	**Progress:**	Complete
	Maintenance and update frequency:	Layer could be refined and updated with additional analysis of fauna locations and movement patterns throughout the area, especially outside of the Greater Southern Sydney Region.
DATASET ENVIRONMENT	**Software:**	Arcview 3.2
	Computer Operating System:	
	Location of Data:	EPRD Metro, DEC Hurstville
	Filename(s):	hncacorridors.shp, corridor_cut_to_cma_boundary_dis.shp
	Dataset size:	615KB
MAP SPECIFICATIONS	**Number of maps:**	5 Source layers were referred to
	Map number(s) and name(s):	2005 Spot 5 Satalite Imagery Mitchell Landscapes Eastern Bushlands Database Greater Southern Sydney Region Corridor Mapping 2000 Cadastre layers from the Lands Dept
	Scale of source map(s)	1:25000
	Location of original map(s):	Various but all held at DECC Hurstville
	Mapped by:	Various
	Map(s) Digitised by:	Corridor layer digitised by Helen Achurch
ACCESS	**Available format types:**	Digital - ARC/INFO shapefile, Hardcopy - Printed Maps
	Available format forms:	
	Access constraints:	Release of these data is subject to endorsement of Manager - Information and Assessment, EPRD Metro, DECC
	Use constraints:	Release of these data is subject to endorsement of Manager - Information and Assessment, EPRD Metro, DECC
DATA QUALITY	**Lineage:**	The layer was generated by digitising from 2005 Spot 5 imagery. Other layers were used as a guide for areas that were selected for inclusion.

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	Positional accuracy:	Digitising was conducted at a scale of 1:25000 within the Hawkesbury Nepean Catchment area. Outside of this area, digitising was done at a scale of 1:50000. The accuracy of the layer varied with the quality of the image and the ease with which connections between patches of vegetation could be determined.base vegetation maps varied across the area due to their different scale and purpose and time since they were created. The most accurate vegetation mapping was used first to determine the location of priority habitats and the less accurate layers filled in the gaps.
	Attribute accuracy:	The reliability of the information informing the creation of the corridor layer varied across the HNCMA area. Within the Greater Southern Sydney region the location of the corridors was informed by recent fauna assessment work. Outside of this region the layer was created using environmental layers and obvious connections in the vegetation cover to guide the placement of the regional corridors.
	Logical consistency:	
	Completeness:	The layer covers the HNCMA ara and extends up to 56km outside the boundary to give the corridors context. This layer could be refined by further fauna assessment work outside of the Greater Southern Sydney Region.
NOTES	**Notes:**	
METADATA DATE	**Metadata date:**	07/11/2005
METADATA COMPLETED BY	**Metadata sheet compiled by:**	Helen Achurch
FURTHER INFORMATION	**Further information:**	Notes on Layer Creation: Regional Corridor Assessment and Priority Fauna Habitats

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APPENDIX 9 EEC mapping review methodology

(using documentation and advice provided by Amanda Sullivan of DEC)

The SCIVI data set does not identify EECs listed under NSW *Threatened Species Conservation Act 1995* (TSC) or Commonwealth *Environmental Protection and Conservation Act 2000* (EPBC) as separate items, nor does SCIVI adequately map grasslands. Instead SCIVI identifies 9 vegetation types that may contain EECs under certain circumstances. Supporting data such as soil mapping and IBRA bioregional mapping was thus used to identify the patches of vegetation that are EEC. The vegetation types that may contain EECs are listed below along with the methodology used to qualify the mapping.:

SCIVI Veg type	Where veg type is an EEC	EPBC	TSC	Supporting GIS data used in analysis	Result
Blue Mountains - Shoalhaven Hanging Swamp	part of EPBC Temperate Highland Peat Swamps on Sandstone	yes		Soil Landscapes (Search for "sandstone" in name fields)	One patch only intersected mapped sandstone soil landscape (1), other patches were tagged as non-EPBC (EPBC_relat field states reason why not EPBC)
Frost Hollow Grassy Woodland	Includes areas matching EPBC listed Natural Temperate Grasslands of the Southern Tablelands of NSW and the ACT	yes	yes		Planning framework grasslands were incorporated into SCIVI data at an earlier stage in model.(EPBC: Temperate Grasslands of the Southern tablelands and ACT
Grey Myrtle Dry Rainforest	includes Western Sydney Dry Rainforest in the Sydney Basin Bioregion		yes	Sydney bioregion boundary from IBRA v5.1 (buffered by 2km, reflecting	Patches not in Sydney Basin Bioregion were tagged as NOT TSC (reason noted in TSC_relat

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				accuracy as stated in metadata)	field)
Highland Range Sheltered Forest	Includes patches of Mount Gibraltar Forest in the Sydney Basin Bioregion		yes	Sydney bioregion boundary from IBRA v5.1 (buffered by 2km, reflecting accuracy as stated in metadata)	Patches not in Sydney Basin Bioregion were tagged as NOT TSC (reason noted in TSC_relat field)
Shale-Basalt Sheltered Forest	Blue Mountains Shale Cap Forest in the Sydney Basin Bioregion		yes	Soil Landscapes	Wiannamatta shale is not located in Goulburn Mulwaree LGA so this community tagged as NOT TSC.
Tableland Bog	part of EPBC Temperate Highland Peat Swamps on Sandstone	yes	yes	Soil Landscapes	Three patches occurred on sandstone, remaining patches were tagged as NOT EPBC
Tableland Granite Grassy Woodland	includes areas matching White Box Yellow Box Blakely's Red Gum Woodland EEC; includes areas matching EPBC listings Grassy White Box Woodlands + Natural Temperate Grasslands of the South	yes	yes		Planning framework grasslands were incorporated into SCIVI data at an earlier stage in model.(EPBC: Temperate Grasslands of the Southern tablelands and ACT
Tableland Grassy Box-Gum Woodland	includes areas matching White Box Yellow Box Blakely's Red Gum Woodland EEC; includes areas matching EPBC listings Grassy White Box Woodlands + Natural Temperate Grasslands of the South	yes	yes		Planning framework grasslands were incorporated into SCIVI data at an earlier stage in model.(EPBC: Temperate Grasslands of the Southern tablelands and ACT

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Tableland Swamp Meadow	part of EPBC Temperate Highland Peat Swamps on Sandstone	yes	yes		Some patches on sandstone soils (1, 2); remaining patches were tagged as NOT EPBC

Table is data provided by Ken Turner (DNR)

1. Psb - Berry Formation; sandstone, shale, some Illawarra Coal measures, (LITH code ls)
2. Berry Formation; sandstone, shale, some Illawarra Coal measures

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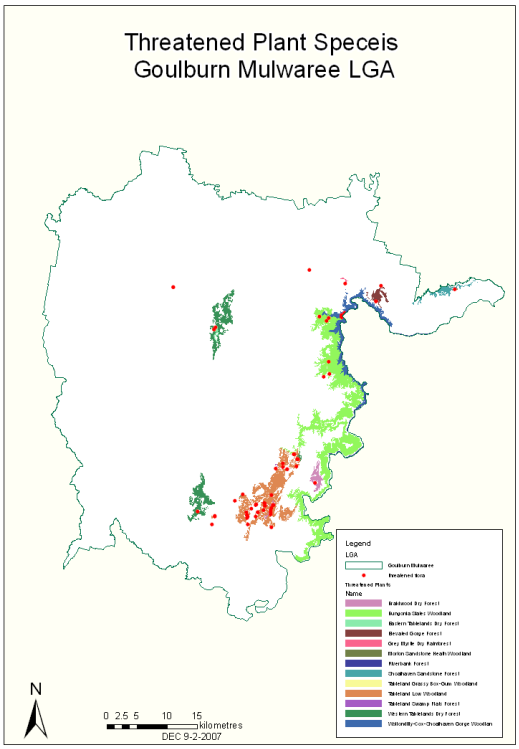
Appendix 10 Mapping of Flora Hotspots

DECC supplied NSW Wildlife Atlas data showing known locations of selected threatened flora species in the Windellema area. The points were buffered by the accuracy information provided within the record attribute table. The locations were then intersected with the patches of vegetation types with which they are know to be associated as advised by DEC:

Tableland low woodland (SCIVI p9):
-Bossiaea oligosperma,
-Pultenaea pedunculata and
-Dilwynia glaucula.

Western Tablelands Dry Forest (SCIVI p.14) (around Windellema and south east of Goulburn)
- *Pomaderris delicata.*



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APPENDIX 11 Conservation Significance Value GIS layer: Metadata

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APPENDIX 12 Conservation Significance Value GIS layer: Attribute field names and descriptions

Field Name	Field content	Description of data	Methodology used (in GIS)
LGA	Name of Local Government Area	LGA boundaries	Union with LGA boundaries
TSC_match	'Equivalent', "Community'	Indicates the extent to which the SCIVI or Planning framework vegetation type fits the TSC EEC description as advised in SCIVI /P5MA report.	Used SCIVI report and advice
EPBC_match	'Equivalent', "Comm'	Indicates the extent to which the SCIVI or Planning framework vegetation type fits the EPBC EEC description as advised in SCIVI/P5MA report.	Used SCIVI report and advice on Planning framework veg types in relation to EEC
Veg_type2	SCIVI vegetation mapping name or Planning framework vegetation mapping - broad vegetation type names	Mapping name, as provided in SCIVI (Native vegetation of southeast NSW: a revised classification and map for the coast and eastern tablelands.) V1.0) Based on the South Coast - Illawarra Vegetation Integration (SCIVI) Project; (Tozer et al, 2006) Department of Environment and Conservation (DEC) and Department of Natural Resources (DNR) or Planning Framework for Natural Ecosystems of the ACT & NSW Southern Tablelands. (Fallding 2002) NPWS	SCIVI vegetation merged (unioned) with Planning Framework vegetation as per methodology in Section 6.3.
Source	"Planning Framework" or "SCIVI"	Source of Vegetation mapping	
EEC	"Yes" or Null	Endangered Ecological Community listed under NSW *TSC Act* and/or Commonwealth *EPBC Act*	Record was assigned value of "EEC" If either EEC__TSC_ or EEC__EPBC_ were equal to 'Yes'
EEC__TSC_	"Yes" or NULL	Endangered Ecological Community listed under NSW *TSC Act,* Provided in SCIVI report (Tozer et al, 2006) with advice from DEC (see Appendix 7)	Assigned using SCIVI report, Planning Framework data, following advice from DEC (see Appendix 7)
EEC__EPBC_	"Yes" or NULL	Endangered Ecological Community listed under EPBC Act, Provided in SCIVI report (Tozer et al, 2006) with advice from DEC (see Appendix 7); Planning framework Grassland EPBC classification advised be DEC (pers. comm. Amanda Sullivan).	Assigned using SCIVI report, Planning Framework data, following advice from DEC (see Appendix 7)
Z_EXTANT	% of SCIVI vegetation that is extant (Number range)	Provided in SCIVI report (Tozer et al, 2006) with advice from DEC (see Appendix 7)	Only available for SCIVI, not planning framework data
Z_RESERVED	% of SCIVI vegetation that is extant (Number range)	Provided in SCIVI report (Tozer et al, 2006) with advice from DEC (see Appendix 7); EPBC grassland provided in determination on DEH website	Only available for SCIVI, not planning framework data
gt_70pc_cl	Vegetation type is greater than 70 percent cleared (<30% extant): "Yes" or NULL	Based on analysis on Z_EXTANT data, see Limitations of methodology in Section 7.4	Only available for SCIVI, not planning framework data
oc_mitchel	Over-cleared (.70% cleared) Mitchell	Occurrence of vegetation mapping in Over-cleared mitchell landscape (clearing statistics from website: http://www.nationalparks.nsw.gov.au	Based on intersection with Mitchell Landscape mapping and accompanying statistics

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Field Name	Field content	Description of data	Methodology used (in GIS)
	Landscape: "Yes" or NULL	/images/WE_Mitchell_landscapes_by_ CMA_dropdown_list.xls)	from website
lt15pc_res	Vegetation type is less than 15 percent reserved	Based on analysis on Z_RESERVED data, see Limitations of methodology in Section 7.6	
LANDSCAPE	Mitchell Landscape Name		Union of Mitchell Landscape data with vegetation mapping
_CLEARED	% of clearing in Mitchell landscape	Statistics from website: http://www.nationalparks.nsw.gov.au /images/WE_Mitchell_landscapes_by_ CMA_dropdown_list.xls	
Flora_HS	Flora Hotspots	Relevant Vegetation polygons falling within buffered Atlas point locations.	Western tablelands Dry Forest (SCIVI p. 14) polygons that intersect with the buffered locations of selected threatened species (*Bossiaea oligosperma, Pultanaea pedunculata* and *Dillwynia glauc*a) and Western Tablelands Dry Forest (SCIVI p.14) (around Windellema and south east of Goulburn)- *Pomaderris delicata* as supplied by DEC, 2006
Reserve	Reserve name and tenure status	DEC Estate, proposed reserves, VCAs and Council reserve	Merging of data sources. DEC Estate gazetted at January 2007, Proposed Reserves derived from CRA process, provided by DEC; VCAs provided by DEC; Council Reserve location provided by Council.
CORRIDOR	Corridor Location	HN Corridor: Regional Corridor Assessment and Priority Fauna Habitats from project titled: Regional Corridor Assessment and Priority Fauna Habitats. Digitised from 2005 Spot 5 imagery.	
Rdside_VEG	"Roadside veg- "high" "med" or "low"	Definition of condition rating of roadside vegetation for each segment described in detail in report "Roadside Vegetation Assessment – Goulburn Mulwaree Council, 13 February 2007" prepared by Prepared by: West of the Divide Environmental Consultants	15m buffer of line segments
Wetld_buff	40 or 30, Wetland boundary plus buffer	• 40 : Wetland listed on the Register of Important Wetlands (Wetland plus 40m buffer) • 30: Non important wetland wetlands (metres) (Wetland plus 40m buffer) Based on wetland data provided by DEC (Kingsford et al, 2003). Buffered following guidelines in the Water Quality Tool Reference Guide (Black, 2005).	40m or 30m Buffer of wetland boundaries
Rip_buffer	40 or 20	**40: Category 1 (RCO1) – *Environmental corridor.*** **20: Category 2 (RCO2)– *Terrestrial and aquatic habitat*** Based on RCO categories (Riparian Corridor Objectives). GIS line data supplied by DNR, methodology available in	All rivers merged for the study area. 40m buffer of RCO1 and 20m buffer of RCO2. 40m buffer cut from 30m

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Field Name	Field content	Description of data	Methodology used (in GIS)
		"DNR **RIPARIAN CORRIDOR MANAGEMENT STUDIES AN OVERVIEW"** **South Coast Region** **August 2006.**	buffer to prevent overlapping sections.
CONS_VALUE	"HCV", "MCV" or "LCV"	Conservation Value is defined by the Goulburn Mulwaree Conservation Significance Mapping methodology (Section 7 of report, 2007).	As per Conservation Significance Assessment methodology (Section 7 of report, 2007).
Hectares		Area in hectares	NB. Area for some MCV and LCV patches are for numerous patches (joined to form a single record)

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