Appendix A

Accuracy of databases

Appendix A Accuracy of searched databases

This appendix details the types of data and accuracy of the Department of Environment, Climate Change and Water Atlas of NSW Wildlife and the Department of the Environment, Water, Heritage and the Arts Protected Matter Search Tool.

Atlas of NSW Wildlife

The Atlas of NSW Wildlife is based on records of specific sightings. Each point is entered on a 1 km grid and hence location is only accurate to within one kilometre. The Atlas of NSW Wildlife is not based on systematic surveys across New South Wales and the number of records is generally biased towards coastal sites and areas where people commonly visit, such as national parks. It is also biased towards particular species, reserves and roads.

Protected Matters Search Tool

The Protected Matters Search Tool is based on predicted distributions compiled from a number of sources at various resolutions. Generally, where distributions are well known, maps are derived from recovery plans, state vegetation maps, remote sensing imagery and detailed habitat studies. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps. For species whose distributions are less well known, point locations are collated from various sources and bioclimatic distribution models generated and then validated by experts. In some cases, distribution maps are based solely on expert knowledge. For species where the distributions are well known, maps have been digitised from sources such as recovery plans and detailed habitat studies.

The following species and ecological communities have not been mapped and do not appear in reports produced from the protected matters search tool:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have been listed since the database was accessed for this study
- cetaceans which are not listed as threatened
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or occur only in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent.

Appendix B

Species of plant recorded

Species of plant recorded in the study area

Appendix B provides a summary of the vegetation surveys done for the proposal. Table B-1 provides a summary of the species recorded with the detection frequency in each vegetation community. Table B-2 provides a summary of the vegetation habitat assessment used to describe the communities.

The detection frequency is based on a count of the number of times each species was recorded divided by the number of sample plots for each community. A score of 1 indicated the species was recorded at every site in a community: a score of 0 (-) indicated the species was not recorded at any sites within the community.

Table B-1 Species of plant recorded within each vegetation in the study area

Family name	Species	Native	Frequency of occurrence in each community type			
			Shale Plains Woodland	Shale Hills Woodland	Alluvial Woodland	No Native Overstorey Vegetation
Acanthaceae	*Brunoniella australis*	Y	0.21	-	0.33	0.25
Adiantaceae	*Cheilanthes sieberi*	Y	0.42	-	0.33	0.50
Agavaceae	*Agave americana*	N	-	0.20	-	-
Aizoaceae	*Tetragonia tetragonioides*	Y	-	-	0.17	-
Alismataceae	*Alisma plantago-aquatica*	N	-	0.20	-	0.25
	Damasonium minus	Y	0.05	-	-	0.25
Alliaceae	*Nothoscordum borbonicum*	N	-	0.20	0.17	0.25
Amaranthaceae	*Alternanthera denticulata*	Y	-	0.20	0.17	0.50
	Alternanthera nana	Y	0.05	-	-	-
	Alternanthera philoxeroides	N	-	0.20	0.17	0.25
	Alternanthera pungens	N	-	0.20	-	0.25
	Amaranthus viridis	N	0.05	0.20	-	0.25
Anthericaceae	*Arthropodium milleflorum*	Y	0.16	-	-	-
	Arthropodium minus	Y	0.11	-	-	-
	Laxmannia gracilis	Y	0.11	-	-	-
	Tricoryne simplex	Y	0.16	-	-	0.50
	Tricoryne sp.	Y	0.05	-	-	-
Apiaceae	*Apium leptophyllum*	N	-	-	0.17	0.25
	Centella asiatica	Y	0.37	0.20	-	0.50
	Daucus glochidiatus	Y	-	0.20	-	0.25
	Foeniculum vulgare	N	-	0.20	0.33	0.50
Apocynaceae	*Gomphocarpus fruticosus*	N	-	0.20	-	0.25
	Nerium oleander	N	0.05	-	-	-
	Parsonsia straminea	Y	0.05	-	-	-
	Vinca major	N	0.05	-	-	-
Arecaceae	*Phoenix canariensis*	N	-	-	-	-
Asclepiadaceae	*Araujia sericifera*	N	0.11	0.20	0.17	0.75
Asparagaceae	*Asparagus asparagoides*	N	0.53	0.60	0.50	0.25
	Asparagus officinalis	N	0.05	-	-	-
	Protasparagus aethiopicus	N	0.11	-	-	0.25
Asphodelaceae	*Aloe sp.*	Y	0.05	-	-	-
Asteraceae	*Aster subulatus*	N	-	0.20	0.33	0.25

Family name	Species	Native	Frequency of occurrence in each community type			
			Shale Plains Woodland	Shale Hills Woodland	Alluvial Woodland	No Native Overstorey Vegetation
	Bidens pilosa	N	0.16	-	0.33	0.25
	Bidens subalternans	N	0.05	-	0.17	-
	Calotis cuneifolia	Y	0.05	-	-	-
	Calotis lappulacea	Y	0.11	-	-	-
	Cassinia arcuata	Y	0.05	-	-	-
	Chrysocephalum apiculatum	Y	0.11	-	-	-
	Cirsium vulgare	N	0.05	0.20	0.33	0.50
	Conyza sp.	N	0.11	0.20	0.17	1.00
	Euchiton involucratus	Y	0.11	-	0.17	-
	Hypochaeris radicata	N	0.05	0.40	0.17	1.00
	Ozothamnus diosmifolius	Y	-	-	0.17	-
	Pseudognaphalium luteoalbum	Y	0.05	0.20	-	0.50
	Senecio diaschides	Y	0.05	-	-	-
	Senecio madagascariensis	N	0.47	0.20	0.33	1.00
	Silybum marianum	N	-	0.20	-	0.25
	Solenogyne bellioides	Y	0.05	-	-	-
	Soliva sessilis	N	0.05	0.20	0.17	0.25
	Sonchus oleraceus	N	0.05	-	0.17	0.25
	Tagetes minuta	Y	0.05	0.20	-	0.50
	Taraxacum officinale	N	0.05	-	0.17	-
	Vernonia cinerea var. cinerea	Y	0.05	-	-	-
	Vittadinia pustulata	Y	0.16	-	0.17	-
	Xanthium spinosum	N	-	0.20	-	0.25
Azollaceae	*Azolla pinnata*	Y	-	0.20	-	0.25
Basellaceae	*Anredera cordifolia*	N	0.05	0.20	0.17	0.25
Boraginaceae	*Echium plantagineum*	N	-	0.20	-	0.25
Brassicaceae	*Brassica rapa ssp. sylvestris*	N	-	0.20	-	0.25
Cactaceae	*Opuntia sp.*	N	0.05	-	0.17	-
	Opuntia stricta	N	-	-	0.17	-
	Opuntia tomentosa	N	0.11	-	-	0.25
Campanulaceae	*Wahlenbergia gracilis*	Y	0.21	-	0.17	0.50
Caprifoliaceae	*Lonicera japonica*	N	0.05	-	-	-
Caryophyllaceae	*Cerastium glomeratum*	N	-	-	0.17	-
Casuarinaceae	*Allocasuarina littoralis*	Y	0.26	-	-	-
	Casuarina cunninghamiana	Y	0.26	-	0.83	-
	Casuarina glauca	Y	0.05	-	-	-
Chenopodiaceae	*Atriplex semibaccata*	Y	0.11	-	0.17	-
	Chenopodium album	N	0.05	-	-	-
	Einadia hastata	Y	0.26	0.40	0.67	0.50
	Einadia polygonoides	Y	-	0.20	-	0.25
	Einadia trigonos	Y	-	-	0.17	-
Clusiaceae	*Hypericum perforatum*	N	0.05	-	-	0.25

Family name	Species	Native	Frequency of occurrence in each community type			
			Shale Plains Woodland	Shale Hills Woodland	Alluvial Woodland	No Native Overstorey Vegetation
Commelinaceae	*Commelina cyanea*	Y	0.05	0.20	0.33	0.25
	Tradescantia fluminensis	N	0.05	-	0.17	-
Convolvulaceae	*Convolvulus erubescens*	Y	0.05	0.20	0.17	0.25
	Dichondra repens	Y	0.42	0.40	0.50	0.75
	Ipomoea indica	N	0.05	-	-	-
Crassulaceae	*Bryophyllum delagoense*	N	0.05	-	0.17	-
	Bryophyllum tubiflorum	N	0.11	-	-	0.25
Cyperaceae	*Carex appressa*	Y	-	-	0.17	-
	Cyperus aggregatus	N	-	0.20	-	0.25
	Cyperus brevifolius	N	-	0.40	-	0.25
	Cyperus difformis	Y	-	0.20	-	0.25
	Cyperus eragrostis	N	0.11	0.40	0.33	0.50
	Cyperus gracilis	Y	0.05	0.20	-	0.50
	Cyperus sesquiflorus	Y	-	0.20	-	0.50
	Eleocharis cylindrostachys	Y	-	-	-	0.25
	Eleocharis minuta	N	0.11	0.20	-	0.50
	Fimbristylis dichotoma	Y	0.05	0.40	-	0.50
	Isolepis inundata	Y	-	0.20	-	-
Davalliaceae	*Nephrolepis cordifolia*	Y	0.05	-	-	-
Dilleniaceae	*Hibbertia obtusifolia*	Y	0.21	-	-	-
Epacridaceae	*Astroloma humifusum*	Y	0.05	-	-	-
	Leucopogon juniperinus	Y	-	-	0.33	-
Euphorbiaceae	*Euphorbia drummondii*	Y	0.11	-	-	-
	Phyllanthus similis	Y	0.26	0.20	-	0.50
Fabaceae (Caesalpinioideae)	*Senna pendula var. glabrata*	N	0.05	0.20	-	0.25
Fabaceae (Faboideae)	*Bossiaea prostrata*	Y	0.05	-	-	0.25
	Chorizema parviflorum	Y	0.05	-	-	-
	Daviesia genistifolia	Y	0.11	-	-	0.25
	Daviesia ulicifolia	Y	0.11	0.20	-	0.50
	Daviesia ulicifolia ssp. ulicifolia	Y	0.05	-	-	-
	Desmodium brachypodum	Y	0.05	-	-	-
	Desmodium varians	Y	0.21	-	0.17	0.25
	Dillwynia sieberi	Y	0.47	-	0.17	0.25
Fabaceae (Faboideae)	*Erythrina X sykesii*	N	-	0.20	-	-
	Glycine clandestina	Y	0.42	0.20	0.17	0.50
	Glycine microphylla	Y	-	0.20	-	0.25
	Glycine tabacina	Y	0.21	-	0.17	0.50
	Hardenbergia violacea	Y	0.26	0.20	0.17	0.25
	Indigofera australis	Y	0.11	-	-	0.25
	Trifolium repens	N	0.05	0.20	0.17	0.50

Family name	Species	Native	Frequency of occurrence in each community type			
			Shale Plains Woodland	Shale Hills Woodland	Alluvial Woodland	No Native Overstorey Vegetation
	Vicia sativa	N	-	0.20	-	0.25
	Zornia dyctiocarpa	Y	0.05	-	-	-
Fabaceae (Mimosoideae)	*Acacia baileyana*	Y	-	-	0.17	0.25
	Acacia decurrens	Y	0.42	0.20	0.67	0.25
	Acacia falcata	Y	0.11	0.20	-	0.50
	Acacia floribunda	Y	0.05	-	-	0.50
	Acacia implexa	Y	0.32	-	-	-
	Acacia parramattensis	Y	-	-	0.17	-
Gentianaceae	*Centaurium spicatum*	Y	0.05	-	-	0.25
Gentianaceae	*Centaurium tenuiflorum*	N	-	0.20	-	0.25
Goodeniaceae	*Goodenia hederacea ssp. hederacea*	Y	0.42	-	-	0.25
	Scaevola albida var. albida	Y	0.05	-	-	-
Haloragaceae	*Myriophyllum variifolium*	Y	0.05	-	-	0.25
	Hypoxis hygrometrica var. hygrometrica	Y	0.11	0.20	-	0.50
Juncaceae	*Juncus usitatus*	Y	0.32	0.40	-	0.25
	Triglochin microtuberosum	Y	0.05	-	-	0.25
Lamiaceae	*Ajuga australis*	Y	0.05	-	0.17	-
	Mentha satureioides	Y	0.05	-	-	-
	Plectranthus parviflorus	Y	-	0.20	0.17	0.50
Lauraceae	*Cinnamomum camphora*	N	-	-	-	-
Lobeliaceae	*Pratia purpurascens*	Y	-	-	0.17	-
Lomandraceae	*Lomandra filiformis*	Y	0.26	-	-	0.25
	Lomandra longifolia	Y	0.05	-	-	-
	Lomandra multiflora	Y	0.37	-	-	0.25
Loranthaceae	*Amyema gaudichaudii*	Y	-	0.20	-	0.25
	Amyema pendulum ssp. pendulum	Y	0.05	-	-	-
	Amyema sp.	Y	0.05	-	-	-
Lythraceae	*Lythrum salicaria*	Y	-	-	0.17	0.25
Malaceae	*Cotoneaster sp.*	N	0.05	0.20	-	0.25
	Pyracantha sp.	Y	0.05	-	-	-
Malvaceae	*Malva parviflora*	N	0.11	0.20	0.17	0.50
	Modiola caroliniana	N	0.05	-	-	-
	Sida rhombifolia	N	0.26	0.40	0.50	1.00
	Sida subspicata	Y	0.11	-	-	0.25
Meliaceae	*Melia azedarach*	Y	0.05	-	-	-
Myoporaceae	*Eremophila debilis*	Y	0.37	0.20	0.17	0.25
Myrtaceae	*Angophora bakeri*	Y	-	-	-	0.25
	Angophora subvelutina	Y	-	-	0.33	-
	Corymbia maculata	Y	0.05	-	-	-
	Eucalyptus amplifolia	Y	0.11	0.60	0.50	0.25

Family name	Species	Native	Frequency of occurrence in each community type			
			Shale Plains Woodland	Shale Hills Woodland	Alluvial Woodland	No Native Overstorey Vegetation
	Eucalyptus crebra	Y	-	-	0.33	-
	Eucalyptus elata	Y	-	-	-	-
	Eucalyptus eugenioides	Y	0.16	-	-	-
	Eucalyptus fibrosa	Y	0.16	-	0.33	-
	Eucalyptus moluccana	Y	0.89	0.40	0.67	0.50
	Eucalyptus paniculata	Y	-	-	-	-
	Eucalyptus robusta	Y	-	-	-	-
	Eucalyptus sideroxylon	Y	-	-	-	-
	Eucalyptus tereticornis	Y	0.79	0.60	0.50	0.75
	Kunzea ambigua	Y	0.05	-	-	-
	Leptospermum juniperinum	Y	-	-	-	0.25
	Lophostemon confertus	Y	0.05	-	-	-
	Melaleuca decora	Y	0.05	0.40	0.67	0.25
	Melaleuca decussata	N	-	-	-	0.25
	Melaleuca sieberi	Y	-	-	0.17	-
	Melaleuca styphelioides	Y	0.37	0.20	0.67	-
Oleaceae	*Ligustrum lucidum*	N	0.11	0.40	0.17	0.25
	Ligustrum sinense	N	0.11	0.20	-	0.50
	Olea europaea ssp. africana	N	0.32	1.00	0.33	0.75
Onagraceae	*Ludwigia peploides*	Y	0.05	0.20	-	0.50
Oxalidaceae	*Oxalis perennans*	Y	0.26	0.20	0.17	0.50
Oxalidaceae	*Oxalis sp.*	Y	0.05	-	-	-
Philydraceae	*Philydrum lanuginosum*	Y	0.05	0.20	-	0.25
Phormiaceae	*Dianella caerulea*	Y	-	-	0.17	-
	Dianella revoluta	Y	0.32	0.40	-	0.50
	Dianella revoluta var. revoluta	Y	0.05	-	-	-
Phytolaccaceae	*Phytolacca octandra*	N	0.05	0.20	0.33	0.25
Pinaceae	*Pinus sp.*	N	0.05	-	-	-
Pittosporaceae	*Bursaria spinosa*	Y	0.53	0.60	0.33	0.75
Plantaginaceae	*Plantago cunninghamii*	Y	0.05	0.20	0.17	-
	Plantago gaudichaudii	Y	0.26	-	-	-
	Plantago lanceolata	N	0.32	0.20	0.50	0.50
Poaceae	*Aristida ramosa*	Y	0.16	0.20	-	0.75
	Aristida sp.	Y	0.32	-	0.17	-
	Aristida vagans	Y	0.21	-	0.17	0.25
	Arundo donax	N	-	-	0.17	-
	Austrodanthonia monticola	Y	0.11	-	0.17	-
	Austrodanthonia racemosa	Y	-	-	0.17	-
	Austrodanthonia sp.	Y	0.05	0.20	-	0.50
	Axonopus fissifolius	N	0.05	-	-	-
	Bothriochloa macra	Y	0.11	0.20	0.17	0.50
	Briza subaristata	N	-	0.40	-	0.50

Family name	Species	Native	Frequency of occurrence in each community type			
			Shale Plains Woodland	Shale Hills Woodland	Alluvial Woodland	No Native Overstorey Vegetation
	Bromus catharticus	N	0.11	0.20	0.17	0.50
	Capillipedium spicigerum	Y	-	-	0.17	-
	Chloris divaricata	Y	0.05	-	-	-
	Chloris gayana	N	0.16	0.40	0.33	0.75
	Chloris truncata	Y	0.37	0.20	0.33	0.50
	Chloris ventricosa	Y	0.11	0.20	0.17	0.25
	Chloris virgata	N	0.05	-	-	-
	Cymbopogon refractus	Y	0.37	0.20	-	0.50
	Cynodon dactylon	Y	0.74	0.80	0.50	1.00
	Dactylis glomerata	N	-	0.20	-	0.25
	Dichanthium sericeum	Y	-	0.20	-	0.25
	Dichelachne micrantha	Y	-	-	0.17	-
	Digitaria ciliaris	N	-	-	0.17	0.25
	Digitaria ischaemum	N	-	-	-	0.25
	Echinochloa crusgalli	N	-	-	0.17	-
	Echinopogon caespitosus	Y	-	-	0.17	-
	Ehrharta erecta	N	0.11	0.20	0.17	0.25
	Eleusine tristachya	N	-	-	0.17	-
	Elymus multiflorus	Y	0.05	-	-	-
	Elymus scaber	Y	-	-	-	-
	Entolasia marginata	Y	0.05	-	-	-
	Eragrostis brownii	Y	0.05	-	0.17	0.25
	Eragrostis curvula	N	0.37	-	-	-
	Eragrostis elongata	Y	0.05	-	-	0.25
	Eragrostis leptostachya	Y	0.11	0.20	0.17	0.50
	Eriochloa pseudoacrotricha	Y	0.05	0.20	0.33	0.25
	Imperata cylindrica	Y	0.11	-	-	0.50
	Lachnagrostis filiformis	Y	-	0.20	0.17	0.25
	Microlaena stipoides	Y	0.26	0.20	0.17	0.75
	Nassella neesiana	N	0.05	0.20	-	0.25
	Panicum effusum	Y	0.05	0.20	-	0.50
	Panicum maximum var. maximum	N	-	0.20	-	0.25
	Panicum obseptum	Y	-	0.20	-	0.25
	Panicum simile	Y	0.16	-	0.33	-
	Paspalidium distans	Y	0.16	0.40	0.17	0.75
	Paspalum dilatatum	N	0.21	0.60	0.33	1.00
	Paspalum distichum	Y	-	0.20	0.17	0.50
	Paspalum urvillei	N	0.05	-	-	-
	Pennisetum clandestinum	N	0.26	0.20	0.50	0.50
	Phalaris aquatica	N	-	-	-	0.25
	Setaria gracilis	N	0.16	0.40	0.33	0.50
	Setaria pumila	N	0.05	-	-	0.50

Family name	Species	Native	Frequency of occurrence in each community type			
			Shale Plains Woodland	Shale Hills Woodland	Alluvial Woodland	No Native Overstorey Vegetation
	Setaria verticillata	N	0.26	-	0.17	0.50
	Sorghum halepense	N	-	0.20	-	0.25
	Sporobolus africanus	N	0.11	0.20	0.17	0.50
	Sporobolus elongatus	Y	0.11	0.20	-	0.50
	Stenotaphrum secundatum	N	0.05	-	-	-
	Themeda australis	Y	0.53	0.60	0.33	0.75
Polygonaceae	*Persicaria decipiens*	Y	-	0.40	-	0.25
	Persicaria hydropiper	Y	0.11	-	-	0.25
	Rumex acetosella	N	0.05	-	-	-
	Rumex brownii	Y	-	0.20	0.17	0.25
	Rumex crispus	N	0.11	0.20	0.17	0.50
Portulacaceae	*Portulaca sp.*	Y	0.05	-	-	0.25
Primulaceae	*Anagallis arvensis*	N	0.05	-	0.17	0.50
Proteaceae	*Grevillea robusta*	Y	0.05	-	-	-
Ranunculaceae	*Clematis aristata*	Y	0.05	-	0.17	-
Rosaceae	*Rubus fruiticosus*	N	0.11	0.80	0.17	0.75
	Rubus parvifolius	Y	-	-	0.17	-
Rubiaceae	*Asperula conferta*	Y	0.11	-	-	-
	Galium aparine	N	-	-	-	0.25
	Galium propinquum	Y	-	0.20	-	0.25
	Opercularia diphylla	Y	0.11	-	-	-
	Richardia stellaris	N	0.05	-	-	-
Salicaceae	*Salix babylonica*	N	-	0.20	-	-
Santalaceae	*Exocarpos cupressiformis*	Y	0.11	0.20	0.33	-
Sapindaceae	*Cardiospermum grandiflorum*	N	-	-	0.17	-
	Dodonaea viscosa ssp. cuneata	Y	0.16	-	0.17	0.50
Solanaceae	*Cestrum parqui*	N	-	-	-	0.25
	Datura sp.	Y	0.05	-	-	0.25
	Lycium ferocissimum	N	0.21	0.20	0.33	0.25
	Solanum aculeatissimum	N	-	0.20	-	0.25
	Solanum mauritianum	N	0.11	0.20	-	0.50
	Solanum nigrum	N	0.21	0.20	0.33	0.75
	Solanum prinophyllum	Y	0.16	0.20	0.17	0.50
	Solanum pseudocapsicum	N	0.05	-	-	0.25
	Solanum radicans	N	-	0.20	-	0.25
Stackhousiaceae	*Stackhousia viminea*	Y	0.11	-	-	-
Sterculiaceae	*Brachychiton acerifolius*	Y	0.05	-	-	-
	Brachychiton populneus	Y	0.05	-	-	0.25
Theophrastaceae	*Samolus valerandi*	Y	-	0.20	-	0.25
Typhaceae	*Typha orientalis*	Y	0.11	0.40	-	0.50
Verbenaceae	*Lantana camara*	N	0.16	0.40	0.17	0.50
	Verbena bonariensis	N	0.32	0.20	0.17	1.00

Family name	Species	Native	Frequency of occurrence in each community type			
			Shale Plains Woodland	Shale Hills Woodland	Alluvial Woodland	No Native Overstorey Vegetation
	Verbena officinalis	N	-	0.20	0.17	0.50
	Verbena tenuisecta	N	0.05	-	-	-
No of reference sites			19	5	6	4

Table B-2 Vegetation community structure and flora diversity summary

Vegetation community profiles	Shale Plains Woodland			Shale Hills Woodland			Alluvial Woodland			No Native Overstorey Vegetation		
Vegetation structure	**max**	**min**	**%**	**max**	**min**	**%**	**max**	**min**	**%**	**max**	**min**	**%**
Canopy maximum height (meters)	22	12	-	14	10	-	22	12	-	14	0	-
Canopy minimum height (meters)	20	8	-	12	8	-	20	10	-	12	0	-
Canopy average height (meters)	20	11	-	12	8	-	20	10	-	12	0	-
% foliage cover	40 %	10%	-	30%	10%	-	30%	10%	-	5%	0%	-
Canopy native dominated	-	-	100%	-	-	100%	-	-	100%	-	-	50%
Canopy exotic dominated	-	-	0%	-	-	0%	-	-	0%	-	-	0%
Habitat trees present	-	-	45%	-	-	40%	-	-	29%	-	-	25%
Regrowth dominated / recruitment occurring	-	-	100%	-	-	100%	-	-	57%	-	-	50%
Vegetation clearing (partially or fully)	-	-	90%	-	-	80%	-	-	57%	-	-	100%
Shrub maximum height (meters)	4	2	-	8	4		8	4		4	0	
Shrub minimum height (meters)	2	1	-	6	2		4	2		2	0	
% foliage cover	80	10	-	10	10		80	15		15	0	
% of sites with native dominated shrub layer	-	-	50%	-	-	20%	-	-	20%	-	-	0%
% of sites with exotic dominated shrub layer	-	-	50%	-	-	60%	-	-	60%	-	-	50%
Ground Cover maximum height (meters)	1	0.2	-	1	0.4	-	0.2	0.2	-	1.8	0.2	
% of sites with native dominated ground cover	-	-	55%	-	-	0%	-	-	0%	-	-	50%
Ground cover exotic dominated	-	-	45%	-	-	100%	-	-	100%	-	-	50%
% Ground Cover	100%	25%	-	100%	90%	-	73%	10%	-	100%	60%	-
% bare soil	40 %	0%	-	5%	0%	-	50%	10%	-	15%	0%	-

Vegetation community profiles	**Shale Plains Woodland**			**Shale Hills Woodland**			**Alluvial Woodland**			**No Native Overstorey Vegetation**		
%Litter	30 %	0%	-	5%	0%	-	30%	15%	-	20%	0%	-
% timber	5%	0%	-	0%	0%	-	10%	2%	-	0%	0%	-
% rock	5%	0%	-	0%	0%	-	0%	0%	-	5%	0%	-
Floral Species diversity	**max**	**min**	**mean**	**max**	**min**	**mean**	**max**	**min**	**mean**	**max**	**min**	**mean**
Total number of species (count)	129	2	28	112	7	33.2	79	2	30	112	29	67
Number of native species (count)	80	2	21	55	2	16.8	50	2	18	55	4	36
Number of exotic (count)	50	0	8	57	5	16.4	29	0	12	57	13	31
% of species of plant native	100%	59%	79%	67%	29%	48%	100%	41%	68%	72%	14%	50%
Community summary	**total**			**total**			**total**			**total**		
Total number of species in community (count)	198			125			177			169		
Total number of native species in community (count)	130			63			69			93		
Total number of exotic species (count)	68			62			108			76		
% of species of plant native in community	66%			50%			39%			55%		

Appendix C

Species of animal recorded

Appendix C Animals recorded in the study area

This appendix details the animals recorded during current field surveys of the study area.

Locations surveyed in 2008 were:

1. James Mead Estate (the Southern Flyover)
2. Ingleburn Defence site
3. Landcom lands within the Edmondson Park precinct
4. Sydney Western Regional Parklands
5. Kemps Creek at the western end of the alignment.

Table C-1 Species of animal recorded in the study area

Common name	Scientific name	Conservation significance		PB (2006)	Locations				
		State[1]	National[2]		1	2	3	4	5
Frogs									
Common Eastern Froglet	*Crinia signifera*			●	●		●	●	●
Striped Marsh Frog	*Limnodynastes peronii*							●	●
Spotted Marsh frog	*Limnodynastes tasmaniensis*				●				●
Verreaux's Tree Frog	*Litoria verreauxii*				●				●
Dwarf Tree Frog	*Litoria fallax*						●		
Invertebrates									
Cumberland Land Snail	*Meridolum corneovirens*	E		●		●	●		
A native carnivorous snail	*Austrorhytida capillacea (syn. Strangesta capillacea)*					●			
Common Garden Snail (introduced)	*Helix aspera*			●	●	●	●	●	●
Introduced Snail (introduced)	*Bradybaena similaris*						●	●	
Native Birds									
Australian Wood Duck	*Chenonetta jubata*			●	●				
Pacific Black Duck	*Anas superciliosa*			●	●				
White-faced Heron	*Egretta novaehollandiae*			●	●				
Intermediate Egret	*Ardea intermedia*			●					
Black-shouldered Kite	*Elanus axillaris*				●			●	
Pacific Baza	*Aviceda subcristata*					●			
Little Eagle	*Hieraaetus morphnoides*							●	
Wedge-tailed Eagle	*Aquila audax*				●			●	●
Australian Owlet-nightjar	*Aegotheles cristatus*						●		
Masked Lapwing	*Vanellus miles*			●	●				
Grey Butcherbird	*Cracticus torquatus*			●					
Pied Currawong	*Strepera graculina*			●					
Galah	*Cacatua roseicapilla*			●	●		●	●	
Sulphur-crested Cockatoo	*Cacatua galerita*			●	●		●	●	
Yellow-tailed Black-Cockatoo	*Calyptorhynchus funereus*					●			

Common name	Scientific name	Conservation significance		PB (2006)	Locations				
		State[1]	National[2]		1	2	3	4	5
Black-faced Cuckoo-shrike	*Coracina novaehollandiae*						●		
White-bellied Cuckoo-shrike	*Coracina papuensis*								●
Spotted Quail-thrush	*Cinclosoma punctatum*							●	
Common Bronzewing	*Phaps chalcoptera*							●	
Crested Pigeon	*Ocyphaps lophotes*			●				●	
Australian Raven	*Corvus coronoides*			●	●	●			●
Pallid Cuckoo	*Cuculus pallidus*						●		
Mistletoebird	*Dicaeum hirundinaceum*						●		
Grey Fantail	*Rhipidura fuliginosa*				●	●			●
Red-browed Finch	*Neochmia temporalis*			●	●				
Magpie-lark	*Grallina cyanoleuca*			●	●				●
Australian Magpie	*Gymnorhina tibicen*			●	●				
Willie Wagtail	*Rhipidura leucophrys*			●	●		●	●	●
Laughing Kookaburra	*Dacelo novaeguineae*			●	●	●			
Tree Martin	*Hirundo nigricans*				●				
Welcome Swallow	*Hirundo neoxena*		M	●	●				●
Superb Fairy-wren	*Malurus cyaneus*			●	●		●	●	
Noisy Friarbird	*Philemon corniculatus*				●		●		
Bell Miner	*Manorina melanophrys*			●			●		
Noisy Miner	*Manorina melanocephala*			●	●	●	●	●	
White-plumed Honeyeater	*Lichenostomus penicillatus*					●			●
Yellow-faced Honeyeater	*Lichenostomus chrysops*						●		
Rufous Songlark	*Cincloramphus mathewsi*		M		●				
Grey Shrike-thrush	*Colluricincla harmonica*						●		
Chestnut-rumped Heathwren	*Hylacola pyrrhopygia*				●				
Striated Pardalote	*Pardalotus striatus*						●		
Weebill	*Smicrornis brevirostris*			●			●	●	
Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*						●	●	
Brown Thornbill	*Acanthiza pusilla*			●			●		
Striated Thornbill	*Acanthiza lineata*			●			●		
Eastern Yellow Robin	*Eopsaltria australis*					●	●	●	
Rose Robin	*Petroica rosea*								●
Brown Quail	*Coturnix ypsilophora*				●				
Tawny Frogmouth	*Podargus strigoides*						●		
Australian King-Parrot	*Alisterus scapularis*				●				
Crimson Rosella	*Platycercus elegans*							●	
Eastern Rosella	*Platycercus eximius*			●	●	●	●		
Rainbow Lorikeet	*Trichoglossus haematodus*				●				
Red-rumped Parrot	*Psephotus haematonotus*			●	●				
Dusky Moorhen	*Gallinula tenebrosa*			●	●				
Australian White Ibis	*Threskiornis molucca*			●					
Straw-necked Ibis	*Threskiornis spinicollis*				●				●

Common name	Scientific name	Conservation significance		PB (2006)	Locations				
		State[1]	National[2]		1	2	3	4	5
Double-barred Finch	*Taeniopygia bichenovii*			●					
Silvereye	*Zosterops lateralis*			●					●
Introduced Birds									
Rock Dove	*Columba livia*						●		
Spotted Turtle-Dove	*Streptopelia chinensis*			●					●
House Sparrow	*Passer domesticus*			●					●
Red-Whiskered Bulbul	*Pycnonotus jocosus*				●				
Common Myna	*Acridotheres tristis*			●	●				●
Native Mammals									
Common Brushtail Possum	*Trichosurus vulpecula*			●		●			
Grey-headed Flying-fox	*Pteropus poliocephalus*	V	V		●	●			●
Yellow-bellied Sheathtail Bat	*Saccolaimus flaviventris*	V							
Eastern Freetail-bat	*Mormopterus norfolkensis*	V					●		
White-striped Freetail Bat	*Tadarida australis*							●	
Freetail Bat	*Mormopterus species 3*								
Chocolate Wattled Bat	*Chalinolobus morio*						●		●
Eastern Bent-wing Bat	*Miniopterus schreibersii oceanensis*	V						●	
Gould's Wattled Bat	*Chalinolobus gouldii*					●	●	●	●
Greater Broad-nosed Bat	*Scoteanax rueppellii*	V						●	
Introduced Mammals									
Fox	*Vulpes vulpes*			●	●				
Cat feral	*Felis catus*							●	
Rabbit	*Oryctolagus cuniculus*			●	●		●	●	
Mouse	*Mus musculus*							●	
Reptiles									
Jacky Lizard	*Amphibolurus muricatus*						●		
Eastern Water Skink	*Eulamprus quoyii*						●		
Wall Lizard	*Cryptoblepharus virgatus*								
White's Skink	*Egernia whitii*						●		
Lace Monitor	*Varanus varius*							●	
Eastern Striped Skink	*Ctenotus robustus*			●					
Delicate Skink	*Lampropholis delicata*						●	●	
Garden Skink	*Lampropholis guichenoti*			●				●	
Common Bearded Dragon	*Pogona barbata*						●		

1. State conservation status: V= Vulnerable, E1 = Endangered, (Threatened Species Conservation Act 1995).

2. National conservation status: V = Vulnerable, E = Endangered, M = Migratory (*Environment Protection and Biodiversity Conservation Act 1999*)

Appendix D

Threatened species of plant and fungi in the locality

Attachment D Threatened species of plant

This appendix details the Threatened species of plant and fungi that have been recorded in the local area based on records of the Atlas of NSW Wildlife. Threatened species with habitat likely to occur in the locality were also considered based on records from the EPBC Protected Matters Search Tool as well as predicted to occur based on habitat within the CMA subregion.

Table D-1 Threatened species of plant in the locality

Family Name	Latin Name	Conservation status			Habitat	Number of records in locality (source)	Likelihood of occurrence
		State[1]	National[2]	ROTAP[3]			
Anthericaceae	*Caesia parviflora var. minor*	E1			Occurs south from Corindi area where it grows in heath woodland and dry sclerorophyll forest on sandstone derived soils (Harden 1993). Found in damp places in open forest (Department of Environment and Climate Change 2007).	1 (Atlas of NSW Wildlife)	Low Distribution of *Caesia parviflora var. minor* is known in north-east NSW, whereas *C. parviflora* var. *parviflora* and *C. parviflora* var. *vittata* occur further south in the Central Coast region. This record may be a misidentification.
Asclepiadaceae	*Cynanchum elegans*	E1	E	3Ei	Occurs from the Gloucester district to the Wollongong area and inland to Mt Dangar where it grows in rainforest gullies, scrub and scree slopes (Harden 1992). This species typically occurs at the ecotone between dry subtropical forest/woodland communities (James 1997b; NSW National Parks and Wildlife Service 2002a).	2 (Atlas of NSW Wildlife)	Low There is no rainforest, scrub or scree slopes in the study area.

Family Name	Latin Name	Conservation status			Habitat	Number of records in locality (source)	Likelihood of occurrence
		State[1]	National[2]	ROTAP[3]			
Asclepiadaceae	*Marsdenia viridiflora ssp. viridiflora* Endangered population in Bankstown, Blacktown, Camden, Campbelltown, Fairfield, Holroyd, Liverpool and Penrith	E2			Occurs in subcoastal and southern Queensland but rarely in NSW with a disjunct occurrence near Sydney. It occurs as scattered plants in remnant woodland and scrub (Harden 2002; NSW Scientific Committee 2000b).	3 (Atlas of NSW Wildlife)	Low Suitable habitat is present in the study area in patches of Cumberland Plain Woodland and Alluvial Woodland, however this conspicuous species was not recorded.
Casuarinaceae	*Allocasuarina glareicola*	E1	E		Restricted to the Sydney basin where it occurs in the Penrith Local Government Area in or near Castlereagh State Forest. Grows on lateritic soil in open forest (Harden 2000).	(PlantNet)	Low The study area is not within the known range of the local population.
Convolvulaceae	*Wilsonia backhousei*	V			Occurs chiefly in the Sydney district but also common at Jervis Bay (Harden 2000). A salt tolerant species, it is found in intertidal saltmarshes and sometimes on seacliffs (NSW Scientific Committee 2000c).	Known from Cumberland CMA subregion (DECC)	Low
Dilleniaceae	*Hibbertia hermanniifolia*			3Ra	Around Sydney this species is confined to rocky benches on a steep hillside in Bents Basins State Recreation Area (Fairley, Alan 2004).	(PlantNet)	Low The study area is not within the known range of the local population nor is similar habitat present.

Family Name	Latin Name	Conservation status			Habitat	Number of records in locality (source)	Likelihood of occurrence
		State[1]	National[2]	ROTAP[3]			
Dilleniaceae	*Hibbertia superans*	E			Occurs from Castle Hill to South Maroota where it grows in ridgetop woodlands usually near Shale/Sandstone Transition Forest. It is often associated with other threatened flora including *Pimelea curviflora* var. *curviflora*, *Darwinia biflora*, *Epacris purpurascens* var. *purpurascens*, *Leucopogon fletcheri* subsp. *Fletcheri*, *Acacia bynoeana*, *Eucalyptus* sp. Cattai and *Persoonia hirsuta* (NSW Scientific Committee, 2001).	Known from Cumberland CMA subregion (DECC)	Low No Shale/Sandstone Transition Forest in the study area.
Epacridaceae	*Epacris purpurascens* var. *purpurascens*	V		2K	Occurs in Gosford and Sydney districts where it grows in sclerophyll forest, scrub and swamps (Harden 1992). Usually found in sites with a strong shale influence (NSW National Parks and Wildlife Service 2002b). Thought to require wet heath vegetation (Teresa James pers comm 2004).	Known from Cumberland CMA subregion (DECC)	Low No suitable habitat as vegetation on site is woodland rather than forest, scrub or swamp vegetation.
Epacridaceae	*Leucopogon exolasius*	V	V	2V	Restricted chiefly to the Woronora and Grose Rivers and Stokes Creek, Sydney catchments and the Royal National Park. One old record from the Grose River. Grows in woodland on sandstone (Royal Botanic Gardens 2004).	2 (Atlas of NSW Wildlife)	Low
Epacridaceae	*Leucopogon fletcheri ssp. fletcheri*	E1		2R	Grows in dry eucalypt woodland or in shrubland on clay, lateritic soils or Hawkesbury sandstone (Fairley, Alan 2004). Found on sandstone ridges and upper slopes in heath or woodland, sometimes in or below sandstone-shale ecotone; often associated with lateritic soils with some clay influence (James 1997a; James et al. 1999).	(PlantNet)	Low Woodland present although there are no ridges or slopes within the study area, nor is the site close to the sandstone-shale ecotone.

Family Name	Latin Name	Conservation status			Habitat	Number of records in locality (source)	Likelihood of occurrence
		State[1]	National[2]	ROTAP[3]			
Euphorbiaceae	*Chamaesyce psammogeton*	E1			Occurs in coastal regions of NSW where it grows on sand dunes near the sea (Harden 2000). Grows on fore-dunes and exposed headlands, often with Spinifex (*Spinifex sericeus*) (Department of Environment and Conservation 2005).	Predicted in Cumberland CMA subregion (DECC)	Low Study area is not coastal
Fabaceae (Faboideae)	*Dillwynia tenuifolia / Dillwynia tenuifolia* Endangered population at Kemps Creek and in Baulkum Hills	V / E2	V	2Vi	Occurs on the Cumberland Plain from the Blue Mountains to Howes Valley area where it grows in dry sclerophyll woodland on sandstone, shale or laterite (Harden 2002). Specifically, occurs within Castlereagh woodlands, particularly in shale gravel transition forest. Associated species include *Eucalyptus fibrosa, E. sclerophylla, Melaleuca decora, Daviesia ulicifolia, Dillwynia juniperina* and *Allocasuarina littoralis* (James 1997b).	39 (Atlas of NSW Wildlife)	Low No sandstone or shale transitional geology in the study area. Location of population at Kemp Creek is not within the study area.
Fabaceae (Faboideae)	*Pultenaea parviflora*	E1	V	2E	Restricted to the Cumberland Plain where it grows in dry sclerophyll forest on Wianamatta shale, laterite or alluvium (Harden 2002). Locally abundant within Castlereagh Ironbark Forest and Shale Gravel Transition Forest on tertiary alluvium or laterised clays. Also occurs in transitional areas where these communities adjoin Castlereagh Scribbly Gum Woodland (James 1997b; NSW National Parks and Wildlife Service 2002c).	32 (Atlas of NSW Wildlife)	Low No Castlereagh Ironbark Forest and Shale Gravel Transition Forest in the study area.

Family Name	Latin Name	Conservation status			Habitat	Number of records in locality (source)	Likelihood of occurrence
		State[1]	National[2]	ROTAP[3]			
Fabaceae (Faboideae)	*Pultenaea pedunculata*	E1			*Pultenaea pedunculata* is a rare species that occurs in small populations over a large geographic area in several habitats. In western Sydney it occurs on Wianamatta Shales from Bankstown to Liverpool and on the South Coast in the Southeast Corner Bioregion at Bournda. It grows on a variety of soils in dry sclerophyll forest and disturbed sites (Harden, 1991; NSW Scientific Committee, 1999).	4 (Atlas of NSW Wildlife)	Low Although there are records of the species from the locality, the species is known to occur in very restricted populations. As such, presence of habitat is not a reliable indicator of likelihood.
Fabaceae (Mimosoideae)	*Acacia bynoeana*	E1	V	3V	Occurs south of Dora Creek-Morisset area to Berrima and the Illawarra region and west to the Blue Mountains. It grows mainly in heath and dry sclerophyll forest on sandy soils (Harden 2002). Seems to prefer open, sometimes disturbed sites such as trail margins and recently burnt areas. Typically occurs in association with *Corymbia gummifera, Eucalyptus haemastoma, E. gummifera, E. parramattensis, E. sclerophylla, Banksia serrata* and *Angophora bakeri* (NSW National Parks and Wildlife Service 1999a).	Predicted in Cumberland CMA subregion (DECC)	Low Study area occurs on Cumberland Plain (clay soils) rather than sandy soils
Fabaceae (Mimosoideae)	*Acacia pubescens*	V	V	3Va	Restricted to the Sydney Region from Bilpin to the Georges River and also at Woodford where it usually grows in open sclerophyll forest and woodland on clay soils. Typically it occurs at the intergrade between shales and sandstones in gravely soils often with ironstones (Harden 2002; NSW National Parks and Wildlife Service 2003).	45 (Atlas of NSW Wildlife)	Low Suitable habitat present, however conspicuous species not detected despite adequate survey effort.
Grammitaceae	*Grammitis stenophylla*	E1			Fern which occurs in coastal regions from Queensland to the NSW south coast where it grows on rocks in rainforest and in wet sclerophyll forest (Harden 2000).	Known from Cumberland CMA subregion (DECC)	Low Study area does not contain rainforest or wet sclerophyll forest

Family Name	Latin Name	Conservation status			Habitat	Number of records in locality (source)	Likelihood of occurrence
		State[1]	National[2]	ROTAP[3]			
Gyrostemonaceae	*Gyrostemon thesioides*	E1		2K	Confined to the Georges and Nepean Rivers where it occurs on river banks. It is a fire-opportunist (James 1997b; NSW Scientific Committee 1998b; Royal Botanic Gardens 2005).	1 (Atlas of NSW Wildlife)	Low Georges and Nepean River do not pass through the study area. Also last recorded in 1966.
Haloragaceae	*Gonocarpus longifolius*			3R	Records of *G. longifolius* exist in the mountain ranges from Blue Mountains north to Armidale and east of Rylstone, particularly in northern Wollemi NP, Western Slopes and around Goulburn Valley. In Sydney, records exist around the Georges and Nepean River, where it occurs in eucalypt shrubland/woodland on rocky sandstone slopes or alluvial sands (Robinson 2003, PlantNet). Specific locations include Nepean River at Menangle, Nortons Basin and Bents Basin and Georges River at Holsworthy, and at Rookwood Cemetery (McDougall and Benson 1999).	(PlantNet)	Low Study area does not contain rocky sandstone slopes or alluvial sands of the Georges or Nepean Rivers.
Haloragaceae	*Haloragodendron lucasii*	E1	E	2Ea	Confined to the Sydney area where it grows in dry sclerophyll open forest on sheltered slopes near creeks on sandstone (Harden 2002). Reported to grow in moist sandy loam soils in sheltered aspects, and on gentle slopes below cliff-lines near creeks in low open woodland. Associated with high soil moisture and relatively high soil-phosphorus levels (Department of Environment and Conservation 2005).	Known from Cumberland CMA subregion (DECC)	Low No suitable sandstone habitat

Family Name	Latin Name	Conservation status			Habitat	Number of records in locality (source)	Likelihood of occurrence
		State[1]	National[2]	ROTAP[3]			
Lomandraceae	*Lomandra fluviatilis*			3Ra	Endemic to the Sydney region, bounded by Mt Keira and Bargo in the south, Northern Wollemi and Howes Valley in the north and Glenbrook Creek (Blue Mountains) in the west. *L. fluviatilis* grows amongst sandstone rocks along freshwater creek beds with occasional inundation (Robinson 2003, Fairley 2004).	(PlantNet)	Low No suitable sandstone habitat
Juncaginaceae	*Maundia triglochinoides*	V			Occurs north from Sydney. Grows in swamps, creeks or shallow freshwater 30 to 60 cm deep on heavy clay, low nutrients. Associated with wetland species such as *Triglochin procerum* (Harden 1993).	Known from Cumberland CMA subregion (DECC)	Low Out of range
Myrtaceae	*Callistemon linearifolius*	V		2Ri	Occurs chiefly from Georges to the Hawkesbury River where it grows in dry sclerophyll forest, open forest, scrubland or woodland on sandstone. Found in damp places, usually in gullies (Fairley, A. & Moore 2002; Harden 2002; Robinson 1994). Within the Sydney region, recent records are limited to the Hornsby Plateau area near the Hawkesbury River (NSW Scientific Committee 1999a).	Known from Cumberland CMA subregion (DECC)	Low No suitable sandstone habitat and out of range
Myrtaceae	*Darwinia biflora*	V	V	2Va	Occurs from Cheltenham to Hawkesbury River where it grows in heath on sandstone or in the understorey of woodland on shale-capped ridges (Harden 2002). Occurs on the edges of weathered shale-capped ridges, where these intergrade with Hawkesbury Sandstone. Associated overstorey species include *Eucalyptus haemastoma, Corymbia gummifera* and/or *E. squamosa*. The vegetation structure is usually woodland, open forest or scrub-heath (Department of Environment and Climate Change 2008).	Known from Cumberland CMA subregion (DECC)	Low No suitable habitat and out of range

Family Name	Latin Name	Conservation status			Habitat	Number of records in locality (source)	Likelihood of occurrence
		State[1]	National[2]	ROTAP[3]			
Myrtaceae	*Eucalyptus benthamii*	V	V	2Vi	Restricted to Wallacia to Camden areas, Nepean River and Kedumba Creek, and Reedy and Cedar creeks in the central Blue Mountains. Grows on sandy flats or ridges near streams (Fairley, A. & Moore 2002), often with a wet sclerophyll understory (Robinson 2003).	(PlantNet)	Low No suitable habitat
Myrtaceae	*Eucalyptus camfieldii*	V	V	2Vi	Occurs from Tomago to the Royal National Park where it grows in coastal shrub heath in sandy soils on sandstone (Harden 2002).	Known from Cumberland CMA subregion (DECC)	Low No suitable habitat, study area is not coastal
Myrtaceae	*Eucalyptus nicholii*	V	V	3V	Occurs from Niangala to Glenn Innes where it grows in grassy sclerophyll woodland on shallow relatively infertile soils on shales and slates (Harden, 1991; DLWC, 2001). Endemic on the NSW Northern Tablelands, of limited occurrence, particularly in the area from Walcha to Glen Innes; often on porphyry or granite (Brooker and Kleinig 1999).	1 (Atlas of NSW Wildlife)	Low Out of species range.
Myrtaceae	*Eucalyptus scoparia*	E1	V	2Vi	Occurs in Queensland and reaches its southern limit in NSW. In NSW it is known from three locations all near Tenterfield in the far northern New England Tableland Bioregion where it grows on well drained granitic hilltops, slopes and outcrops, often as scattered trees in open forest and woodland (Royal Botanic Gardens 2004).	1 (Atlas of NSW Wildlife)	Low Out of species range. Record may be a misidentification
Myrtaceae	*Melaleuca deanei*	V	V	3R	Occurs in coastal districts, including western Sydney (e.g. Baulkham Hills, Liverpool shires) from Berowra to Nowra where it grows in wet heath on sandstone and shallow/skeletal soils near streams or perched swamps (Harden 2002; James 1997b).	5 (Atlas of NSW Wildlife)	Low No sandstone geology in study area.

Family Name	Latin Name	Conservation status			Habitat	Number of records in locality (source)	Likelihood of occurrence
		State[1]	National[2]	ROTAP[3]			
Myrtaceae	*Syzygium paniculatum*	V	V	3Ri	Occurs between Buladelah and St Georges Basin where it grows in subtropical and littoral rainforest on sandy soils or stabilized dunes near the sea (Harden 2002). On the south coast the Magenta Lilly Pilly occurs on grey soils over sandstone, restricted mainly to remnant stands of littoral (coastal) rainforest. On the central coast Magenta Lilly Pilly occurs on gravels, sands, silts and clays in riverside gallery rainforests and remnant littoral rainforest communities (Department of Environment and Climate Change 2008).	Known from Cumberland CMA subregion (DECC)	Low No suitable rainforest habitat
Orchidaceae	*Caladenia tessellata*	E1	V	3V	Occurs south of Swansea where it grows on clay loam or sandy soils (Harden 1993). Prefers low open forest with a heathy or sometimes grassy understorey (Bishop 2000). Within NSW, currently known from two disjunct areas; one population near Braidwood on the Southern Tablelands and three populations in the Wyong area on the Central Coast. Previously known also from Sydney and South Coast areas (NSW Scientific Committee 2002a).	Predicted habitat only (EPBC Protected matters search tool and DECC)	Low Location of known populations are not within or near to the study area. Vegetation structure on site is woodland rather than forest with heath understory, although grassy understory is present.
Orchidaceae	*Cryptostylis hunteriana*	V	V	3V	Occurs south from the Gibraltar Range, chiefly in coastal districts but also extends on to tablelands. Grows in swamp-heath and drier forest on sandy soils on granite & sandstone. Occurs in small, localised colonies most often on the flat plains close to the coast but also known from some mountainous areas growing in moist depressions and swampy habitats (Harden 1993; NSW National Parks and Wildlife Service 1999b).	Predicted habitat only (EPBC Protected matters search tool and DECC)	Low No suitable sandstone habitat

Family Name	Latin Name	Conservation status			Habitat	Number of records in locality (source)	Likelihood of occurrence
		State[1]	National[2]	ROTAP[3]			
Orchidaceae	*Diuris aequalis*	E1	V	3V	Occurs chiefly in the ranges and tablelands from Braidwood to Kanangra and Liverpool where it grows among grass in sclerophyll forest (Harden 1993). It typically occurs on gentle slopes, in gravely clay-loam soil within montane eucalypt forest with a grass or heath understorey (Bishop 2000). Three small populations are known to occur within Kanangra Boyd National Park, other populations are restricted to remnant vegetation within roadsides and agricultural lands (NSW Scientific Committee 2002b).	1 (Atlas of NSW Wildlife)	Low Record dates to 1905. No slopes or montane forest within the study area.
Orchidaceae	*Genoplesium baueri*	V		3R	Grows in sparse sclerophyll forest and moss gardens over sandstone; from the Hunter Valley to Nowra district (Royal Botanic Gardens 2004).	Known from Cumberland CMA subregion (DECC)	Low No suitable sandstone habitat
Orchidaceae	*Pterostylis saxicola*	E1	E		Known now only from Freemans Reach to Picton district. Grows in Sydney Sandstone Gully Forest in shallow or skeletal soils over sandstone shelves, often near streams (Department of Environment and Climate Change 2007; Harden 1993; James 1997b) Has a preference for shale sandstone interface and typically occurs where vegetation up-slope of potential habitat is shale derived (T. James pers. comm.)	8 (Atlas of NSW Wildlife)	Low No shale-sandstone interface or sandstone habitat within the study area
Poaceae	*Deyeuxia appressa*	E1	E	2E	Occurs in the Hornsby area on wet ground. (Harden 1993; Sharp & Simon 2002).	Predicted in Cumberland CMA subregion (DECC)	Low Out of range

Family Name	Latin Name	Conservation status			Habitat	Number of records in locality (source)	Likelihood of occurrence
		State[1]	National[2]	ROTAP[3]			
Proteaceae	*Grevillea juniperina ssp. juniperina*	V			Endemic to Western Sydney, centred on an area bounded by Blacktown, Erskine Park, Londonderry and Windsor with outlier populations at Kemps Creek and Pitt Town., where it grows in open dry sclerophyll (eucalypt-dominated) forest or woodland, at altitudes of less than about 50 m, in sandy to clay-loam soils and red pseudolateritic or sandy gravels (Fairley, Alan 2004; Royal Botanic Gardens 2005). More specifically it grows in Cumberland Plain Woodland and Castlereagh Woodland, typically in moist sites, often beside creeks on acidic soils and often recorded on road verges. Restricted to red sandy to clay soils (often lateritic) on Wianamatta Shale and Tertiary Alluvium (NSW Scientific Committee 2000a).	1 (Atlas of NSW Wildlife)	Low Suitable habitat but outside known distribution of species.
Proteaceae	*Grevillea parviflora ssp. parviflora*	V	V		Mainly known from the Prospect area (but now extinct there) and lower Georges River to Camden, Appin and Cordeaux Dam areas, with a disjunct populations near Putty, Cessnock and Cooranbong. Grows in heath or shrubby woodland in sandy or light clay soils usually over thin shales (Harden 2002; NSW Scientific Committee 1998a).	6 (Atlas of NSW Wildlife)	Low Out of range, and generally associated with thin shales overlying sandstone.
Proteaceae	*Persoonia nutans*	E1	E	2Ei	Confined to the Cumberland Plain where it grows in Castlereagh Scribbly Gum Woodlands and Agnes Banks Woodlands (Harden 2002; James 1997b; NSW National Parks and Wildlife Service 2001).	12 (Atlas of NSW Wildlife)	Low Vegetation communities in which the species is known to occur are absent in study area.

Family Name	Latin Name	Conservation status			Habitat	Number of records in locality (source)	Likelihood of occurrence
		State[1]	National[2]	ROTAP[3]			
Rhamnaceae	*Pomaderris brunnea*	V	V	2V	Confined to the Colo and Upper Nepean Rivers where it grows in open forest (Harden 2000); in western Sydney (Camden to Picton area) known from sandy alluvium on levee and creek banks (James 1997b).	Predicted habitat only (EPBC Protected matters search tool)	Low No sandy alluvium within study area.
Thymelaeaceae	*Pimelea curviflora* var. *curviflora*	V	V		Confined to coastal areas around Sydney where it grows on sandstone and laterite soils. It is found between South Maroota, Cowan, Narrabeen, Allambie Heights, Northmead and Kellyville, but its former range extended south to the Parramatta River and Port Jackson region including Five Dock, Bellevue Hill and Manly. Usually occurs in woodland in the transition between shale and sandstone, often on Lucas Heights soil landscape (Harden 2000; James 1997b; James et al. 1999; NSW Scientific Committee 1998c).	Known from Cumberland CMA subregion (DECC)	Low No sandstone or laterite soils within study area
Thymelaeaceae	*Pimelea spicata*	E1	E	3Ei	This species occurs in two disjunct areas: in coastal districts from Lansdowne to Shellharbour, and in Cumberland Plain Woodland inland to Penrith. In western Sydney it grows on Wianamatta Shales in Grey Box - Ironbark Woodland with *Bursaria spinosa* and *Themeda australis*. In the Illawarra, it occurs on well structured clay soils in grassland or open woodland (Harden 2000; James 1997b; NSW National Parks and Wildlife Service 2000).	25 (Atlas of NSW Wildlife)	Low Suitable habitat was identified in the study area however the species was not recorded during numerous targeted surveys.

Family Name	Latin Name	Conservation status			Habitat	Number of records in locality (source)	Likelihood of occurrence
		State[1]	National[2]	ROTAP[3]			
Tremandraceae	*Tetratheca glandulosa*	V	V	2V	Occurs from Mangrove Mountain to the Blue Mountains where it grows in sandy or rocky heath or scrub (Harden 1992). Associated with shale-sandstone transition habitat where shale-cappings occur over sandstone, with associated soil landscapes such as Lucas Heights, Gymea, Lambert and Faulconbridge. Vegetation communities correspond broadly to Benson & Howell's Sydney Sandstone Ridgetop Woodland (Map Unit 10ar). Common woodland tree species include: *Corymbia gummifera, C. eximia, Eucalyptus haemastoma, E. punctata, E. racemosa,* and/or *E. sparsifolia*, (Department of Environment and Climate Change 2008).	Known from Cumberland CMA subregion (DECC)	Low No suitable habitat

1) V= Vulnerable, E1 = Endangered (Threatened Species Conservation Act 1995)

2) ROTAP (Rare or Threatened Australian Plants, Briggs and Leigh 1996) is a conservation rating for Australian plants. Codes are: **1** = Species only known from one collection. **2** = Species with a geographic range of less than 100km in Australia. **3** = Species with a geographic range of more than 100km in Australia, **X =** Species presumed extinct; no new collections for at least 50 years. **E** = Endangered species at risk of disappearing from the wild state if present land use and other causal factors continue to operate, **V** = Vulnerable species at risk of long-term disappearance through continued depletion. **R** = Rare, but not currently considered to be endangered. **K** = Poorly known species that are suspected to be threatened. **C** = Known to be represented within a conserved area. **a** = At least 1,000 plants are known to occur within a conservation reserve(s). **i** = Less than 1,000 plants are known to occur within a conservation reserve(s). The reserved population size is unknown. **t** = The total known population is reserved. **+** = The species has a natural occurrence overseas.

3) V = Vulnerable, E = Endangered (Environment Protection and Biodiversity Conservation Act 1999)

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Appendix E

Threatened species of animal in the locality

Appendix E Threatened and migratory species of animal in the locality

This appendix details the Threatened species of animal that have either been recorded in the local area based on records from the Department of Environment and Climate Change *Atlas of NSW Wildlife* (Department of Environment and Climate Change 2008a). Threatened species that have predicted habitat within the study area were also considered based on records from the Department of the Environment, Water, Heritage and the Arts *EPBC Protected Matters Search Tool* (Department of the Environment Water Heritage and the Arts 2008) and Department of Environment, Climate Change and Water combined geographic and habitat search (Department of Environment and Climate Change 2008b) for the Cumberland Catchment Management Authority area.

Table E-1 Threatened and migratory species of animal in the locality

Common Name (Scientific Name)	Conservation Status		Habitat	Number of records in locality (source)	Likelihood of occurrence
	State [1]	National [2]			
Frogs					
Giant Burrowing Frog (*Heleioporus australiacus*)	V	V	Preference for sandstone ridge top habitat and broader upland valleys. In these locations the frog is associated with small headwater creek lines and along slow flowing to intermittent creek lines. The vegetation is typically woodland, open woodland and heath and may be associated with 'hanging swamp' seepage lines and where small pools form from the collected water. Do not appear to inhabit areas that have been cleared for agriculture or for urban development. (Cogger 2000; NSW National Parks and Wildlife Service 2001a).	4 (Atlas of NSW Wildlife)	Low. Suitable habitat was absent. Records of this species occur at Holsworthy Military Area.
Green and Golden Bell Frog (*Litoria aurea*)	E1	V	The Green and Golden Bell Frog inhabits marshes, dams and stream sides, particularly those containing bullrushes *Typha* spp. or spikerushes *Eleocharis* spp. Optimum habitat includes water bodies which are unshaded, free of predatory fish *Gambusia holbrooki*, have a grassy area nearby and diurnal sheltering sites available such as vegetation and/or rocks (NSW National Parks and Wildlife Service 1999d).	28 (Atlas of NSW Wildlife)	Low. No species were recorded during the field surveys. Riparian and aquatic habitats in the study area are highly modified and unlikely to support a local population.

Common Name (Scientific Name)	Conservation Status		Habitat	Number of records in locality (source)	Likelihood of occurrence
	State [1]	National [2]			
Heath Frog (*Litoria littlejohni*)	V	V	Distributed along the eastern slopes of the Great Dividing Range from Watagan State Forest near Wyong, south to Buchan in north-eastern Victoria. It appears to be restricted to sandstone woodland and heath communities at mid to high altitude. It forages both in the tree canopy and on the ground, and it has been observed sheltering under rocks on high exposed ridges during summer. It is not known from coastal habitats (NSW Scientific Committee 2000).	Predicted habitat only (EPBC Protected matters search tool)	Low. No suitable habitat was present. This species has not been previously recorded in the locality.
Stuttering Frog *(Mixophyes balbus)*	E1	V	Terrestrial species, found in rainforest, Antarctic beech forest or wet sclerophyll forest. The species depends on freshwater streams and riparian vegetation for breeding and habitation. No records are known from riparian habitat that has been disturbed (Cogger 2000; NSW Scientific Committee 2003).	Predicted habitat only (EPBC Protected matters search tool)	Low. Suitable habitat was absent. This species has not been recorded in the locality.
Giant Barred Frog *(Mixophyes iteratus)*	E1	E	Terrestrial species which occurs in rainforests, Antarctic beech or wet sclerophyll forests. Feeds on insects and smaller frogs (Cogger 2000). The species is associated with permanent flowing drainages, from shallow rocky rainforest streams to slow-moving rivers in lowland open forest. It is not known to utilise still water areas (NSW Scientific Committee 1999).	Predicted habitat only (EPBC Protected matters search tool)	Low. No suitable habitat for this species was recorded during the field surveys.
Red-crowned Toadlet *(Pseudophryne australis)*	V		Occurs within 160 km of Sydney where it is restricted to Hawkesbury Sandstone. It breeds in deep grass and debris adjacent to ephemeral drainage lines. When not breeding individuals are found scattered on sandstone ridges under rocks and logs (Cogger 2000).	7 (Atlas of NSW Wildlife)	Low. Suitable habitat was absent. Record of this species occurs at Holsworthy Military Area which are on sandstone geology.
Invertebrates					
Adam's Emerald Dragonfly (*Archaeophya adamsi*)	V*		Only five adults have ever been collected, and the species is only known from a few sites in the greater Sydney region. Larvae have been found in small creeks with gravel or sandy bottoms, in narrow, shaded riffle zones with moss and rich riparian vegetation (Department of Environment and Climate Change 2008c).	Predicted habitat only (DECC Habitat and Geographic search tool)	Low. No suitable habitat for this species was recorded within the study area.

Common Name (Scientific Name)	Conservation Status		Habitat	Number of records in locality (source)	Likelihood of occurrence
	State [1]	National [2]			
Cumberland Land Snail (*Meridolum corneovirens*)	E1		Restricted to the Cumberland Plain and Castlereagh Woodlands of Western Sydney and also along the fringes of River Flat Forest, especially where it meets Cumberland Plain Woodland. It is typically found under logs and other debris, amongst leaf litter and bark around bases of trees. It is also sometimes found under grass clumps and where possible it will burrow into loose soil (NSW National Parks and Wildlife Service 1999b).	Predicted habitat only (DECC Habitat and Geographic search tool)	**High**. This species was recorded during field surveys at Edmondson Park and the Ingleburn Defence Site. Potential habitat occurs within Open Woodland and Remnant Woodland fauna habitats including riparian areas of drainage lines.
Birds					
Australasian Bittern (*Botaurus poiciloptilus*)	V		Occurs in shallow, vegetated freshwater or brackish swamps. Requires permanent wetlands with tall dense vegetation, particularly bulrushes and spikerushes. When breeding, pairs are found in areas with a mixture of tall and short sedges but will also feed in more open territory. (Garnett & Crowley 2000; NSW National Parks and Wildlife Service 2002).	Predicted habitat only (DECC Habitat and Geographic search tool)	Low. No suitable habitat for this species was recorded within the study area.
Fork-tailed Swift *(Apus pacificus)*		M	Breeds from central Siberia eastwards through Asia, and is migratory, wintering south to Australia. Individuals never settle voluntarily on the ground and spend most of their lives in the air, living on the insects they catch in their beaks (Higgins 1999).	Predicted habitat only (EPBC Protected matters search tool)	Low. No important habitat for this species in the study area as defined under the *EPBC Act 1999*.
Great Egret *(Ardea alba)*		M	Great Egrets occur throughout most of the world. They are common throughout Australia, with the exception of the most arid areas. Great Egrets prefer shallow water, particularly when flowing, but may be seen on any watered area, including damp grasslands. Great Egrets can be seen alone or in small flocks, often with other egret species, and roost at night in groups. In Australia, the breeding season of the Great Egret is normally October to December in the south and March to May in the north. This species breeds in colonies, and often in association with cormorants, ibises and other egrets. (Australian Museum 2003).	Predicted habitat only (EPBC Protected matters search tool)	Moderate. No important habitat for this species in the study area as defined under the *EPBC Act 1999*.

Common Name (Scientific Name)	Conservation Status		Habitat	Number of records in locality (source)	Likelihood of occurrence
	State [1]	National [2]			
Cattle Egret *(Ardea ibis)*		M	Subsepecies *A. i. coromanda* is found across the Indian subcontinent and Asia as far north as Korea and Japan, and in South-east Asia, Papua New Guinea and Australia (McKilligan 2005).	Predicted habitat only (EPBC Protected matters search tool)	Moderate. No important habitat for this species in the study area as defined under the *EPBC Act 1999*.
Glossy Black-Cockatoo (*Calyptorhynchus lathami*)	V		Occurs in eucalypt woodland and forest with Casuarina/Allocasuarina spp. Characteristically inhabits forests on sites with low soil nutrient status, reflecting the distribution of key Allocasuarina species. The drier forest types with intact and less rugged landscapes are preferred by the species. Nests in tree hollows (Garnett & Crowley 2000; NSW National Parks and Wildlife Service 1999c).	Predicted habitat only (DECC Habitat and Geographic search tool)	Low. No suitable habitat for this species was recorded within the study area.
Bush Stone-curlew *(Burhinus grallarius)*	E1		Require sparsely grassed, lightly timbered, open forest of woodland. In southern Australia they often occur where there is a well structured litter layer and fallen timber debris. Feed on a range of invertebrates and small vertebrates, as well as seeds and shoots (NSW National Parks and Wildlife Service 1999a, 2003b).	1 (Atlas of NSW Wildlife)	Low. No suitable habitat for this species was recorded within the study area. This species was last recorded in the locality in 1950.
Gang-gang Cockatoo *(Callocephalon fimbriatum)*	V		Occurs in wetter forests and woodland from sea level to an altitude over 2000 metres, timbered foothills and valleys, coastal scrubs, farmlands and suburban gardens (Pizzey & Knight 1997).	2 (Atlas of NSW Wildlife)	Low. No suitable habitat for this species was recorded within the study area. Records for this species occur
Black-necked Stork *(Ephippiorhynchus asiaticus)*	E1		Feed in shallow water up to 0.5 m deep on fish, reptiles and frogs. Build nests in trees close to feeding sites (Garnett & Crowley 2000).	1 (Atlas of NSW Wildlife)	Low. No suitable habitat for this species was recorded within the study area. This species was last recorded in the locality in 1978.
Brown Treecreeper (*Climacteris picumnus*)	V		Occurs in eucalypt woodland and adjoining vegetation. Feeds on ants, beetles and larvae on trees and from fallen timber and leaf litter. Usually nests in hollows (Garnett & Crowley 2000).	Predicted habitat only (DECC Habitat and Geographic search tool)	Low. No suitable habitat for this species was recorded within the study area.

Common Name (Scientific Name)	Conservation Status		Habitat	Number of records in locality (source)	Likelihood of occurrence
	State [1]	National [2]			
Painted Honeyeater (*Grantiella picta*)	V		Lives in dry forests and woodlands. Primary food is the mistletoes in the genus Amyema, though it will take some nectar and insects. Its breeding distribution is dictated by presence of mistletoes which are largely restricted to older trees. Less likely to be found in strips of remnant box-ironbark woodlands, such as occur along roadsides and in windbreaks, than in wider blocks (Garnett & Crowley 2000).	Predicted habitat only (DECC Habitat and Geographic search tool)	Low. No suitable habitat for this species was recorded within the study area.
Latham's Snipe *(Gallinago hardwickii)*		M	Occurs in freshwater or brackish wetlands generally near protective vegetation cover. This species feeds on small invertebrates, seeds and vegetation. It migrates to the northern hemisphere to breed (Garnett & Crowley 2000).	Predicted habitat only (EPBC Protected matters search tool)	Low. No important habitat for this species in the study area as defined under the *EPBC Act 1999*.
White-bellied Sea-Eagle *(Haliaeetus leucogaster)*		M	Occurs in coastal areas including islands, estuaries, inlets, large rivers, inland lakes and reservoirs. Builds a huge nest of sticks in tall trees near water, on the ground on islands or on remote coastal cliffs (Pizzey & Knight 1997).	Predicted habitat only (EPBC Protected matters search tool)	Low. No important habitat for this species in the study area as defined under the *EPBC Act 1999*.
White-throated Needletail *(Hirundapus caudacutus)*		M	Occurs in airspace over forests, woodlands, farmlands, plains, lakes, coasts and towns. Breeds in the northern hemisphere and migrates to Australia in October-April (Pizzey & Knight 1997).	Predicted habitat only (EPBC Protected matters search tool)	Low. No important habitat for this species in the study area as defined under the *EPBC Act 1999*.
Black-tailed Godwit (*Limosa limosa*)	V	M	A coastal species found on tidal mudflats, swamps, shallow river margins and sewage farms. Also found inland on larger shallow fresh or brackish waters. A migratory species visiting Australia between September and May (Pizzey & Knight 1997).	Predicted habitat only (DECC Habitat and Geographic search tool)	Low. No suitable habitat for this species was recorded within the study area.
Comb-crested Jacana (*Irediparra gallinacean*)	V		Occurs in floating vegetation of permanent well-vegetated wetlands and dams. Walks on floating plants. Occasionally feeds along muddy wetland margins on east coast of NSW (Garnett & Crowley 2000).	Predicted habitat only (DECC Habitat and Geographic search tool)	Low. No suitable habitat for this species was recorded within the study area.

Common Name (Scientific Name)	Conservation Status		Habitat	Number of records in locality (source)	Likelihood of occurrence
	State [1]	National [2]			
Black Bittern (*Ixobrychus flavicollis*)	V		Usually found in dense vegetation in and fringing streams, swamps, tidal creeks and mudflats, particularly amongst swamp she-oaks and mangroves. Feeds on aquatic fauna along streams, in estuaries and beside billabongs and pools. Breeding occurs in summer in secluded places in densely vegetated wetlands. It nests in trees that overhang the water (Garnett & Crowley 2000; NSW National Parks and Wildlife Service 2002).	Predicted habitat only (DECC Habitat and Geographic search tool)	Low. No suitable habitat for this species was recorded within the study area.
Swift Parrot *(Lathamus discolour)*	E1	EM	Occur in eucalypt forests and woodlands, particularly in box-ironbark forests. Prefer sites with flowering *Acacia pycnantha* or highly fertile soils where large trees have high nectar production (including drainage lines and isolated trees in rural or urban landscapes). Breeding occurs in Tasmania (Garnett & Crowley 2000).	8 (Atlas of NSW Wildlife)	Low. No suitable habitat for this species was recorded within the study area.
Diamond Firetail (*Stagonopleura guttata*)	V		Occurs in a range of eucalypt dominated communities with a grassy understorey including woodland, forest and mallee. Most populations occur on the inland slopes of the dividing range. Feed on seeds, mostly of grasses (Garnett & Crowley 2000).	Predicted habitat only (DECC Habitat and Geographic search tool)	Low. No suitable habitat for this species was recorded within the study area.
Freckled Duck (*Stictonetta naevosa*)	V	M	In most years this species appear to be nomadic between ephemeral inland wetlands. In dry years they congregate on permanent wetlands while in wet years they breed prolifically and disperse widely, generally towards the coast. In inland eastern Australia, they generally occur in brackish to hyposaline wetlands that are densely vegetated with Lignum (*Muehlenbeckia cunninghamii*) within which they build their nests (Garnett & Crowley 2000).	Predicted habitat only (DECC Habitat and Geographic search tool)	Low. No suitable habitat for this species was recorded within the study area.

Common Name (Scientific Name)	Conservation Status		Habitat	Number of records in locality (source)	Likelihood of occurrence
	State [1]	National [2]			
Masked Owl (*Tyto novaehollandiae*)	V		Occurs within a diverse range of wooded habitats including forests, remnants and almost treeless inland plains. This species requires large-hollow bearing trees for roosting and nesting and nearby open areas for foraging. They typically prey on terrestrial mammals including rodents and marsupials but will also take other species opportunistically. Also known to occasionally roost and nest in caves (Garnett & Crowley 2000).	Predicted habitat only (DECC Habitat and Geographic search tool)	Low. No suitable habitat for this species was recorded within the study area. Few large hollow bearing trees for nesting or roosting by this species were recorded during recent surveys. Where present these trees were in highly fragmented patches of woodland.
Square-tailed Kite *(Lophoictinia isura)*	V	M	This species hunts primarily over open forest, woodland and mallee communities as well as over adjacent heaths and other low scrubby habitats in wooded towns. It feeds on small birds, their eggs and nestlings as well as insects. Seems to prefer structurally diverse landscapes (Garnett & Crowley 2000).	1 (Atlas of NSW Wildlife)	Low. Record in locality is likely to be a vagrant.
Hooded Robin *(Melanodryas cucullata)*	V		Found in south-eastern Australia, generally east of the Great Dividing Range. Found in eucalypt woodland and mallee and acacia shrubland. This is one of a suite of species that has declined in woodland areas in south-eastern Australia (Garnett & Crowley 2000; Traill & Duncan 2000).	1 (Atlas of NSW Wildlife)	Low. No suitable habitat for this species was recorded within the study area. This species was last recorded in the locality in 1990.
Black-chinned Honeyeater *(Melithreptus gularis gularis)*	V		Found in dry eucalypt woodland particularly those containing ironbark and box. Occurs within areas of annual rainfall between 400-700 mm. Feed on insects, nectar and lerps (Garnett & Crowley 2000).	5 (Atlas of NSW Wildlife)	Low. Records in locality is likely to be a vagrant.
Turquoise Parrot (*Neophema pulchella*)	V		Occurs in the foothills of the great dividing range in eucalypt woodlands and forests with a grassy or sparsely shrubby understorey. Nests in hollows in trees, stumps or even fence posts. It feeds on seeds of both native and introduced grass and herb species (Garnett & Crowley 2000).	Predicted habitat only (DECC Habitat and Geographic search tool)	Low. Predicted habitat only for a rare species.

Common Name (Scientific Name)	Conservation Status		Habitat	Number of records in locality (source)	Likelihood of occurrence
	State [1]	National [2]			
Rainbow Bee-eater *(Merops ornatus)*		M	Usually occur in open or lightly timbered areas, often near water. Breed in open areas with friable, often sandy soil, good visibility, convenient perches and often near wetlands. Nests in embankments including creeks, rivers and sand dunes. Insectivorous, most foraging is aerial, in clearings (Higgins 1999).	Predicted habitat only (EPBC Protected matters search tool)	Low. No important habitat for this species in the study area as defined under the *EPBC Act 1999*.
Black-faced Monarch *(Monarcha melanopsis)*		M	Occurs in rainforests, eucalypt woodlands, coastal scrubs, damp gullies in rainforest, eucalypt forest and in more open woodland when migrating (Pizzey & Knight 1997).	Predicted habitat only (EPBC Protected matters search tool)	Low. No important habitat for this species in the study area as defined under the *EPBC Act 1999*.
Satin Flycatcher *(Myiagra cyanoleuca)*		M	Occurs in heavily vegetated gullies, in forests and taller woodlands. During migration it is found in coastal forests, woodlands, mangroves, trees in open country and gardens (Pizzey & Knight 1997).	Predicted habitat only (EPBC Protected matters search tool)	Low. No important habitat for this species in the study area as defined under the *EPBC Act 1999*.
Orange-bellied Parrot *(Neophema chrysogaster)*	E1	CE, M	Orange-bellied Parrot breeds in the south-west of Tasmania and migrates in autumn to spend the winter on the mainland coast of south-eastern South Australia and southern Victoria. Typical winter habitat is salt marsh and strandline/fore dune vegetation communities either on coastlines or coastal lagoons. Spits and islands are favoured but they will turn up anywhere within these coastal regions. The species can be found foraging in weedy areas associated with these coastal habitats or even in totally modified landscapes such as pastures, seed crops and golf courses. Orange-bellied Parrots are known to forage among flocks of Blue-winged Parrots (Higgins 1999). It is expected that NSW habitats may be being more frequently utilised than observations suggest (Department of Environment and Conservation 2005).	Predicted habitat only (EPBC Protected matters search tool)	Low. No suitable habitat for this species was recorded within the study area.

Common Name (Scientific Name)	Conservation Status		Habitat	Number of records in locality (source)	Likelihood of occurrence
	State [1]	National [2]			
Barking Owl *(Ninox connivens)*	V		Occurs in dry sclerophyll woodland. In the south west it is often associated with riparian vegetation while in the south east it generally occurs on forest edges. It nests in large hollows in live eucalypts, often near open country. It feeds on insects in the non-breeding season and on birds and mammals in the breeding season (Garnett & Crowley 2000).	1 (Atlas of NSW Wildlife)	Low. No suitable habitat for this species was recorded within the study area. This species was last recorded in the locality in 1903.
Powerful Owl *(Ninox strenua)*	V		A sedentary species with a home range of approximately 1000 hectares it occurs within open eucalypt, Casuarina or Callitris pine forest and woodland. It often roosts in denser vegetation including rainforest of exotic pine plantations. Generally feeds on medium-sized mammals such as possums and gliders but will also eat birds, flying-foxes, rats and insects. Prey are generally hollow dwelling and require a shrub layer and owls are more often found in areas with more old trees and hollows than average stands (Garnett & Crowley 2000).	6 (Atlas of NSW Wildlife)	Low. Woodland habitats in the study area are too fragmented for this species which generally occurs in large tracts of woodland habitat.
Pink Robin *(Petroica rodinogaster)*	V		Found in open forest and woodland including native tea-tree scrubs. Rarely found in open cleared areas. Breeds in dense gullies in temperate rainforests (Pizzey & Knight 1997).	2 (Atlas of NSW Wildlife)	Low. No suitable habitat for this species was recorded within the study area. This species was last recorded in the locality in 1978
Speckled Warbler *(Pyrrholaemus sagittatus)*	V		Occurs in a wide range of eucalypt dominated vegetation with a grassy understorey and is often found on rocky ridges or in gullies. It feeds on seeds and insects and builds domed nests on the ground (Garnett & Crowley 2000).	2 (Atlas of NSw Wildlife)	Low. No suitable habitat for this species was recorded within the study area.
Rufous Fantail *(Rhipidura rufifrons)*		M	Occurs in a range of habitats including the undergrowth of rainforests/wetter eucalypt forests/gullies, monsoon forests paperbarks, sub-inland and coastal scrubs, mangroves, watercourses, parks and gardens. When migrating they may also be recorded on farms, streets and buildings. Migrates to SE Australia in October-April to breed, mostly in or on the coastal side of the Great Dividing Range (Pizzey & Knight 1997).	Predicted habitat only (EPBC Protected matters search tool)	Low. No important habitat for this species in the study area as defined under the *EPBC Act 1999*.

Common Name (Scientific Name)	Conservation Status		Habitat	Number of records in locality (source)	Likelihood of occurrence
	State [1]	National [2]			
Painted Snipe *(Rostratula benghalensis)*	E1	VM	Inhabits shallow, vegetated, temporary or infrequently filled wetlands, including where there are trees such as *Eucalyptus camaldulensis* (River Red Gum), *E. populnea* (Poplar Box) or shrubs such as *Muehlenbeckia florulenta* (Lignum) or *Sarcocornia quinqueflora* (Samphire). Feeds at the water's edge and on mudlflats on seeds and invertebrates, including insects, worms, molluscs and crustaceans. Males incubate eggs in a shallow scrape nest (Garnett & Crowley 2000).	Predicted habitat only (EPBC and DECC search tool)	Low. No suitable habitat for this species was recorded within the study area.
Regent Honeyeater *(Xanthomyza Phrygia)*	E1	EM	Occurs mostly in box-ironbark forests and woodland and prefers the wet, fertile sites such as along creek flats, broad river valleys and foothills. Riparian forests with *Casuarina cunninghamiana* and *Amyema cambagei* are important for feeding and breeding. Important food trees include *Eucalyptus sideroxylon* (Mugga Ironbark), *E. albens* (White Box) , *E. melliodora* (Yellow Box) and *E. leucoxylon* (Yellow Gum) (Garnett & Crowley 2000).	9 (Atlas of NSW Wildlife)	Low. No suitable habitat for this species was recorded within the study area. This species was last recorded in the locality in 1990.
Mammals					
Eastern Pygmy-possum *(Cercartetus nanus)*	V		Found in a range of habitats from rainforest through sclerophyll forest to tree heath. It feeds largely on the nectar and pollen of banksias, eucalypts and bottlebrushes and sometimes soft fruits. It nests in very small tree holes, between the wood and bark of a tree, abandoned birds nests and shredded bark in the fork of trees (Turner & Ward 1995).	1 (Atlas of NSW Wildlife)	Low. No suitable habitat for this species was recorded within the study area.
Greater Broad-nosed Bat (*Scoteanax rueppellii*)	V		The preferred hunting areas of this species include tree-lined creeks and the ecotone of woodlands and cleared paddocks but it may also forage in rainforest. Typically it forages at a height of 3-6 metres but may fly as low as one metre above the surface of a creek. It feeds on beetles, other large, slow-flying insects and small vertebrates. It generally roosts in tree hollows but has also been found in the roof spaces of old buildings (Churchill 1998).	Predicted habitat only (DECC Habitat and Geographic search tool)	**High.** This species was recorded during the current survey

Common Name (Scientific Name)	Conservation Status		Habitat	Number of records in locality (source)	Likelihood of occurrence
	State [1]	National [2]			
Large-eared Pied Bat (*Chalinolobus dwyeri*)	V	V	Occurs in moderately wooded habitats and roosts in caves, mine tunnels and the abandoned, bottle-shaped mud nests of Fairy Martins. Thought to forage below the forest canopy for small flying insects (Churchill 1998).	Predicted habitat only (EPBC Protected matters search tool)	Low. Predicted habitat only, no suitable roosting habitat for this species was recorded within the study area.
Spotted-tailed Quoll *(Dasyurus maculates)*	V	E	Occurs in sclerophyll forests and rainforests. Nests in rock caves and hollow logs or trees. Feeds on a variety of prey including birds, terrestrial and arboreal mammals, small macropods, reptiles and arthropods (NSW National Parks and Wildlife Service 1999f).	2 (Atlas of NSW Wildlife)	Low. Habitat in the study area is too fragmented. Last sighting in locality dates to the early 1990s
Eastern False Pipistrelle *(Falsistrellus tasmaniensis)*	V		Usually roosts in tree hollows in higher rainfall forests. Sometimes found in caves (Jenolan area) and abandoned buildings. Forages within the canopy of dry sclerophyll forest. It prefers wet habitats where trees are more than 20 metres high (Churchill 1998).	8 (Atlas of NSW Wildlife)	**Moderate.** Suitable habitat for this species was recorded within the study area.
Eastern Bent-wing Bat *(Miniopterus schreibersii)*	V	CD	Usually found in well timbered valleys where it forages on small insects above the canopy. Roosts in caves, old mines, stormwater channels and sometimes buildings and often return to a particular nursery cave each year (Churchill 1998).	11 (Atlas of NSW Wildlife)	**High.** This species was recorded during the current survey
Eastern Freetail-bat *(Mormopterus norfolkensis)*	V		Thought to live in sclerophyll forest and woodland. Small colonies have been found in tree hollows or under loose bark. It feeds on insects above the forest canopy or in clearings at the forest edge (Churchill 1998).	24 (Atlas of NSW Wildlife)	**High.** This species was recorded during the current survey
Large-footed Myotis *(Myotis adversus)*	V		Colonies occur in caves, mines, tunnels, under bridges and buildings. Colonies always occur close to bodies of water where this species feeds on aquatic insects (Churchill 1998).	3 (Atlas of NSW Wildlife)	Low. Water bodies in the study area are generally too small for this species.
Squirrel Glider *(Petaurus norfolcensis)*	V		Found in dry sclerophyll forest and woodland but not found in dense coastal ranges. Nests in hollows and feeds on gum of acacias, eucalypt sap and invertebrates (NSW National Parks and Wildlife Service 1999g).	1 (Atlas of NSW Wildlife)	Low. Woodland habitats in the study area are too fragmented and generally lacking in hollows.

Common Name (Scientific Name)	Conservation Status		Habitat	Number of records in locality (source)	Likelihood of occurrence
	State [1]	National [2]			
Brush-tailed Rock-wallaby *(Petrogale penicillata)*	E1	V	Occurs in inland and sub-coastal south eastern Australia where it inhabits rock slopes. It has a preference for rocks which receive sunlight for a considerable part of the day. Windblown caves, rock cracks or tumbled boulders are used for shelter. Occur in small groups or "colonies" each usually separated by hundreds of metres (NSW National Parks and Wildlife Service 2003a).	1 (Atlas of NSW Wildlife)	Low. No suitable habitat for this species was recorded within the study area.
Koala *(Phascolarctos cinereus)*	V		Found in sclerophyll forest. Throughout New South Wales, Koalas have been observed to feed on the leaves of approximately 70 species of eucalypt and 30 non-eucalypt species. However, in any one area, Koalas will feed almost exclusively on a small number of preferred species. The preferred tree species vary widely on a regional and local basis. Some preferred species in NSW include Forest Red Gum *Eucalyptus tereticornis*, Grey Gum *E. punctata*, Monkey Gum *E. cypellocarpa* and Ribbon Gum *E. viminalis*. In coastal areas, Tallowwood *E. microcorys* and Swamp Mahogany *E. robusta* are important food species, while in inland areas White Box *E. albens*, Bimble Box *E. populnea* and River Red Gum *E. camaldulensis* are favoured (NSW National Parks and Wildlife Service 1999e, 2003c).	40 (Atlas of NSW Wildlife)	Low. No suitable habitat for this species was recorded within the study area.
Long-nosed Potoroo *(Potorous tridactylus)*	V	V	It occurs within coastal heath and sclerophyll forests generally in areas with rainfall greater than 760 millimetres. Relatively thick ground cover is a major habitat requirement and it seems to prefer areas with light sandy soils. Feeds at dusk on roots, tubers, fungi, insects and their larvae and other soft bodied animals in the soil (Johnston 1995).	Predicted habitat only (EPBC Protected matters search tool)	Low. No suitable habitat for this species was recorded within the study area.
Grey-headed Flying-fox *(Pteropus poliocephalus)*	V	V	Occurs in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps. Urban gardens and cultivated fruit crops also provide habitat for this species. Feeds on the flowers and nectar of eucalypts and native fruits including lilly pillies. It roosts in the branches of large trees in forests or mangroves (Churchill 1998; NSW National Parks and Wildlife Service 2001b).	72 (Atlas of NSW Wildlife)	**High.** This species was recorded during the current survey

Common Name (Scientific Name)	Conservation Status		Habitat	Number of records in locality (source)	Likelihood of occurrence
	State [1]	National [2]			
Yellow-bellied Sheathtail Bat *(Saccolaimus flaviventris)*	V		Occurs in eucalypt forest where it feeds above the canopy and in mallee or open country where it feeds closer to the ground. Generally a solitary species but sometimes found in colonies of up to 10. It roosts in tree hollows. Thought to be a migratory species (Churchill 1998).	3 (Atlas of NSW Wildlife)	**High.** This species was recorded during the current survey
Reptiles					
Rosenberg's Goanna (*Varanus rosenbergi*)	V		Rosenberg's Goanna occurs on the Sydney Sandstone in Wollemi National Park to the north-west of Sydney, in the Goulburn and ACT regions and near Cooma in the south. There are records from the South West Slopes near Khancoban and Tooma River. This species is found in heath, open forest and woodland and is normally associated with termites of which this species uses to nest in. Termite mounds are a important habitat component for this species.	Predicted habitat only (DECC Habitat and Geographic search tool)	Low: No suitable habitat for this species was recorded within the study area.
Broad-headed Snake *(Hoplocephalus bungaroides)*	E1	V	A nocturnal species that occurs in association with communities occurring on Triassic sandstone within the Sydney Basin. Typically found among exposed sandstone outcrops with vegetation types ranging from woodland to heath. Within these habitats they generally use rock crevices and exfoliating rock during the cooler months and tree hollows during summer (Webb, J.K. & Shine 1994; Webb, J.K & Shine 1998).	Predicted habitat only (EPBC and DECC search tools)	Low. No suitable habitat for this species was recorded within the study area.
Fish					
Trout Cod (*Maccullochella macquariensis*)	E*	E	The trout cod is endemic to the southern Murray-Darling river system, including the Murrumbidgee and Murray Rivers, and the Macquarie River in central New South Wales. This species is often found close to cover and in relatively fast currents, especially in fairly deep water close to the bank, and often congregate around snags (Department of Environment and Climate Change 2007)	Predicted habitat only (DECC Habitat and Geographic search tool)	Low. No suitable habitat for this species was recorded in the study area.

Common Name (Scientific Name)	Conservation Status		Habitat	Number of records in locality (source)	Likelihood of occurrence
	State [1]	National [2]			
Macquarie Perch *(Macquaria australasica)*	V*	E	The natural range of Macquarie Perch included the upper and middle reaches of the Murray-Darling basin as well as the Shoalhaven and Hawkesbury Rivers. However, this species has recently been sighted in only a few localities within these river systems. Preferred habitat is deep holes covered with rocks, and spawning occurs above shallow running water. Macquarie Perch is a schooling species (Department of the Environment and Water Resources, 2007).	Predicted habitat only (EPBC and DECC search tool)	Low. No suitable habitat for this species was recorded in the study area.
Australian Grayling *(Prototroctes maraena)*		V	It is a mid-water, freshwater species that occurs most commonly in clear, gravelly streams with a moderate flow. Prefers deep, slow flowing pools (NSW Fisheries 2004).	Predicted habitat only (EPBC Protected matters search tool)	Low. No suitable habitat for this species was recorded in the study area.

Notes:

1. State conservation status: V= Vulnerable, E1 = Endangered, (*Threatened Species Conservation Act 1995* and *Fisheries Management Act 1994*). * indicates species listed under the *Fisheries Management Act 1994.*

2. National conservation status: V = Vulnerable, E = Endangered, CE, Critically Endangered, CD = Conservation dependant, M = Migratory, C = Conservation Dependent (*Environment Protection and Biodiversity Conservation Act 1999*)

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