ATTACHMENT 1: Pendoley marine turtle survey results (13th January 2018)

Date	Time (hours)	Latitude	Longitude	All Data	Track Species	Activity	Zone	Marked for nest success?	Evidence of Predation?	Comment
13/01/2018	8:20:53 AM	-21.08676287	115.9099184	Comment						Low profile, dune roughly 100m behind beach, spinifex, beach debris (sponges), mangrove at Eastern end, rocky intertidal area
13/01/2018	8:23:28 AM	-21.08563056	115.910605	Comment						Fox tracks
13/01/2018	8:25:01 AM	-21.08540861	115.9110944	Adult Turtle Track	Flatback	Abandoned Egg Chamber	Dune crest			
13/01/2018	8:26:35 AM	-21.08499155	115.911345	Adult Turtle Track	Flatback	Abandoned Egg Chamber	Dune face			
13/01/2018	8:28:18 AM	-21.08488016	115.911487	Adult Turtle Track	Unknown		Dune crest			
13/01/2018	8:37:31 AM	-21.08234337	115.9138979	Adult Turtle Track	Flatback	Nest	Dune face	No	No	
13/01/2018	8:38:31 AM	-21.08238749	115.9139371	Adult Turtle Track	Flatback	Nest	Dune face	No	No	
13/01/2018	8:39:40 AM	-21.08231166	115.9138626	Comment						Photo 101-0053
13/01/2018	8:40:47 AM	-21.08221601	115.913874	Comment						Photo 101-0054
13/01/2018	8:41:06 AM	-21.08225201	115.9139298	Adult Turtle Track	Flatback	Nest	Dune face	No	No	
13/01/2018	8:43:36 AM	-21.08188316	115.9142401	Adult Turtle Track	Flatback	Abandoned Egg Chamber	Base of dune			
13/01/2018	8:44:09 AM	-21.081853	115.9142196	Comment						Photo 101-0056
13/01/2018	8:56:10 AM	-21.07770608	115.9191488	Adult Turtle Track	Flatback	Abandoned Egg Chamber	Base of dune			
13/01/2018	9:30:57 AM	-21.06384942	115.9541681	Adult Turtle Track	Flatback	False Crawl	HT to vegetation line			

13/01/2018	9:34:32 AM	-21.06305339	115.9552196	Adult Turtle Track	Flatback	False Crawl	Vegetation line to dune			
13/01/2018	9:35:10 AM	-21.06299778	115.9551886	Comment						Photo 101-0058
13/01/2018	9:37:41 AM	-21.0629119	115.9552686	Comment						Low profile, dune height 1-2m, spinifex, wide Beach roughly 50m, no rocks offshore, some rocky bays and headlands, photo 101-0059
13/01/2018	9:39:08 AM	-21.06280938	115.955601	Adult Turtle Track	Flatback	Nest	Base of dune	No	No	
13/01/2018	9:40:59 AM	-21.06254168	115.9559449	Crater (no track)	Unknown					
13/01/2018	9:41:26 AM	-21.06251538	115.9559836	Adult Turtle Track	Flatback	Abandoned Egg Chamber	Vegetation line to dune			
13/01/2018	9:42:22 AM	-21.06236509	115.9562788	Adult Turtle Track	Flatback	Nest	HT to vegetation line	No	No	
13/01/2018	9:43:25 AM	-21.06231104	115.956401	Crater (no track)	Unknown					
13/01/2018	9:44:08 AM	-21.06226681	115.9564488	Adult Turtle Track	Flatback	Nest	Vegetation line to dune	No	No	
13/01/2018	9:45:44 AM	-21.0619059	115.9571082	Adult Turtle Track	Flatback	Abandoned Egg Chamber	Base of dune			
13/01/2018	9:47:03 AM	-21.06180851	115.9570403	Comment						Higher dune, 2-3m, closer to back of beach, photo 61
13/01/2018	9:49:04 AM	-21.06162708	115.9575379	Adult Turtle Track	Hawksbill	Abandoned Egg Chamber	Vegetation line to dune			
13/01/2018	9:50:07 AM	-21.06156626	115.9576683	Adult Turtle Track	Flatback	Abandoned Egg Chamber	Base of dune			
13/01/2018	9:58:02 AM	-21.05920015	115.9604653	Adult Turtle Track	Flatback	Nest	Vegetation line to dune	No	No	
13/01/2018	10:10:22 AM	-21.05494377	115.9648412	Comment						Low dunes, maybe 1m in height further back off the beach, low profile beach, 50m wide, sloping offshore, overcast, light breeze, photo 66 and 67

Appendix 2 Survey site descriptions

Site:	**NP01 (Audio recording) (-21.201519, 115.908283)**
Habitat description:	Targeted Night Parrot site. Island on saltflats. *Triodia* grassland (semi-mature hummocks) with minor samphire spp. presence at perimeter. *Triodia* species not ring-forming species. Eleven nights (~132 hours) of audio recordings completed (7-18 December 2017).
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	sandy clay, sandy loam
Soil colour:	red-brown
Rock type:	none
Fire age:	>5 years
Disturbance:	grazing - low

Site:	**NP02 (Audio recording) (-21.216921, 115.888818)**
Habitat description:	Targeted Night Parrot site. Island on saltflats. *Triodia* grassland (mature ring-forming hummocks present). Mesquite (*Prosopis* spp.)present. A single line of samphire present around island. Eleven nights (~132 hours) of audio recordings completed (7-18 December 2017).
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	sandy clay, sandy loam
Soil colour:	red-brown
Rock type:	none
Fire age:	>5 years
Disturbance:	grazing - low

Site:	**NP03 (Audio recording) (-21.248319, 115.931445)**
Habitat description:	Targeted Night Parrot site. *Triodia* grassland (mature hummocks, not ring-forming species.) on eastern boundary of saltflats. Good samphire cover at margin. Sixteen nights (~192 hours) of recordings completed (19 Devember 2017 - 4 January 2018).
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	sand, sandy clay, sandy loam
Soil colour:	red-orange
Rock type:	none
Fire age:	>5 years
Disturbance:	grazing - low

Site:	**NP04 (Audio recording) (-21.166954, 115.937422)**
Habitat description:	Targeted Night Parrot site. Grassland of *Triodia spp.* (mature hummocks present) and Buffel Grass (*Cenchrus ciliaris*). Mesquite (*Prosopis* spp.) present. Fifteen nights (~180 hours) of audio recordings completed (28 February - 15 March 2018).
Habitat type:	mudflat or saltflat
Topography:	plain
Slope:	negligible
Soil:	sandy loam
Soil colour:	red-orange
Rock type:	none
Fire age:	> 5 years
Disturbance:	grazing - low

Site:	**NP05 (Audio recording) (-21.151023, 115.932104)**
Habitat description:	Targeted Night Parrot site. *Triodia* grassland (mature hummocks, not ring-forming species.) Good samphire cover at margin of saltflats. Fifteen nights (~180 hours) of audio recordings completed (28 February - 15 March 2018).
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	sandy loam
Soil colour:	red-orange
Rock type:	none
Fire age:	> 5 years
Disturbance:	grazing - low

Site:	**NP06 (Audio recording) (-21.115022, 115.951531)**
Habitat description:	Targeted Night Parrot site. *Triodia* grassland (semi-mature hummocks, with some ring-forming presence). Good samphire cover at margin of saltflats. Mesquite (*Prosopis* spp.) well established. Twelve nights (~144 hours) of audio recordings completed.
Habitat type:	grassland
Topography:	plain
Slope:	negligible
Soil:	sand
Soil colour:	red-orange
Rock type:	none
Fire age:	> 5 years
Disturbance:	grazing - low

Site:	**NP08 (Audio recording) (-21.093132, 115.983347)**
Habitat description:	Targeted Night Parrot site. *Triodia* grassland (semi-mature hummocks, with some ring-forming presence). Good samphire cover at margin of saltflats. Mesquite (*Prosopis* spp.) well established. Ten nights (~120 hours) of audio recordings completed.
Habitat type:	grassland
Topography:	plain
Slope:	negligible
Soil:	sandy loam
Soil colour:	red-orange
Rock type:	none
Fire age:	> 5 years
Disturbance:	grazing - low

Site:	**NP09 (Audio recording) (-21.074613, 115.946505)**
Habitat description:	Targeted Night Parrot site. Grassland at edge of occassionally inundated saline flats. Semi-mature *Triodia* (not forming large, dense hummocks). Large expanses of *Tecticornia* spp. Two nights (~24 hours) of audio recordings completed (12-15 January 2018).
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	sandy loam
Soil colour:	red-orange
Rock type:	none
Fire age:	> 5 years
Disturbance:	grazing - medium

Site:	**NP10 (Audio recording) (-21.293092, 115.842637)**
Habitat description:	Targeted Night Parrot site. *Triodia* grassland (mature hummocks, not ring-forming). Mesquite (*Prosopis* spp.) well established. Sixteen nights (~192 hours) of recordings completed (19 December 2017 - 4 January 2018).
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	clay loam
Soil colour:	red-brown
Rock type:	none
Fire age:	> 5 years
Disturbance:	grazing - medium

Site:	**NP11 (Audio recording) (-21.281286, 115.878123)**
Habitat description:	Targeted Night Parrot site. *Triodia* grassland (semi-mature hummocks, not ring-forming). Mesquite (*Prosopis* spp.) well established. Sixteen nights (~192 hours) of recordings completed (28 February - 16 March 2018).
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	clay loam
Soil colour:	red-brown
Rock type:	none
Fire age:	> 5 years
Disturbance:	grazing - medium

Site:	**NP12 (Audio recording) (-21.30279, 115.818946)**
Habitat description:	Tageted Night Parrot site. *Triodia* grassland (matue hummocks to 1 m; not ring-forming). Sparse *Acacia* shrubs present also. Sixteen nights (~192 hours) of recordings completed (19 December 2017 - 4 January 2018).
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	clay loam
Soil colour:	red-brown
Rock type:	none
Fire age:	> 5 years
Disturbance:	grazing - low

Site:	**NP13 (Audio recording) (-21.103215, 115.967347)**
Habitat description:	Targeted Night Parrot site. *Triodia* grassland, with pockets of mature spinifex; not ring-forming. Mesquite (*Prosopis* spp.) encroaching. *Tecticornia* spp. shrubland on adjacent saltflats. Two nights (~24 hours) of audio recordings have been completed (15-17 Janunary 2018).
Habitat type:	grassland
Topography:	plain
Slope:	negligible
Soil:	sandy loam
Soil colour:	red-brown
Rock type:	none
Fire age:	>5 years
Disturbance:	none

Site:	**NP14 (Audio recording) (-21.296139, 115.8359)**
Habitat description:	Targeted Night Parrot site. *Spinifex* grassland of mature hummocks to 0.8m. Sparse Mesquite (*Prosopis* spp.) and other tall shrubs. *Tecticornia* spp. shrubs on saltflats, 100m to the west. Three nights audio recordings completed (17-20 March 2018).
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	sandy loam
Soil colour:	red-brown
Rock type:	ferrous - Ironstone
Fire age:	>5 years
Disturbance:	grazing – low

Site:	**NP15 (Audio recording) (-21.29666, 115.89548)**
Habitat description:	Isolated tall Vachelia farnesiana and Prosopis sp. shrubs over tall Triodia longiceps hummock grassland.
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	clay loam, clay,
Soil colour:	red–orange,
Rock type:	ferrous - Ironstone;
Fire age:	>5 years
Disturbance:	weed infestation,

Site:	**NP16 (Audio recording) (-21.31409, 115.8655)**
Habitat description:	Tall open Acacia synchronicia and Prosopis sp. shrubland over mid Triodia longiceps hummock grassland over Angianthus acrohyalinus.
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	clay loam, clay,
Soil colour:	red–orange,
Rock type:	ferrous - Ironstone;
Fire age:	>5 years
Disturbance:	weed infestation,

Site:	**NP17 (Audio recording) (-21.207295, 115.929307)**
Habitat description:	Isolated clumps mid shrubs of Prosopis sp over closed mid hummock grassland of Triodia sp. (hard and non resinous)
Habitat type:	spinifex grassland
Topography:	plain
Slope:	gentle
Soil:	gravel–alluvial, clay loam,
Soil colour:	red–brown,
Rock type:	ferrous - Ironstone
Fire age:	>5 years
Disturbance:	grazing – low, weed infestation,

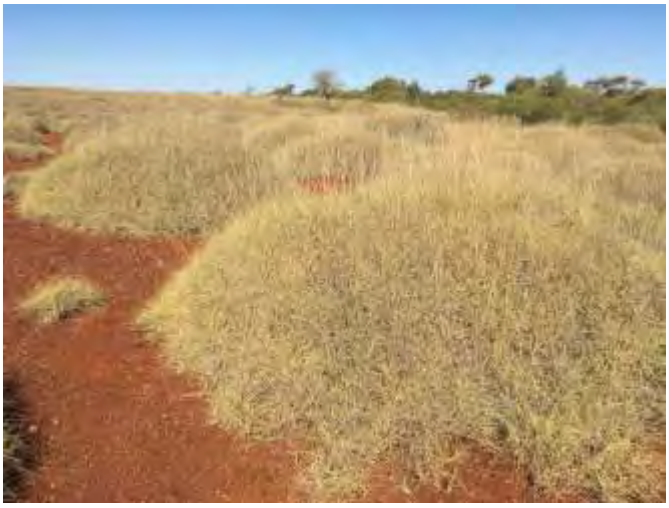
Site:	**NP18 (Audio recording) (-21.16895, 115.956271)**
Habitat description:	Shrubland of Prosopis sp. over isolated tussock grasses of Cenchrus ciliaris.
Habitat type:	shrubland
Topography:	plain
Slope:	negligible
Soil:	clay loam,
Soil colour:	red–brown,
Rock type:	
Fire age:	>5 years
Disturbance:	grazing – medium, historic operations, livestock tracks, weed infestation,

Site:	**NP19 (Audio recording) (-21.18595, 115.94143)**
Habitat description:	Tall open Prosopis sp. shrubland over mid Triodia longiceps hummock grassland.
Habitat type:	shrubland
Topography:	undulating plain
Slope:	gentle
Soil:	sandy clay, sandy loam,
Soil colour:	red–brown,
Rock type:	ferrous - Ironstone;
Fire age:	>5 years
Disturbance:	grazing – medium, livestock tracks, weed infestation,

Site:	**NP20 (Audio recording) (-21.23298, 115.94746)**
Habitat description:	Mid open Acacia bivenosa and A. xiphophylla shrubland over tall Triodia epactia and T. longiceps hummock grassland.
Habitat type:	shrubland
Topography:	plain
Slope:	negligible
Soil:	clay loam, clay,
Soil colour:	red–brown,
Rock type:	ferrous - Ironstone;
Fire age:	>5 years
Disturbance:	none

Site:	**NP21 (Audio recording) (-21.225198, 115.943039)**
Habitat description:	Open shrubland of Acacia bivenosa and A. xyphophylla over open hummock grassland of Triodia sp (hard and non-resinous).
Habitat type:	shrubland
Topography:	plain
Slope:	negligible
Soil:	gravel–alluvial, clay loam, clay,
Soil colour:	red–brown,
Rock type:	ferrous - Ironstone
Fire age:	>5 years
Disturbance:	grazing – low,

Site:	**NP22 (Audio recording) (-21.272031, 115.924241)**
Habitat description:	Isolated clumps of mid shrubs of Acacia bivenosa and Eremophila longifolia over tall hummock grassland of Triodia sp (hard non resinous)
Habitat type:	spinifex grassland
Topography:	plain
Slope:	gentle
Soil:	gravel–alluvial, clay loam,
Soil colour:	red–brown,
Rock type:	ferrous - Ironstone
Fire age:	>5 years
Disturbance:	grazing – low, livestock tracks,



Site:	**OPP031 (Fauna site) (-21.282581, 115.907968)**
Habitat description:	Mature *Triodia spp.* grassland, hummocks to 1m. Isolated low shrubs. Vegetation in excellent condition throughout this area. Suitable Night Parrot roosting habitat.
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	sandy loam
Soil colour:	red-brown
Rock type:	ferrous - Ironstone
Fire age:	>5 years
Disturbance:	grazing – low, vehicle tracks

Site:	**OPP033 (Fauna site) (-21.249572, 115.939414)**
Habitat description:	Mature *Triodia spp.* hummock grassland to 1m, with minor buffel grass (*Cenchrus ciliaris*) incursions. Suitable Night Parrot roosting habitat.
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	sandy loam
Soil colour:	red-brown
Rock type:	ferrous - Ironstone
Fire age:	>5 years
Disturbance:	grazing – low

Site:	**S002 (Fauna site) (-21.266869, 115.948223)**
Habitat description:	Major creekline. Eucalyptus trees to 12 m over tall and low shrubs, over mature *Triodia* spp. hummocks on banks; moderately grazed.
Habitat type:	open woodland (riparian)
Topography:	creek
Slope:	negligible
Soil:	gravel-alluvial
Soil colour:	red-brown
Rock type:	none
Fire age:	>5 years
Disturbance:	grazing - moderate

Site:	**S004 (Fauna site) (-21.278898, 115.825833)**
Habitat description:	Upper reaches of tidal creek. Mangrove and samphire species on mudflats.
Habitat type:	tidal samphire mudflat
Topography:	plain
Slope:	negligible
Soil:	sandy clay
Soil colour:	brown
Rock type:	none
Fire age:	>5 years
Disturbance:	none

Site:	**S005 (Audio recording) (-21.238111, 115.95638)**
Habitat description:	*Triodia* spp. grassland (mature hummocks) with snakewood shrubs. Small pockets of cracking clays present.
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	sandy loam
Soil colour:	red-brown
Rock type:	chirt
Fire age:	>5 years
Disturbance:	evidence of feral animals, grazing – low, vehicle tracks

Site:	**S006 (Fauna site) (-21.251786, 115.953194)**
Habitat description:	*Acacia* shrubland over *Triodia* spp. grassland (mature hummocks to 1m.)
Habitat type:	shrubland
Topography:	plain
Slope:	negligible
Soil:	sandy loam
Soil colour:	red-brown
Rock type:	ferrous - Ironstone
Fire age:	>5 years
Disturbance:	evidence of feral animals

Site:	**S009 (Fauna site) (-21.283194, 115.941106)**
Habitat description:	Major creekline. Eucalyptus trees over mixed medium shrubs, over mature *Triodia* spp. (mature hummocks) and other grasses.
Habitat type:	open woodland (riparian)
Topography:	creek
Slope:	negligible
Soil:	gravel-alluvial
Soil colour:	brown
Rock type:	chirt
Fire age:	>5 years
Disturbance:	evidence of feral animals

Site:	**S012 (Fauna site) (-21.076481, 115.927393)**
Habitat description:	Rockshelf. Shorebird low tide count.
Habitat type:	tidal channel or ocean
Topography:	coast
Slope:	n/a
Soil:	n/a
Soil colour:	n/a
Rock type:	reef
Fire age:	n/a
Disturbance:	none

Site:	**S014 (Fauna site) (-21.079213, 115.926423)**
Habitat description:	Mangrove shrubland at major tidal creek headwaters. Photo representative.
Habitat type:	tidal samphire mudflat
Topography:	coast
Slope:	negligible
Soil:	gravel-alluvial
Soil colour:	brown
Rock type:	none
Fire age:	>5 years
Disturbance:	none

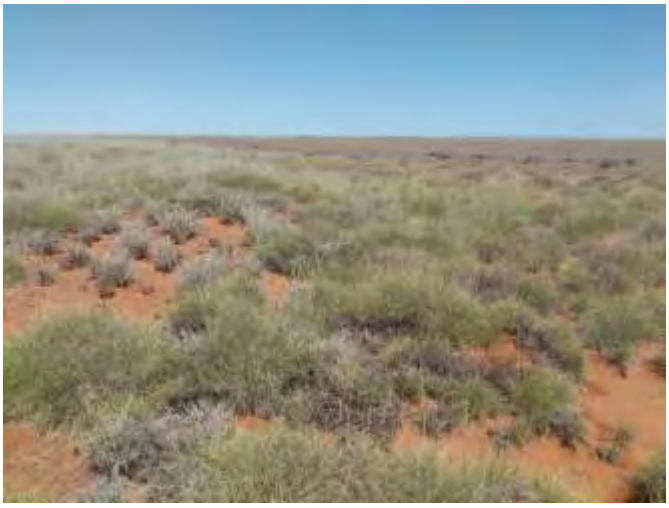
Site:	**S015 (Fauna site) (-21.080461, 115.92786)**
Habitat description:	Coastal shrubland over *Triodia* spp. and other grasses.
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	sand
Soil colour:	brown
Rock type:	none
Fire age:	>5 years
Disturbance:	none

Site:	**S016 (Fauna site) (-21.198661, 115.901311)**
Habitat description:	*Triodia* spp. grassland on saltflat island (low hummocks) and other grasses. Sparse mixed, low shrubs. Marine mollusc shells found across island.
Habitat type:	spinifex grassland
Topography:	undulating plain
Slope:	gentle
Soil:	sandy loam
Soil colour:	red-brown
Rock type:	none
Fire age:	>5 years
Disturbance:	none

Site:	**S017 (Fauna site) (-21.565811, 115.866827)**
Habitat description:	Old Night Parrot record, 1967 (DBCA 2017). Open woodland (riparian) on Robe River flood plain. Sparse mature hummocks. Moderately grazed, buffel grass (*Cenchrus ciliaris*) present.
Habitat type:	open woodland (riparian)
Topography:	plain
Slope:	negligible
Soil:	sandy loam
Soil colour:	red-brown
Rock type:	basalt
Fire age:	>5 years
Disturbance:	grazing – medium, weed infestation

Site:	**S018 (Fauna site) (-21.126012, 115.930488)**
Habitat description:	*Triodia* spp. grassland on saltflat island (low hummocks). Unsuitable for Night Parrot roosting.
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	sandy loam
Soil colour:	brown, yellow
Rock type:	basalt
Fire age:	>5 years
Disturbance:	none

Site:	**S019 (Fauna site) (-21.134111, 115.927847)**
Habitat description:	*Triodia* spp. grassland on saltflats island (sparse, low hummocks). Other grassland species and isolated *Acacia* shrubs present, including mesquite (*Prosopis* spp.). Samphire fringing the island. Poor roosting habitat for Night Parrot.
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	sandy loam
Soil colour:	brown, yellow
Rock type:	basalt
Fire age:	>5 years
Disturbance:	none



Site:	**S023 (Fauna site) (-21.248922, 115.807185)**
Habitat description:	Mangal community.
Habitat type:	mangal community
Topography:	plain
Slope:	negligible
Soil:	sand, mud
Soil colour:	brown
Rock type:	none
Fire age:	>5 years
Disturbance:	none

Site:	**S024 (Fauna site) (-21.302488, 115.798128)**
Habitat description:	*Triodia* spp. grassland on saltflat island (mature hummocksto 1m) with buffel grass (*Cenchrus ciliaris*), and low *Sclaeoleana* shrubs. Potential Night Parrot roosting habitat.
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	sandy loam
Soil colour:	red-orange
Rock type:	none
Fire age:	>5 years
Disturbance:	grazing - low

Site:	**S025 (Fauna site) (-21.284793, 115.833212)**
Habitat description:	*Acacia* and *Grevillea* shrubland to 2m, over mixed low shrubs and mature *Triodia* spp. hummocks to 50cm, buffel grass (*Cenchrus ciliaris*) and other grasses. Vegetation condition much better around island periphery,
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	sandy loam
Soil colour:	red-orange
Rock type:	limestone
Fire age:	>5 years
Disturbance:	evidence of feral animals, grazing – high, vehicle tracks

Site:	**S026 (Fauna site) (-21.270135, 115.842129)**
Habitat description:	*Triodia* spp. gassland to 50cm and buffel grass (*Cenchrus ciliaris*). Isolated *Acacia* tall shrubs and mesquite (*Prosopis* spp.) fairly well grazed.
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	sandy loam
Soil colour:	red-orange
Rock type:	none
Fire age:	>5 years
Disturbance:	grazing - moderate

Site:	**S027 (Fauna site) (-21.258081, 115.861743)**
Habitat description:	*Triodia* spp. grassland to 0.3-1m. Isolated tall *Acacia* shrubs to 2.5m. Unsuitable for Night Parrot roosting.
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	sandy loam
Soil colour:	red-orange
Rock type:	none
Fire age:	>5 years
Disturbance:	evidence of feral animals, grazing – low

Site:	**S028 (Fauna site) (-21.266004, 115.864985)**
Habitat description:	*Triodia* spp. grassland on saltflat island (mature hummocks to 1 m, especially around island periphery). Isolated *Acacia* shrubs to 1.5 - 2.5 m.
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	sandy loam
Soil colour:	red-orange
Rock type:	none
Fire age:	>5 years
Disturbance:	evidence of feral animals, grazing – low

Site:	**S029 (Fauna site) (-21.245597, 115.890005)**
Habitat description:	Saltflats. Bare.
Habitat type:	mudflat or saltflat
Topography:	plain
Slope:	negligible
Soil:	sandy loam
Soil colour:	whitish
Rock type:	none
Fire age:	>5 years
Disturbance:	vehicle tracks

Site:	**S030 (Fauna site) (-21.296834, 115.867893)**
Habitat description:	*Triodia* spp. and buffel grass (*Cenchrus ciliaris*) grassland. Pockets of large mature *Triodia* hummocks. Isolated *Acacia* medium shrubs to 1.5m and *Sclaeoleana* shrubs.
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	sandy loam
Soil colour:	red-brown
Rock type:	ferrous - Ironstone
Fire age:	>5 years
Disturbance:	grazing – medium

Site:	**S032 (Fauna site) (-21.27802, 115.896832)**
Habitat description:	Creekline at entrance to saltflats.*Triodia* spp. grassland. Isoated mixed medium *Acacia* shrubs to 2.5m and samphire spp. flowing in January 2018 due to TC Joyce, pools still present.
Habitat type:	spinifex grassland
Topography:	creek
Slope:	negligible
Soil:	gravel-alluvial, sandy loam
Soil colour:	red-brown
Rock type:	chirt
Fire age:	>5 years
Disturbance:	grazing – low

Site:	**S034 (Fauna site) (-21.184353, 115.947679)**
Habitat description:	Permanent pool. Mesquite (*Prosopis* spp.) infestation. Shrubland of mesquite over *Baumea* spp. reeds. Fish present (not sampled).
Habitat type:	open woodland (riparian)
Topography:	creek
Slope:	negligible
Soil:	gravel-alluvial, sand
Soil colour:	red-brown
Rock type:	none
Fire age:	>5 years
Disturbance:	grazing – medium, historic clearing, weed infestation

Site:	**S035 (Fauna site) (-21.200819, 116.030212)**
Habitat description:	*Triodia* spp. grassland (mature hummocks to 0.5 m) with isolated tall medium *Grevillea* and *Acacia* shrubs.
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	sandy loam
Soil colour:	red-brown
Rock type:	ferrous - Ironstone
Fire age:	>5 years
Disturbance:	grazing – low

Site:	**S036 (Fauna site) (-21.195162, 116.026206)**
Habitat description:	Shrubland of tall and medium *Grevillea* and *Acacia* shrubs, over buffel grass (*Cenchrus ciliaris*) and sparse, low Triodia spp. Kuykuyu and mesquite (*Prosopis* spp.) present.
Habitat type:	shrubland
Topography:	plain
Slope:	negligible
Soil:	sandy loam
Soil colour:	red-brown
Rock type:	chirt
Fire age:	>5 years
Disturbance:	grazing – medium

Site:	**S037 (Fauna site) (-21.19495, 116.015632)**
Habitat description:	Open ripariann woodland of Eucalyptus trees to 10 m over mixed tall, medium and low shrubs, over mature *Triodia* spp. hummocks to 1m and other grasses including buffel grass (*Cenchrus ciliaris*), Isolated mesquite (*Prosopis* spp.) present.
Habitat type:	open woodland (riparian)
Topography:	drainage line
Slope:	negligible
Soil:	gravel-alluvial, sand
Soil colour:	red-brown
Rock type:	chirt
Fire age:	>5 years
Disturbance:	grazing – low, weed infestation

Site:	**S038 (Fauna site) (-21.173025, 116.003875)**
Habitat description:	Open woodland of Eucalyptus trees over mesquite (*Prosopis* spp.)infestation and mixed tall *Acacia* shrubs, over buffel grass (*Cenchrus ciliaris*) and some Triodia spp. Minor cracking clays present.
Habitat type:	Prosopis shrubland
Topography:	creek
Slope:	negligible
Soil:	sandy loam
Soil colour:	red-brown
Rock type:	basalt
Fire age:	>5 years
Disturbance:	grazing – medium, weed infestation

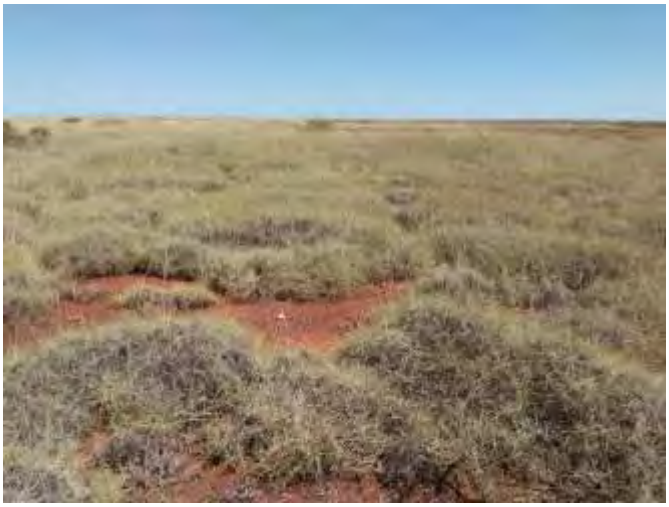
Site:	**S039 (Fauna site) (-21.166293, 115.994905)**
Habitat description:	Shrubland of mesquite (*Prosopis* spp.) over mixed low shrubs and grasses. Evaporating pool present - attracting a lot of bird activity.
Habitat type:	Prosopis shrubland
Topography:	plain
Slope:	negligible
Soil:	sandy loam
Soil colour:	red-brown
Rock type:	basalt
Fire age:	>5 years
Disturbance:	grazing – medium, livestock tracks, vehicle tracks, weed infestation

Site:	**S040 (Fauna site) (-21.162399, 115.977682)**
Habitat description:	Open woodland of Eucalyptus trees over mesquite (*Prosopis* spp.) infestation and mixed medium and low *Acacia* shrubs over grasses.
Habitat type:	open woodland
Topography:	drainage line
Slope:	negligible
Soil:	sandy loam
Soil colour:	red-orange
Rock type:	basalt
Fire age:	>5 years
Disturbance:	weed infestation, vehicle tracks, grazing - moderate

Site:	**S041 (Fauna site) (-21.163272, 115.971525)**
Habitat description:	Triodia spp. Grassland (mature hummocks), isolated *Grevillea*, *Acacia* and mesquite (*Prosopis* spp.) tall shrubs.
Habitat type:	spinifex grassland
Topography:	undulating plain
Slope:	negligible
Soil:	sandy loam
Soil colour:	red-brown
Rock type:	ferrous - Ironstone
Fire age:	>5 years
Disturbance:	weed infestation, grazing - low

Site:	**S042 (Fauna site) (-21.230322, 115.94524)**
Habitat description:	Triodia spp. grassland (mature hummocks to 0.8 m), with mixed *Acacia* low shrubs.
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	sandy loam
Soil colour:	red-orange
Rock type:	ferrous - Ironstone
Fire age:	>5 years
Disturbance:	grazing – low

Site:	**S043 (Fauna site) (-21.262538, 115.929079)**
Habitat description:	*Triodia* spp. grassland (mature hummocks to 1m). Isolated *Acacia* medium shrubs.
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	sandy loam
Soil colour:	red-brown
Rock type:	basalt
Fire age:	>5 years
Disturbance:	none

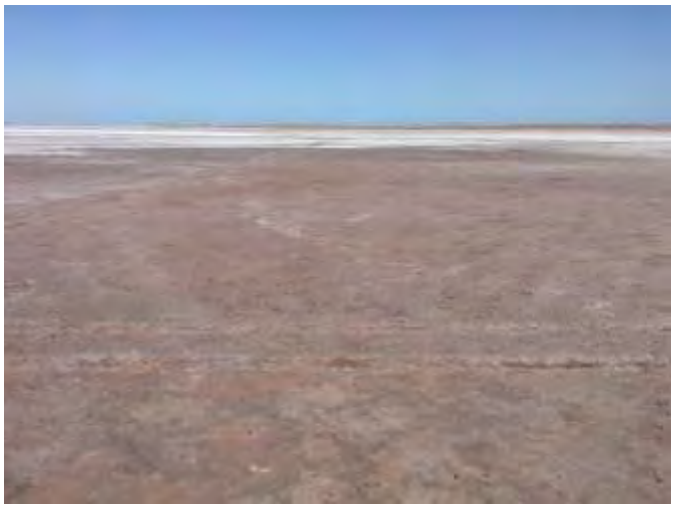


Site:	**S046 (Fauna site) (-21.180331, 115.870249)**
Habitat description:	Coastal samphire shrubland, *Tecticornia* spp. to 0.4 m. Inundated by larger tides to 0.4 m.
Habitat type:	samphire shrubland
Topography:	plain
Slope:	negligible
Soil:	clay loam
Soil colour:	brown
Rock type:	none
Fire age:	>5 years
Disturbance:	none

Site:	**S048 (Fauna site) (-21.187292, 115.948134)**
Habitat description:	Old abandoned shearing shed and quarters. Large scale clearing with sparse vegetation, surrounding by mesquite (*Prosopis* spp.) infestation.
Habitat type:	cleared
Topography:	plain
Slope:	gentle
Soil:	gravel-alluvial
Soil colour:	red-brown
Rock type:	none
Fire age:	
Disturbance:	current operations, grazing – low, historic clearing, large-scale clearing, litter, vehicle tracks

Site:	**S049 (Fauna site) (-21.209032, 115.947372)**
Habitat description:	*Triodia* spp. grassland of mature hummocks, with sparse medium shrubs to 2.5 m and exposed substrate. Scattered small thickets of mesquite (*Prosopis* spp.) present.
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	gravel-alluvial
Soil colour:	red-brown
Rock type:	none
Fire age:	
Disturbance:	grazing – low, livestock tracks, vehicle tracks, weed infestation

Site:	**S050 (Fauna site) (-21.200588, 115.915872)**
Habitat description:	Saltflat playa, devoid of vegetation.
Habitat type:	mudflat or saltflat
Topography:	salt lake (playa)
Slope:	negligible
Soil:	loam, clay loam, silt
Soil colour:	red-brown
Rock type:	none
Fire age:	> 5 years
Disturbance:	vehicle tracks



Site:	**S051 (Fauna site) (-21.223959, 115.932613)**
Habitat description:	*Triodia* spp. grassland (mature hummocks to 0.75 m), over isolated small to medium mixed shrubs to 2 m, on gravelly clay-loam substrate.
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	clay loam
Soil colour:	red-brown
Rock type:	none
Fire age:	>5 years
Disturbance:	livestock tracks, vehicle tracks

Site:	**S052 (Fauna site) (-21.21272, 115.968929)**
Habitat description:	Low open buffel grass (*Cenchrus ciliaris*) grassland on stony plain with sparsely scattered small to medium shrubs to 2 m. Large areas of exposed stony clay loam substrate.
Habitat type:	grassland
Topography:	plain
Slope:	negligible
Soil:	gravel-alluvial, loam, clay loam
Soil colour:	red-brown
Rock type:	none
Fire age:	> 5 years
Disturbance:	grazing – high, historic clearing, livestock tracks, vehicle tracks, weed infestation

Site:	**S053 (Fauna site) (-21.169678, 115.95669)**
Habitat description:	Dense thicket of mesquite (*Prosopis* spp.) thicket to 3.5 m, over very sparsely scattered small to medium shrubs to 2 m, over buffel grass (*Cenchrus ciliaris*) to 0.3 m and scattered patches of mature *Triodia* spp. grasses to 0.75 m, on gravelly clay loam substrate.
Habitat type:	Prosopis shrubland
Topography:	plain
Slope:	negligible
Soil:	gravel-alluvial, clay loam
Soil colour:	red-brown
Rock type:	none
Fire age:	>5 years
Disturbance:	grazing – medium, historic clearing, livestock tracks, vehicle tracks, weed infestation

Site:	**S054 (Fauna site) (-21.178577, 115.97577)**
Habitat description:	Open woodland of Eucalyptus spp. to 12 m, over clumps of dense mixed tall shrubs, dominated by mesquite (*Prosopis* spp.) to 3 m, over scattered small to medium shrubs to 2 m, over buffel grass (Cenchrus ciliaris), on clay loam substrate.
Habitat type:	open woodland
Topography:	plain
Slope:	negligible
Soil:	clay loam
Soil colour:	red-brown
Rock type:	none
Fire age:	> 5 years
Disturbance:	grazing – medium, livestock tracks, vehicle tracks, weedinfestation,

Site:	**S054B (Fauna site) (-21.078206, 115.930378)**
Habitat description:	Grassland on low primary dune. Scattered small to medium shrubs to 2 m, over Triodia spp. hummock and tussock grasses to 0.75 m on sandy substrate.
Habitat type:	spinifex grassland
Topography:	sand dune
Slope:	gentle
Soil:	sand
Soil colour:	brown, whitish
Rock type:	none
Fire age:	> 5 years
Disturbance:	litter

Site:	**S055 (Fauna site) (-21.076658, 115.93342)**
Habitat description:	Mangal community at intertidal zone on shoreline.
Habitat type:	open woodland (riparian)
Topography:	beach
Slope:	gentle
Soil:	sand
Soil colour:	brown, grey, whitish
Rock type:	none
Fire age:	> 5 years
Disturbance:	litter

Site:	**S056 (Fauna site) (-21.187169, 115.947979)**
Habitat description:	Major creekline (upstream of site S034 - permanent pool). Scattered patches of riparian vegetation dominated by Melaleuca sp., planted introduced palms and mesquite (*Prosopis* spp.), over heavily grazed understorey. Numerous large pools of water present, with fringing *Baumea* spp.
Habitat type:	cleared
Topography:	creek
Slope:	gentle
Soil:	sandy loam
Soil colour:	red-brown
Rock type:	none
Fire age:	> 5 years
Disturbance:	erosion channels, evidence of feral animals, grazing – high, historic clearing, livestock tracks, weed infestation

Site:	**S057 (Fauna site) (-21.072022, 115.938347)**
Habitat description:	Intertidal mudflat.
Habitat type:	mudflat or saltflat
Topography:	intertidal zone
Slope:	gentle
Soil:	sand
Soil colour:	brown, grey
Rock type:	none
Fire age:	> 5 years
Disturbance:	none

Site:	**S058 (Fauna site) (-21.154688, 115.922869)**
Habitat description:	Small low islands on saltflat playa. Scattered low *Tecticornia* spp. shrubs to 0.75 m, over scattered *Triodia* spp. grasses to 0.75 m on gravelly clay loam substrate. *Tecticornia* shrubs more abundant on island periphery, with *Triodia* grasses common on more elevated ground.
Habitat type:	mudflat or saltflat
Topography:	plain
Slope:	negligible
Soil:	gravel-alluvial, clay loam
Soil colour:	red-brown
Rock type:	none
Fire age:	> 5 years
Disturbance:	none

Site:	**S059 (Fauna site) (-21.296304, 115.835837)**
Habitat description:	*Triodia* spp. grassland (mature hummocks to 0.75 m), with scattered small to medium shrubs to 3 m, over on gravelly clay loam substrate.
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	gravel-alluvial, clay loam
Soil colour:	red-brown
Rock type:	none
Fire age:	> 5 years
Disturbance:	grazing – low, livestock tracks, vehicle tracks

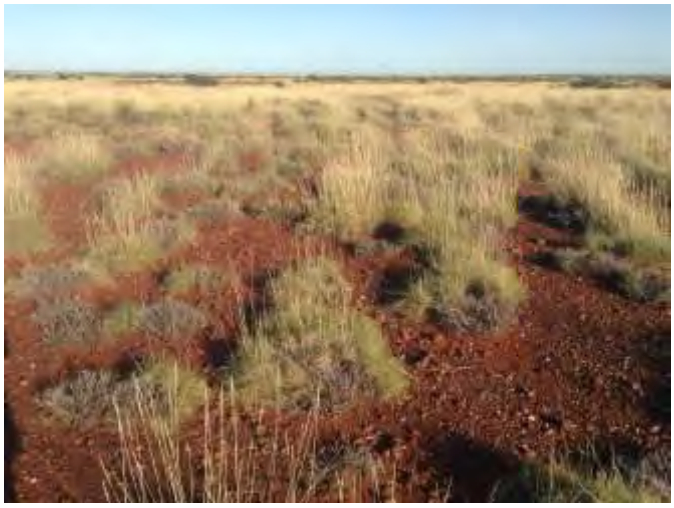
Site:	**S060 (Fauna site) (-21.306795, 115.823587)**
Habitat description:	Minor creekline with small water pool. Scattered eucalypts to 8 m over mixed, dense shrub understorey to 3 m, over mixed small shrubs to 1 m, over tussock grasses to 0.5 m, on gravely clay loam substrate.
Habitat type:	open woodland (riparian)
Topography:	creek
Slope:	gentle
Soil:	gravel-alluvial, loam, clay loam
Soil colour:	red-brown
Rock type:	none
Fire age:	> 5 years
Disturbance:	grazing – medium, livestock tracks, vehicle tracks

Site:	**S061 (Fauna site) (-21.287492, 115.829857)**
Habitat description:	*Triodia* spp. grassland of low, hummocks, with scattered low *Acacia* shrubs to 1.5 m, on stony clay-loam substrate.
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	clay loam, rocks
Soil colour:	red-brown
Rock type:	none
Fire age:	
Disturbance:	livestock tracks

Site:	**S062 (Fauna site) (-21.308542, 116.113412)**
Habitat description:	*Triodia* spp. grassland of mature (to 1 m) and immature hummocks, with scattered *Acacia* shrubs to 2.5 m over, on gravelly clay-loam substrate.
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	gravel-alluvial, clay loam
Soil colour:	red-brown
Rock type:	none
Fire age:	> 5 years
Disturbance:	grazing – medium, livestock tracks, vehicle tracks

Site:	**S063 (Fauna site) (-21.299078, 116.105101)**
Habitat description:	*Triodia* spp. grassland of mature muccks to 0.6 m, with scattered individual or clusters of medium *Acacia* shrubs to 1.5 to 2.5 m, on gravelly clay-loam substrate.
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	gravel-alluvial, clay loam
Soil colour:	red-brown
Rock type:	none
Fire age:	> 5 years
Disturbance:	livestock tracks

Site:	**S064 (Fauna site) (-21.280369, 116.095972)**
Habitat description:	*Triodia* spp. grassland of scattered, low hummocks with sparsely scattered medium shrubs to 2.5 m, with large areas of exposed stony substrate.
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	gravel-alluvial, clay loam
Soil colour:	red-brown
Rock type:	none
Fire age:	> 5 years
Disturbance:	livestock tracks



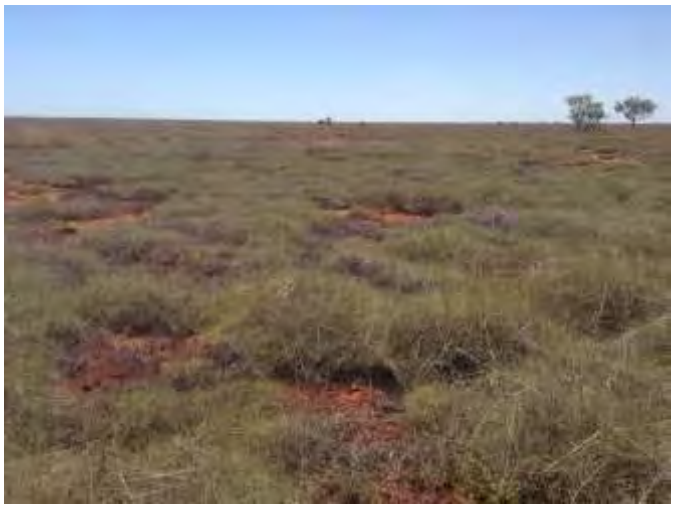
Site:	**S065 (Fauna site) (-21.26804, 116.090005)**
Habitat description:	Grassland of buffel grass (*Cenchrus ciliaris*) with sparsely scattered individual or small patches of medium shrubs to 2 m, on clay-loam substrate.
Habitat type:	grassland
Topography:	plain
Slope:	negligible
Soil:	clay loam
Soil colour:	red-brown
Rock type:	none
Fire age:	> 5 years
Disturbance:	evidence of feral animals, grazing – high, livestock tracks, vehicle tracks, weed infestation

Site:	**S066 (Fauna site) (-21.254513, 116.079649)**
Habitat description:	*Triodia* spp. grassland of low, but dense hummocks, with scattered small to medium shrubs to 2 m, on gravelly clay loam substrate.
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	gravel-alluvial, clay loam
Soil colour:	red-brown
Rock type:	none
Fire age:	> 5 years
Disturbance:	grazing – medium, livestock tracks, vehicle tracks

Site:	**S067 (Fauna site) (-21.245697, 116.074027)**
Habitat description:	*Triodia* spp. grassland of scattered, low hummocks, with sparsely scattered small to medium shrubs to 2 m on low stony hill with small areas of exposed baserock at top.
Habitat type:	spinifex grassland
Topography:	hill slope
Slope:	gentle
Soil:	gravel-alluvial, clay loam, rocks
Soil colour:	red-brown
Rock type:	ferrous - Ironstone
Fire age:	> 5 years
Disturbance:	livestock tracks

Site:	**S068 (Fauna site) (-21.229303, 116.058933)**
Habitat description:	Heavily grazed grassland on plain, largely void of vegetation with exception of scattered patches of buffel grass (*Cenchrus ciliaris*) to 0.05 m.
Habitat type:	grassland
Topography:	plain
Slope:	negligible
Soil:	clay loam
Soil colour:	red-brown
Rock type:	none
Fire age:	> 5 years
Disturbance:	evidence of feral animals, grazing – high, livestock tracks, vehicle tracks, weed infestation

Site:	**S069 (Fauna site) (-21.313065, 115.790973)**
Habitat description:	*Triodia* spp. grassland of low, scattered hummocks, with sparsely scattered large shrubs and small trees to 4 m, over scattered low shrubs to 1 m, on clay loam substrate.
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	gravel-alluvial, clay loam
Soil colour:	red-brown
Rock type:	none
Fire age:	> 5 years
Disturbance:	livestock tracks, vehicle tracks



Site:	**S070 (Fauna site) (-21.318817, 115.814124)**
Habitat description:	*Triodia* spp. grassland of mature hummocks to 1 m, with with sparsely scattered small to medium shrubs to 1.5 m, on gravelly clay-loam substrate with large areas of exposed substrate.
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	gravel-alluvial, clay loam
Soil colour:	red-brown
Rock type:	none
Fire age:	> 5 years
Disturbance:	livestock tracks, vehicle tracks

Site:	**S071 (Fauna site) (-21.313105, 115.874552)**
Habitat description:	Heavily grazed grassland on plain with sparsely scattered small to medium shrubs to 2 m over sparsely scattered patches of Triodia grasses of various life stages to 1 m and mixed grazing grasses to .25 m on gravelly clay loam substrate. Large areas of sparse to no vegetation with exposed substrate.
Habitat type:	grassland
Topography:	plain
Slope:	negligible
Soil:	gravel-alluvial, clay loam
Soil colour:	red-brown
Rock type:	none
Fire age:	> 5 years
Disturbance:	evidence of feral animals, grazing – high, livestock tracks, vehicle tracks, weed infestation

Site:	**S072 (Fauna site) (-21.299552, 115.887347)**
Habitat description:	*Triodia* spp. grassland along fenceline track. West of fence with scattered patches of small shrubs to 1.5 m, over *Triodia* spp. hummocks of various life stages, including isolated large mature hummocks, on gravelly clay loam substrate. East side of fence heavily grazed with scattered patches of immature *Triodia spp.* grasses and buffel grass (*Cenchrus ciliaris*) to 0.25 m, with large areas of bare, gavelly substrate.
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	gravel-alluvial, clay loam
Soil colour:	red-brown
Rock type:	none
Fire age:	>5 years
Disturbance:	evidence of feral animals, grazing – high, livestock tracks, vehicle tracks

Site:	**S073 (Fauna site) (-21.224805, 115.919508)**
Habitat description:	Saltflat playa devoid of vegetation.
Habitat type:	mudflat or saltflat
Topography:	salt lake (playa)
Slope:	negligible
Soil:	clay loam
Soil colour:	red-brown, grey, whitish
Rock type:	none
Fire age:	> 5 years
Disturbance:	livestock tracks, vehicle tracks

Site:	**S074 (Fauna site) (-21.233486, 115.945245)**
Habitat description:	Triodia spp. grassland of large mature hummocks to 0.75m, with scattered patches of small to medium shrubs to 1.5 m on gravelly clay loam substrate. Suitable Night Parrot roosting habitat.
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	gravel-alluvial, clay loam
Soil colour:	red-brown
Rock type:	none
Fire age:	> 5 years
Disturbance:	livestock tracks, vehicle tracks

Site:	**SM01-01 (Audio recording) (-21.105237, 115.924251)**
Habitat description:	Mangrove shrubland over low *Tecticornia* spp. shrubs near terminus of tidal creek. Photos is example only.
Habitat type:	tidal samphire mudflat
Topography:	plain
Slope:	negligible
Soil:	sand
Soil colour:	brown
Rock type:	none
Fire age:	>5 years
Disturbance:	none

Site:	**SM01-02 (Audio recording) (-21.237904, 115.956213)**
Habitat description:	*Triodia* spp. grassland of large, mature hummocks to 0.8 m, with snakewood shrubs. Pockets of minor cracking clays. Suitable for Night Parrot roosting.
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	sandy loam
Soil colour:	red-brown
Rock type:	chirt
Fire age:	>5 years
Disturbance:	evidence of feral animals, grazing – low, vehicle tracks

Site:	**SM02-01 (Audio recording) (-21.114234, 115.912895)**
Habitat description:	Mangrove shrubland over low *Tecticornia* spp. shrubs near terminus of tidal creek. Photos is example only.
Habitat type:	samphire shrubland
Topography:	plain
Slope:	negligible
Soil:	sand
Soil colour:	grey-brown
Rock type:	none
Fire age:	>5 years
Disturbance:	none

Site:	**SM02-02 (Audio recording) (-21.266468, 115.948846)**
Habitat description:	Major creekline. Open riparian woodland of eucalyptus spp. to 10 m, over mid to tall mixed shrubs, over low mixed shrubs, over *Triodia* spp. hummocks to 0.5 m..
Habitat type:	open woodland (riparian)
Topography:	creek
Slope:	negligible
Soil:	gravel-alluvial
Soil colour:	brown
Rock type:	chirt
Fire age:	>5 years
Disturbance:	none

Site:	**SM03-01 (Audio recording) (-21.122803, 115.910802)**
Habitat description:	Mangrove shrubland over low *Tecticornia* spp. shrubs near terminus of tidal creek. Photos is example only.
Habitat type:	tidal samphire mudflat
Topography:	plain
Slope:	negligible
Soil:	sand
Soil colour:	grey-brown
Rock type:	none
Fire age:	>5 years
Disturbance:	none

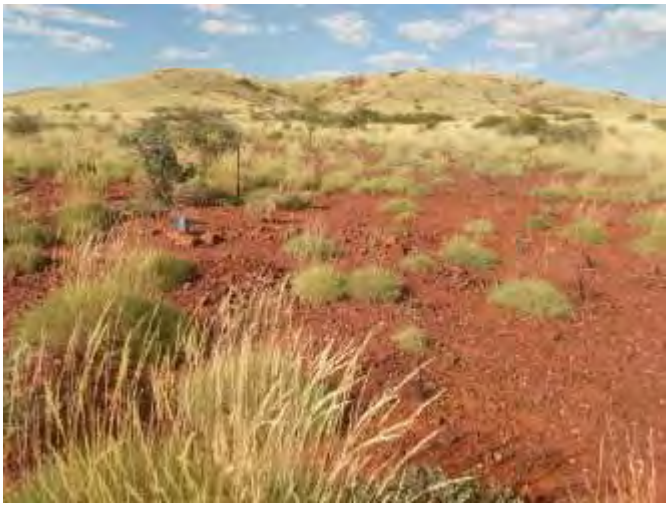
Site:	**SM04-01 (Audio recording) (-21.221999, 115.866408)**
Habitat description:	Mangrove shrubland over low *Tecticornia* spp. shrubs near terminus of tidal creek. Photos is example only.
Habitat type:	mangal community
Topography:	plain
Slope:	negligible
Soil:	sand
Soil colour:	grey-brown
Rock type:	none
Fire age:	>5 years
Disturbance:	none

Site:	**SM04-02 (Audio recording) (-21.184775, 115.949398)**
Habitat description:	Permanent pool. Mesquite (*Prosopis* spp.) infestation. Shrubland of mesquite over *Baumea* spp. reeds. Fish present (not sampled).
Habitat type:	open woodland (riparian)
Topography:	creek
Slope:	negligible
Soil:	gravel-alluvial
Soil colour:	brown
Rock type:	basalt
Fire age:	>5 years
Disturbance:	evidence of feral animals, grazing – high

Site:	**SM05-01 (Audio recording) (-21.25567, 115.848387)**
Habitat description:	Mangrove shrubland over low *Tecticornia* spp. shrubs near terminus of tidal creek. Photos is example only.
Habitat type:	tidal samphire mudflat
Topography:	plain
Slope:	negligible
Soil:	sand
Soil colour:	grey-brown
Rock type:	none
Fire age:	>5 years
Disturbance:	none

Site:	**SM05-02 (Audio recording) (-21.310721, 116.114037)**
Habitat description:	*Triodia* spp. grassland of mature (to 1 m) and immature hummocks, with scattered *Acacia* shrubs to 2.5 m over, on gravelly clay-loam substrate.
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	gravel-alluvial, clay loam
Soil colour:	red-brown
Rock type:	none
Fire age:	>5 years
Disturbance:	grazing – medium, livestock tracks, vehicle tracks

Site:	**SM06-02 (Audio recording) (-21.292567, 116.100085)**
Habitat description:	*Triodia* spp. grassland of mature hummocks to 0.7 m, with medium *Acacia* trees and mixed low shrubs, at base of low hills.
Habitat type:	spinifex grassland
Topography:	undulating plain
Slope:	gentle
Soil:	sandy loam
Soil colour:	red-brown
Rock type:	ferrous - Ironstone
Fire age:	>5 years
Disturbance:	grazing – low, firebreak, vehicle tracks

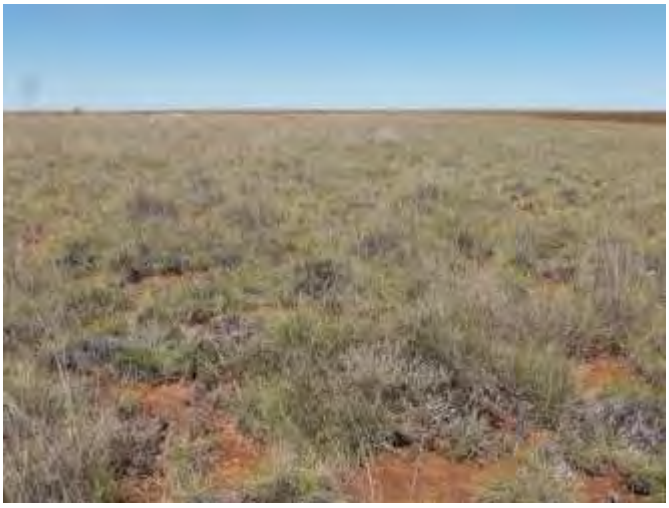


Site:	**SM07-02 (Audio recording) (-21.195525, 116.015581)**
Habitat description:	Open riparian woodland of eucalyptus trees to 12 m, over mixed tall shrubs, over mixed low shrubs, over sparse *Triodia* hummocks and buffel grass (*Cenchrus ciliaris*).
Habitat type:	open woodland (riparian)
Topography:	drainage line
Slope:	negligible
Soil:	gravel-alluvial, sandy loam
Soil colour:	red-brown
Rock type:	ferrous - Ironstone
Fire age:	>5 years
Disturbance:	grazing – low, vehicle tracks

Site:	**SM08-02 (Audio recording) (-21.166617, 115.956057)**
Habitat description:	Shrubland dominated by mesquite (Prosopis spp.) with isolated eucalyptus trees to 12 m, over mixed medium shrubs, over sparse *Triodia* spp. hummocks and buffel grass (Cenchrus ciliaris).
Habitat type:	Prosopis shrubland
Topography:	plain
Slope:	negligible
Soil:	sandy loam
Soil colour:	red-brown
Rock type:	basalt
Fire age:	>5 years
Disturbance:	grazing – moderate, weed infestation

Site:	**SRE001 (Fauna site) (-21.108121, 115.955419)**
Habitat description:	*Triodia* spp. grassland on saltflat island. Island fringed with samphire shrubland. Mesquite (*Prosopis* spp.) present. Presence of marine mollusc shells suggests unlikely SRE habitat. Unsuitable for Night Parrot roosting.
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	sandy loam
Soil colour:	red-orange
Rock type:	ferrous - Ironstone
Fire age:	>5 years
Disturbance:	evidence of feral animals, weed infestation

Site:	**SRE002 (Fauna site) (-21.278142, 115.828235)**
Habitat description:	*Triodia* spp. grassland on saltflat island. Island fringed with samphire shrubland. Presence of marine mollusc shells suggests unlikely SRE habitat. Unsuitable for Night Parrot roosting.
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	sandy loam
Soil colour:	red-brown
Rock type:	none
Fire age:	>5 years
Disturbance:	none



Site:	**SRE003 (Fauna site) (-21.238312, 115.955924)**
Habitat description:	Triodia spp. grassland of large mature hummocks to 0.8m, with snakewood shrubs. Pockets of minor cracking clays. Suitable Night Parrot roosting habitat.
Habitat type:	spinifex grassland
Topography:	plain
Slope:	negligible
Soil:	sandy loam
Soil colour:	red-brown
Rock type:	chirt
Fire age:	>5 years
Disturbance:	none

Appendix 3 Specialised Zoological bat call identification reports

Bat call identification from Mardie Station, Western Australia

Type:	Acoustic analysis
Prepared for:	Phoenix Environmental Sciences
Date:	8 January 2018
Job No.:	SZ442

Prepared by:

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This report should be included amongst the technical appendices of the main report, and cited as:

Specialised Zoological (2018). Bat call identification from Mardie Station, Western Australia. Acoustic analysis. Unpublished report by Specialised Zoological for Phoenix Environmental Sciences Pty Ltd, 8 January 2018, Job number SZ442.

SUMMARY

Bat identifications from acoustic recordings are provided from Mardie Station in the Pilbara region of Western Australia. At least three species of bat were identified as being present (**Tables 1** and **2**). Representative echolocation calls for each identification are illustrated (**Figure 1**), as recommended by the Australasian Bat Society (ABS 2006). Further data are available should verification be required.

COMMENTS ON IDENTIFICATIONS

The identification of bat species from full spectrum WAV-format recordings of their echolocation calls was based on measurements of characteristic frequency, observation of pulse shape, and the pattern of harmonics—as well as the recording habitat. A small proportion of calls could not be attributed unambiguously to one species because of the absence of harmonic components in recordings—some low frequency calls could have derived from either the Greater Northern Free-tailed Bat *Chaerephon jobensis* or the Yellow-bellied Sheath-tailed Bat *Saccolaimus flaviventris*.

METHODS

A total of 703 WAV files recorded with an SM2BAT bat detector were submitted for analysis. Each of these was inspected for bat calls in Adobe Audition CS6 version 5.0.2. Species were identified based on information in McKenzie and Bullen (2009), and nomenclature follows Jackson and Groves (2015).

REFERENCES

ABS (2006). Recommendations of the Australasian Bat Society Inc for reporting standards for insectivorous bat surveys using bat detectors. *The Australasian Bat Society Newsletter* 27: 6–9. [ISSN 1448-5877]

Jackson, S.M. and Groves, C.P. (2015). *Taxonomy of Australian mammals*. CSIRO Publishing, Victoria.

McKenzie, N.L. and Bullen, R.D. (2009). The echolocation calls, habitat relationships, foraging niches and communities of Pilbara microbats. *Records of the Western Australian Museum* Supplement 78: 123–155.

LIMITATIONS

The identifications presented in this report have been made within the following context:

1. The identifications made herein were based on the ultrasonic acoustic data recorded and provided by a 'third party' (the client named on the front of this report).
2. The scope of this report extended to providing information on the identification of bat species in bulk ultrasonic recordings. Further comment on these species and the possible impacts of a planned project on bat species were not part of the scope.
3. In the case of the present report, the recording equipment was not set up and supplied by Specialised Zoological. The equipment was operated by the third party during the survey.
4. Other than the general locality of the study area, Specialised Zoological has not been provided with detailed information of the survey area, has not made a site visit to observe the habitats available for bats, nor have we visited the specific project areas on a previous occasion.
5. Specialised Zoological has had no input into the overall design of this bat survey. Specialised Zoological has had no input into the survey timing, recording site placement, nor degree of recording site replication on this survey.
6. While Specialised Zoological has made identifications to the best of our ability given the available materials, and reserves the right to re-examine the data and revise any identification following a query, it is the client's and / or proponent's responsibility to provide supporting evidence for any identification, which might require follow-up trapping effort or non-invasive methods such as video recordings. Specialised Zoological bears no liability for any follow-up work that may be required to support an identification based initially on the analysis of acoustic recordings undertaken and reported on here.
7. There are a variety of factors that affect the 'detectability' of each bat species, given the frequency, power and shape characteristics of their calls. Further information on the analysis and the various factors that can impinge on the reliability of identifications can be provided upon request.

TABLE 1. Species identified in the present survey from all sites combined.

EMBALLONURIDAE Yellow-bellied Sheath-tailed Bat	*Saccolaimus flaviventris*
VESPERTILIONIDAE Arnhem Long-eared Bat	*Nyctophilus arnhemensis*
MOLOSSIDAE Northern Coastal Free-tailed Bat	*Ozimops* (=*Mormopterus*) *cobourgianus*
Ambiguous Greater Northern Free-tailed Bat / **and / or** Yellow-bellied Sheath-tailed Bat	*Chaerephon jobensis* / ***and / or*** *Saccolaimus flaviventris*

TABLE 2. Species identifications, with the degree of confidence indicated by a code. Date and serial/unit number correlates with site; see **Table 1** for full species names.

	C. jobensis / S. flaviventris	*N. arnhemensis*	*O. cobourgianus*	*S. flaviventris*
SM01				
4/12/2017	—	◆	◆	—
5/12/2017	—	—	◆	—
SM03				
4/12/2017	NC	◆	◆	—
5/12/2017	NC	◆	◆	◆
SM04				
6/12/2017	NC	◆	◆	—
SM05				
6/12/2017	NC	—	◆	—

Definition of confidence level codes:

— Not detected.

◆ Unambiguous identification of the species at the site based on measured call characteristics and comparison with available reference material. Greater confidence in this ID would come only after capture and supported by morphological measurements or a DNA sequence.

NC Needs Confirmation. Either call quality was poor, or the species cannot be distinguished reliably from another that makes similar calls. Alternative identifications are indicated in the *Comments on identifications* section of this report. If this is a species of conservation significance, further survey work might be required to confirm the record.

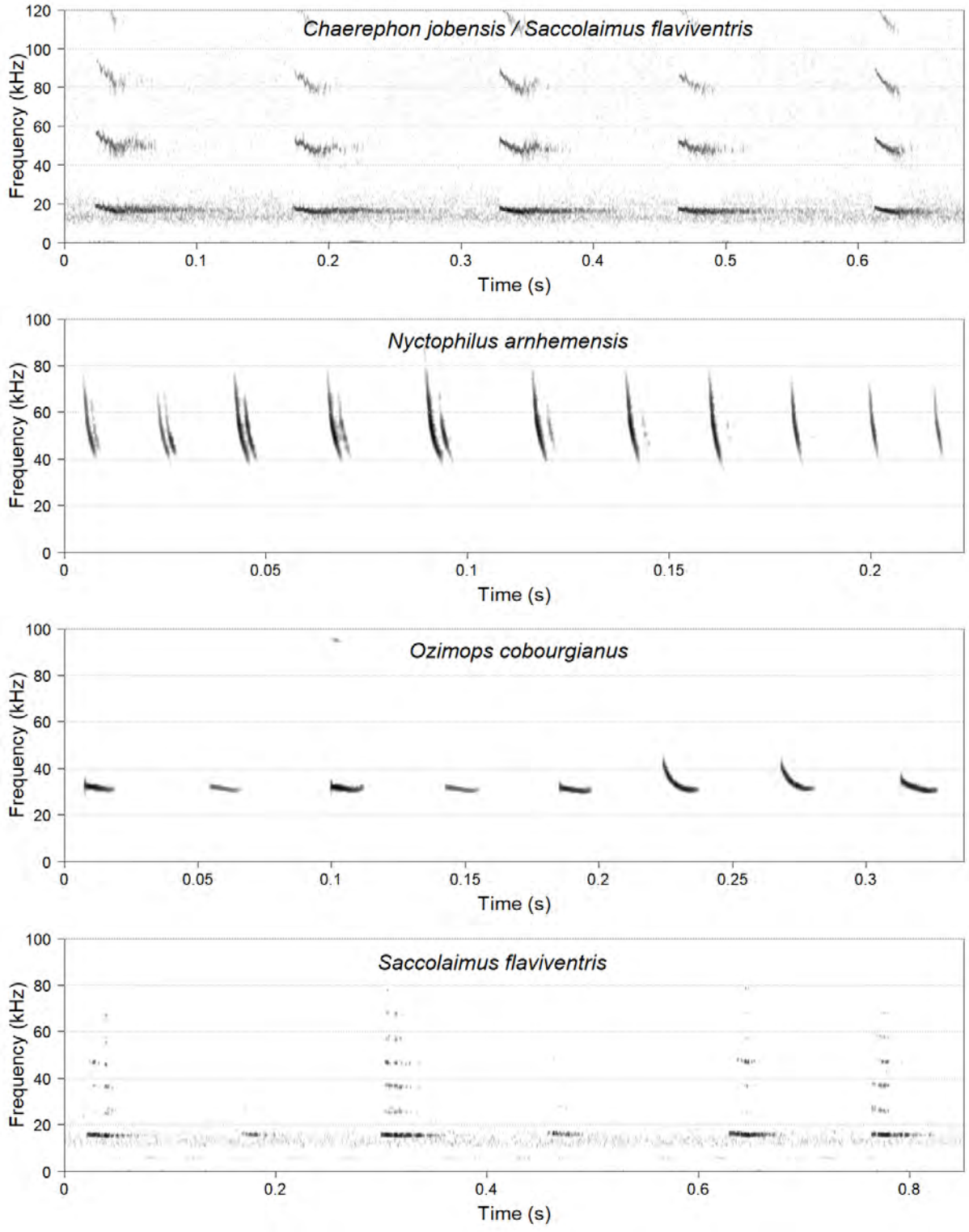

FIGURE 1. Representative call sequence portions of the species identified (time between pulses has been compressed).

Bat call identification from Mardie, Western Australia

Type:	Acoustic analysis
Prepared for:	Phoenix Environmental Sciences
Date:	23 April 2018
Job No.:	SZ456

Prepared by:

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This report should be included amongst the technical appendices of the main report, and cited as:

Specialised Zoological (2018). Bat call identification from Mardie, Western Australia. Acoustic analysis. Unpublished report by Specialised Zoological for Phoenix Environmental Sciences Pty Ltd, 23 April 2018, Job number SZ456.

Summary

Bat identifications from acoustic recordings are provided from Mardie, west of Karratha, in the Pilbara region of Western Australia. Seven species of bat were identified as being present (**Tables 1** and **2**). Representative echolocation calls for each identification are illustrated (**Figure 1**), as recommended by the Australasian Bat Society (ABS 2006). Further data are available should verification be required.

Comments on identifications

The identification of bat species from full spectrum WAV-format recordings of their echolocation calls was based on measurements of characteristic frequency, observation of pulse shape, and the pattern of harmonics. Calls with a characteristic frequency between 30–34 kHz were attributed to the Northern Coastal Free-tailed Bat *Ozimops cobourgianus*. Such calls are similar to those produced by Gould's Wattled Bat *Chalinolobus gouldii*, but no unambiguous diagnostic examples of this latter species were observed (pulses that alternate sequentially in characteristic call frequency by c. 3 kHz). The most likely source of calls with a characteristic frequency between 30–34 kHz is *O. cobourgianus*.

The sampling rate of most recordings submitted for analysis was 192 kHz, which is insufficient for an accurate representation of calls with frequency components above 96 kHz, such as the Pilbara Leaf-nosed bat *Rhinonicteris aurantia*. However, sometimes artefacts are present in recordings from under-sampled high frequency recordings, whereby calls can appear at a lower frequency and upside down. In the present batch of recordings, there were numerous examples of calls from *R. aurantia*, recognisable from their typical shape (a tonal portion followed by a short broad-band frequency sweep, though in this case upside down), and with a characteristic frequency of c. 70 kHz for the tonal portion. Despite the low sampling rate used in the recordings, the identification of *R. aurantia* was unambiguous. There were numerous passes throughout the night for recordings made by SM2BAT recording unit SM04-S056-U2 17635 on 17/3/2018 (**Table 2**; activity not quantified; time of first detection 21:01:51), and one sequence was present on recordings made on SM2BAT unit SM02-U3 17627 on 16/2/2018 at 03:41:45.

Methods

Data recorded in full spectrum WAV format with Wildlife Acoustics SM2BAT bat detectors (sampling rates between 16 and 384 kHz) were provided for analysis.

A multi-step acoustic analysis procedure developed to process large full spectrum echolocation recording datasets from insectivorous bats (Armstrong and Aplin 2014;

Armstrong et al. 2016) was applied to the recordings made on the survey. Firstly, the WAV files were scanned for bat echolocation calls using several parameter sets in the software SCAN'R version 1.7.7 (Binary Acoustic Technology), which also provides measurements (in "SonoBat™ compatible output") from each putative bat pulse. The output was then used to determine if putative bat pulses measured in SCAN'R could be identified to species. This was done using a custom [R] language script that performed three tasks: 1. undertook a Discriminant Function Analysis on training data from representative calls from Western Australia; 2. from the measurements of each putative bat pulse from SCAN'R, calculated values for the first two Discriminant Functions that could separate the echolocation call types derived from the analysis of training data, and plotted these resulting coordinates over confidence regions for the defined call types; and 3. facilitated an inspection in a spectrogram of multiple examples of each call type for each recording night by opening the original WAV files containing pulses of interest in Adobe Audition CS6 version 5.0.2. Species were identified based on information in McKenzie and Bullen (2009), and nomenclature follows Jackson and Groves (2015).

Limitations

The identifications presented in this report have been made within the following context:

1. The identifications made herein were based on the acoustic data recorded and provided by a 'third party' (the client named on the front of this report).
2. The scope of this report extended to providing information on the identification of bat species in bulk acoustic recordings. Further comment on these species and the possible impacts of a planned project on bat species were not part of the scope.
3. In the case of the present report, the recording equipment was not set up and supplied by Specialised Zoological. The equipment was operated by the third party during the survey.
4. Other than the general locality of the study area, Specialised Zoological has not been provided with detailed information of the survey area, has not made a site visit to observe the habitats available for bats, nor have we visited the specific project areas on a previous occasion.
5. Specialised Zoological has had no input into the overall design of this bat survey, the timing of the survey, recording site placement, nor degree of recording site replication.
6. While Specialised Zoological has made identifications to the best of our ability given the available materials, and reserves the right to re-examine the data and revise any identification following a query, it is the client's and / or proponent's responsibility to provide supporting evidence for any identification, which might require follow-up trapping effort or non-invasive methods such as video recordings. Specialised Zoological bears no liability for any follow-up work that may be required to support an identification based initially on the analysis of acoustic recordings undertaken and reported on here.

7. There are a variety of factors that affect the 'detectability' of each bat species, given the frequency, power and shape characteristics of their calls. Further information on the analysis and the various factors that can impinge on the reliability of identifications can be provided upon request.

References

ABS (2006). Recommendations of the Australasian Bat Society Inc for reporting standards for insectivorous bat surveys using bat detectors. *The Australasian Bat Society Newsletter* 27: 6–9. [ISSN 1448-5877]

Armstrong, K.N. and Aplin, K.P. (2014). Identifying bats in an unknown acoustic realm using a semi-automated approach to the analysis of large full spectrum datasets. Oral presentation at the 16th Australasian Bat Society Conference 22–25 April 2014, Townsville, Queensland. *The Australasian Bat Society Newsletter* 42: 35–36.

Armstrong, K.N., Aplin, K.P. and Crotty, S. (2016). A pipeline and app for massive filtering, and assisted inspection of enormous acoustic datasets. Poster presentation at the 17th Australasian Bat Society Conference, 29 March-1 April 2016, Hobart, Tasmania, Australia. *The Australasian Bat Society Newsletter* 46: 51.

McKenzie, N.L. and Bullen, R.D. (2009). The echolocation calls, habitat relationships, foraging niches and communities of Pilbara microbats. *Records of the Western Australian Museum* Supplement 78: 123–155.

Jackson, S.M. and Groves, C.P. (2015). *Taxonomy of Australian mammals*. CSIRO Publishing, Victoria.

Table 1. Species identified in the present survey from all sites combined.

RHINONYCTERIDAE	
Pilbara Leaf-nosed Bat	*Rhinonicteris aurantia*
EMBALLONURIDAE	
Yellow-bellied Sheath-tailed Bat	*Saccolaimus flaviventris*
Common Sheath-tailed Bat	*Taphozous georgianus*
VESPERTILIONIDAE	
Little Broad-nosed Bat	*Scotorepens greyii*
Finlayson's Cave Bat	*Vespdadelus finlaysoni*
MOLOSSIDAE	
Greater Northern Free-tailed Bat	*Chaerephon jobensis*
Northern Coastal Free-tailed Bat	*Ozimops* (=*Mormopterus*) *cobourgianus*

Table 2. Species identifications, with the degree of confidence indicated by a code. Date and recording unit number correlates with site; see **Table 1** for full species names.

		C. jobensis	*O. cobourgianus*	*R. aurantia*	*S. flaviventris*	*S. greyii*	*T. georgianus*	*V. finlaysoni*
	Sampling rate							
NP14-U3	44.1 kHz							
17/3/2018-19/3/2018	sampling rate too low for bat echolocation	x	x	x	x	x	x	x
SM01-U2 SM2BAT 17635	192 kHz							
16/03/2018		◆	◆	—	—	◆	◆	—
SM02-U3 SM2BAT 17627	192 kHz							
16/03/2018		◆	◆	◆	—	◆	◆	◆
SM04-S056-U2 SM2BAT 17635	192 kHz							
17/03/2018		◆	◆	◆	◆	◆	◆	◆
SM05-U3 SM2BAT 17903	192 kHz							
17/03/2018		◆	—	—	—	◆	◆	◆
SM07-U2 SM2BAT 17635	192 kHz							
18/03/2018	problematic recording	x	x	x	x	x	x	x
SM08-U3 SM2BAT 17903	192 kHz							
18/03/2018		—	◆	—	—	◆	◆	◆
Unknown-U2 SM2BAT 17635	16 kHz (06:02-06:18 at 384 kHz)							
16/03/2018	sampling rate too low for bat echolocation	x	x	x	x	x	x	x

Definition of confidence level codes:

x recording was problematic.

— Not detected.

◆ Unambiguous identification of the species at the site based on measured call characteristics and comparison with available reference material. Greater confidence in this ID would come only after capture and supported by morphological measurements or a DNA sequence.

NC Needs Confirmation. Either call quality was poor, or the species cannot be distinguished reliably from another that makes similar calls. Alternative identifications are indicated in the *Comments on identifications* section of this report. If this is a species of conservation significance, further survey work might be required to confirm the record.

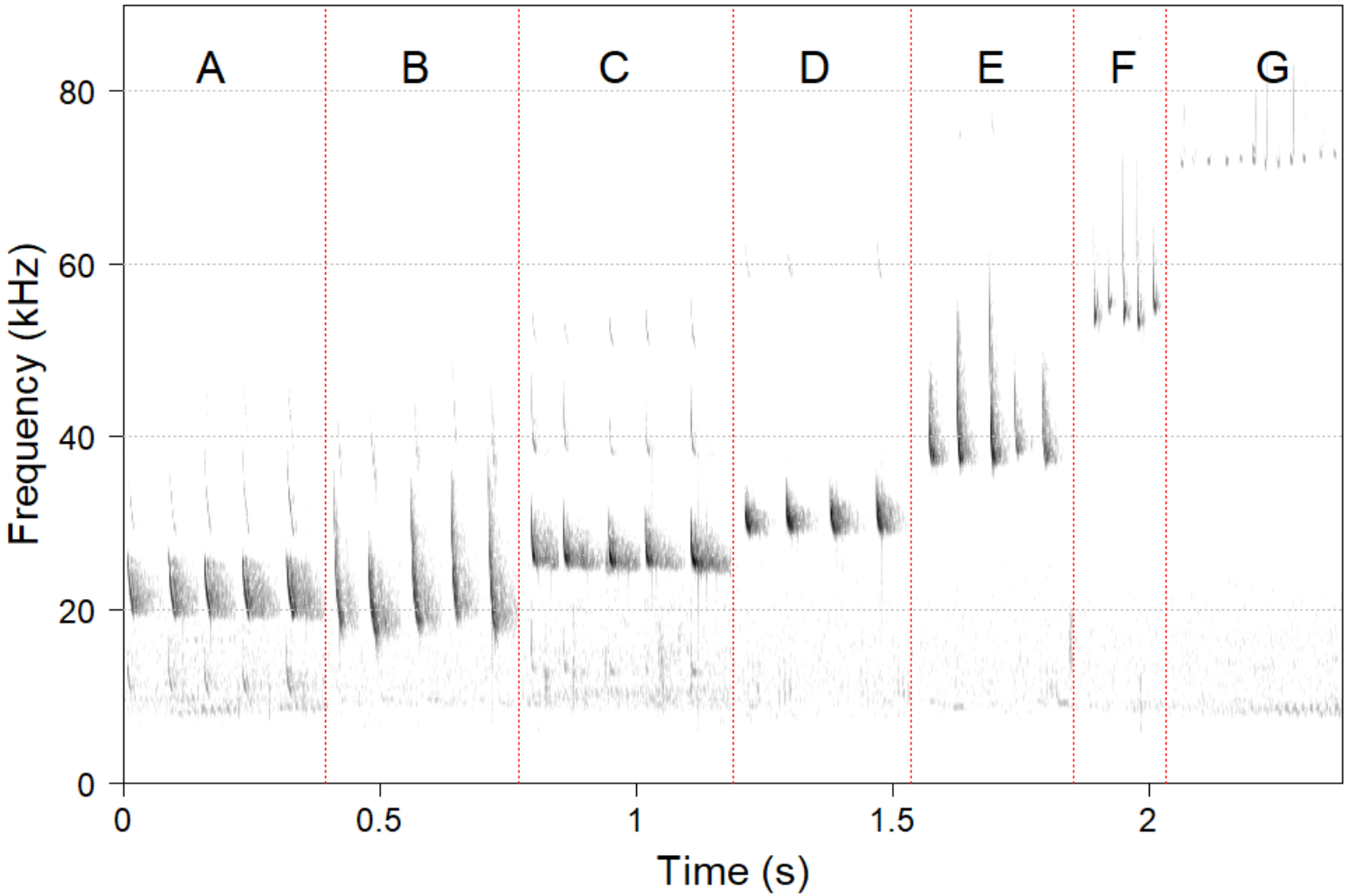

Figure 1. Representative call sequence portions of the species identified (**A**: *Saccolaimus flaviventris*; **B**: *Chaerephon jobensis*; **C**: *Taphozous georgianus*; **D**: *Ozimops cobourgianus*; **E**: *Scotorepens greyii*; **F**: *Vespadelus finlaysoni*; **G**: *Rhinonicteris aurantia* [represented as an artefact from under-sampling, but pulse shape diagnostic, though upside down]; time between pulses has been compressed).