



Gnaraloo Station

Gascoyne

Registration: Full
Registration Number: 2647
Sign Numbers: 2124 & 2125



Department of Biodiversity,
Conservation and Attractions
Science and Conservation



LAND FOR WILDLIFE

PROPERTY ASSESSMENT REPORT

***LFW* Reg. No. 2647**

Property description

Mailing address

Gnaraloo Wilderness Foundation Inc. PO Box 632 Australind WA 6233

Property address

Gnaraloo Station

Principal land use or enterprise

Pastoralism and tourism

Total area of property (ha)

82,125 ha

Area of remnant vegetation (ha)

82,125 ha

% of whole which is *LFW* site(s)

82,125 ha

Landholder interests

Endangered sea turtles in adjacent Gnaraloo coastal area & reptiles, marsupials and birds at the property perimeter with the Lake MacLeod wetland system
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Biodiversity protection, including all native flora and fauna

1 Land for Wildlife assessment

From 1–2 July 2019, a Land for Wildlife (LFW) assessment was undertaken over relevant, accessible areas of the Gnaraloo Station, which included key land systems and habitat types, as per the sites listed (Table 1). Within these areas, vegetation communities were assessed according to their habitat, visible fauna (individuals and/or tracks/signs) and conservation values.

Vegetation communities traversed include:

- Mallee land system (Site 1)
- Cardabia land system (Site 2)
- Coast land system (Site 3)
- Warroora land system (Site 4)
- MacLeod land system (Site 5)



Site 1: Mallee land system



Site 2: Cardabia land system



Site 4: Warroora land system



Site 5: MacLeod land system

Table 1: Key sites traversed during the assessment

Site	Total area of station (ha)	Land system	Description	Habitat condition/quality/regeneration
1	47.5%	Mallee	This system supports mixed Hard Spinifex and Soft Spinifex pastures with variable inclusions of useful low shrubs.	Vegetation in this area is mostly fair to good with a large fire in 2009 impacting some areas.
2	11.5%	Cardabia	Vegetation on this system are hummock grasslands of soft spinifex and hard spinifex with numerous low shrubs. The system is generally stable under grazing except for occasional dunes and dune crests, which may become unstable because of fire or excessive grazing pressure. Periodic controlled burning is desirable to maintain pastures in an attractive condition for stock. Some sand drift can occur after fire, but the system revegetates rapidly after rain and stabilises.	Habitat condition is predominantly good with smaller proportions in very good and fair condition.
3	4.9%	Coast	This system supports coastal dune shrub pastures and soft spinifex pastures. Along the coast are large, long-walled parabolic coastal dunes and narrow swales, unstable blowout areas, low sea cliffs, rocky wave cut platforms and beach; patchy acacia shrublands and hummock grasslands of soft and hard spinifex	Habitat condition is predominantly good There are a few areas along the coastal strip where perhaps a combination of wind erosion and high use (vehicle thoroughfare) has stripped the soil to expose the underlying limestone.
4	4%	Warroora	Nearly flat, saline alluvial plains, drainage tracts and prominent drainage foci, minor limestone outcrop plains and sandy banks; low shrublands of saltbush and bluebush.	The saltbush and bluebush pastures on this system are in good condition
5	2.9%	MacLeod	Samphire flats and sandy plains with bare marginal mudflats; low shrublands of samphire and saltbush	Samphire and Saltbush pastures on this system are in fair to good condition.

Reference: Payne, A L, Spencer, G F, and Curry, P J. (1987), *An inventory and condition survey of rangelands in the Carnarvon Basin, Western Australia.*

2 Current management

An ESRM (Ecologically Sustainable Rangelands Management) Plan underpins this report. Tourism is the primary enterprise on Gnaraloo station with the harvesting of feral goats an additional source of income.

The threat of fire on the property is of concern due to large wildfires occurring in the recent past (2009) and throughout the managed history of the station. Fire breaks surrounding major tourist areas and throughout the property are managed on a regular basis.

In terms of feral animals, no large feral herbivores have been recorded on the property. Smaller predators such as feral cats, wild dogs and foxes are prominent on the station. These species have been managed through other feral animal control programs on Gnaraloo from 2008 to present.

3 Flora

A search of the NatureMap database (Department of Biodiversity Conservation and Attractions 2019c; WAM 2019) has found a total of 38 flora species recorded or known to occur within suitable habitats on Gnaraloo station (Appendix A). In terms of the quality of vegetation, most of the vegetation was in good to very good condition with a diversity of species noted and a good range of structural complexity in plants. There was evidence of managed goat grazing in some sections of the station visited (coastal land system) and this appears to be well managed due to the low numbers of goats present. In terms of the quality of vegetation, most of the vegetation was intact with minimal grazing. Regeneration appears to be occurring naturally in some areas and consists of younger plants.

Historically, fire has been a natural feature of the Gnaraloo environment. The composition of native vegetation is altered preceding a fire with rapid growing species such as native poplar and fire bush becoming temporarily dominant (Payne et al 1987). A variety of small shrubs, herbs and grasses are also prominent for a few years after a fire (Payne et al 1987).

There are no significant weeds found on the property in areas traversed during the land for wildlife assessment. *Cenchrus spp.* is naturalised in some coastal pockets, lakebeds and amongst sand dunes on Gnaraloo Station.

3.1 Threatened and Priority Flora

The following Threatened or Priority flora species have been previously recorded within and 50km outside the property (Department of Biodiversity Conservation and Attractions 2019a) See Table 2 below. *Stackhousia clementii* has been previously recorded within the station itself. No threatened or priority flora species were searched for during the assessment process.

Table 2: Priority flora previously recorded within and 50km outside the property boundary

Species	Conservation code	Description	Site/land feature	Vegetation description	Recorded location	Date
<i>Cyperus victoriensis</i>	1	N/A	Along creek.	N/A	Winning Pool area, on North West Coastal Highway, 130 miles S of Onslow	1965
<i>Eremophila cuneata</i>	1	N/A	Limestone outcrop. Dry red sand.	Sparse bunch grass plains with scattered <i>Eremophila</i> spp. Associated species: <i>Eremophila</i> spp., <i>Ptilotus</i> sp., <i>Hakea stenophylla</i> and <i>Cenchrus ciliatus</i> .	Minilya Exmouth Road (c. 64 SLK) turnoff onto W side of road into gravel pit area. C. 13.7 km S of the Coral Bay turnoff, Warroora Station	2017
<i>Indigofera oraria</i>	1	Small perennial shrub 30 cm tall and 50 cm across.	W-facing steep dune slope above (6 m +) beach. Very pale tan coloured calcareous sand.	Mixed open shrubland: Asteraceae, <i>Angianthus cunninghamii</i> , <i>Eremophila</i> spp. with annuals and <i>Cenchrus</i> . Associated species: <i>Ptilotus villosiflorus</i> , <i>Portulaca</i> spp., <i>Olearacea</i> spp., <i>Trichodesma</i> spp.	Coral Bay; Coastal Dune W of Carnarvon Park	2003
<i>Swainsona ecallosa</i>	1	1-4 ft.	N/A	N/A	Minilya River	1932
<i>Acacia ryaniana</i>	2	Small semi-prostrate spreading shrub 30-40 cm tall Phyllodes bright green. Flowers yellow. globular, on long peduncles.	In light red-pink sand over limestone.	On grassland (mainly <i>Triodia</i>) with <i>A. Gregorii</i> and in coastal heath with <i>Acacia spathulifolia</i>	Near Cape Cuvier, N of Quobba Homestead, W of the Exmouth - Minilya road on road to Coral Bay, W of Minilya-Exmouth road on road to Coral Bay	1970, 1982, 1987, 1988,
<i>Crinum flaccidum</i>	2	N/A	N/A	N/A	5 miles N of Minilya River	1952
<i>Ptilotus alexandri</i>	2	Annual herb, flowers deep pink.	In sand.	On <i>Triodia</i> steppe.	Lake Macleod mine site, N of Quobba Homestead, N of Carnarvon	1970
<i>Acacia startii</i>	3	Broad leaf wattle, spreading bush 1.5 m high and 3 m wide. Infundibular shrub with rounded crown, 1-2 m tall, to 3 m wide. Bark smooth, light grey, 'chalky' pruinose extending to branchlets. Phyllodes green to sub-glaucous, inclined, 2-nerved. Young growth densely tomentose, young phyllodes milky-green. Heads 7	Calcrete soils, on sandhills.	With Very open low scrub with <i>Acacia victoriae</i> & <i>A. tetragonophylla</i> , <i>A. gregorii</i> over open dwarf chenopods & open tall spinifex also with <i>Triodia</i> sp. Associated species: <i>Melaleuca eleuterostachya</i> .	Tropic of Capricorn, North West Coastal Highway, 5 miles N of Warroora turnoff, 160 km S of Exmouth, junction of North West Coastal Highway & turnoff to Coral Bay, S of Coral Bay on the Minilya to Exmouth Road.	1964,1984, 1986,1983, 1988, 2005

Species	Conservation code	Description	Site/land feature	Vegetation description	Recorded location	Date
<i>Calandrinia rubrisabulosa</i>	3	Erect / semi-erect annual herb, 11-18 cm high x 9-32 cm wide.	Upper slope of sand dune. Red sand.	Open shrubs with <i>Thryptomene sp.</i> , <i>Ptilotus polystachyus</i> , <i>Sida sp. Carnarvon</i> (P.S. Short 2492), <i>Waitzia acuminata</i> and <i>Cenchrus ciliaris</i> .	C. 8-10 km N of the Manberry Station turnoff on the North West Coastal Highway, c. 10-15 km S of Minilya Roadhouse	2018
<i>Dysphania congestiflora</i>	3	N/A	N/A	N/A	Lyndon River, Minilya - Learmonth Road	1961
<i>Gymnanthera cunninghamii</i>	3	Slender shrub 1-2 m. Flowers pale green, scented.	N/A	N/A	Minilya R [River], North West Coastal Highway	1960
<i>Nicotiana heterantha</i>	3	Straggling annual 30-70 cm. Flowers white.	N/A	N/A	Lyndon River, Minilya - Learmonth road,	1960
<i>Owenia acidula</i>	3	Small tree, to 5 m high. Suckering.	Creekside.	N/A	Porters Tank, Minilya Station,	2000
<i>Phyllanthus fuernrohrii</i>	3	Low shrub 1 m high, flowers more or less green, leaves ovate, soft.	Pale red sandy loam	N/A	19 miles N of Quobba Homestead, 60 km N of Exmouth turnoff, 60 km on North West Cape Road, 11 miles N of Warroora turnoff	1962, 1970, 1976
<i>Stackhousia clementii</i> *	3	Dense broom-like perennial, herb, to 0.45 m high. Fl. green/yellow/brown. Skeletal soils. Sandstone hills. Annual erect herb, flowers yellow.	Very low kopi dune with pale sand on the western side of Lake MacLeod	<i>Scaevola crassifolia</i> , <i>Tecticornia spp.</i> Low open shrubland over <i>Sporobolus virginicus</i> very open tussock grassland. Associated Species: <i>Acacia tetragonophylla</i> , <i>Scaevola crassifolia</i> , <i>Atriplex paludosa subsp. baudinii</i> , <i>Sporobolus virginicus</i> , <i>Acacia ampliceps</i> ,	4 km N of Lake MacLeod site office along Gypsum Access Road (eastern side of track), 58 km NNW of Carnarvon, W facing edge of peninsula in Lake MacLeod, 20.5 km ESE of Gnaraloo Homestead	1995, 2009
<i>Stenanthemum divaricatum</i>	3	Dense small shrub, bright green 0.5m	Broad flat between dunes. Red sand over limestone.	<i>Acacia chartacea</i> , <i>Acacia coriacea</i> and <i>Heterodendron oleifolium</i> Open Low Scrub B over <i>Thryptomene baeckeacea</i> and <i>Dampiera incana</i> Open Dwarf Scrub D over <i>Triodia pungens</i> , grass	7.25 km E of Cape Cuvier, N of Carnarvon. (Site: cu4)	1970, 1994
<i>Eremophila youngii subsp. lepidota</i>	4	Shrub 1.6 m high x 2.5 m wide. Flowers purplish pink.	N/A	In chenopod steppe with <i>Rhagodia spinescens</i> , <i>Frankenia sp.</i> , <i>E. pterocarpa</i> and <i>Exocarpus.spp.</i>	6.7 km from Warroora, NNE of Minilya Roadhouse (Minilya River Crossing) on North West Coastal Highway	1977

*Species was previously recorded on the property.



4 Fauna

This property provides habitat for many fauna species due to the nature of it being primarily remnant vegetation. A search of the NatureMap database (Department of Biodiversity Conservation and Attractions 2019c; WAM 2019) has found a total of 144 fauna species recorded or known to occur within suitable habitats on Gnaraloo station. These include birds, fish, amphibians, reptiles and invertebrates (Appendix A).

Undulating sandy plains, linear dunes and interdunal swales of the Mallee, Cardabia and Coast land systems make up approximately two-thirds of Gnaraloo station. These land systems support tall shrubland and/or low woodland with a variety of Acacia species and intermittent stands of eucalypts in both mallee and tree form (Payne et al 1987). A variety of birds of prey, nectivorous and insectivorous birds and reptiles have been seen to utilise these areas for foraging and more so during flowering periods. The mixture of soft and hard spinifex *Triodia sp* in the ground layer of these systems provide excellent habitat for small sized vertebrate fauna (mammals and reptiles) offering them protection from predators such as goannas and any larger carnivorous ground dwelling mammals. These grasses also provide a valuable food source to granivorous species such as pigeons, doves and finches. Burnt logs, branches and other plant debris in areas where there were previous fires provide additional protection through hollows. Hollows provide shelter and nesting habitat for an abundance of wildlife such as the nightjars, owls, small lizards and *Varanus* species.

Coastline areas of Gnaraloo Bay and Gnaraloo Cape Farquhar Bay are significant turtle rookeries (breeding areas for large numbers of turtles) for three threatened marine turtle species. These are the Loggerhead turtle (*Caretta caretta*), Green turtle (*Chelonia mydas*) and Hawksbill turtle (*Eretmochelys imbricate*). All three are protected under the *Environment Protection and Biodiversity Conservation Act 1999* and *Wildlife Conservation Act 1950* and listed as migratory species having large home ranges often travelling vast kilometres to foraging grounds and nesting sites (Hattingh et al., 2018).

Some sea turtles will return to nesting areas to lay eggs every 2–8 years. During nesting season some sea turtles can lay up to five clutches of eggs in approximately two-week intervals, dependent upon species (King *pers comm.*, DBCA, 11 September 2019). As these sea turtles are often part of a larger worldwide population, protecting and managing foraging or nesting areas and upland ecosystems is a necessary management tool (Hattingh et al., 2018). This is of particular relevance to Gnaraloo station where ongoing predator control for foxes, feral cats and wild dogs is needed in upland terrestrial areas. As previously mentioned, small predators have been targeted and controlled through feral animal control programs over Gnaraloo for the last 10 years.

Fauna species noted during the site visit, mentioned by the owners or found by previous fauna surveys are included in Table 3 below.

Table 3: Fauna observed during assessment, noted by landholders or through previous fauna surveys

Fauna group	Species
Mammals	Echidna (tracks) (Fig 1) unidentified bat species Spinifex Hopping-mouse (<i>Notomys alexis</i>) Sandy Inland Mouse (<i>Pseudomys hermannsburgensis</i>) Lesser Hairy-footed (Dunnart (<i>Sminthopsis youngsoni</i>) Stripe-faced Dunnart (<i>Sminthopsis macroura</i>)
Birds	Galah Pelican Swan Intermediate Egret Red-capped Plover Red-necked Avocet Singing Bushlark Singing Honeyeater Crested Pigeon Brown Falcon Black-faced wood swallow Bush Stone Curlew Australian Bustard Little Grassbird
Reptiles	<i>Moloch horridus</i> <i>Morelia spilota</i> <i>Varanus gouldii</i> <i>Varanus giganteus</i> <i>Pseudechis sp.</i> <i>Diplodactylus stenodactylus</i> <i>Ctenotus colletti</i>
Invertebrates	Unidentified Dung beetle species (Fig 2)



Figure 1: Echidna tracks



Figure 2: Unidentified Dung beetle species

Gnaraloo station borders on the western side of Lake MacLeod (Figure 3). Lake MacLeod is a large salt lake, 120km long and 10-40km wide, covering about 220,000 hectares and listed in *A Directory of Important Wetlands in Australia* (Environment Australia 2001). Lake MacLeod is eligible for listing as a Wetland of International Importance under the Ramsar Convention on Wetlands (Rio Tinto Minerals 2008; George 2009) and listed as a Draft proposed RAMSAR addition in 2008 (BirdLife International 2019, Naturemap accessed 2019).

Seawater entering through a karst system feeds the northern sections of Lake MacLeod and connects the lake bed to the Indian Ocean resulting in 2000 km² of the lake being permanently inundated, also referred to as the Northern Ponds (Logan 1987; Davis et al. 2001; Russel 2004). Surrounding these northern ponds are intermittently inundated, brackish-hypersaline flats (BirdLife International 2019). This results in a unique, inland saline wetland of international and national significance to migrant and resident bird species as a stopover, wintering and drought refuge area (Bertzeletos et al 2012; Rio Tinto Minerals 2008; George 2009).

The greater part of Lake MacLeod periodically receives freshwater from the Lyndon River in the north, Minilya River, Cardabia Creek and Boolathana Creek (a distributary

of the Gascoyne River) but is usually dry from September to June. Major flooding from the Gascoyne River occurs infrequently, often following cyclones (BirdLife International 2019). The lake also receives seawater inflows from subterranean sinkholes.

Presently, 37 species of shorebirds have been recorded at Lake MacLeod (Bertzeletos et al 2012; Jaensch & Vervest 1990; George 2009). Many of these are trans-equatorial migrants that use the East Asian–Australasian Flyway to spend the summer (their non-breeding season) in Australia, with the nine species nomadic residents that move around the continent in response to rainfall (Jaensch & Vervest 1990; Geering et al. 2007; George 2009). All 28 migratory species occurring at Lake MacLeod are protected by international treaties (Bertzeletos et al 2012; JAMBA 1974; CAMBA 1986; ROKAMBA 2006). Under Schedule 5 of the *Wildlife Conservation Act 1950* there are 35 bird taxa with the potential to be found on Gnaraloo and Lake MacLeod subject to international agreements relating to the protection of migratory birds that are declared to be in need of special protection. This includes five taxa also listed as Endangered and Vulnerable (Table 4).

Lake MacLeod has supported more than 1% of the East Asia-Australasian Flyway populations of six shorebirds species including the populations of three migrant species the

Red knot (*Calidris canutus*), Red-necked stint (*Calidris ruficollis*) and Curlew sandpiper (*Calidris ferruginea*); and has held more than 1% of the national population of three endemic species: Red-necked avocet (*Recurvirostra novaehollandiae*), Banded stilt (*Cladorynchus leucocephalus*) and Red-capped plover (*Charadrius ruficapillus*) (Bertzeletos et al 2012; Rio Tinto Minerals 2008; George 2009).

In terms of threats to significant migratory species, vehicles, foxes, feral cats and goats have been highlighted as a major threat to the shorebirds, waders and seabirds within and surrounding Lake MacLeod and Gnaraloo station (DBCA, 2019d).

4.1 Threatened and Priority Fauna

The following Threatened or Priority fauna species have been previously recorded within the property (DBCA 2019b) (Table 4). No threatened or priority species were recorded during the Land for Wildlife assessment.

Table 4: Threatened or Priority fauna previously recorded and/or observed during the assessment

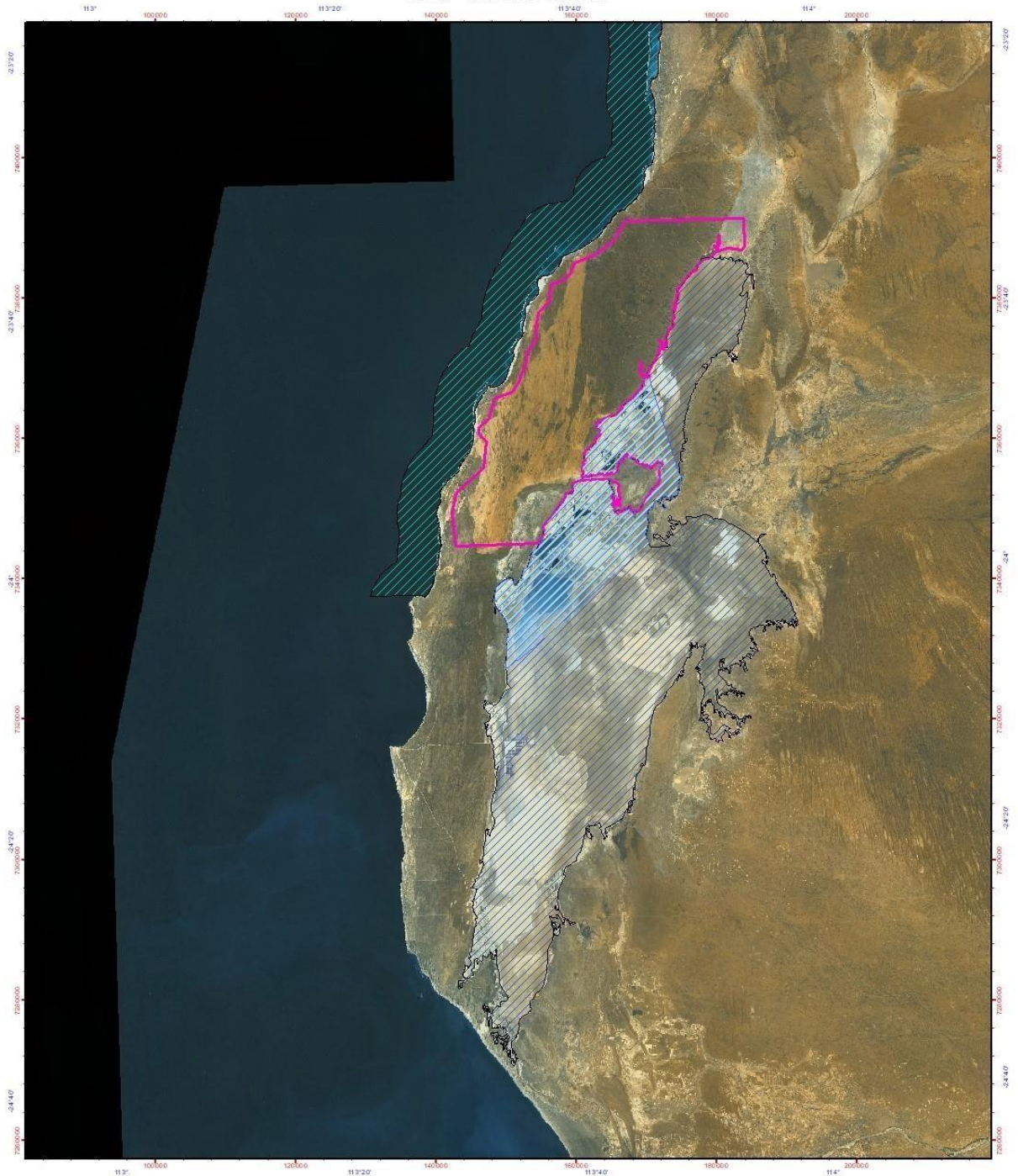
Fauna	Conservation code		Previously recorded and/or recorded during the assessment
	Federal	State (WA)	
Mammals			
<i>Phascogale calura</i> (Red-tailed phascogale)	VU	CD	Fossil
Birds			
<i>Leipoa ocellata</i> (Malleefowl)	VU	VU	Recorded near the station boundary
<i>Falco hypoleucos</i> (Grey falcon)		VU	Recorded in 2006 at Lyndon River and Lyndon River Rest Area
<i>Falco peregrinus</i> (Peregrine falcon)		OS	Recorded at the Lyndon River Rest Area

<i>Elanus scriptus</i> (Letter-winged kite)		P4	Recorded in 1994 at Gnaraloo station, Three Mile Camp and 150 kilometres North of Carnarvon
Fauna	Conservation code		Previously recorded and/or recorded during the assessment
Reptiles			
<i>Caretta caretta</i> (Loggerhead turtle)	EN, MI	EN	Recorded in 2011-2016 Gnaraloo Bay/Gnaraloo Bay Rookery, 2013 and 2015-2016 at Gnaraloo Cape Farquhar Bay and 2011-2012 Gnaraloo Farquhar Rookery
<i>Chelonia mydas</i> (Green turtle)	VU, MI	VU	Recorded in Gnaraloo Bay/Gnaraloo Bay Rookery 2011-2014, Recorded in 2013 at Gnaraloo Cape Farquhar Rookery
<i>Eretmochelys imbricate</i> (Hawksbill turtle)	VU, MI	VU	Recorded in 2011-2014 at Gnaraloo Bay/Gnaraloo Bay Rookery and 2013 Gnaraloo Cape Farquhar Rookery
<i>Lerista haroldi</i> (Gnaraloo mulch slider)		P1	Recorded at Gnaraloo homestead
Migratory birds			
<i>Calidris canutus</i> (Red knot), <i>Charadrius mongolus</i> (Lesser Sand Plover), <i>Puffinus huttoni</i> (Hutton's shearwater)	EN, MI	EN	Some of these species have been recorded or have the potential to occur on shoreline areas, of Gnaraloo, Lake McLeod, Northern Ponds, Dog Leg
<i>Charadrius leschenaultia</i> (Greater Sand Plover)	VU, MI	VU	Some of these species have been recorded or have the potential to occur on shoreline areas of Gnaraloo, Lake McLeod, Northern Ponds, Dog Leg
<i>Sternula nereis nereis</i> (Fairy Tern)	VU	VU	Some of these species have been recorded or have the potential to occur on shoreline areas of Gnaraloo, Lake McLeod, Northern Ponds, Dog Leg
<i>Chlidonias leucopterus</i> (White-winged Black Tern), <i>Hydroprogne caspia</i> (Caspian Tern), <i>Sterna dougallii</i> (Roseate Tern), <i>Sterna hirundo</i> (Common Tern), <i>Sternula albifrons</i> (Little Tern), <i>Thalasseus bergii</i> (Crested Tern), <i>Pandion cristatus</i> (Osprey), <i>Apus pacificus</i> (Fork-tailed swift), <i>Arenaria interpres</i> (Ruddy Turnstone), <i>Calidris acuminata</i> (Sharp-tailed Sandpiper), <i>Calidris alba</i> (Sanderling), <i>Actitis hypoleucos</i> (Common Sandpiper), <i>Charadrius veredus</i> (Oriental Plover), <i>Calidris melanotos</i> (Pectoral sandpiper), <i>Calidris ruficollis</i> (Red-necked Stint), <i>Calidris subminuta</i> (Long-toed stint), <i>Gelochelidon nilotica</i> (Gull-billed Tern), <i>Glareola maldivarum</i> (Oriental Pratincole), <i>Hirundo rustica</i> (Barn Swallow), <i>Limicola falcinellus</i> (Broad-billed sandpiper), <i>Limosa lapponica</i> (Bar-tailed godwit), <i>Limosa limosa</i> (Black-tailed godwit), <i>Numenius phaeopus</i> (Whimbrel), <i>Onychoprion anaethetus</i> (Bridled Tern), <i>Phalaropus lobatus</i> (Red-necked phalarope), <i>Pluvialis fulva</i> (Pacific golden plover), <i>Pluvialis squatarola</i> (Grey Plover), <i>Tringa brevipes</i> (Grey-tailed Tattler), <i>Tringa glareola</i> (Wood Sandpiper), <i>Tringa nebularia</i> (Common Greenshank), <i>Tringa stagnatilis</i> (Marsh sandpiper), <i>Xenus cinereus</i> (Terek Sandpiper)	MI	MI	Some of these species have been recorded or have the potential to occur on shoreline areas of Gnaraloo, Lake McLeod, Northern Ponds, Dog Leg

Classifications under the Commonwealth EPBC Act: CR = Critically Endangered, EN = Endangered, VU = Vulnerable, MI = Migratory

Classifications under the Biodiversity Conservation Act 2016: S1 - Rare or likely to become extinct (Critically Endangered (CE), S2 - Fauna that is rare or is likely to become extinct as endangered fauna (Endangered (EN), S3 - Fauna that is rare or is likely to become extinct as vulnerable fauna (Vulnerable (VU), S5 - Migratory birds protected under an International Agreement (IA), S7/OS - Other specially protected fauna
Classifications under the Department of Biodiversity Conservation and Attractions Priority fauna lists: P1-P4 -- Priority species

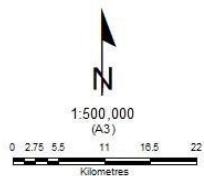
2647 - Gnaraloo Station



Distances shown at 20 minute intervals
 OSs shown at 20000 metre intervals

Legend

-  Lake MacLeod Important Bird Area
-  Ningaloo Marine Park
-  Lake MacLeod - Important Wetland
-  2647_GnaralooStation



Produced by LFW,
 Department of
 Biodiversity, Conservation
 and Attractions

Job Ref: LFW2647
 Produced at 10:41am, on June 17, 2019



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Figure 3: Gnaraloo station and Lake MacLeod

4.2 Priority Ecological Communities and Threatened Ecological Communities

An Ecological Communities database search (Department of Biodiversity Conservation and Attractions 2019) was conducted for the property with an additional 30 km buffer. This search identified a Priority 4 (ii), Priority Ecological Community (PEC) the *Lake MacLeod invertebrate assemblages*. Priority 4 species are adequately known, are rare but not threatened, or meet criteria for near threatened, or have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons. These species require regular monitoring.

This particular conservation listing refers to the “saline aquatic community with strong marine affinities with particularly rich copepod elements”. “This community is effectively a well-developed, very rich birrida community with strong marine and terrestrial components with especially rich hypactacoid community”. “A distinctive community but lacks threats” (DBCA 2019).

5 Conclusion

Based on the areas observed, it is evident that the overall condition of vegetation communities assessed is fair to good, providing suitable habitat for all suites of fauna both terrestrial and aquatic (when areas are wet and/or full). The relative connectivity of these habitats also supports wildlife migration by allowing animals to move, shift their ranges, establish new territories, providing access to other resources and ensuring the flow of genetics etc.

The successful co-existence of minimal grazing, tourism and wildlife conservation at a landscape scale such as this, and ongoing commitment to develop management practices aligned to the natural environment and ecological function, is an important demonstration that sustainable grazing can reduce the intensity of impact on a range of native flora and fauna species and their ecological habitats.

6 Additional information

Is any part of the property subject to a Conservation Covenant?	No
Is the landholder interested in covenanting, now, or at some future date?	Unsure
Is the landholder involved in other Landcare, Greening or NRM programs?	Not anymore
Have any grants been received?	Yes
Would the landowner like to be kept informed of any grants?	Yes
Is the landholder prepared to allow an organised Field Day to include this property?	Yes
Does the landholder agree to the 'LFW site' being recorded on a GIS mapping database for Natural Resource Management planning?	Whole Station
Does the landholder give consent for any photographic images taken during this visit to be used for the purposes of <i>Land for Wildlife</i> promotion?	Yes
Does the landholder give consent for the recording of locations of rare fauna, rare flora, Threatened Ecological Communities (TEC), Priority Ecological Communities (PEC) on the property?	Yes
Any other relevant observations?	No

Signed: M Clunies-Ross

Date: 1-2 July 2019

Position: Rangelands NRM Project Officer (Southern Rangelands)

LFW Assessment Summary

Name of assessor: M Clunies-Ross
[Reviewed by: C Curnow 10/10/2019]

Date on request for admission to LFW received: 1-2 July 2019

Date on which property surveyed: 2019

Is *LFW* registration of property recommended? Yes

Type of registration: Full

LFW Registration number: 2647

Specific comments given to landholder in respect to the above recommendation: None

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Date of issue of sign: 18/11/2019

Sign number: 2124 and 2125

7 References

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Appendix A



NatureMap Species Report

Created By Guest user on 18/06/2019

Current Names Only Yes
 Core Datasets Only Yes
 Method 'Predefined Area Intersect'
 Area Type Pastoral Leases
 Intersect Gnaraloo
 Group By Species Group

Species Group	Species	Records
Amphibian	2	2
Bird	99	239
Dicotyledon	37	46
Fish	1	1
Invertebrate	4	4
Monocotyledon	1	1
Reptile	38	213
TOTAL	182	506

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
Amphibian				
1.	25424 <i>Neobatrachus fulvus</i> (Tawny Trilling Frog)			
2.	42306 <i>Platyplectrum spenceri</i> (Centralian Burrowing Frog)			
Bird				
3.	41323 <i>Actitis hypoleucos</i> (Common Sandpiper)		IA	
4.	24312 <i>Anas gracilis</i> (Grey Teal)			
5.	47414 <i>Anhinga novaehollandiae</i> (Australasian Darter)			
6.	25634 <i>Anous stolidus</i> (Common Noddy)		IA	
7.	24285 <i>Aquila audax</i> (Wedge-tailed Eagle)			
8.	41324 <i>Ardea modesta</i> (great egret, white egret)			
9.	24610 <i>Ardeotis australis</i> (Australian Bustard)			
10.	25736 <i>Arenaria interpres</i> (Ruddy Turnstone)		IA	
11.	25566 <i>Artamus cinereus</i> (Black-faced Woodswallow)			
12.	25567 <i>Artamus leucorhynchus</i> (White-breasted Woodswallow)			
13.	47897 <i>Butorides striata</i> (Striated Heron, Mangrove Heron)			
14.	24725 <i>Cacatua roseicapilla</i> subsp. <i>assimilis</i> (Galah)			
15.	24269 <i>Calamanthus campestris</i> (Rufous Fieldwren)			
16.	24779 <i>Calidris acuminata</i> (Sharp-tailed Sandpiper)		IA	
17.	24780 <i>Calidris alba</i> (Sanderling)		IA	
18.	25738 <i>Calidris canutus</i> (Red Knot, knot)		IA	
19.	24784 <i>Calidris ferruginea</i> (Curlew Sandpiper)		T	
20.	24786 <i>Calidris melanotos</i> (Pectoral Sandpiper)		IA	
21.	24788 <i>Calidris ruficollis</i> (Red-necked Stint)		IA	
22.	24789 <i>Calidris subminuta</i> (Long-toed Stint)		IA	
23.	24790 <i>Calidris tenuirostris</i> (Great Knot)		T	
24.	25575 <i>Charadrius leschenaultii</i> (Greater Sand Plover)		T	
25.	25576 <i>Charadrius mongolus</i> (Lesser Sand Plover)		T	
26.	24377 <i>Charadrius ruficapillus</i> (Red-capped Plover)			
27.	24378 <i>Charadrius veredus</i> (Oriental Plover)		IA	
28.	47909 <i>Cheramoeca leucosterna</i> (White-backed Swallow)			
29.	41332 <i>Chlidonias leucopterus</i> (White-winged Black Tern, white-winged tern)		IA	
30.	<i>Chroicocephalus novaehollandiae</i>			
31.	24774 <i>Cidadorhynchus leucoccephalus</i> (Banded Stilt)			
32.	25568 <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
33.	24416 <i>Corvus bennetti</i> (Little Crow)			
34.	25593 <i>Corvus orru</i> (Torresian Crow)			
35.	24420 <i>Cracticus nigrogularis</i> (Pied Butcherbird)			
36.	24322 <i>Cygnus atratus</i> (Black Swan)			
37.	24470 <i>Dromaius novaehollandiae</i> (Emu)			
38.	<i>Egretta garzetta</i>			
39.	<i>Egretta novaehollandiae</i>			

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Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
40.	<i>Elanus axillaris</i>			
41.	47937 <i>Euseyornis melanops</i> (Black-fronted Dotterel)			
42.	<i>Eolophus roseicapillus</i>			
43.	24567 <i>Epthianura albifrons</i> (White-fronted Chat)			
44.	24568 <i>Epthianura aurifrons</i> (Orange Chat)			
45.	24379 <i>Erythronyctes cinctus</i> (Red-kneed Dotterel)			
46.	25621 <i>Falco berigora</i> (Brown Falcon)			
47.	25622 <i>Falco cenchroides</i> (Australian Kestrel, Nankeen Kestrel)			
48.	25623 <i>Falco longipennis</i> (Australian Hobby)			
49.	25624 <i>Falco peregrinus</i> (Peregrine Falcon)		S	
50.	47954 <i>Gelochelidon nilotica</i> (Gull-billed Tern)		IA	
51.	24276 <i>Gerygone tenebrosa</i> (Dusky Gerygone)			
52.	24443 <i>Grallina cyanoleuca</i> (Magpie-lark)			
53.	24487 <i>Haematopus longirostris</i> (Pied Oystercatcher)			
54.	24293 <i>Haliaeetus leucogaster</i> (White-bellied Sea-Eagle)			
55.	25734 <i>Himantopus himantopus</i> (Black-winged Stilt)			
56.	24491 <i>Hirundo neoxena</i> (Welcome Swallow)			
57.	48587 <i>Hydroprogne caspia</i> (Caspian Tern)		IA	
58.	24557 <i>Leipoa ocellata</i> (Malleefowl)		T	
59.	25739 <i>Limicola falcinellus</i> (Broad-billed Sandpiper)		IA	
60.	30932 <i>Limosa lapponica</i> (Bar-tailed Godwit)		IA	
61.	25741 <i>Limosa limosa</i> (Black-tailed Godwit)		IA	
62.	25651 <i>Malurus lamberti</i> (Variegated Fairy-wren)			
63.	25652 <i>Malurus leucopterus</i> (White-winged Fairy-wren)			
64.	24583 <i>Manorina flavigula</i> (Yellow-throated Miner)			
65.	25758 <i>Megalurus gramineus</i> (Little Grassbird)			
66.	<i>Microcarbo melanoleucos</i>			
67.	25545 <i>Mirafra javanica</i> (Horsfield's Bushlark, Singing Bushlark)			
68.	25564 <i>Nycticorax caledonicus</i> (Rufous Night Heron)			
69.	24742 <i>Nymphicus hollandicus</i> (Cockatiel)			
70.	24407 <i>Ocyphaps lophotes</i> (Crested Pigeon)			
71.	24618 <i>Oreoica gutturalis</i> (Crested Bellbird)			
72.	48591 <i>Pandion cristatus</i> (Osprey, Eastern Osprey)		IA	
73.	24648 <i>Pelecanus conspicillatus</i> (Australian Pelican)			
74.	48061 <i>Petrochelidon nigricans</i> (Tree Martin)			
75.	25697 <i>Phalacrocorax carbo</i> (Great Cormorant)			
76.	24667 <i>Phalacrocorax sulcirostris</i> (Little Black Cormorant)			
77.	25699 <i>Phalacrocorax varius</i> (Pied Cormorant)			
78.	24801 <i>Phalaropus lobatus</i> (Red-necked Phalarope)		IA	
79.	24409 <i>Phaps chalcoptera</i> (Common Bronzewing)			
80.	24383 <i>Pluvialis squatarola</i> (Grey Plover)		IA	
81.	25704 <i>Podiceps cristatus</i> (Great Crested Grebe)			
82.	24681 <i>Poliocephalus poliocephalus</i> (Hoary-headed Grebe)			
83.	24683 <i>Pomatostomus superciliosus</i> (White-browed Babbler)			
84.	24390 <i>Psophodes occidentalis</i> (Western Wedgebill, Chiming Wedgebill)			
85.	24776 <i>Recurvirostra novaehollandiae</i> (Red-necked Avocet)			
86.	48096 <i>Rhipidura albiscapa</i> (Grey Fantail)			
87.	25614 <i>Rhipidura leucophrys</i> (Willie Wagtail)			
88.	24457 <i>Rhipidura phasiana</i> (Mangrove Grey Fantail)			
89.	25640 <i>Sterna dougallii</i> (Roseate Tern)		IA	
90.	25642 <i>Sterna hirundo</i> (Common Tern)		IA	
91.	48593 <i>Sternula albifrons</i> (Little Tern)		IA	
92.	48594 <i>Sternula nereis</i> (Fairy Tern)			
93.	24331 <i>Tadorna tadornoides</i> (Australian Shelduck, Mountain Duck)			
94.	30870 <i>Taeniopygia guttata</i> (Zebra Finch)			
95.	<i>Thalasseus bengalensis</i>			
96.	48597 <i>Thalasseus bergii</i> (Crested Tern)		IA	
97.	25549 <i>Todiramphus sanctus</i> (Sacred Kingfisher)			
98.	24808 <i>Tringa nebularia</i> (Common Greenshank, greenshank)		IA	
99.	24386 <i>Vanellus tricolor</i> (Banded Lapwing)			
100.	25765 <i>Zosterops lateralis</i> (Grey-breasted White-eye, Silvereye)			
101.	24857 <i>Zosterops luteus</i> (Yellow White-eye)			

Dicotyledon

102.	13072 <i>Acacia chartacea</i>			
103.	3356 <i>Acacia gregorii</i> (Gregory's Wattle)			
104.	19483 <i>Acacia ramulosa</i> var. <i>linophylla</i>			
105.	19499 <i>Acacia ramulosa</i> var. <i>ramulosa</i>			
106.	4907 <i>Alyogyne pinoniana</i> (Sand Hibiscus)			
107.	12073 <i>Cassityha aurea</i> var. <i>aurea</i>			
108.	2949 <i>Cassityha capillaris</i>			

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Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
109.	7921 <i>Centipeda thespidioides</i> (Desert Sneezewood)			
110.	13114 <i>Chorizema racemosum</i>			
111.	7951 <i>Cratystylis subspinescens</i> (Australian Sage, Spiny Grey Bush)			
112.	3796 <i>Daviesia benthamii</i>			
113.	31334 <i>Duperreya sericea</i>			
114.	7235 <i>Eremophila mackinlayi</i> (Desert Pride)			
115.	16733 <i>Eremophila setacea</i>			
116.	5640 <i>Eucalyptus eudesmioides</i> (Malalie, Marlarli)			
117.	5654 <i>Eucalyptus fruticosa</i>			
118.	5722 <i>Eucalyptus obtusiflora</i> (Dongara Mallee)			
119.	2001 <i>Grevillea eriostachya</i> (Flame Grevillea, Kaliny-kalinypa)			
120.	2096 <i>Grevillea stenobotrya</i>			
121.	15686 <i>Grevillea variifolia</i> subsp. <i>bundera</i>			
122.	15685 <i>Grevillea variifolia</i> subsp. <i>variifolia</i>			
123.	2784 <i>Gyrostemon ramulosus</i> (Corkybark)			
124.	17781 <i>Hannafordia quadrivalvis</i> subsp. <i>quadrivalvis</i>			
125.	16489 <i>Leptosema macrocarpum</i>			
126.	2554 <i>Maireana pentagona</i> (Hairy Bluebush)			
127.	5908 <i>Melaleuca eleuterostachya</i>			
128.	2573 <i>Neobassia astrocarpa</i>			
129.	41300 <i>Pittosporum phillyreoides</i> (Weeping Pittosporum, Yaliti)			
130.	41061 <i>Quoya paniculata</i>			
131.	7606 <i>Scaevola crassifolia</i> (Thick-leaved Fan-flower)			
132.	4729 <i>Stackhousia clementii</i>		P3	
133.	33319 <i>Tecticornia indica</i> subsp. <i>bidens</i>			
134.	33318 <i>Tecticornia indica</i> subsp. <i>leiostachya</i> (Samphire)			
135.	31674 <i>Tecticornia peltata</i>			
136.	33220 <i>Tecticornia pterygosperma</i> subsp. <i>denticulata</i>			
137.	44710 <i>Thryptomene dampieri</i>			
138.	<i>Wahlenbergia</i> sp.			
Fish				
139.	<i>Rhinecanthus aculeatus</i>			
Invertebrate				
140.	<i>Aname mainae</i>			
141.	<i>Argiope protensa</i>			
142.	<i>Missulena occatoria</i>			
143.	<i>Tamopsis occidentalis</i>			
Monocotyledon				
144.	48467 <i>Triodia glabra</i>			
Reptile				
145.	30833 <i>Amphibolurus longirostris</i> (Long-nosed Dragon)			
146.	<i>Aprasia</i> sp.			
147.	25335 <i>Caretta caretta</i> (Loggerhead Turtle)		T	
148.	25336 <i>Chelonia mydas</i> (Green Turtle)		T	
149.	25020 <i>Cryptoblepharus plagiocephalus</i>			
150.	24877 <i>Ctenophorus maculatus</i> subsp. <i>badius</i> (Spotted Military Dragon)			
151.	24882 <i>Ctenophorus nuchalis</i> (Central Netted Dragon)			
152.	30897 <i>Ctenophorus parviceps</i> (Western Heath Dragon, Northern Heath Dragon)			
153.	24886 <i>Ctenophorus reticulatus</i> (Western Netted Dragon)			
154.	24885 <i>Ctenophorus rubens</i> (Red Dragon)			
155.	24889 <i>Ctenophorus scutulatus</i> (Lozenge-marked Dragon)			
156.	25046 <i>Ctenotus iapetus</i>			
157.	25052 <i>Ctenotus leonhardii</i>			
158.	25064 <i>Ctenotus pantherinus</i> subsp. <i>ocellifer</i> (Leopard Ctenotus)			
159.	25087 <i>Cyclodomorphus celatus</i> (Western Slender Blue-tongue)			
160.	25292 <i>Demansia calodera</i> (Black-necked Whipsnake)			
161.	25231 <i>Diplodactylus klugei</i>			
162.	24938 <i>Diplodactylus ornatus</i>			
163.	25473 <i>Eretmochelys imbricata</i> (Hawksbill Turtle)		T	
164.	25342 <i>Eretmochelys imbricata</i> subsp. <i>bissa</i> (Hawksbill Turtle)		T	
165.	24959 <i>Gehyra variegata</i>			
166.	24961 <i>Heteronotia binoei</i> (Bynoe's Gecko)			
167.	25129 <i>Lerista connivens</i>			
168.	25133 <i>Lerista elegans</i>			
169.	25140 <i>Lerista haroldi</i> (Gnaraloo mulch-slider, skink)		P1	
170.	25148 <i>Lerista lineopunctulata</i>			
171.	25151 <i>Lerista macropisthopus</i> subsp. <i>fusciceps</i>			
172.	25163 <i>Lerista planiventralis</i> subsp. <i>planiventralis</i>			

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Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
173.	25165 <i>Lerista praepedita</i>			
174.	25176 <i>Lerista uniduo</i> (<i>Spotted Broad-blazed Slider, skink</i>)			
175.	25194 <i>Menetia greyii</i>			
176.	25191 <i>Morethia lineocellata</i>			
177.	25192 <i>Morethia obscura</i>			
178.	25497 <i>Nephurus levis</i>			
179.	24968 <i>Nephurus levis subsp. occidentalis</i>			
180.	24907 <i>Pogona minor subsp. minor</i> (<i>Dwarf Bearded Dragon</i>)			
181.	25267 <i>Simoseiaps littoralis</i> (<i>West Coast Banded Snake</i>)			
182.	24941 <i>Strophurus rankini</i>			

Conservation Codes
 T - Rare or likely to become extinct
 X - Presumed extinct
 IA - Protected under International agreement
 S - Other specially protected fauna
 1 - Priority 1
 2 - Priority 2
 3 - Priority 3
 4 - Priority 4
 5 - Priority 5

¹ For NatureMap's purposes, species flagged as endemic are those whose records are wholly contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.