A

Species List for Site

Bold Threatened Species
* Exotic Species
*W3 The plant must be fully and continuously suppressed and destroyed;
*W4 The growth and spread of the plant must be controlled according to the measures specified in a management plan published by the local control authority;
*W5 The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with.

Family	***Scientific Name***	***Common Name***	***Littoral Rainforest***	***Swamp Oak Forest***	***Swamp Sclerophyll Forest***	***Sedgeland/ Rushland***	***Low Closed Grassland***
Adiantaceae	*Adiantum aethiopicum*	Common Maidenhair	√				
Adiantaceae	*Adiantum hispidulum*	Rough Maidenhair	√				
Agavaceae	*Cordyline rubra*	Red Fruited Palm Lily	√				
Agavaceae	*Cordyline stricta*	Narrow-leaved Palm Lily	√				
Amaryllidaceae	*Crinum pedunculatum*	Swamp Lily		√	√		
Apiaceae	*Centella asiatica*	Pennywort	√				
Apiaceae	*Hydrocotyle bonariensis*	Hydrocotyle		√	√		
Apocynaceae	*Taberbaemontana pandacaqui*	Banana Bush	√				
Apocynaceae	*Thevetia peruviana**	Yellow Oleander	√				
Apocynaceae	*Gomphocarpus fruticosus**	Narrow-Leaved Cotton Bush	√				
Apocynaceae	*Marsdenia rostrata*	Milk Vine	√				
Apocynaceae	*Melodinus australis*	Southern Melodinus	√				
Apocynaceae	*Parsonsia rotate*	Veinless Silkpod	√				
Apocynaceae	*Parsonsia straminea*	Common Silkpod	√		√		

Family	Scientific Name	Common Name	Littoral Rainforest	Swamp Oak Forest	Swamp Sclerophyll Forest	Sedgeland/ Rushland	Low Closed Grassland
Araceae	*Alocasia brisbanensis*	Cunjevoi	√				
Araliaceae	*Schefflera actinophylla**	Umbrella Tree	√	√	√		
Arecaceae	*Arcontophoenix cunninghamiana*	Bangalow Palm	√				√
Arecaceae	*Calamus caryotoides*	Lawyer Vine	√				
Arecaceae	*Pothos longipes*	Pothos Vine	√				
Arecaceae	*Syagrus romanzoffiana**	Cocos Palm	√				
Asclepiadaceae	*Asclepias curassavica*	Redhead Cotton Bush	√	√	√	√	√
Asclepiadaceae	*Gomphocarpus fruiticosus*	Narrow-leaved Cotton Bush	√	√	√	√	√
Asparagaceae	*Protasparagus aethiopicus**	Ground Asparagus	√				
Asparagaceae	*Protasparagus plumosus**	Climbing Asparagus	√				
Aspleniaceae	*Asplenium australasicum*	Birds Nest Fern	√				
Asteraceae	*Ageratina adenophora*W4*	Crofton Weed	√	√	√		
Asteraceae	*Ageratina riparia*W4*	Mistflower	√				
Asteraceae	*Ageratum houstonianum**	Blue Billy Goat	√	√	√		√
Asteraceae	*Ambrosia artemisiifolia*W5*	Ragweed	√				√
Asteraceae	*Baccharis*	Groundsel Bush		√	√		

Family	Scientific Name	Common Name	Littoral Rainforest	Swamp Oak Forest	Swamp Sclerophyll Forest	Sedgeland/ Rushland	Low Closed Grassland
	*halimifolia*W3*						
Asteraceae	*Bidens pilosa**	Cobbler's Pegs	√	√			√
Asteraceae	*Cirsium vulgare**	Spear Thistle	√				√
Asteraceae	*Conyza bonariensis**	Fleabane	√	√			√
Asteraceae	*Chrysanthemoides monilifera*W4*	Bitou Bush	√				
Asteraceae	*Erechtites valerianifolia**	Brazilian Fireweed	√	√			√
Asteraceae	*Onopordum acanthium**	Scotch Thistle	√	√			√
Asteraceae	*Senecio madagascariensis**	Fire Weed	√	√			√
Asteraceae	*Tagetes minuta**	Stinking Roger	√				√
Asteraceae	*Xanthium occidentale*W4*	Noogoora Burr					√
Basellaceae	*Anredera cordifolia**	Madeira Vine	√				
Bignoniaceae	*Pandorea pandorana*	Wonga Wonga Vine	√				
Bignoniaceae	*Pyrostegia venusta**	Flame Vine	√				
Blechnaceae	*Blechnum indicum*	Swamp Water Fern			√	√	
Blechnaceae	*Blechnum wattsii*	Hard Water Fern	√	√			
Blechnaceae	*Doodia aspera*	Prickly Rasp Fern		√			
Buddlejaceae	*Buddleja madagascariensis**	Butterfly Bush	√				
Caesalpinioideae	*Caesalpinia*	Corky-Prickle	√				

Family	Scientific Name	Common Name	Littoral Rainforest	Swamp Oak Forest	Swamp Sclerophyll Forest	Sedgeland/ Rushland	Low Closed Grassland
	subtropica	Vine					
Caesalpinioideae	*Senna barclayana**	Smooth Senna	√				
Caesalpinioideae	*Senna pendula* var. *glabrata**	Winter Senna	√				
Cannabaceae	*Aphananthe philippinensis*	Rough-leaved Elm	√				
Capparaceae	*Capparis arborea*	Brush Caper Berry	√				
Caryophyllaceae	*Stellaria media**	Common Chickweed	√				
Casuarinaceae	*Casuarina glauca*	Swamp Oak		√			
Celastraceae	*Celastrus subspicata*	Large-leaf Staff Vine	√				
Celastraceae	*Elaeodendron australe var. australie*	Red Olive Plum	√				
Celastraceae	*Hedraianthera porphyropetala*	Hedraianthera	√				
Commelinaceae	*Commelina benghalensis**	Hairy Commelina	√		√		
Commelinaceae	*Commelina cyanea*	Native Commelina	√	√	√		
Commelinaceae	*Tradescantia fluminensis**	Wandering Jew	√				
Convolvulaceae	*Ipomoea cairica**	Coastal Morning Glory	√		√		
Cyatheaceae	*Cyathea australis*	Black Tree-fern		√			

Family	Scientific Name	Common Name	Littoral Rainforest	Swamp Oak Forest	Swamp Sclerophyll Forest	Sedgeland/ Rushland	Low Closed Grassland
Cyperaceae	*Bolboschoenus fluviatilis*	Marsh Club-rush				√	
Cyperaceae	*Schoenoplectus validus*	A Rush					
Cyperaceae	*Eleocharis acuta*	A Spikerush			√	√	
Cyperaceae	*Eleocharis dulcis*	A Spikerush			√	√	
Cyperaceae	*Eleocharis equisetina*	A Spikerush			√	√	
Cyperaceae	*Gahnia clarkei*	Tall Saw-sedge		√	√	√	
Cyperaceae	*Cyperus eragrostis**	Umbrella Sedge		√		√	
Cyperaceae	*Carex appressa*	Tall Sedge				√	
Davalliaceae	*Nephrolepis cordifolia**	Fishbone Fern	√				
Dennstaedtiaceae	*Hypolepsis muelleri*	Harsh Ground Fern	√	√	√		
Dennstaedtiaceae	*Pteridium esculentum*	Bracken Fern	√	√			
Dicksoniaceae	*Calochlaena dubia*	Mountain Bracken	√				
Dilleniaceae	*Hibbertia scandens*	Climbing Guinea Flower	√	√	√		
Dioscoreaceae	*Dioscorea transversa*	Native Yam	√				
Elaeocarpaceae	*Elaeocarpus obovatus*	Hard Quandong	√				
Ebenaceae	*Diospyros pentamera*	Myrtle Ebony	√				

Family	Scientific Name	Common Name	Littoral Rainforest	Swamp Oak Forest	Swamp Sclerophyll Forest	Sedgeland/ Rushland	Low Closed Grassland
Escalloniaceae	*Abrophyllum omans*	Native Hydrangea	√				
Euphorbiaceae	*Breynia oblongifolia*	Coffee Bush	√				
Euphorbiaceae	*Drypetes deplanchei*	Yellow Tulipwood	√				
Euphorbiaceae	*Glochidion ferdinandi*	Cheese Tree	√		√		
Euphorbiaceae	*Glochidion sumatranum*	Umbrella Cheese Tree	√		√		
Euphorbiaceae	*Macaranga tanarius*	Macaranga	√				
Euphorbiaceae	*Mallotus discolor*	White Kamala	√				
Euphorbiaceae	*Mallotus phillipensis*	Red Kamala	√	√	√		
Euphorbiaceae	*Ricinus communis**	Castor Oil Plant		√			
Eupomatiaceae	*Eupomatia bennettii*	Small Bolwarra	√				
Fabaceae	*Acacia elongata*	Swamp Wattle		√			
Fabaceae	*Acacia longissima*	Long-leaf Wattle	√	√			
Fabaceae	*Acacia longifolia* subsp. *sophorae*	Coastal Wattle	√				
Fabaceae	*Acacia melanoxylon*	Black Wattle	√	√	√		
Fabaceae	***Archidendron hendersonii***	**White Laceflower**	√				
Fabaceae	*Caesalpinia decapetala**	Thorny Poinciana	√				
Fabaceae	*Derris involuta*	Derris	√				
Fabaceae	*Desmodium uncinatum**	Silver-leaved Desmodium	√				
Fabaceae	*Erythrina sykesii**	Coral Tree			√		

Family	Scientific Name	Common Name	Littoral Rainforest	Swamp Oak Forest	Swamp Sclerophyll Forest	Sedgeland/ Rushland	Low Closed Grassland
Fabaceae	*Pararchidendron pruinosum*	Snow Wood	√				
Fabaceae	*Trifolium repens**	Clover					√
Fabaceae	*Vicia sp.**	Vetch					√
Flagellariacese	*Flagellaria indica*	Whip Vine	√				
Geraniaceae	*Geranium solanderi*	Native Geranium	√				
Gleicheniaceae	*Gleichenia dicarpa*	Coral Fern	√				
Juncaceae	*Juncus continuus*	A Rush				√	
Juncaceae	*Juncus usitatus*	Tussock Rush				√	
Lamiaceae	*Clerodendrum floribundum*	Clerodendrum	√		√		
Lamiaceae	*Gmelina leichhardtii*	White Beech	√				
Lauraceae	*Cinnamomum camphora*W4*	Camphor Laurel	√	√	√		
Lauraceae	*Cryptocarya erythroxylon*	Pigeonberry Ash	√				
Lauraceae	*Cryptocarya laevigata*	Red-fruited Laurel	√				
Lauraceae	*Cryptocarya obovata*	Pepperberry Tree	√				
Lauraceae	*Cryptocarya triplinervis* var. *triplinervis*	Three Veined Laurel	√				
Lauraceae	*Endiandra discolor*	Rose Walnut	√				
Lauraceae	*Neolitsea dealbata*	Hairy-leaved	√				

Family	Scientific Name	Common Name	Littoral Rainforest	Swamp Oak Forest	Swamp Sclerophyll Forest	Sedgeland/ Rushland	Low Closed Grassland
		Bolly Gum					
Lauraceae	*Neolitsea australiensis*	Green Bolly Gum	√				
Laxmanniaceae/Dracaenaceae	*Cordyline rubra*	Red-Fruited Palm Lilly	√				
Laxmanniaceae/Dracaenaceae	*Corydyline stricta*	Narrow-leaved Palm	√				
Lomandraceae	*Lomandra longifolia*	Spiny-headed Mat Rush				√	
Luzuriagaceae	*Eustrephus latifolius*	Wombat Berry	√		√		
Luzuriagaceae	*Geitonoplesium cymosum*	Scrambling Lily	√				
Malaceae	*Cotoneaster glaucophyllus**	Cotoneaster	√				
Malvaceae	*Brachychiton acerifolius*	Flame Tree	√				
Malvaceae	*Sida rhombifolia**	Paddy's Lucerne	√	√	√		
Meliaceae	*Dysoxylum fraserianum*	Rosewood	√				
Meliaceae	*Dysoxylum Mollissimum subsp. molle*	Red Bean	√				
Meliaceae	*Dysoxylum rufum*	Hairy Rosewood	√				
Meliaceae	*Synoum glandulosum*	Scentless Rosewood	√				
Meliaceae	*Toona ciliate*	Red Cedar	√				

Family	*Scientific Name*	*Common Name*	*Littoral Rainforest*	*Swamp Oak Forest*	*Swamp Sclerophyll Forest*	*Sedgeland/ Rushland*	*Low Closed Grassland*
Menispermaceae	*Stephania japonica*	Snake Vine	√				
Menispermaceae	***Tinospora tinasporoides***	**Arrow-Head Vine**	√				
Monimiaceae	*Wilkiea huegeliana*	Veiny Wilkiea	√				
Moraceae	*Ficus coronata*	Creek Sandpaper Fig	√				
Moraceae	*Ficus fraseri*	Sandpaper Fig	√				
Moraceae	*Ficus macrophylla*	Moreton Bay Fig	√				√
Moraceae	*Fiucs obliqua*	Small Leaf Fig	√				√
Moraceae	*Maclura cochinchinensis*	Cockspur Thorn	√				√
Moraceae	*Trophis scandens*	Burny Vine	√				
Moraceae	*Morus alba**	White Mulberry		√			
Moraceae	*Streblus brunonianus*	Whalebone Tree	√				
Myrsinaceae	*Embelia australiana*	Embelia	√				
	Rapanea howittiana	Brush Muttonwood	√				
Myrtaceae	*Acmena smithii*	Lilly Pilly	√	√	√		
Myrtaceae	*Austromyrtus dulcis*	Midgen Berry	√				
Myrtaceae	*Decaspermum humile*	Silky Myrtle	√				
Myrtaceae	*Eugenia uniflora**	Brazilian Cherry	√				
Myrtaceae	*Gossia bidwillii*	Python Tree	√				
Myrtaceae	*Melaleuca quinquenervia*	Broad-Leaved Paper Bark		√	√		

Family	*Scientific Name*	*Common Name*	*Littoral Rainforest*	*Swamp Oak Forest*	*Swamp Sclerophyll Forest*	*Sedgeland/ Rushland*	*Low Closed Grassland*
Myrtaceae	*Pilidiostigma glabrum*	Plum Myrtle	√				
Myrtaceae	*Psidium guajava**	Guava	√				
Myrtaceae	*Rhodamnia maideniana*	Smooth Scrub Turpentine	√				
Myrtaceae	***Syzygium hogkinsoniae***	**Red Lilly Pilly**	√				
Myrtaceae	*Syzygium luehmannii*	Riberry	√				
Ochnaceae	*Ochna serraulata**	Mickey Mouse Plant	√				
Oleaceae	*Ligustrum lucidum**	Large Leaved Privet	√				
Oleaceae	*Ligustrum sinense**	Small Leaved Privet	√				
Oleaceae	*Olea europaea subsp. africana**	African Olive	√				
Oleaceae	*Olea paniculata*	Native Olive	√				
Onagraceae	*Ludwigia octovalvis*	Willow Primrose		√			
Onagraceae	*Ludwigia peploides* subsp. *montevidensis*	Water Primrose	√				
Passifloraceae	*Passiflora edulis**	Edible Passionfruit	√				
Passifloraceae	*Passiflora suberosa**	Corky Passionfruit	√				
Passifloraceae	*Passiflora subpeltata**	White Passionflower	√	√			

Family	*Scientific Name*	*Common Name*	*Littoral Rainforest*	*Swamp Oak Forest*	*Swamp Sclerophyll Forest*	*Sedgeland/ Rushland*	*Low Closed Grassland*
Philydraceae	*Philydrum lanuginosum*	Frogmouth		√	√		
Phytolaccaceae	*Phytolacca octandra**	Inkweed	√	√			
Phytolaccaceae	*Rivina humilis**	Coral Berry	√				
Pinaceae	*Pinus elliottii*	Slash Pine	√				
Pittosporaceae	*Bursaria spinosa*	Boxthorn	√				
Pittosporaceae	*Hymenosporum flavum*	Native Frangipani	√				
Pittosporaceae	*Pittosporum revolutum*	Hairy Pittosporum	√				
Pittosporaceae	*Pittosporum undulatum*	Sweet Pittosporum	√				
Plantaginaceae	*Plantago gaudichaudii*	Plantain	√				
	Plantago lanceolata	Lamb's Tongue	√				√
Poaceae	***Arthraxon hispidus***	**Hairy Joint Grass**				√	√
Poaceae	*Axonopus affinus*	Narrow Leaved Carpet Grass					√
Poaceae	*Chloris gayana*	Rhodes Grass					√
Poaceae	*Cynodon dactylon*	Couch				√	√
Poaceae	*Eleusine indica**	Crowsfoot Grass	√				√
Poaceae	*Imperata cylindrical*	Blady Grass	√			√	
Poaceae	*Isachne globosa*	Swamp Millet				√	√

Family	Scientific Name	Common Name	Littoral Rainforest	Swamp Oak Forest	Swamp Sclerophyll Forest	Sedgeland/ Rushland	Low Closed Grassland
Poaceae	*Microlaena stipoides*	Weeping Grass	√				√
Poaceae	*Oplismenus aemulus*	Basket Grass	√				
Poaceae	*Oplismenus imbecillis*	Basket Grass	√				
Poaceae	*Paspalum dilatum**	Paspalum	√				√
Poaceae	*Paspalum wettsteinii**	Broad-leaved Paspalum	√				√
Poaceae	*Pennisetum alopecuroides*	Swamp Foxtail		√		√	√
Poaceae	*Pennisetum clandestinum**	Kikuyu			√		√
Poaceae	*Phragmites australis*	Common Reed		√	√	√	
Poaceae	*Setaria sphacelata*	Setaria					√
Poaceae	*Stenotaphrum secundatum**	Buffalo Grass	√				√
Poaceae	*Themeda australis*	Kangaroo Grass					√
Poaceae	*Triraphis mollis*	Purple Needlegrass					√
Polygonaceae	*Acetosa sagittata**	Turkey Rhubarb	√				
Polygonaceae	*Persicaria deciphens*	Smartweed				√	
Polygonaceae	*Persicaria strigosum*	Spotted Knotweed		√			
Polypodiaceae	*Platycerium bifurcatum*	Elkhorn	√				
Polypodiaceae	*Platycerium superbum*	Staghorn	√				

Family	*Scientific Name*	*Common Name*	*Littoral Rainforest*	*Swamp Oak Forest*	*Swamp Sclerophyll Forest*	*Sedgeland/ Rushland*	*Low Closed Grassland*
Polypodiaceae	*Pyrrosia rupestris*	Rock Felt Fern	√				
Proteaceae	***Macadamia tetraphylla***	**Rough-Shelled Bush Nut**	√				
Proteaceae	*Stenocarpus sinuatus*	Flame Tree	√				
Psilotaceae	*Psilotum nudum*	Skeleton Fork Fern	√		√		
Ranunculaceae	*Ranunculus inundatus*	River Buttercup				√	
Rhamnaceae	*Alphitonia excelsa*	Red Ash	√				
Rosaceae	*Rubus rosifolius*	Native Raspberry	√				
Rosaceae	*Prunus sp.**	Peach	√				
Rubiaceae	*Cyclophyllum longipetalum*	Brush Canthium	√				
Rubiaceae	*Psychotria loniceroides*	Hairy Psychotria	√				
Rutaceae	*Acronychia imperforate*	Beach Acronychia	√				
Rutaceae	*Medicosma cunninghamii*	Pinkheart	√				
Rutaceae	*Melicope elleryana*	Pink Euodia		√			
Rutaceae	*Murraya paniculata**	Murraya	√	√			
Sapindaceae	*Alectryon coriaceus*	Beach Alectryon	√				
Sapindaceae	*Arytera distylis*	Twin-Leaved Coogera	√				
Sapindaceae	*Arytera divaricata*	Coogera	√				

Family	Scientific Name	Common Name	Littoral Rainforest	Swamp Oak Forest	Swamp Sclerophyll Forest	Sedgeland/ Rushland	Low Closed Grassland
Sapindaceae	*Castanospora alphandii*	Brown Tamarind	√				
Sapindaceae	*Cupaniopsis anacardioides*	Tuckeroo	√	√	√		√
Sapindaceae	*Guioa semiglauca*	Guioa	√	√	√		√
Sapindaceae	*Jagera psuedorhus*	Foambark Tree	√				
Sapindaceae	*Mischocarpus pyriformis*	Yellow Pear Fruit	√				
Sapindaceae	*Sarcopteryx stipitata*	Steelwood	√				
Sapotaceae	*Planchonella australis*	Black Apple	√				
Sapotaceae	*Planchonella chartacea*	Thin-leaved Condoo					
Schizaeaceae	*Lygodium microphyllum*	*Climbing Snake Fern*	√				
Simaroubaceae	*Ailanthus triphysa*	White Bean	√				
Simaroubaceae	*Quassia sp 'A'*	Quassia	√				
Smilacaceae	*Smilax australis*	Austral Sarsparilla	√	√	√		
Smilacaceae	*Smilax glyciphylla*	Sweet Sarsaparilla	√				
Solanaceae	*Cestrum nocturnum**	Lady Of The Night	√				
Solanaceae	*Solanium seaforthianium**	Climbing Nightshade	√				√
Solanaceae	*Solanum*	Devils Apple	√	√			

Family	Scientific Name	Common Name	Littoral Rainforest	Swamp Oak Forest	Swamp Sclerophyll Forest	Sedgeland/ Rushland	Low Closed Grassland
	*capsicoides**						
Solanaceae	*Solanum mauritianum**	Wild Tobacco Bush	√	√			√
Solanaceae	*Solanum nigrum**	Blackberry Nightshade	√				
Solanaceae	*Solanum psuedocapsicum**	Jerusalem Cherry	√				
Thymelaeaceae	*Pimelea ligustrina*	Rice Flower	√		√		
Thymelaeaceae	*Wikstroemia indica*	Native Wikstroemia	√	√	√		
Typhaceae	*Typha orientalis*	Broad-leaved Cumbungi			√	√	
Ulmaceae	*Aphananthe philippinensis*	Rough-leaved Elm	√				
Ulmaceae	*Celtis paniculata*	Native Celtis	√				
Ulmaceae	*Trema aspera*	Native Peach	√	√	√		
Verbenaceae	*Lantana camara*W4*	Lantana	√	√	√		√
Verbenaceae	*Verbena bonariensis*	Purple Top	√				
Violaceae	*Viola hederaceae*	Native Violet	√				
Vitaceae	*Cissus antartica*	Kangaroo Grape	√				
Vitaceae	*Cissus hypoglauca*	Water Vine	√				
Zingiberaceae	*Alpinia caerulea*	Native Ginger	√				

B

Seven Part Test of Significance

Seven Part Test of Significance for White Laceflower (*Archidendron hendersonii*), Roush-shelled Bush Nut (*Macadamia tetraphylla*), Red Lilly Pilly (*Syzygium hodgkinsoniae*) and Arrow Head Vine (*Tinospora tinosporoides*)

The Scientific Committee, established by the *Threatened Species Conservation Act 1995*, has made a Final Determination to list White Laceflower (*Archidendron hendersonii*), Rough-shelled Bush Nut (*Macadamia tetraphylla*), Red Lilly Pilly (*Syzygium hodgkinsoniae*) and Arrow Head Vine (*Tinospora tinosporoides*) as Vulnerable in Schedule 2 of the Act.

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

White Laceflower is at threat from:

- loss of habitat through clearing and fragmentation;

The proposed works will not remove any areas of littoral rainforest or specimens of White Laceflower.

- habitat degradation through weed invasion and disturbance; and

Camphor Laurel is located within areas of littoral rainforest, especially on the edges of this community. Areas of littoral rainforest will be rehabilitated, which includes weed removal, as part of the proposed works.

- illegal collection of seeds for horticulture (NPWS 2002).

Threatened species will be carefully monitored.

Rough-shelled Bush Nut is at threat from:

- clearing and fragmentation of habitat for coastal development, agriculture and road works;

All recorded stems are to be retained. The majority of stems will be reserved within open space. However, the few specimens in the north-western section of the site will be located within residential lots and protected by the use of covenants. Open space areas will buffer retained specimens and provide additional habitat for dispersal. Development of areas of the site represents a loss of suitable dispersal areas.

- risk of local extinction due to low numbers;

Approximately 58 specimens were recorded within the Littoral Rainforest, regrowth rainforest along Hendersons Lane and several isolated specimens in the north western corner. Specimens ranged from trees of approximately 9m in height to seedlings only 10cm in height. Rough-shelled Bush Nut is also known from the SEPP 26 Littoral Rainforest to the north-west of the site. The proposed development will not result in a reduction of numbers of Rough-shelled Bush Nut and will therefore not increase this threat.

- grazing and trampling by domestic stock;

The site is currently utilised for cattle grazing and cattle have full access to areas of littoral rainforest including specimens of Rough-shelled Bush Nut. Several specimens showed evidence of grazing by cattle. The proposed development will require the removal of cattle and therefore will reduce this threat.

- fire;

The proposed works will not increase the risk of this threat. The proposed development has been designed in accordance with Planning for Bushfire Protection 2006.

- invasion of habitat by introduced weeds; and

Camphor Laurel is located within areas of littoral rainforest, especially on the edges of this community. Areas of littoral rainforest will be rehabilitated, which includes weed removal, as part of the proposed works.

- loss of local genetic strains through hybridisation with commercial varieties (NPWS 2002).

The proposed works will not increase the risk of this threat.

Red Lilly Pilly is at threat from:

- clearing of rainforest habitat for development or agriculture;

The proposed works will not remove any areas of littoral rainforest or specimens of Red Lilly Pilly. One small tree was recorded within the north-eastern linear section of littoral rainforest. This specimen will be retained within the littoral rainforest. Open space areas will buffer retained specimens and provide additional habitat for dispersal.

- invasion of habitat by introduced weeds, particularly Lantana and exotic vines

Camphor Laurel is located within areas of littoral rainforest, especially on the edges of this community. Areas of littoral rainforest will be rehabilitated, which includes weed removal, as part of the proposed works.

- fire;

The proposed works will not increase the risk of this threat. The proposed development has been designed in accordance with Planning for Bushfire Protection 2006.

- collection of seed for horticulture(NPWS 2002).

Threatened species will be carefully monitored.

Arrow Head Vine is at threat from:

- clearing and fragmentation of habitat for development, agriculture, and road works;

Arrow Head Vine was recorded within one patch of linear Littoral Rainforest in the central north-western section of the site. This specimen will be protected by a covenant and retained within the littoral rainforest in residential lots.

- risk of local extinction because populations are small at some locations;

The existing population is currently small as it has only been recorded from one location within the site.

- grazing and trampling by domestic stock;

The site is currently utilised for cattle grazing and cattle have full access to areas of littoral rainforest including specimens of Arrow Head Vine. The proposed development will require the removal of cattle and therefore will reduce this threat.

- fire;

The proposed works will not increase the risk of this threat. The proposed development has been designed in accordance with Planning for Bushfire Protection 2006.

- invasion of habitat by introduced weeds;

Areas of littoral rainforest will be rehabilitated, which includes weed removal, as part of the proposed development.

- accidental damage to plants when cutting introduced vines during bush regeneration.

Rehabilitation works will only be undertaken by qualified bush regenerators. Known specimens of Arrow head Vine have been tagged.

Each of the threatened species will be reserved within open space except for Arrow Head Vine, which will be protected by a covenant and retained within the littoral rainforest in residential lots. It is unlikely that the proposed development will not increase the risk of existing threats nor will the development have an adverse effect on the lifecycle of the species such that a viable local population will be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No consideration under this part of the assessment is required.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

No consideration under this part of the assessment is required.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

Each of the subject species prefers rainforest habitats. The two main elongated areas of littoral rainforest, which occur within the eastern portion of the site, are to be dedicated as open space. They will be rehabilitated and buffered in order to prevent impacts on this vegetation community. Another elongated section of littoral rainforest located in the central northern portion of the site, which also follows an existing fence line, will be incorporated into residential lots. Restrictions on the title of lots in this area will be used to protect these areas of rainforest vegetation, which cover approximately 0.2ha.

White Laceflower One large White Laceflower and one smaller shrub were recorded within the upper slopes of southern linear Littoral Rainforest which runs in a north / south direction. This specimen will be retained within the littoral rainforest. Open space areas will buffer retained specimens and provide additional habitat for dispersal.

Rough-shelled Bush Nut: All 58 recorded stems are to be retained. These were recorded within the littoral rainforest and several isolated stems were recorded within grassland in the far north-western corner of the site. The majority of stems will be reserved within open space. However, the few specimens in the north-western section of the site will be located within residential lots and protected by the use of covenants. Open space areas will buffer retained specimens and provide additional habitat for dispersal. Development of areas of the site represents a loss of suitable dispersal areas.

Red Lilly Pilly One small tree was recorded within the north-eastern linear section of littoral rainforest. This specimen will be retained within the littoral rainforest. Open space areas will buffer retained specimens and provide additional habitat for dispersal.

Arrow Head Vine This vine was recorded within one patch of linear Littoral Rainforest in the central north-western section of the site. This specimen will be protected by a covenant and retained within the littoral rainforest in residential lots.

No habitat of the subject species will be removed or modified as a result of the proposed development.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

Each of the threatened species are currently located within small, isolated pockets of littoral rainforest. Some stems of Rough-shelled Bush Nut exist as isolated specimens within grassland or rainforest regrowth. The site consists of cleared coastal land that is currently used for cattle grazing. It is located to the north of the existing stages of the Pacific Pines Estate and the majority of vegetation has been cleared in the past. The proposed works will preserve all areas of littoral rainforest and specimens of the subject threatened species. These areas will be rehabilitated and buffered. Additionally, the proposed development will include extensive landscaping and street trees. It is unlikely that the proposed works will cause the habitat to become fragmented or isolated from other areas of habitat.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The area to be affected by the proposed development mainly consists of cleared land currently utilised for cattle grazing. Areas of littoral rainforest will be regenerated, buffered and dedicated as open space. The areas beyond the buffer may represent a loss of potential area for seed dispersal and expansion for these threatened species.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No areas of critical habitat are listed under the *Threatened Species Conservation Act 1995* within the study area nor are there any areas of critical habitat for the subject species listed under the TSC Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

No recovery plans or threat abatement plans are prepared for the subject species under the TSC Act.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

A threatening process is defined under the *Threatened Species Conservation Act 1995* as a process that threatens, or may have the capability to threaten, the survival or evolutionary development of species, populations or ecological communities. The current list of key threatening processes under TSC Act, and whether the proposed development is recognised as a threatening process is shown below.

Table B.1 Key Threatening Process

Listed Key Threatening Process (as described in the final determination of the Scientific Committee to list the threatening process)	***Is the development or activity proposed of a class of development or activity that is recognised as a threatening process?***		
	Likely	***Possible***	***Unlikely***
Invasion and establishment of *Bufo marinus*			✓
Invasion and establishment of exotic vines and scramblers		✓	
Alteration of habitat following subsidence due to longwall mining			✓
Invasion of the Yellow Crazy Ant			✓
Herbivory and environmental degradation caused by feral deer			✓
Competition and habitat degradation by feral goats			✓
Predation, habitat degradation, competition and disease transmission by feral pigs			✓
Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands			✓
Bush rock removal			✓
Clearing of native vegetation		✓	
Lantana camara		✓	
Competition and grazing by the feral European Rabbit, *Oryctolagus cuniculus* (L.)			✓

Listed Key Threatening Process (as described in the final determination of the Scientific Committee to list the threatening process)	*Is the development or activity proposed of a class of development or activity that is recognised as a threatening process?*		
	Likely	*Possible*	*Unlikely*
Competition from feral honeybee			✓
Death or injury to marine species following capture in shark control programs on ocean beaches			✓
Ecological consequences of high frequency fires			✓
Entanglement in or ingestion of anthropogenic debris in marine and estuarine environments			✓
Human caused climate change			✓
Importation of red imported fire ants into NSW			✓
Infection by *Psittacine circoviral* (beak and feather) disease affecting endangered psittacine species and populations			✓
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis			✓
Infection of native plants by *Phytophthora cinnamomi*			✓
Introduction of the large earth bumblebee, *Bombus terrestris*			✓
Invasion of native plant communities by *Chrysanthemoides monilifera*			✓
Invasion of native plant communities by exotic perennial grasses			✓
Loss and/or degradation of sites used for hill-topping by butterflies			✓
Predation by the Feral Cat *Felis catus* (Linnaeus, 1758)			✓
Predation by the European Red Fox *Vulpes vulpes* (Linnaeus, 1758)			✓
Predation by *Gambusia holbrooki* Girard, 1859 (Plague Minnow or Mosquito Fish)			✓
Predation by the Ship Rat *Rattus rattus* on Lord Howe Island			✓
Removal of dead wood and dead trees			✓

Clearing of native vegetation is a threatened process listed under this Act. Clearing is defined as the destruction of a sufficient proportion of one or more strata (layers) within a stand or stands of native vegetation so as to result in the loss, or long term modification, of the structure, composition and ecological function of stand or stands.

Rainforests are susceptible to invasion by exotic vines particularly after canopy disturbance (Floyd 1989). Exotic vines and scramblers may smother existing vegetation, both in the ground layer and canopy (NPWS 2002). As previously stated, areas of littoral rainforest will be regenerated by a trained bush regenerator. This will involve the gradual removal of weeds such as Camphor Laurel. Regeneration works will be undertaken in accordance with a Vegetation Management Plan which will guide the gradual removal of weeds in order to avoid invasion by weeds such as exotic vines and Lantana. The proposed development will not involve the removal of any littoral rainforest or removal of the subject species. The areas of littoral rainforest will be regenerated and buffered. Extensive mitigation measures are proposed for the period of construction works. It is highly unlikely that the proposed action will result in increased impacts of this key threatening process.

Conclusion

It is unlikely that the proposed development will significantly adversely affect the White Laceflower, Rough-shelled Bush Nut, Red Lily Pilly or Arrow Head Vine. The proposed development will not affect substantial areas of habitat and will not increase any key threatening processes or cause the species to become further endangered.

References

NSW National Parks and Wildlife Service (2002). *Threatened Species of the Upper North Coast of New South Wales: Flora*, NPWS Coffs Harbour

Floyd AG (1989). The vine weeds of coastal rainforests. In *'Proceedings of the 5th Biennial Noxious Plants Conference*'. pp 1109-115. New South Wales Department of Agriculture and Fisheries: Sydney

Seven Part Test of Significance for Hairy Joint Grass (*Arthraxon hispidus*)
The Scientific Committee, established by the *Threatened Species Conservation Act 1995*, has made a Final Determination to list Hairy Joint Grass (*Arthraxon hispidus*) as Vulnerable in Schedule 2 of the Act.

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

Cardno (2007) note that Hairy Joint Grass is a slender, creeping grass with branching to semi-erect purplish stems that form roots at the node. The species is distinguished by a hispid (having bristly hairs) leaf sheath 1 – 3 cm long and leaf margins that are fringed with long, white hairs. While generally considered to be a perennial, the species life-cycle can be comparable to an annual plant, where individuals arise from seed during spring, flower in autumn and die off in winter. Hairy Joint Grass is typically described as a moisture and shade-loving species often associated with the edge of rainforest, wet sclerophyll forest, creeks and swamps. However, at present there is dearth of published knowledge concerning the species biology and ecology.

This species is at threat from:

- clearing of habitat for agriculture and development;
- inappropriate fire regimes;
- over-grazing by domestic stock;
- competition from introduced grasses such as Paspalum and Kikuyu; and
- slashing or mowing of habitat (NPWS 2002).

The proposed concept plan for the development incorporates a management strategy for Hairy Joint Grass. This management strategy includes a significant amount of monitoring and research into effective management of Hairy Joint Grass populations as well as contributing to a number of Priority Actions for the recovery of Hairy Joint Grass as identified by DEC (2005). Implementation of the strategy will ensure a sustainable local population of the species, protected in perpetuity by Environmental Protection Zoning and public ownership.

If the proposed development is assessed in isolation without the proposed management strategy for Hairy Joint Grass, the proposed development could be assessed as having an adverse effect on the life cycle of the species such that a viable local population is likely to be placed at risk of extinction. The proposed management strategy will provide important information about the life cycle of this species and will aim to link and enhance areas of known Hairy Joint Grass habitat off-site within an area zoned environmental protection in perpetuity.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No consideration under this part of the assessment is required.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

No consideration under this part of the assessment is required.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

Hairy Joint Grass was recorded throughout the sedgeand / rushland community below the 6.5m contour within two main locations; in the north-western portion of the site and the central section to the east of the Water Quality Control Pond. The area of potential habitat suitable for Hairy Joint Grass is approximately 7.9ha. Approximately 5.8ha of habitat potentially suitable for Hairy Joint Grass will be removed as a result of the proposed development. 2.1ha will be retained within open space.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

Hairy Joint Grass was recorded throughout the sedgeand / rushland community below the 6.5m contour within two main locations; in the north-western portion of the site and the central section to the east of the Water Quality Control Pond. These two areas within the site are currently isolated. Other populations throughout the broader Lennox Head area are also currently isolated. These populations are known from properties known as "Coastal Grove," "Henderson" and "Newton". The proposed Hairy Joint Grass management strategy will contribute to linking and enhancing areas of known Hairy Joint Grass habitat off-site within an area zoned environmental protection in perpetuity.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

As information regarding ecology and distribution of Hairy Joint Grass are not well known, any area of Hairy Joint Grass is of high importance. Hairy Joint Grass habitat within the site however is small and isolated. Improving the linkage of Hairy Joint Grass with other areas of known habitat is a key objective of the management strategy. The area off-site that will be protected in perpetuity will become of high importance and will be available for further research of this species.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No areas of critical habitat are listed under the *Threatened Species Conservation Act 1995* within the study area nor are there any areas of critical habitat for *Arthraxon hispidus* listed under the TSC Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

No recovery plan or threat abatement plan is prepared for *Arthraxon hispidus.*

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

A threatening process is defined under the *Threatened Species Conservation Act 1995* as a process that threatens, or may have the capability to threaten, the survival or evolutionary development of species, populations or ecological communities. The current list of key threatening processes under TSC Act, and whether the proposed development is recognised as a threatening process is shown below.

Table B2 Key Threatening Process

Listed Key Threatening Process (as described in the final determination of the Scientific Committee to list the threatening process)	*Is the development or activity proposed of a class of development or activity that is recognised as a threatening process?*		
	Likely	*Possible*	*Unlikely*
Invasion and Establishment of *Bufo marinus*			✓
Invasion and establishment of exotic vines and scramblers			✓
Alteration of habitat following subsidence due to longwall mining			✓
Invasion of the Yellow Crazy Ant			✓
Herbivory and environmental degradation caused by feral deer			✓
Competition and habitat degradation by feral goats			✓
Predation, habitat degradation, competition and disease transmission by Feral pigs			✓
Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands		✓	
Bush rock removal			✓
Clearing of native vegetation		✓	
Lantana camara			✓
Competition and grazing by the feral European Rabbit, *Oryctolagus cuniculus* (L.)			✓
Competition from feral honeybee			✓
Death or injury to marine species following capture in shark control programs on ocean beaches			✓
Ecological consequences of high frequency fires			✓
Entanglement in or ingestion of anthropogenic debris in marine and estuarine environments			✓
Human caused climate change			✓
Importation of red imported fire ants into NSW			✓
Infection by *Psittacine circoviral* (beak and feather) disease affecting endangered psittacine species and populations			✓
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis			✓
Infection of native plants by *Phytophthora cinnamomi*			✓
Introduction of the large earth bumblebee, *Bombus terrestris*			✓
Invasion of native plant communities by *Chrysanthemoides monilifera*			✓
Invasion of native plant communities by exotic perennial grasses		✓	
Loss and/or degradation of sites used for hill-topping by butterflies			✓
Predation by the Feral Cat *Felis catus* (Linnaeus, 1758)			✓
Predation by the European Red Fox *Vulpes vulpes* (Linnaeus, 1758)			✓
Predation by *Gambusia holbrooki* Girard, 1859 (Plague Minnow or Mosquito Fish)			✓

Listed Key Threatening Process (as described in the final determination of the Scientific Committee to list the threatening process)	*Is the development or activity proposed of a class of development or activity that is recognised as a threatening process?*		
	Likely	*Possible*	*Unlikely*
Predation by the Ship Rat *Rattus rattus* on Lord Howe Island			✓
Removal of dead wood and dead trees			✓

Clearing of native vegetation is a threatened process listed under this Act. Clearing is defined as the destruction of a sufficient proportion of one or more strata (layers) within a stand or stands of native vegetation so as to result in the loss, or long term modification, of the structure, composition and ecological function of stand or stands. The site consists of cleared coastal land that is currently used for cattle grazing. The proposed development will require the clearance of areas of vegetation for the construction of dwellings, roads and associated infrastructure. Hairy Joint Grass was recorded throughout the sedgeand / rushland community below the 6.5m contour within two main locations; in the north-western portion of the site and the central section to the east of the Water Quality Control Pond. The area of potential habitat suitable for Hairy Joint Grass is approximately 7.9ha. Approximately 5.8ha of habitat potentially suitable for Hairy Joint Grass will be removed as a result of the proposed development. 2.1 ha will be retained within open space.

Alteration to natural flow regimes can occur through reducing or increasing flows, altering seasonality of flows, changing the frequency, duration, magnitude, timing, predictability and variability of flow events, altering surface and subsurface water levels and changing the rate of rise or fall of water levels (DEC 2004).

Cardno (2007) notes that *Arthraxon* is typically described as moisture and shade-loving grass often associated with the edges of ranforest, wet sclerophyll forest, creeks and swamps. Essential habitat for the species within the Northern Rivers Region is identified as moist sites on edges of rainforest or in wet sclerophyll forest. There is growing evidence from the north coast of NSW, that the species persistence and survival is driven more by a dependence on groundwater than a preference for the prevailing vegetation type (Kooyman 2005). More specifically, populations of the species are being recorded in degraded, weed-infested cow paddocks that support ground-fed springs, wetlands and swamps (Benwell 2003; Kooyman 2005; Parker 2006). It is predicted that these environments at some stage represented the ecotone between Littoral rainforest and *Melaleuca* swamps along the north coast of NSW.

A number of exotic perennial grasses invade and may dominate native plant communities competing with, and displacing, many native species (DECC 2007). At present, the life-cycle and population dynamics of *Arthraxon* is poorly understood. Within the subject site, the species is specifically associated with damp areas that would be subject to periods of brief inundation, amongst Swamp ricegrass (*Leersia hexandra*) and Swamp foxtail (*Pennisetum alopecuroides*). The distribution of Hairy Joint Grass appears to depend on a delicate balance on competition and moisture.

If the proposed development is assessed in isolation without the proposed management strategy for Hairy Joint Grass, the proposed development could be assessed as contributing to these three key threatening processes. The proposed management strategy will include trials to determine threats, optimal growing conditions and general information about the ecology of this cryptic grass.

Conclusion

If the proposed development is assessed in isolation without the proposed management strategy for Hairy Joint Grass, the proposed development could be assessed as having a significant adverse impact on the survival of this species. The proposed management strategy however will provide important information

about the ecology of this species and will aim to link and enhance areas of known Hairy Joint Grass habitat off-site within an area zoned environmental protection in perpetuity.

References

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Kooyman, R. (2005). *Site-specific research, monitoring and interim management plan for Arthraxon hispidus.*

Parker, P. (2006). *Coastal Grove residential development flora and fauna report*.

Seven-Part Test of Significance for Littoral Rainforest, Swamp Oak Floodplain Forest and Swamp Sclerophyll Forest on NSW North Coast Bioregions

The Scientific Committee, established by the *Threatened Species Conservation Act 1995*, has made a Final Determination to list *Littoral Rainforest of the NSW North Coast, Sydney Basin and South East Corner bioregions*, *Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner bioregions and Swamp Sclerophyll Forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions* as an Endangered Ecological Communities in Part 3 of Schedule 1 of the TSC Act 1995.

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

No consideration under this part of the assessment is required.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No consideration under this part of the assessment is required.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Littoral Rainforest is generally a closed forest, the structure and composition of which is strongly influenced by proximity to the ocean. The plant species in this ecological community are predominantly rainforest species with evergreen mesic or coriaceous leaves. Several species have compound leaves, and vines may be a major component of the canopy. Littoral rainforest occurs on both sand dunes and on soils derived from underlying rocks (DEC 2005a). Littoral Rainforest mainly occurs within two elongated sections on elevated areas along an old fence line which runs north / south within the eastern portion of the site. Another elongated section also follows an existing fence further west. The littoral rainforest vegetation is in a degraded state, with relatively low species diversity. The small, isolated pockets of littoral rainforest are fragmented, are subject to trampling by cattle and contain a significant portion of exotic species, mainly Camphor Laurel (*Cinnamomum camphora*). The proposed development will not remove any areas of littoral rainforest. Areas of littoral rainforest will be regenerated and buffered. It is unlikely that the proposed development will have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction. Similarly, it is unlikely that the proposed development will substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

Swamp Oak Forest occurs as a fragmented patch (approximately 0.3 ha) to the north-east of the southern rainforest community. The Swamp Oak Forest is in a degraded state with a fragmented canopy dominated by Swamp Oak (*Casuarina glauca*) and Camphor Laurel (*Cinnamomum camphora*). The midstorey and understorey vegetation is relatively low in diversity and contains a significant proportion of exotic species. The site is also subject to trampling by cattle. The proposed development will not remove any areas of Swamp Oak Forest. It is unlikely that the proposed development will have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction. Similarly, it is unlikely that the proposed development will substantially and adversely modify

the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

Swamp Sclerophyll Forest occurs as a small patch (approximately 0.1ha) in the low-lying south-western portion of the site, directly east of the water quality control pond. This vegetation community will be entirely removed as a result of the proposed development. This vegetation community is also located within Ballina Nature Reserve, immediately west of the site. Lennox Head Structure Plan (BSC 2004) notes that "swamp forest habitat is well covered by environmental protection zones." Despite 0.1 ha of this vegetation type being removed, it is unlikely that the proposed development will have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction. The extensive local occurrence of this vegetation community off site will not be affected by the proposed development. Similarly, it is unlikely that the proposed development will substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

The proposed development will require removal of vegetation for the construction of dwellings, roads and associated infrastructure. The proposed Concept Plan illustrates that the site layout has been designed to allow for the retention and embellishment of most stands of native forested vegetation. Estimations of the areas of EECs to be lost as a result of the proposed development are shown in **Table B.3**.

Table B.3 Areas of EECs to be directly removed as a result of the proposed development

Vegetation Community	*Approximate Area of Vegetation Community within Site*	*Approximate Area of Vegetation Community to be Directly Removed*
Littoral Rainforest	1.9 ha	Nil
Swamp Oak Forest	0.3 ha	Nil
Swamp Sclerophyll Forest	0.1 ha	0.1 ha

The two main elongated areas of littoral rainforest, which occur within the eastern portion of the site, are to be dedicated as open space. They will be rehabilitated and buffered in order to prevent impacts on this vegetation community. Another elongated section of littoral rainforest located in the central northern portion of the site, which also follows an existing fence line, will be incorporated into residential lots. Restrictions on the title of lots in this area will be used to protect these areas of rainforest vegetation, which cover approximately 0.2ha.

No areas of Swamp Oak Forest will be directly removed as a result of the proposed works. This area will be dedicated as open space and will be rehabilitated and buffered.

The 0.1ha patch of Swamp Sclerophyll Forest will be entirely removed by the proposed development. This small remnant is highly edge affected, cattle have full access and it is highly degraded. This community type is widely distributed in Ballina Nature Reserve.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

Each of the EECs within the site are currently isolated. The site consists of cleared coastal land that is currently used for cattle grazing. It is located to the north of the existing stages of the Pacific Pines Estate

and the majority of vegetation has been cleared in the past. Forested areas except 0.1 ha of Swamp Sclerophyll Forest will be rehabilitated and buffered. Additionally, the proposed development will include extensive landscaping and street trees. It is unlikely that the proposed works will cause the habitat to become fragmented or isolated from other areas of habitat.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The only area of EEC to be removed as a result of the proposed development is 0.1 ha of Swamp Sclerophyll Forest. Cattle currently have access to this area as trampling is evident around the fringes of the community. This community is highly edge effected and healthier stands are located off-site within the adjacent Ballina Nature Reserve. This vegetation community however does provide an island for fauna.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No areas of critical habitat are listed under the *Threatened Species Conservation Act 1995* within the study area nor are there any areas of critical habitat for the subject EECs listed under the TSC Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

No recovery plan or threat abatement plans are prepared for the subject EECs under the TSC Act.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

A threatening process is defined under the *Threatened Species Conservation Act 1995* as a process that threatens, or may have the capability to threaten, the survival or evolutionary development of species, populations or ecological communities. The current list of key threatening processes under TSC Act, and whether the proposed development is recognised as a threatening process is shown below.

Table B.4 Key Threatening Process

Listed Key Threatening Process (as described in the final determination of the Scientific Committee to list the threatening process)	***Is the development or activity proposed of a class of development or activity that is recognised as a threatening process?***		
	Likely	Possible	Unlikely
Invasion and establishment of *Bufo marinus*			✓
Invasion and establishment of exotic vines and scramblers		✓	
Alteration of habitat following subsidence due to longwall mining			✓
Invasion of the Yellow Crazy Ant			✓
Herbivory and environmental degradation caused by feral deer			✓
Competition and habitat degradation by feral goats			✓
Predation, habitat degradation, competition and disease transmission by Feral pigs			✓
Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands			✓
Bush rock removal			✓

Listed Key Threatening Process (as described in the final determination of the Scientific Committee to list the threatening process)	***Is the development or activity proposed of a class of development or activity that is recognised as a threatening process?***		
Clearing of native vegetation		✓	
Lantana camara		✓	
Competition and grazing by the feral European Rabbit, *Oryctolagus cuniculus* (L.)			✓
Competition from feral honeybee			✓
Death or injury to marine species following capture in shark control programs on ocean beaches			✓
Ecological consequences of high frequency fires			✓
Entanglement in or ingestion of anthropogenic debris in marine and estuarine environments			✓
Human caused climate change			✓
Importation of red imported fire ants into NSW			✓
Infection by *Psittacine circoviral* (beak and feather) disease affecting endangered psittacine species and populations			✓
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis			✓
Infection of native plants by *Phytophthora cinnamomi*			✓
Introduction of the large earth bumblebee, *Bombus terrestris*			✓
Invasion of native plant communities by *Chrysanthemoides monilifera*			✓
Invasion of native plant communities by exotic perennial grasses			✓
Loss and/or degradation of sites used for hill-topping by butterflies			✓
Predation by the Feral Cat *Felis catus* (Linnaeus, 1758)			✓
Predation by the European Red Fox *Vulpes vulpes* (Linnaeus, 1758)			✓
Predation by *Gambusia holbrooki* Girard, 1859 (Plague Minnow or Mosquito Fish)			✓
Predation by the Ship Rat *Rattus rattus* on Lord Howe Island			✓
Removal of dead wood and dead trees			✓

Clearing of native vegetation is a threatened process listed under this Act. Clearing is defined as the destruction of a sufficient proportion of one or more strata (layers) within a stand or stands of native vegetation so as to result in the loss, or long term modification, of the structure, composition and ecological function of stand or stands.

Exotic vines and scramblers may smother existing vegetation, both in the ground layer and canopy. As previously stated, areas of forested vegetation will be regenerated by a trained bush regenerator. This will involve the gradual removal of weeds such as Camphor Laurel. Regeneration works will be undertaken in accordance with a Vegetation Management Plan which will guide the gradual removal of weeds in order to avoid invasion by weeds such as exotic vines and Lantana. It is highly unlikely that the proposed action will result in increased impacts of this key threatening process.

Conclusion

The proposed development does not involve the removal of any Littoral Rainforest or Swamp Oak Forest. These two EECs will be buffered and regenerated. The Swamp Sclerophyll EEC within the site is 0.1 ha, highly edge effected and trampled by cattle. This vegetation community will be removed as part of the proposed development. Extensive areas of this vegetation community are located within the adjacent Ballina Nature Reserve. It is highly unlikely that the proposed development will adversely affect the long term survival of these endangered ecological communities in the broader study area.

References

Department of Environment Conservation (Last Updated 1st September 2005a). *Littoral Rainforest of the NSW North Coast, Sydney Basin and South East Corner bioregions - endangered ecological listing*
http://www.nationalparks.nsw.gov.au/npws.nsf/content/littoral_rainforest_endangered
Accessed 20th August 2007

Department of Environment Conservation (Last Updated 1st September 2005b). *Swamp oak floodplain forest of the NSW North Coast, Sydney Basin and South East Corner bioregions - Endangered ecological community determination*
http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10945
Accessed 20th September 2007

Department of Environment Conservation (Last Updated 1st September 2005c). *Swamp sclerophyll forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions*
http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10786
Accessed 20th September 2007

Ballina Shire Council (2004). *Lennox Head Structure Plan*, Ballina Shire Council

Seven-Part Test of Significance for Green Sawfish (*Nannoperca oxleyana*)
The Scientific Committee, established by the *Threatened Species Conservation Act 1995*, has made a Final Determination to list Green Sawfish (*Nannoperca oxleyana*) as Endangered in Schedule 1 of the Act.

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

Green Sawfish is a predominantly marine species known to enter areas of fresh water and, prior to the 1970s, was regularly found in the shallow waters at the mouth of the Tweed, Clarence and Richmond Rivers. This species practices internal fertilisation and is known to have low fecundity, with estimates of approximately 20 young. The probable causes of decline are bycatch in prawn trawling; targeted harvest for flesh, fins and saws and habitat degradation. The NSW Fisheries Scientific Committee note that the last recorded museum specimen from NSW was in 1972. The occurrence of a local population near the site cannot be demonstrated however suitable habitat exists within North Creek. The proposed development includes extensive mitigation measures to ensure that adverse impacts are not experienced within the nearby North Creek. The proposed development is highly unlikely to have an adverse effect on the lifecycle of the species such that a viable local population of the species is placed at risk of extinction, should it persist in the locality.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No consideration under this part of the assessment is required.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

No consideration under this part of the assessment is required.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

It is not expected that any habitat will be removed or modified as a result of the proposed development. The proposed development includes extensive mitigation measures to ensure that adverse impacts are not experienced within the nearby North Creek.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

Areas are considered likely to become "fragmented or isolated" if the proposal is likely to create a situation preventing future movement of individuals between these areas. The proposed development is unlikely to adversely impact upon or alienate movement corridors or limit dispersal options for the Green Sawfish, as there will be little or no impact on habitats within North Creek.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

Areas to be directly affected by the proposed development are terrestrial and do not provide habitat for Green Sawfish. The occurrence of a local population near the site cannot be demonstrated. The proposed development includes extensive mitigation measures to ensure that adverse impacts are not experienced within the nearby North Creek.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No areas of critical habitat are listed under the *Threatened Species Conservation Act 1995* within the study area nor are there any areas of critical habitat for Green Sawfish listed under the TSC Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

No recovery plan or threat abatement plan is prepared for Green Sawfish.

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Key Threatening Processes listed within Schedule 6 of the *Fisheries Management Act 1994* are listed in **Table B.5**.

Table B.5 FM Act 1994 Key Threatening Processes

Listed Key Threatening Process	***Is the activity likely to be a KTP?***		
	Likely	***Possible***	***Unlikely***
Degradation of native riparian vegetation along New South Wales water courses		✓	
Hook and line fishing in areas important for the survival of threatened fish species			✓
Installation and operation of instream structures and other mechanisms that alter natural flow regimes of rivers and streams			✓
Introduction of fish to waters within a river catchment outside their natural range			✓
Introduction of non-indigenous fish and marine vegetation to the coastal waters of New South Wales			✓
Removal of large woody debris from New South Wales rivers and streams			✓
The current shark meshing program in New South Wales waters			✓

Threatening processes to the Green Sawfish include bycatch in prawn trawling; targeted harvest for flesh, fins and saws and habitat degradation. The proposed development is unlikely to make a significant contribution to any of these threatening processes. A 50m vegetated buffer is to be established as part of works associated with the Water Quality Control Pond. This buffer will protect and enhance riparian vegetation.

A threatening process is defined under the *Threatened Species Conservation Act 1995* as a process that threatens, or may have the capability to threaten, the survival or evolutionary development of species, populations or ecological communities. The current list of key threatening processes under TSC Act, and whether the proposed development is recognised as a threatening process is shown below.

Table B.6 Key Threatening Process

Listed Key Threatening Process (as described in the final determination of the Scientific Committee to list the threatening process)	***Is the development or activity proposed of a class of development or activity that is recognised as a threatening process?***		
	Likely	Possible	Unlikely
Invasion and establishment of *Bufo marinus*			✓
Invasion and establishment of exotic vines and scramblers			✓
Alteration of habitat following subsidence due to longwall mining			✓
Invasion of the Yellow Crazy Ant			✓
Herbivory and environmental degradation caused by feral deer			✓
Competition and habitat degradation by feral goats			✓
Predation, habitat degradation, competition and disease transmission by Feral pigs			✓
Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands			✓
Bush rock removal			✓
Clearing of native vegetation			✓
Competition and grazing by the feral European Rabbit, *Oryctolagus cuniculus* (L.)			✓
Competition from feral honeybee			✓
Death or injury to marine species following capture in shark control programs on ocean beaches			✓
Ecological consequences of high frequency fires			✓
Entanglement in or ingestion of anthropogenic debris in marine and estuarine environments			✓
Human caused climate change			✓
Importation of red imported fire ants into NSW			✓
Infection by *Psittacine circoviral* (beak and feather) disease affecting endangered psittacine species and populations			✓
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis			✓
Infection of native plants by *Phytophthora cinnamomi*			✓
Introduction of the large earth bumblebee, *Bombus terrestris*			✓
Invasion of native plant communities by *Chrysanthemoides monilifera*			✓
Invasion of native plant communities by exotic perennial grasses			✓
Loss and/or degradation of sites used for hill-topping by butterflies			✓
Predation by the Feral Cat *Felis catus* (Linnaeus, 1758)			✓
Predation by the European Red Fox *Vulpes vulpes* (Linnaeus, 1758)			✓

Listed Key Threatening Process (as described in the final determination of the Scientific Committee to list the threatening process)	*Is the development or activity proposed of a class of development or activity that is recognised as a threatening process?*		
Predation by *Gambusia holbrooki* Girard, 1859 (Plague Minnow or Mosquito Fish)			✓
Predation by the Ship Rat *Rattus rattus* on Lord Howe Island			✓
Removal of dead wood and dead trees			✓

Conclusion

It is highly unlikely that the proposed development will adversely affect Green Sawfish. The proposed development do not affect substantial areas of habitat and will not increase any key threatening processes or cause the population to become further endangered.

References

Department of Environment Conservation (Last Updated 1st September 2005). *Green Sawfish - Profile*
http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10953
Accessed 20th September 2007

Department of Primary Industries (Fisheries) (2005). *Prime Fact 7 Green Sawfish*
http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0018/5085/Primefact_Green_sawfish.pdf
Accessed 20th September 2007

Seven-part Test of Significance for Grey-headed Flying-fox (*Pteropus poliocephalus*)
Grey-headed Flying-fox (*Pteropus poliocephalus*) is listed as Vulnerable on Schedule 2 of the TSC Act 1995.

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

The Grey-headed Flying-fox is a large, grizzled-grey flying-fox with a wide orange-yellow collar. It has fully furred upper legs and they roost in conspicuous often large camps in lowland rainforest, swamp forest and gullies often in remnants or on islands in rivers. The Grey-headed Flying-fox may share camps with Little Red and Black Flying-foxes. They feed on the fruit, nectar and blossom of more than 80 species of eucalypts and rainforest plants as well as eating cultivated fruit in times of natural food shortage (NPWS 2004).

This species is at threat from:

- loss of foraging habitat;

The proposed development will result in a loss of approximately 0.1 ha of swamp sclerophyll forest which may be utilised as foraging habitat. Extensive areas of this vegetation community are located immediately west within Ballina Nature Reserve.

- disturbance of roosting sites;

No roosting sites have been recorded within the site.

- unregulated shooting; and

The proposed development will not increase this threat.

- electrocution on powerlines (NPWS 2002).

The proposed development will incorporate underground powerlines.

It is not expected that the proposed development is likely to have an adverse effect on the life cycle of the species such that a viable local population is likely to be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No consideration under this part of the assessment is required.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

No consideration under this part of the assessment is required.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

No roost sites have been recorded within the site however the swamp sclerophyll forest and the patches of littoral rainforest may provide foraging habitat for the Grey-headed Flying-fox. No areas of littoral

rainforest will be removed as a result of the proposed development however the 0.1 ha of swamp sclerophyll forest will be entirely removed as a result of the proposed development. Swamp sclerophyll forest is also located within Ballina Nature Reserve, immediately west of the site. Lennox Head Structure Plan (BSC 2004) notes that "swamp forest habitat is well covered by environmental protection zones." The extensive local occurrence of this vegetation community off-site will not be affected by the proposed development.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

Areas are considered likely to become "fragmented or isolated" if the proposal is likely to create a situation preventing future movement of individuals between these areas. Grey-headed Flying-fox (*Pteropus poliocephalus*) is a highly mobile species. The site consists of cleared coastal land that is currently used for cattle grazing. It is located to the north of the existing stages of the Pacific Pines Estate and the majority of vegetation has been cleared in the past. Forested areas except 0.1 ha of Swamp Sclerophyll Forest will be rehabilitated and buffered. Additionally, the proposed development will include extensive landscaping and street trees. It is unlikely that the proposed works will cause the habitat to become fragmented or isolated from other areas of habitat.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The only area of forested vegetation to be removed as a result of the proposed development is 0.1 ha of Swamp Sclerophyll Forest. Cattle currently have access to this area as trampling is evident around the fringes of the community. This community is highly edge effected and healthier stands are located off-site within the adjacent Ballina Nature Reserve. Swamp forest is however viewed as an important source of food and habitat.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No areas of critical habitat are listed under the *Threatened Species Conservation Act 1995* within the study area nor are there any areas of critical habitat for these species of concern listed under the TSC Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

No recovery plan or threat abatement plan has been prepared for Grey-headed Flying-fox *(Pteropus poliocephalus).*

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

A threatening process is defined under the *Threatened Species Conservation Act 1995* as a process that threatens, or may have the capability to threaten, the survival or evolutionary development of species, populations or ecological communities. The current list of key threatening processes under TSC Act, and whether the proposed development is recognised as a threatening process is shown in **Table B.7**.

Table B.7 Key Threatening

Listed Key Threatening Process (as described in the final determination of the Scientific Committee to list the threatening process)	*Is the development or activity proposed of a class of development or activity that is recognised as a threatening process?*		
	Likely	*Possible*	*Unlikely*
Invasion and Establishment of *Bufo marinus*			✓
Invasion and establishment of exotic vines and scramblers		✓	
Alteration of habitat following subsidence due to longwall mining			✓
Invasion of the Yellow Crazy Ant			✓
Herbivory and environmental degradation caused by feral deer			✓
Competition and habitat degradation by feral goats			✓
Predation, habitat degradation, competition and disease transmission by Feral pigs			✓
Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands			✓
Bush rock removal			✓
Clearing of native vegetation		✓	
Lantana camara			✓
Competition and grazing by the feral European Rabbit, *Oryctolagus cuniculus* (L.)			✓
Competition from feral honeybee			✓
Death or injury to marine species following capture in shark control programs on ocean beaches			✓
Ecological consequences of high frequency fires			✓
Entanglement in or ingestion of anthropogenic debris in marine and estuarine environments			✓
Human caused climate change			✓
Importation of red imported fire ants into NSW			✓
Infection by *Psittacine circoviral* (beak and feather) disease affecting endangered psittacine species and populations			✓
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis			✓
Infection of native plants by *Phytophthora cinnamomi*			✓
Introduction of the large earth bumblebee, *Bombus terrestris*			✓
Invasion of native plant communities by *Chrysanthemoides monilifera*			✓
Invasion of native plant communities by exotic perennial grasses			✓
Loss and/or degradation of sites used for hill-topping by butterflies			✓
Predation by the Feral Cat *Felis catus* (Linnaeus, 1758)			✓
Predation by the European Red Fox *Vulpes vulpes* (Linnaeus, 1758)			✓
Predation by *Gambusia holbrooki* Girard, 1859 (Plague Minnow or Mosquito Fish)			✓

Listed Key Threatening Process (as described in the final determination of the Scientific Committee to list the threatening process)	*Is the development or activity proposed of a class of development or activity that is recognised as a threatening process?*		
	Likely	***Possible***	***Unlikely***
Predation by the Ship Rat *Rattus rattus* on Lord Howe Island			✓
Removal of dead wood and dead trees			✓

Clearing of native vegetation is a threatened process listed under this Act. Clearing is defined as the destruction of a sufficient proportion of one or more strata (layers) within a stand or stands of native vegetation so as to result in the loss, or long term modification, of the structure, composition and ecological function of stand or stands.

Exotic vines and scramblers may smother existing vegetation, both in the ground layer and canopy. As previously stated, areas of forested vegetation will be regenerated by a trained bush regenerator. This will involve the gradual removal of weeds such as Camphor Laurel. Regeneration works will be undertaken in accordance with a Vegetation Management Plan which will guide the gradual removal of weeds in order to avoid invasion by weeds such as exotic vines and Lantana. It is highly unlikely that the proposed action will result in increased impacts of this key threatening process.

Conclusion
It is highly unlikely that the proposed development will adversely affect the Grey-headed Flying-fox. The proposed works does not affect substantial areas of habitat and will not cause this species to become further endangered.

References
New South Wales National Parks and Wildlife Service (2004). Natural Resource Management Advisory Series: NOTE 8 *North-east New South Wales: Flying Fox Camps*. Available*:* http://www.nationalparks.nsw.gov.au/pdfs/landholder_notes_08_flyingfoxcamps.pdf , NPWS, Coffs Harbour. [Accessed 20 September 2007].

Ballina Shire Council (2004). *Lennox Head Structure Plan*, Ballina Shire Council

NSW National Parks and Wildlife Service (2002). *Threatened Species of the Upper North Coast of New South Wales: Flora*, NPWS Coffs Harbour

Seven-Part Test of Significance for Australasian Bittern (*Botaurus poiciloptilus*)
Australasian Bittern (*Botaurus poiciloptilus*) is listed as Vulnerable on Schedule 2 of the TSC Act 1995.

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

The Australasian Bittern was observed in the Water Quality Control Pond by Council's ecologist in 2002. The Australasian Bittern is a large, stocky bird, reaching up to 75 cm in length. It has a long, thick neck and a straight, brownish-yellow bill. Australasian Bitterns are widespread but uncommon over south-eastern Australia. In NSW they may be found over most of the state except for the far north-west. The Australasian Bittern favours permanent freshwater wetlands with tall, dense vegetation, particularly Bullrushes (*Typha* spp.) and Spikerushes (*Eleoacharis* spp.). Australasian Bitterns hide during the day amongst dense reeds or rushes and feed mainly at night on frogs, fish, yabbies, spiders, insects and snails. Breeding occurs in summer from October to January; nests are built in secluded places in densely-vegetated wetlands on a platform of reeds; there are usually six olive-brown eggs to a clutch.

This species is at threat from:

- drainage of wetlands and ponds;

The Water Quality Control Pond will not be drained and will be maintained for the lifetime of the development. Potential habitat also exists on North Creek, which will not be impacted by the proposed development.

- reduced water quality due to siltation, pollution and salinity;

Extensive mitigation measures, soil erosion and sediment control measures will be implemented during construction works.

- predation by foxes and cats;

The proposed development will not increase this threat. Cats will be restrained at nights.

- use of herbicides, pesticides and other chemicals near wetland areas; and

The grassed area around the Water Quality Control Pond is regularly mown. There is no need for the use of herbicides or pesticides around this area. Bush regeneration within the site will be undertaken by trained professionals.

- grazing and associated frequent burning of wetland areas.

Cattle are currently prevented from accessing the Water Quality Control Pond where the Australasian Bittern has previously been recorded. The proposed development will not increase the threat of fire within the site.

It is not expected that the proposed development is likely to have an adverse effect on the life cycle of the species such that a viable local population is likely to be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No consideration under this part of the assessment is required.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

No consideration under this part of the assessment is required.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

Habitat for the Australasian Bittern is mainly located around the Water Quality Control Pond. This is an artificially constructed area that will not be removed or modified as a result of the proposed development. Furthermore, habitat exists along North Creek which will not be affected by the proposed development.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

Areas are considered likely to become "fragmented or isolated" if the proposal is likely to create a situation preventing future movement of individuals between these areas. Habitat for the Australasian Bittern is mainly located around the Water Quality Control Pond. This is an artificially constructed area that will not become fragmented or isolated from other areas of habitat as a result of the proposed development. The Water Quality Control Pond is located in the south-eastern corner of the site in close proximity to North Creek. It is unlikely that the proposed development will cause an area of habitat to become fragmented or isolated from other areas of habitat.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The areas that are to be removed and modified by the proposed development do not provide suitable habitat for Black Bittern. The removal and modification of these areas that mainly consist of grassland/ sedgeland would therefore not affect the long-term survival of the species. As previously stated, habitat for the Australasian Bittern is mainly located around the Water Quality Control Pond. This is an artificially constructed area that will not be removed, modified, fragmented or isolated from other areas of habitat as a result of the proposed development. An Australasian Bittern was recorded at the Water Quality Control Pond which is located in the south-eastern corner of the site in close proximity to North Creek. This area therefore provides important habitat for the species.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No areas of critical habitat are listed under the *Threatened Species Conservation Act 1995* within the study area nor are there any areas of critical habitat for these species of concern listed under the TSC Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

No recovery plan or threat abatement plan has been prepared for Australasian Bittern (*Botaurus poiciloptilus*).

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

A threatening process is defined under the *Threatened Species Conservation Act 1995* as a process that threatens, or may have the capability to threaten, the survival or evolutionary development of species, populations or ecological communities. The current list of key threatening processes under TSC Act, and whether the proposed development is recognised as a threatening process is shown in **Table B.8**.

Table B.8 Key Threatening

Listed Key Threatening Process (as described in the final determination of the Scientific Committee to list the threatening process)	*Is the development or activity proposed of a class of development or activity that is recognised as a threatening process?*		
	Likely	*Possible*	*Unlikely*
Invasion and Establishment of *Bufo marinus*			✓
Invasion and establishment of exotic vines and scramblers			✓
Alteration of habitat following subsidence due to longwall mining			✓
Invasion of the Yellow Crazy Ant			✓
Herbivory and environmental degradation caused by feral deer			✓
Competition and habitat degradation by feral goats			✓
Predation, habitat degradation, competition and disease transmission by Feral pigs			✓
Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands			✓
Bush rock removal			✓
Clearing of native vegetation			✓
Lantana camara			✓
Competition and grazing by the feral European Rabbit, *Oryctolagus cuniculus* (L.)			✓
Competition from feral honeybee			✓
Death or injury to marine species following capture in shark control programs on ocean beaches			✓
Ecological consequences of high frequency fires			✓
Entanglement in or ingestion of anthropogenic debris in marine and estuarine environments			✓
Human caused climate change			✓
Importation of red imported fire ants into NSW			✓
Infection by *Psittacine circoviral* (beak and feather) disease affecting endangered psittacine species and populations			✓
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis			✓
Infection of native plants by *Phytophthora cinnamomi*			✓
Introduction of the large earth bumblebee, *Bombus terrestris*			✓
Invasion of native plant communities by *Chrysanthemoides monilifera*			✓
Invasion of native plant communities by exotic perennial grasses			✓
Loss and/or degradation of sites used for hill-topping by butterflies			✓
Predation by the Feral Cat *Felis catus* (Linnaeus, 1758)			✓
Predation by the European Red Fox *Vulpes vulpes* (Linnaeus, 1758)			✓
Predation by *Gambusia holbrooki* Girard, 1859 (Plague Minnow or			✓

Listed Key Threatening Process (as described in the final determination of the Scientific Committee to list the threatening process)	*Is the development or activity proposed of a class of development or activity that is recognised as a threatening process?*		
	Likely	*Possible*	*Unlikely*
Mosquito Fish)			
Predation by the Ship Rat *Rattus rattus* on Lord Howe Island			✓
Removal of dead wood and dead trees			✓

Clearing of native vegetation is a threatened process listed under this Act. Clearing is defined as the destruction of a sufficient proportion of one or more strata (layers) within a stand or stands of native vegetation so as to result in the loss, or long term modification, of the structure, composition and ecological function of stand or stands. Clearing will not occur within areas of habitat for Australasian Bittern which are mainly located around the Water Quality Control Pond.

Conclusion

It is highly unlikely that the proposed development will adversely affect the Australasian Bittern. The proposed works does not affect substantial areas of habitat and will not cause this species to become further endangered.

References

Department of Environment and Conservation (2005). *Australasian Bittern – Profile* Accessed 1/9/2005 http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10105 Accessed 20 September 2007

Seven-Part Test of Significance for Greater Broad-nosed Bat (*Scoteanax rueppellii*)

Greater-broad Nosed-bat (*Scoteanax rueppellii*) is listed as Vulnerable on Schedule 2 of the TSC Act 1995.

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

The Greater Broad-nosed Bat is a large powerful bat up to 95 mm long with a broad head and short square muzzle. It is found mainly in the gullies and river systems that drain the Great Dividing Range. In NSW it is widespread on the New England Tablelands, however does not occur at altitudes above 500 m. The Greater Broad-nosed Bat utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest. Open woodland habitat and dry open forest suits the direct flight of this species as it searches for beetles and other large, slow-flying insects; this species has been known to eat other bat species. One young is born in January at maternity sites with suitable tree hollows (NPWS 2002).

This species is at threat from:

- disturbance to roosting and summer breeding sites;

Roosting and breeding habitat within the site is marginal for the Greater Broad-nosed Bat as the vegetation communities are extremely fragmented and do not contain significant tree hollows. The proposed development is not expected to increase this threat.

- foraging habitats are being cleared for residential and agricultural developments, including clearing by residents within rural subdivisions;

The site is currently cleared with several isolated patches of forested vegetation. The vegetation communities within the proposed development site are severely fragmented therefore the area is considered to contain marginal foraging habitat. Suitable habitat exists to the west of the site in vegetation surrounding North Creek. The proposed development is not expected to increase this threat.

- loss of hollow-bearing trees;

The proposed development does not involve the removal of any hollow-bearing trees.

- pesticides and herbicides may reduce the availability of insects, or result in the accumulation of toxic residues in individuals' fat stores; and

No pesticides would be used as a result of the proposed development.. Bush regeneration within the site will be undertaken by trained professionals and herbicide will be kept to a minimum.

- changes to water regimes are likely to impact food resources, as is the use of pesticides and herbicides near waterways.

Some changes are likely to occur to water regimes due to the proposed urban development. However the Water Quality Control Pond will not be drained and will be maintained for the lifetime of the development. Potential habitat also exists on North Creek, which will not be impacted by the proposed development.. No pesticides would be used as a result of the proposed development..

It is not expected that the proposed development is likely to have an adverse effect on the life cycle of the species such that a viable local population is likely to be placed at risk of extinction.

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

No consideration under this part of the assessment is required.

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

No consideration under this part of the assessment is required.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

Vegetation within the development site is severely fragmented and considered marginal foraging and breeding habitat. The majority of this vegetation is to be retained within areas of open space within the proposed development. Furthermore, habitat exists along North Creek which will not be affected by the proposed development.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

Areas are considered likely to become "fragmented or isolated" if the proposal is likely to create a situation preventing future movement of individuals between these areas. Vegetation within the development site is severely fragmented and considered marginal foraging and breeding habitat. The majority of this vegetation is to be retained within areas of open space within the proposed development. Furthermore, habitat exists along North Creek which will not be affected by the proposed development. Therefore it is unlikely that the proposed development will cause the habitat to become fragmented or isolated from other areas of habitat.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The only area of forested vegetation to be removed as a result of the proposed development is 0.1 ha of Swamp Sclerophyll Forest. Cattle currently have access to this area as trampling is evident around the fringes of the community. This community is highly edge effected and healthier stands are located off-site within the adjacent Ballina Nature Reserve. Swamp forest is however viewed as an important source of food and habitat.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

No areas of critical habitat are listed under the *Threatened Species Conservation Act 1995* within the study area nor are there any areas of critical habitat for these species of concern listed under the TSC Act.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

No recovery plan or threat abatement plan has been prepared for Greater-broad Nosed-bat (*Scoteanax rueppellii*).

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

A threatening process is defined under the *Threatened Species Conservation Act 1995* as a process that threatens, or may have the capability to threaten, the survival or evolutionary development of species, populations or ecological communities. The current list of key threatening processes under TSC Act, and whether the proposed development is recognised as a threatening process is shown in **Table B.9**.

Table B.9 Key Threatening Processes

Listed Key Threatening Process (as described in the final determination of the Scientific Committee to list the threatening process)	*Is the development or activity proposed of a class of development or activity that is recognised as a threatening process?*		
	Likely	*Possible*	*Unlikely*
Invasion and Establishment of *Bufo marinus*			✓
Invasion and establishment of exotic vines and scramblers			✓
Alteration of habitat following subsidence due to longwall mining			✓
Invasion of the Yellow Crazy Ant			✓
Herbivory and environmental degradation caused by feral deer			✓
Competition and habitat degradation by feral goats			✓
Predation, habitat degradation, competition and disease transmission by Feral pigs			✓
Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands		✓	
Bush rock removal			✓
Clearing of native vegetation		✓	
Lantana camara			✓
Competition and grazing by the feral European Rabbit, *Oryctolagus cuniculus* (L.)			✓
Competition from feral honeybee			✓
Death or injury to marine species following capture in shark control programs on ocean beaches			✓
Ecological consequences of high frequency fires			✓
Entanglement in or ingestion of anthropogenic debris in marine and estuarine environments			✓
Human caused climate change			✓
Importation of red imported fire ants into NSW			✓
Infection by *Psittacine circoviral* (beak and feather) disease affecting endangered psittacine species and populations			✓
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis			✓
Infection of native plants by *Phytophthora cinnamomi*			✓
Introduction of the large earth bumblebee, *Bombus terrestris*			✓
Invasion of native plant communities by *Chrysanthemoides monilifera*			✓
Invasion of native plant communities by exotic perennial grasses			✓
Loss and/or degradation of sites used for hill-topping by butterflies			✓
Predation by the Feral Cat *Felis catus* (Linnaeus, 1758)			✓
Predation by the European Red Fox *Vulpes vulpes* (Linnaeus, 1758)			✓
Predation by *Gambusia holbrooki* Girard, 1859 (Plague Minnow or			✓

Listed Key Threatening Process (as described in the final determination of the Scientific Committee to list the threatening process)	*Is the development or activity proposed of a class of development or activity that is recognised as a threatening process?*		
	Likely	*Possible*	*Unlikely*
Mosquito Fish)			
Predation by the Ship Rat *Rattus rattus* on Lord Howe Island			✓
Removal of dead wood and dead trees			✓

Clearing of native vegetation is a threatened process listed under this Act. Clearing is defined as the destruction of a sufficient proportion of one or more strata (layers) within a stand or stands of native vegetation so as to result in the loss, or long term modification, of the structure, composition and ecological function of stand or stands. The site consists of cleared coastal land that is currently used for cattle grazing. The proposed development will require the clearance of areas of vegetation for the construction of dwellings, roads and associated infrastructure. The only area of forested vegetation to be removed as a result of the proposed development is 0.1 ha of Swamp Sclerophyll Forest. Cattle currently have access to this area as trampling is evident around the fringes of the community. This community is highly edge effected and healthier stands are located off-site within the adjacent Ballina Nature Reserve. Swamp forest is viewed as an important source of food and habitat however the proposed action is unlikely that the proposed action will result in increased impacts of this key threatening process.

Alteration to natural flow regimes can occur through reducing or increasing flows, altering seasonality of flows, changing the frequency, duration, magnitude, timing, predictability and variability of flow events, altering surface and subsurface water levels and changing the rate of rise or fall of water levels (DEC 2004).

Some changes are likely to occur to water regimes due to the proposed urban development. However the Water Quality Control Pond will not be drained and will be maintained for the lifetime of the development. Potential habitat also exists on North Creek, which will not be impacted by the proposed development. Therefore it is unlikely that the proposed action will result in increased impacts of this key threatening process.

Conclusion

It is highly unlikely that the proposed development will adversely affect the Greater Broad-nosed Bat. The proposed works does not affect substantial areas of habitat and will not cause this species to become further endangered.

References

Department of Environment and Conservation (2005). *Threatened species, populations and ecological communities of NSW - Greater Broad-nosed Bat - Profile*
http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/profile.aspx?id=10748
[Accessed 20 September 2007].

New South Wales National Parks and Wildlife Service (2004). *Alteration to the natural flow regimes of rivers, streams, floodplains & wetlands - key threatening process listing*
http://nationalparks.nsw.gov.au/npws.nsf/Content/Alteration+to+the+natural+flow+regimes+of+rivers%2C+streams%2C+floodplains+and+wetlands+key+threatening+process+declaration

C

Database Search Results

NSW National Parks & Wildlife Service
atlas of nsw wildlife

Search Results

Your selection: Flora, threatened species, Selected Area - 153.53523,-28.85920,153.63821,-28.75920 returned a total of 62 records of 7 species.

Report generated on 21/05/2007 - 17:02 (Data valid to 20/05/2007)

Choose up to 3 species to map.

** Exotic (non-native) species*

Plants	Map	Scientific Name	Common Name	Legal Status	Count	Info
Euphorbiaceae						
	☐	Fontainea oraria	Coastal Fontainea	E1	28	
Fabaceae (Mimosoideae)						
	☐	Archidendron hendersonii	White Lace Flower	V	5	
Lauraceae						
	☐	Cryptocarya foetida	Stinking Cryptocarya	V	8	
Menispermaceae						
	☐	Tinospora tinosporoides	Arrow-head Vine	V	2	
Orchidaceae						
	☐	Phaius australis	Southern Swamp Orchid	E1	2	
Proteaceae						
	☐	Macadamia tetraphylla	Rough-shelled Bush Nut	V	10	
Rutaceae						
	☐	Acronychia littoralis	Scented Acronychia	E1	7	

** Exotic (non-native) species*

Choose up to 3 species to map.

NSW National Parks & Wildlife Service
atlas of nsw wildlife

Search Results

Your selection: Fauna, threatened species, Selected Area - 153.53523,-28.85920,153.63821,-28.75920 returned a total of 658 records of 52 species.
Report generated on 21/05/2007 - 17:01 (Data valid to 20/05/2007)

Choose up to 3 species to map.
** Exotic (non-native) species*

Amphibia	Map	Scientific Name	Common Name	Legal Status	Count	Info
Hylidae						
	☐	Litoria aurea	Green and Golden Bell Frog	E1	1	
	☐	Litoria olongburensis	Olongburra Frog	V	9	
Myobatrachidae						
	☐	Crinia tinnula	Wallum Froglet	V	23	

Aves	Map	Scientific Name	Common Name	Legal Status	Count	Info
Accipitridae						
	☐	Pandion haliaetus	Osprey	V	95	
Anatidae						
	☐	Stictonetta naevosa	Freckled Duck	V	2	
Anseranatidae						
	☐	Anseranas semipalmata	Magpie Goose	V	1	
Ardeidae						
	☐	Botaurus poiciloptilus	Australasian Bittern	V	2	
Burhinidae						
	☐	Burhinus grallarius	Bush Stone-curlew	E1	1	
	☐	Esacus neglectus	Beach Stone-curlew	E1	4	
Charadriidae						
	☐	Charadrius leschenaultii	Greater Sand-plover	V	25	
	☐	Charadrius mongolus	Lesser Sand-plover	V	43	
Ciconiidae						
	☐	Ephippiorhynchus asiaticus	Black-necked Stork	E1	60	
Columbidae						
	☐	Ptilinopus regina	Rose-crowned Fruit-Dove	V	5	
Diomedeidae						
	☐	Phoebetria fusca	Sooty Albatross	V	1	
Gruidae						
	☐	Grus rubicunda	Brolga	V	4	
Haematopodidae						
	☐	Haematopus fuliginosus	Sooty Oystercatcher	V	16	
	☐	Haematopus longirostris	Pied Oystercatcher	V	44	
Jacanidae						
	☐	Irediparra gallinacea	Comb-crested Jacana	V	1	
Laridae						
	☐	Gygis alba	White Tern	V	1	
		Sterna albifrons	Little Tern	E1	72	

☐					
☐	Sterna fuscata	Sooty Tern	V	1	
Meliphagidae					
☐	Lichenostomus fasciogularis	Mangrove Honeyeater	V	14	
Podargidae					
☐	Podargus ocellatus	Marbled Frogmouth	V	1	
Pomatostomidae					
☐	Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	V	3	
Procellariidae					
☐	Pterodroma solandri	Providence Petrel	V	1	
☐	Puffinus carneipes	Flesh-footed Shearwater	V	4	
Psittacidae					
☐	Pezoporus wallicus wallicus	Eastern Ground Parrot	V	3	
Rallidae					
☐	Amaurornis olivaceus	Bush-hen	V	4	
Rostratulidae					
☐	Rostratula benghalensis australis	Painted Snipe (Australian subspecies)	E1	1	
Scolopacidae					
☐	Calidris alba	Sanderling	V	11	
☐	Calidris tenuirostris	Great Knot	V	52	
☐	Limicola falcinellus	Broad-billed Sandpiper	V	4	
☐	Limosa limosa	Black-tailed Godwit	V	17	
☐	Xenus cinereus	Terek Sandpiper	V	75	
Tytonidae					
☐	Tyto capensis	Grass Owl	V	11	
☐	Tyto novaehollandiae	Masked Owl	V	3	

Gastropoda	Map	Scientific Name	Common Name	Legal Status	Count	Info
Camaenidae						
	☐	Thersites mitchellae	Mitchell's Rainforest Snail	E1	2	

Mammalia	Map	Scientific Name	Common Name	Legal Status	Count	Info
Balaenopteridae						
	☐	Megaptera novaeangliae	Humpback Whale	V	1	
Dasyuridae						
	☐	Planigale maculata	Common Planigale	V	3	
Molossidae						
	☐	Mormopterus norfolkensis	Eastern Freetail-bat	V	1	
Phascolarctidae						
	☐	Phascolarctos cinereus	Koala	V	1	
Pteropodidae						
	☐	Pteropus alecto	Black Flying-fox	V	7	
	☐	Pteropus poliocephalus	Grey-headed Flying-fox	V	10	
	☐	Syconycteris australis	Common Blossom-bat	V	1	
Vespertilionidae						
	☐	Miniopterus australis	Little Bentwing-bat	V	5	
	☐	Miniopterus schreibersii oceanensis	Eastern Bentwing-bat	V	2	
	☐	Myotis adversus	Large-footed Myotis	V	2	

	☐ Nyctophilus bifax	Eastern Long-eared Bat	V	1	
	☐ Scoteanax rueppellii	Greater Broad-nosed Bat	V	2	

Reptilia	Map	Scientific Name	Common Name	Legal Status	Count	Info
Cheloniidae						
	☐	Caretta caretta	Loggerhead Turtle	E1	2	
	☐	Chelonia mydas	Green Turtle	V	1	
Dermochelyidae						
	☐	Dermochelys coriacea	Leathery Turtle	V	2	

** Exotic (non-native) species*

Choose up to 3 species to map.

Australian Government
Department of the Environment and Water Resources

Protected Matters Search Tool

You are here: Environment Home > EPBC Act > Search

21 May 2007 16:54

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

You may wish to print this report for reference before moving to other pages or websites.

The Australian Natural Resources Atlas at http://www.environment.gov.au/atlas may provide further environmental information relevant to your selected area. Information about the EPBC Act including significance guidelines, forms and application process details can be found at http://www.environment.gov.au/epbc/assessmentsapprovals/index.html

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Buffer: 5 km
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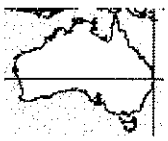
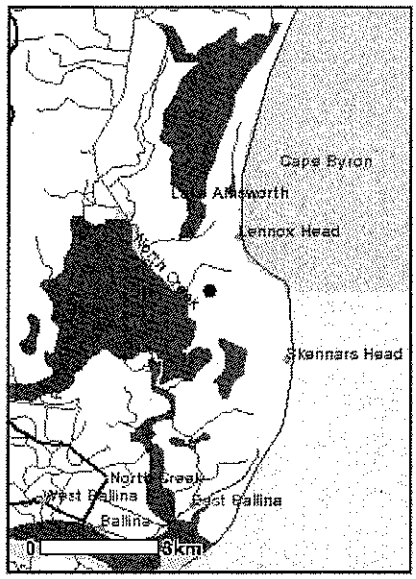


Report Contents:
Summary
Details
- Matters of NES
- Other matters protected by the EPBC Act

- Extra Information
Caveat
Acknowledgments



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance - see http://www.environment.gov.au/epbc/assessmentsapprovals/guidelines/index.html.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Significance: (Ramsar Sites)	None
Commonwealth Marine Areas:	Relevant
Threatened Ecological Communities:	None
Threatened Species:	41
Migratory Species:	39

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place and the heritage values of a place on the Register of the National Estate. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage/index.html.

Please note that the current dataset on Commonwealth land is not complete. Further information on Commonwealth land would need to be obtained from relevant sources including Commonwealth agencies, local agencies, and land tenure maps.

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species. Information on EPBC Act permit requirements and application forms can be found at http://www.environment.gov.au/epbc/permits/index.html.

Commonwealth Lands:	1
Commonwealth Heritage Places:	None
Places on the RNE:	3
Listed Marine Species:	59
Whales and Other Cetaceans:	13
Critical Habitats:	None
Commonwealth Reserves:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	1
Other Commonwealth Reserves:	None
Regional Forest Agreements:	1

Details

Matters of National Environmental Significance

Commonwealth Marine Areas [Dataset Information]

Approval may be required for a proposed activity that is likely to have a significant impact on the environment in a Commonwealth Marine Area, when the action is outside the Commonwealth Marine Area, or the environment anywhere when the action is taken within the Commonwealth Marine Area. Generally the Commonwealth Marine Area stretches from three nautical miles to two hundred nautical miles from the coast.

Within 3 Nautical Mile Limit

Threatened Species [Dataset Information]	Status	Type of Presence
Birds		
*Cyclopsitta diophthalma coxeni** Coxen's Fig-Parrot	Endangered	Species or species habitat likely to occur within area
Diomedea dabbenena * Tristan Albatross	Endangered	Foraging may occur within area
Lathamus discolor * Swift Parrot	Endangered	Species or species habitat may occur within area
Macronectes giganteus * Southern Giant-Petrel	Endangered	Species or species habitat may occur within area
Macronectes halli *	Vulnerable	Species or species habitat may occur within

Northern Giant-Petrel		area
*Poephila cincta cincta** Black-throated Finch (southern)	Endangered	Species or species habitat likely to occur within area
*Pterodroma neglecta neglecta** Kermadec Petrel (western)	Vulnerable	Species or species habitat may occur within area
Rostratula australis * Australian Painted Snipe	Vulnerable	Species or species habitat may occur within area
Thalassarche impavida * Campbell Albatross	Vulnerable	Species or species habitat may occur within area
Xanthomyza phrygia * Regent Honeyeater	Endangered	Species or species habitat may occur within area
Frogs		
Litoria aurea * Green and Golden Bell Frog	Vulnerable	Species or species habitat may occur within area
Litoria olongburensis * Wallum Sedge Frog	Vulnerable	Species or species habitat likely to occur within area
Mammals		
Balaenoptera musculus * Blue Whale	Endangered	Species or species habitat may occur within area
Chalinolobus dwyeri * Large-eared Pied Bat, Large Pied Bat	Vulnerable	Species or species habitat may occur within area
*Dasyurus maculatus maculatus (SE mainland population)** Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population)	Endangered	Species or species habitat may occur within area
Eubalaena australis * Southern Right Whale	Endangered	Species or species habitat likely to occur within area
Megaptera novaeangliae * Humpback Whale	Vulnerable	Species or species habitat known to occur within area
*Potorous tridactylus tridactylus** Long-nosed Potoroo (SE mainland)	Vulnerable	Species or species habitat may occur within area
Pteropus poliocephalus * Grey-headed Flying-fox	Vulnerable	Roosting known to occur within area
Reptiles		
Caretta caretta * Loggerhead Turtle	Endangered	Species or species habitat may occur within area
Chelonia mydas * Green Turtle	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea * Leathery Turtle, Leatherback Turtle, Luth	Vulnerable	Breeding known to occur within area
Sharks		
*Carcharias taurus (east coast population)** Grey Nurse Shark (east coast population)	Critically Endangered	Species or species habitat may occur within area
Carcharodon carcharias * Great White Shark	Vulnerable	Species or species habitat may occur within area
Rhincodon typus * Whale Shark	Vulnerable	Species or species habitat may occur within area
Snails, slugs		
Thersites mitchellae * Mitchell's Rainforest Snail	Critically Endangered	Species or species habitat likely to occur within area
Plants		
Acronychia littoralis * Scented Acronychia	Endangered	Species or species habitat likely to occur within area
Austromyrtus fragrantissima * Scale Myrtle, Sweet Myrtle	Endangered	Species or species habitat likely to occur within area
Cryptocarya foetida * Stinking Cryptocarya, Stinking Laurel	Vulnerable	Species or species habitat likely to occur within area
Davidsonia sp. Mullumbimby-Currumbin Ck (A.G.Floyd 1595) *	Endangered	Species or species habitat likely to occur within area

Desmodium acanthocladum * Thorny Pea	Vulnerable	Community likely to occur within area
Diploglottis campbellii * Small-leaved Tamarind	Endangered	Species or species habitat likely to occur within area
Floydia praealta * Ball Nut, Possum Nut, Big Nut, Beefwood	Vulnerable	Species or species habitat likely to occur within area
Fontainea oraria * Coastal Fontainea	Endangered	Species or species habitat likely to occur within area
Macadamia tetraphylla * Rough-shelled Bush Nut, Macadamia Nut, Rough-shelled Macadamia, Rough-leaved Queensland Nut	Vulnerable	Species or species habitat likely to occur within area
Owenia cepiodora * Onionwood, Bog Onion, Onion Cedar	Vulnerable	Species or species habitat likely to occur within area
Phaius australis * Lesser Swamp-orchid	Endangered	Species or species habitat likely to occur within area
Randia moorei * Spiny Gardenia	Endangered	Species or species habitat likely to occur within area
Syzygium hodgkinsoniae * Smooth-bark Rose Apple, Red Lilly Pilly	Vulnerable	Species or species habitat likely to occur within area
Syzygium moorei * Rose Apple, Coolamon, Robby, Durobby, Watermelon Tree, Coolamon Rose Apple	Vulnerable	Species or species habitat likely to occur within area
Tinospora tinosporoides * Arrow-head Vine	Vulnerable	Species or species habitat likely to occur within area
Migratory Species [Dataset Information]	Status	Type of Presence
Migratory Terrestrial Species		
Birds		
*Cyclopsitta diophthalma coxeni** Coxen's Fig-Parrot	Migratory	Species or species habitat likely to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle	Migratory	Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail	Migratory	Species or species habitat may occur within area
Merops ornatus * Rainbow Bee-eater	Migratory	Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch	Migratory	Breeding may occur within area
Monarcha trivirgatus Spectacled Monarch	Migratory	Breeding likely to occur within area
Myiagra cyanoleuca Satin Flycatcher	Migratory	Breeding likely to occur within area
Rhipidura rufifrons Rufous Fantail	Migratory	Breeding may occur within area
Xanthomyza phrygia Regent Honeyeater	Migratory	Species or species habitat may occur within area
Migratory Wetland Species		
Birds		
Ardea alba Great Egret, White Egret	Migratory	Species or species habitat may occur within area
Ardea ibis Cattle Egret	Migratory	Species or species habitat may occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover	Migratory	Species or species habitat likely to occur within area
Gallinago hardwickii * Latham's Snipe, Japanese Snipe	Migratory	Species or species habitat may occur within area
Pluvialis fulva Pacific Golden Plover	Migratory	Species or species habitat likely to occur within area
Rostratula benghalensis s. lat. Painted Snipe	Migratory	Species or species habitat may occur within area

Migratory Marine Birds

Apus pacificus Fork-tailed Swift	Migratory	Species or species habitat may occur within area
Ardea alba Great Egret, White Egret	Migratory	Species or species habitat may occur within area
Ardea ibis Cattle Egret	Migratory	Species or species habitat may occur within area
Calonectris leucomelas Streaked Shearwater	Migratory	Species or species habitat may occur within area
Diomedea dabbenena Tristan Albatross	Migratory	Foraging may occur within area
Macronectes giganteus Southern Giant-Petrel	Migratory	Species or species habitat may occur within area
Macronectes halli Northern Giant-Petrel	Migratory	Species or species habitat may occur within area
Puffinus leucomelas Streaked Shearwater	Migratory	Species or species habitat may occur within area
Sterna albifrons Little Tern	Migratory	Species or species habitat may occur within area
Thalassarche chlororhynchos Yellow-nosed Albatross, Atlantic Yellow-nosed Albatross	Migratory	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross	Migratory	Species or species habitat may occur within area

Migratory Marine Species

Mammals

Balaenoptera edeni Bryde's Whale	Migratory	Species or species habitat may occur within area
Balaenoptera musculus * Blue Whale	Migratory	Species or species habitat may occur within area
Dugong dugon Dugong	Migratory	Species or species habitat likely to occur within area
Eubalaena australis * Southern Right Whale	Migratory	Species or species habitat likely to occur within area
Lagenorhynchus obscurus Dusky Dolphin	Migratory	Species or species habitat may occur within area
Megaptera novaeangliae * Humpback Whale	Migratory	Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca	Migratory	Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin	Migratory	Species or species habitat may occur within area

Reptiles

Caretta caretta * Loggerhead Turtle	Migratory	Species or species habitat may occur within area
Chelonia mydas * Green Turtle	Migratory	Species or species habitat may occur within area
Dermochelys coriacea * Leathery Turtle, Leatherback Turtle, Luth	Migratory	Breeding known to occur within area

Sharks

Carcharodon carcharias Great White Shark	Migratory	Species or species habitat may occur within area
Rhincodon typus Whale Shark	Migratory	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species [Dataset Information]	Status	Type of Presence
Birds		
Apus pacificus Fork-tailed Swift	Listed - overfly	Species or species habitat may occur within area

	marine area	
Ardea alba Great Egret, White Egret	Listed - overfly marine area	Species or species habitat may occur within area
Ardea ibis Cattle Egret	Listed - overfly marine area	Species or species habitat may occur within area
Calonectris leucomelas Streaked Shearwater	Listed	Species or species habitat may occur within area
Catharacta skua Great Skua	Listed	Species or species habitat may occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover	Listed	Species or species habitat likely to occur within area
Diomedea dabbenena Tristan Albatross	Listed	Foraging may occur within area
Gallinago hardwickii * Latham's Snipe, Japanese Snipe	Listed - overfly marine area	Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle	Listed	Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail	Listed - overfly marine area	Species or species habitat may occur within area
Lathamus discolor * Swift Parrot	Listed - overfly marine area	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel	Listed	Species or species habitat may occur within area
Macronectes halli Northern Giant-Petrel	Listed	Species or species habitat may occur within area
Merops ornatus * Rainbow Bee-eater	Listed - overfly marine area	Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch	Listed - overfly marine area	Breeding may occur within area
Monarcha trivirgatus Spectacled Monarch	Listed - overfly marine area	Breeding likely to occur within area
Myiagra cyanoleuca Satin Flycatcher	Listed - overfly marine area	Breeding likely to occur within area
Pluvialis fulva Pacific Golden Plover	Listed	Species or species habitat likely to occur within area
Rhipidura rufifrons Rufous Fantail	Listed - overfly marine area	Breeding may occur within area
Rostratula benghalensis s. lat. Painted Snipe	Listed - overfly marine area	Species or species habitat may occur within area
Sterna albifrons Little Tern	Listed	Species or species habitat may occur within area

Thalassarche chlororhynchos Yellow-nosed Albatross, Atlantic Yellow-nosed Albatross	Listed	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross	Listed	Species or species habitat may occur within area
Mammals		
Dugong dugon Dugong	Listed	Species or species habitat likely to occur within area
Ray-finned fishes		
Acentronura tentaculata Hairy Pygmy Pipehorse	Listed	Species or species habitat may occur within area
Campichthys tryoni Tryon's Pipefish	Listed	Species or species habitat may occur within area
Corythoichthys amplexus Fijian Banded Pipefish, Brown-banded Pipefish	Listed	Species or species habitat may occur within area
Corythoichthys ocellatus Orange-spotted Pipefish, Ocellated Pipefish	Listed	Species or species habitat may occur within area
Festucalex cinctus Girdled Pipefish	Listed	Species or species habitat may occur within area
Filicampus tigris Tiger Pipefish	Listed	Species or species habitat may occur within area
Halicampus grayi Mud Pipefish, Gray's Pipefish	Listed	Species or species habitat may occur within area
Hippichthys cyanospilos Blue-speckled Pipefish, Blue-spotted Pipefish	Listed	Species or species habitat may occur within area
Hippichthys heptagonus Madura Pipefish, Reticulated Freshwater Pipefish	Listed	Species or species habitat may occur within area
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish	Listed	Species or species habitat may occur within area
Hippocampus kelloggi Kellogg's Seahorse	Listed	Species or species habitat may occur within area
Hippocampus kuda Spotted Seahorse, Yellow Seahorse	Listed	Species or species habitat may occur within area
Hippocampus planifrons Flat-face Seahorse	Listed	Species or species habitat may occur within area
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse	Listed	Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish	Listed	Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish	Listed	Species or species habitat may occur within area
Micrognathus andersonii Anderson's Pipefish, Shortnose Pipefish	Listed	Species or species habitat may occur within area
Micrognathus brevirostris Thorn-tailed Pipefish	Listed	Species or species habitat may occur within area
Microphis manadensis Manado River Pipefish, Manado Pipefish	Listed	Species or species habitat may occur within area
Solegnathus dunckeri Duncker's Pipehorse	Listed	Species or species habitat may occur within area
Solegnathus hardwickii Pipehorse	Listed	Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse	Listed	Species or species habitat may occur within area
Solenostomus cyanopterus Blue-finned Ghost Pipefish, Robust Ghost Pipefish	Listed	Species or species habitat may occur within area
Solenostomus paradoxus Harlequin Ghost Pipefish, Ornate Ghost Pipefish	Listed	Species or species habitat may occur within area
Stigmatopora nigra Wide-bodied Pipefish, Black Pipefish	Listed	Species or species habitat may occur within area
Syngnathoides biaculeatus	Listed	Species or species habitat may occur within

Double-ended Pipehorse, Alligator Pipefish		area
Trachyrhamphus bicoarctatus Bend Stick Pipefish, Short-tailed Pipefish	Listed	Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish	Listed	Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish	Listed	Species or species habitat may occur within area
Reptiles		
Astrotia stokesii Stokes' Seasnake	Listed	Species or species habitat may occur within area
Caretta caretta * Loggerhead Turtle	Listed	Species or species habitat may occur within area
Chelonia mydas * Green Turtle	Listed	Species or species habitat may occur within area
Dermochelys coriacea * Leathery Turtle, Leatherback Turtle, Luth	Listed	Breeding known to occur within area
Hydrophis elegans Elegant Seasnake	Listed	Species or species habitat may occur within area
Pelamis platurus Yellow-bellied Seasnake	Listed	Species or species habitat may occur within area
Whales and Other Cetaceans [Dataset Information]	Status	Type of Presence
Balaenoptera acutorostrata Minke Whale	Cetacean	Species or species habitat may occur within area
Balaenoptera edeni Bryde's Whale	Cetacean	Species or species habitat may occur within area
Balaenoptera musculus * Blue Whale	Cetacean	Species or species habitat may occur within area
Delphinus delphis Common Dolphin	Cetacean	Species or species habitat may occur within area
Eubalaena australis * Southern Right Whale	Cetacean	Species or species habitat likely to occur within area
Grampus griseus Risso's Dolphin, Grampus	Cetacean	Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin	Cetacean	Species or species habitat may occur within area
Megaptera novaeangliae * Humpback Whale	Cetacean	Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca	Cetacean	Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin	Cetacean	Species or species habitat may occur within area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin	Cetacean	Species or species habitat may occur within area
Tursiops aduncus Spotted Bottlenose Dolphin	Cetacean	Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin	Cetacean	Species or species habitat may occur within area

Commonwealth Lands [Dataset Information]

Communications, Information Technology and the Arts - Telstra Corporation Limited

Places on the RNE [Dataset Information]
Note that not all Indigenous sites may be listed.

Indigenous

Lennox Head Aboriginal Area NSW

Natural

Ballina Nature Reserve (1977 boundary) NSW

Lennox Head Littoral Rainforest NSW

Extra Information

State and Territory Reserves [Dataset Information]

Ballina Nature Reserve, NSW

Regional Forest Agreements [Dataset Information]
Note that all RFA areas including those still under consideration have been included.

Upper North East NSW RFA, New South Wales

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the *Environment Protection and Biodiversity Conservation Act 1999*. It holds mapped locations of World Heritage and Register of National Estate properties, Wetlands of International Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. 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 where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under "type of presence". For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

Only selected species covered by the migratory and marine provisions of the Act have been mapped.

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur 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.

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Acknowledgments

This database has been compiled from a range of data sources. The Department acknowledges the following custodians who have contributed valuable data and advice:

- New South Wales National Parks and Wildlife Service
- Department of Sustainability and Environment, Victoria
- Department of Primary Industries, Water and Environment, Tasmania
- Department of Environment and Heritage, South Australia Planning SA
- Parks and Wildlife Commission of the Northern Territory
- Environmental Protection Agency, Queensland
- Birds Australia
- Australian Bird and Bat Banding Scheme

- Australian National Wildlife Collection
- Natural history museums of Australia
- Queensland Herbarium
- National Herbarium of NSW
- Royal Botanic Gardens and National Herbarium of Victoria
- Tasmanian Herbarium
- State Herbarium of South Australia
- Northern Territory Herbarium
- Western Australian Herbarium
- Australian National Herbarium, Atherton and Canberra
- University of New England
- Other groups and individuals

ANUClIM Version 1.8, Centre for Resource and Environmental Studies, Australian National University was used extensively for the production of draft maps of species distribution. Environment Australia is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

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Fauna Species List

Table D1 General Fauna Observations

Grouping	*Scientific Name*	*Common Name*
Birds	*Anas superciliosa*	Pacific Black Duck
	Ardea ibis	Cattle Egret
	Botaurus poiciloptilus	**Australasian Bittern**
	Centropus phasianinus	Pheasant Coucal
	Cisticola exilis	Golden-headed Cisticola
	Colluricincla harmonica	Grey Shrike-thrush
	Columba livia	Feral Pigeon
	Coracina novaehollandiae	Black-faced Cuckoo-shrike
	Corvus orru	Torresian Crow
	Craticus nigrogularis	Pied Butcherbird
	Daphoenositta chrysoptera	Sittela
	Eopsaltria australis	Eastern Yellow-robin
	Elanus notatus	Black-shouldered Kite
	Gallinago hardwickii	Latham's Snipe
	Gallirallus philippensis	Buff-banded Rail
	Gymnorhina tibicen	Australian Magpie
	Hirundapus caudacutus	White-throated Needletail
	Hirundo neoxena	Welcome Swallow
	Licherma indistincta	Brown Honeyeater
	Lochura castaneothorax	Chestnut-breasted Manikin
	Malurus cyancus	Superb Blue Wren
	Malurus melanocephalus	Red-backed Fairy Wren
	Manorina melanocephala	Noisy Minor
	Megalurus timoriensis	Tawny Grassbird
	Myiagra rubecula	Leaden Flycatcher
	Neochmia temporalis	Red-browed Finch
	Oriolus sagittatus	Olive-backed Oriole
	Pachycephala pectoralis	Golden Whistler
	Pachycephala rufiventris	Rufous Whistler
	Platalea regia	Royal Spoonbill
	Porphyrio porphyrio	Purple Swamphen
	Psophodes olivaceus	Eastern Whipbird
	Rhipidura fuliginosa	Grey Fantail
	Rhipidura leucophrys	Willy Wagtail
	Rhipidura rufifrons	Rufous Fantail
	Sphecotheres viridis	Figbird
	Strepera graculina	Pied Currawong

Grouping	*Scientific Name*	*Common Name*
	Threskiornis aethiopicus	White Ibis
	Threskiornis aethiopicus	Sacred Ibis
	Tyto alba	Barn Owl
	Zosterops lateralis	Silvereye
Amphibians	*Crinia signifera*	Common Eastern Froglet
	Litoria caerulea	Green Tree Frog
	Litoria dentate	Bleating Tree Frog
	Litoria fallax	Eastern Dwarf Tree Frog
	Litoria nasuta	Rocket Frog
	Uperoleia laevigata	Smooth Toadlet
	Bufo marinus	Cane Toad
Reptiles	*Lampropholis delicata*	Delicate Skink
	Morelia spilota	Carpet Python
	Pseudechis porphyriacus	Red-bellied Black Snake
	Pseudonaja textilis	Eastern Brown Snake
	Saiphos equalis	Three-toed Skink
Mammals	*Chalinolobus gouldii*	Gould's Wattled Bat
	Isoodon macrourus	Northern Brown-bandicoot
	Mormopterus planiceps	Southern Freetail-bat
	Mus musculus	House Mouse
	Pteropus poliocephalus	**Grey-headed Flying-fox**
	Rattus lutreolus	Swamp Rat
	Scoteanax rueppellii	**Greater Broad-nosed Bat**
	Sus scrofa	Feral Pig
	Tadarida australis	White-striped Mastiff-bat
	Trichosurus caninus	Mountain Brushtail Possum
	Wallabia bicolor	Swamp Wallaby