

MEMO

MULGA DOWNS IRON

ORE MINE

**TARGETED GREY FALCON
SURVEY**

PREPARED FOR: JBS&G | HANROY





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Project ID: 2351		Mulga Downs Iron Ore Mine Targeted Grey Falcon Survey	
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1. INTRODUCTION

1.1. Background

Mulga Downs Iron Ore Mine (MDIOM) is currently being assessed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act; Commonwealth) (EPBC 2022/9255) and the *Environmental Protection Act 1986* (EP Act, Western Australia (WA)) (Assessment Number 2326). In early 2023, JBS&G Pty Ltd (JBS&G) on behalf of Hancock Prospecting Pty Ltd (HPPL) engaged ecologia Environment (ecologia) to conduct a desktop risk assessment of the proposed Mulga Downs Iron Ore Mine for the Grey Falcon (*Falco hypoleucos*; EPBC Act & BC Act, Vulnerable). The risk assessment indicated that the Grey Falcon is likely to occur at the MDIOM and that a targeted survey for the species is required to support the Commonwealth and State environmental impact assessments for the Proposal (ecologia, 2023).

1.2. Scope

The desktop risk assessment completed by ecologia (2023) for the Grey Falcon at the Mulga Downs Iron Ore Project identified two habitat types present at the Project as potential foraging and breeding habitat for the Grey Falcon. These habitats were the Mixed Eucalypt / Mulga Floodplain and Drainage Lines / Floodplains.

JBS&G engaged Spectrum Ecology & Spatial (Spectrum) to undertake a targeted Grey Falcon survey at the MDIOM tenements within potential nesting habitat (Mulga West Borefield E47/1315, Malay Well E47/2117-1, Mine Area M47/1621, Murrays Hill L45/316 (the Survey Area)) during the nesting/breeding season (June to November). Potential foraging and nesting habitat within the Survey Area is displayed on Map 1.1. The targeted survey included searches for individuals and suitable nests (other raptors or corvid nests) within the potential habitat shown on Map 1.1.

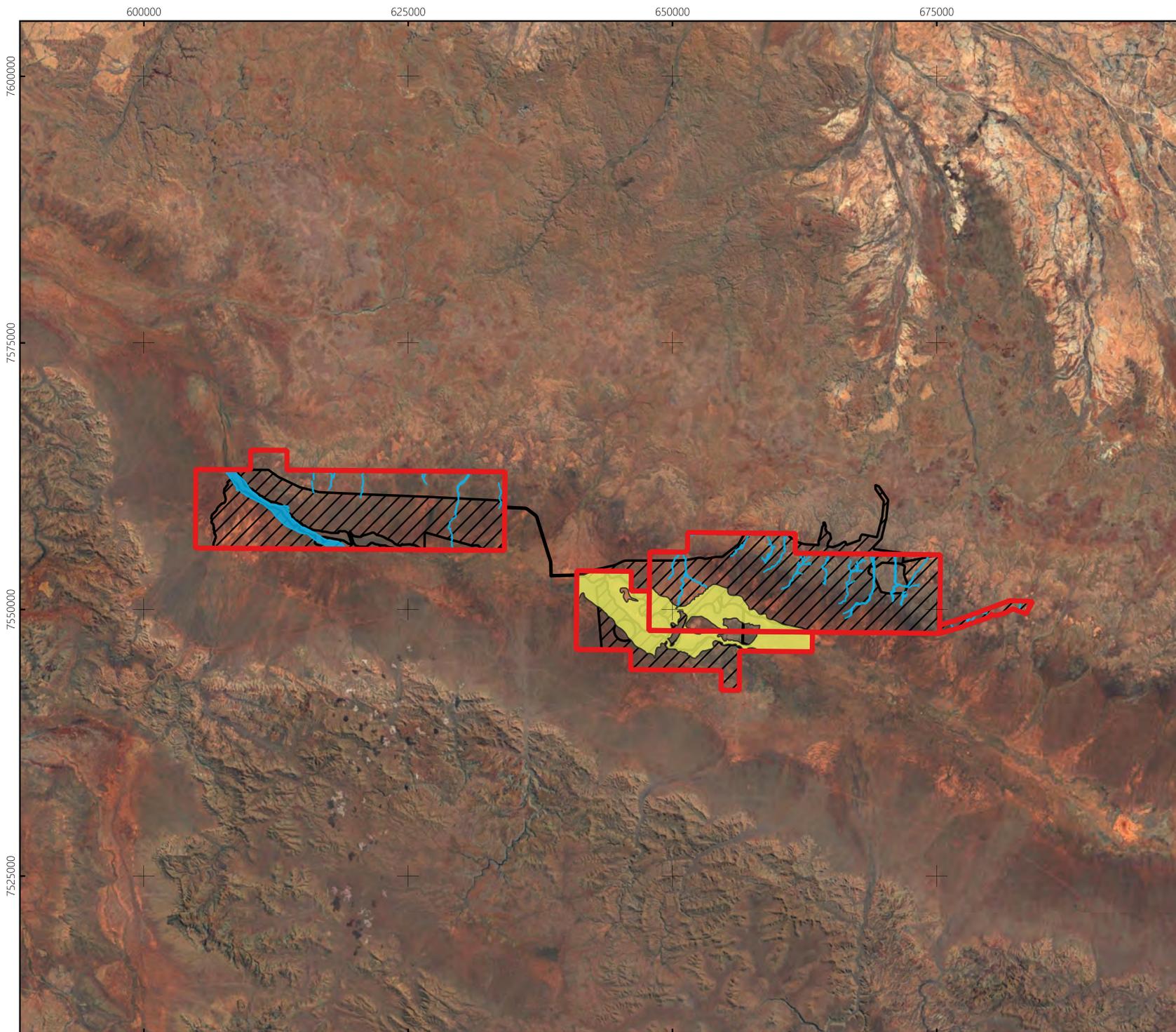
1.3. Legislation & Guidelines

Terrestrial vertebrate in Western Australia are protected under various legislation (Appendix A), including:

- *Biodiversity Conservation Act 2016* (BC Act, WA);
- EP Act, WA; and
- EPBC Act, Commonwealth.

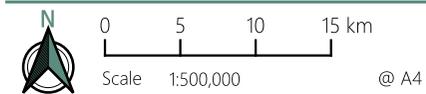
The survey was compliant with survey guidelines, as outlined in:

- EPA Environmental Factor Guideline: Terrestrial Fauna (Environmental Protection Authority, 2016);
- EPA Technical Guidance Technical Guidance – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (Environmental Protection Authority, 2020);
- Survey guidelines for Australia's Threatened birds (Department of the Environment Water Heritage and the Arts, 2010); and
- Conservation Advice – *Falco hypoleucos* Grey Falcon (Threatened Species Scientific Committee, 2020).



Legend

- Survey Area
- MDIOM Development Envelope
- Drainage Lines/ Floodplains
- Mixed Eucalypt/ Mulga Floodplain



Coordinate System: GDA 1994 MGA Zone 50
 Projection: Universal Transverse Mercator
 Units: Metre



Author: GF Approved: AH Date: 08-09-2023

Location of Survey Area

Targeted Grey Falcon Survey

MAP

Prepared for
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1.1

1.4. Species Information

The Grey Falcon is the rarest falcon in Australia with an estimated population size of <1,000 individuals (Schoenjahn, 2013). The species is listed as Vulnerable by the EPBC and BC Act. They occur very sparsely in a wide variety of arid and semi-arid zones across an area of about 5 million km² (Schoenjahn et al., 2020). They have not been found to be associated with any particular vegetation types, however climate characteristics such as temperature and rainfall appear to strongly influence the distribution of the species (Schoenjahn et al., 2020). Breeding habitat appears to be localised in zones with the highest annual average temperatures, and areas with persistently dry and winter drought climatic conditions (Schoenjahn, 2013). Grey Falcons, like most falcons, don't build their own nests and typically use those of other large birds (typically corvids and other raptors) in trees or on human infrastructure such as repeater towers or power-line pylons (Olson & Olson, 1986). Nests are often used over several years and can be near nests of other falcons or raptor species (Schoenjahn, 2013). The Grey Falcon forages in open landscapes such as rocky plains with hummock grasslands, lower shrublands, and small drainage lines where they predominantly prey on birds, mainly pigeons and parrots (Olson & Olson, 1986; Schoenjahn, 2013).

2. METHODS

2.1. Desktop Assessment

A desktop review of relevant and available biological data sources for the Study Area was undertaken prior to the field survey. The desktop Study Area includes a buffer of approximately 50 km surrounding the Survey Area, or as listed in Table 2.1.

2.1.1. Biological Database Searches

The following databases were searched and incorporated into the desktop assessment (Table 2.1).

Table 2.1: Summary of Database Searches

Database	Custodian	Species Group	Details
Commonwealth Protected Matters Search Tool (PMST)	Department of Climate Change, Energy, the Environment and Water (DCCEEW)	EPBC Act listed vertebrate and invertebrate fauna species	Date: 9/02/2023 Buffer: 50 km Survey Area Polygon
Threatened Fauna Database Search	Department of Biodiversity, Conservation and Attractions (DBCA)	Threatened and Priority vertebrate and invertebrate fauna species	Date: 9/02/2023 Details: Polygon plus 80 km Reference: #7549
Dandjoo		Vertebrate and invertebrate fauna species	Date: 8/02/2023 Buffer: 50 km Centre Point: -22.09452, 118.46403
Index of Biodiversity Surveys and Assessments (IBSA) Database	Department of Water and Environmental Regulation (DWER)	Vertebrate and invertebrate fauna species	Date: 9/02/2023 Buffer: 50 km

2.1.2. Literature Review

Previously conducted assessments within the desktop Study Area were reviewed for significant fauna. Reports were incorporated if they were provided by the client or if they were publicly available. The seven reports incorporated into the literature review are listed in Table 2.2.

Table 2.2: Previously Conducted Biological Assessments

Survey	Year	Company	Distance (km)
MDIOM Solar Farm, Haul Road & Pipeline Vertebrate & Short-range Endemic Terrestrial Fauna Assessment (Spectrum, 2023)	2023	Spectrum	0
Mulga Downs Iron Ore Mine: Mulga West Borefield and Mulga East Southern Corridor Terrestrial Fauna Survey (Biologic, 2022)	2022	Biologic	0
RHIL Mulga Downs Hub and Rail Spur – Eastern Portion of Alignments 8B & 1B Basic & Targeted Terrestrial Fauna Assessment (Spectrum, 2022)	2022	Spectrum	10
Hancock Prospecting Pty Ltd Mulga East Baseline Terrestrial Fauna Assessment (ecologia, 2020)	2020	Ecologia Environment	0

Survey	Year	Company	Distance (km)
Fortescue Metals Group Ltd Investigator Project Terrestrial Vertebrate Fauna Assessment (ecologia, 2014)	2014	Ecologia Environment	0-5
Level 2 Fauna Assessment for the Mulga Downs Project Area (Terrestrial Ecosystems, 2013a)	2013	Terrestrial Ecosystems	0
Brockman Resources Limited Rail Proposal Area Level 2 Vertebrate Fauna Survey (ecologia, 2011)	2011	Ecologia Environment	35

2.2. Field Survey

The targeted Grey Falcon survey was completed over a seven-day period from 7 to 13 August 2023 by two zoologists. Targeted searches for the Grey Falcon are best conducted to coincide with breeding/nesting period in June to November (Schoenjahn et al., 2020; Threatened Species Scientific Committee, 2020). Previous surveys mapped two habitat types as potential foraging and breeding habitat within the Survey Area: Mixed Eucalypt / Mulga Floodplain and Drainage Lines / Floodplains (Biologic Environmental Survey, 2022; ecologia, 2020, 2023). A total of 54 survey sites were established in the two habitat types with foot traverses and driving transects completed. Site locations are outlined in Table 2.3 and displayed on Map 2.1.

Table 2.3: Survey Sites

Site name	Coordinates		Date
	Easting	Northing	
GF S1	682946	7550511	13-08-23
GF S2	676392	7548533	12-08-23
GF S3	671118	7554247	11-08-23
GF S4	673822	7554358	11-08-23
GF S5	670832	7550790	11-08-23
GF S6	671717	7550898	11-08-23
GF S7	666910	7549777	11-08-23
GF S8	669017	7552385	11-08-23
GF S9	669129	7555182	11-08-23
GF S10	667321	7553529	11-08-23
GF S11	666537	7551642	11-08-23
GF S12	664772	7554936	11-08-23
GF S13	664580	7553499	11-08-23
GF S14	660666	7552046	10-08-23
GF S15	662603	7554621	10-08-23
GF S16	661357	7553041	10-08-23
GF S17	660126	7554527	10-08-23
GF S18	658729	7554453	10-08-23
GF S19	633697	7560272	10-08-23
GF S20	628911	7557509	9-08-23
GF S21	629497	7558938	9-08-23
GF S22	629764	7560433	9-08-23

Site name	Coordinates		Date
	Easting	Northing	
GF S28	611158	7560181	9-08-23
GF S29	614626	7557847	9-08-23
GF S30	610183	7560766	9-08-23
GF S31	608764	7561959	9-08-23
GF S32	608353	7562735	9-08-23
GF S33	613722	7558271	10-08-23
GF S34	615662	7556990	12-08-23
GF S35	617669	7555671	12-08-23
GF S36	651431	7547665	12-08-23
GF S37	651312	7550295	10-08-23
GF S38	654719	7552085	12-08-23
GF S39	661433	7547905	12-08-23
GF S40	656640	7546398	7-08-23
GF S41	656732	7549732	10-08-23
GF S42	641746	7553101	10-08-23
GF S43	644272	7552481	10-08-23
GF S44	645675	7553162	10-08-23
GF S45	646719	7550061	10-08-23
GF S46	656713	7556003	12-08-23
GF S47	651900	7556985	13-08-23
GF S48	651326	7554472	12-08-23
GF S49	651301	7553662	11-08-23

Site name	Coordinates		Date
	Easting	Northing	
GF S23	630151	7561868	9-08-23
GF S24	626663	7561872	9-08-23
GF S25	620742	7562101	8-08-23
GF S26	617744	7562145	8-08-23
GF S27	616067	7560966	8-08-23

Site name	Coordinates		Date
	Easting	Northing	
GF S50	652267	7552532	11-08-23
GF S51	650933	7552058	11-08-23
GF S52	650390	7554950	11-08-23
GF S53	678545	7549308	11-08-23
GF S54	678064	7549132	11-08-23

3. RESULTS & DISCUSSION

3.1. Desktop Assessment

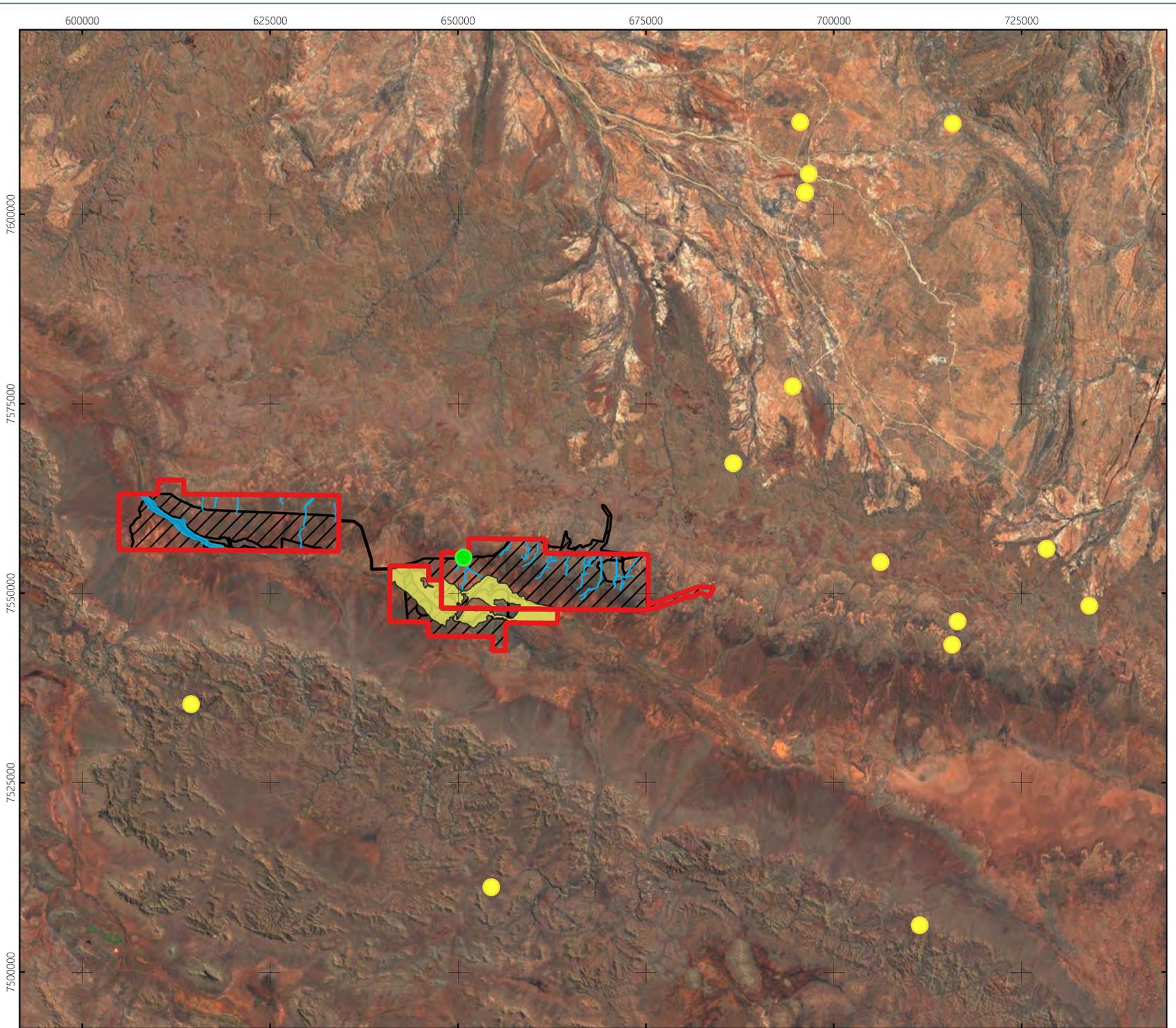
To provide regional context, a species-specific desktop assessment was completed. Grey Falcons have been recorded from the vicinity during previous surveys and database searches. A total of 14 records were returned by the DBCA Database search from within 80 km of the Survey Area, with the majority of records dated 2010-2018. Two historical records were included from 1980 and 1977 (Map 3.1).

From the seven previously conducted fauna assessments within the vicinity of the MDIOM Project area, only three recorded the Grey Falcon during the survey, with an additional survey containing a historic DBCA database search record (Table 3.1). Of these, two records exist from within the Project area:

- ecologia (2020) recorded the species perched in a tree near a drainage line within the Survey Area for this assessment (Map 3.1); and
- Terrestrial Ecosystems (2013) recorded an individual; although the exact location could not be determined from the report.

Table 3.1: Grey Falcon Records from Previously Conducted Biological Assessments

Survey	Year	Company	Grey Falcon Records
MDIOM Solar Farm, Haul Road & Pipeline Vertebrate & Short-range Endemic Terrestrial Fauna Assessment (Spectrum, 2023)	2023	Spectrum	Not recorded, considered a <i>medium</i> likelihood of occurrence in the Survey Areas
Mulga Downs Iron Ore Mine: Mulga West Borefield and Mulga East Southern Corridor Terrestrial Fauna Survey (Biologic, 2022)	2022	Biologic	Not recorded, considered <i>likely</i> to occur
RHIL Mulga Downs Hub and Rail Spur – Eastern Portion of Alignments 8B & 1B Basic & Targeted Terrestrial Fauna Assessment (Spectrum, 2022)	2022	Spectrum	Historical (2014) DBCA record within Survey Area
Hancock Prospecting Pty Ltd Mulga East Baseline Terrestrial Fauna Assessment (ecologia, 2020)	2020	Ecologia Environment	One Grey Falcon recorded
Fortescue Metals Group Ltd Investigator Project Terrestrial Vertebrate Fauna Assessment (ecologia, 2014)	2014	Ecologia Environment	Not recorded, considered to have a <i>medium</i> likelihood of occurrence
Level 2 Fauna Assessment for the Mulga Downs Project Area (Terrestrial Ecosystems, 2013)	2013	Terrestrial Ecosystems	One Grey Falcon recorded
Brockman Resources Limited Rail Proposal Area Level 2 Vertebrate Fauna Survey (ecologia 2011)	2011	Ecologia Environment	Two Grey Falcons recorded



Legend

- Survey Area
- MDIOM Development Envelope
- Drainage Lines/ Floodplains
- Mixed Eucalypt/ Mulga Floodplain
- Grey Falcon Record (Ecologia)
- Grey Falcon Records (DBCA Database Search)

0 5 10 15 20 25 km
 Scale: 1:693,800 @ A4

Coordinate System: GDA 1994 MGA Zone 50
 Projection: Universal Transverse Mercator
 Units: Metre

Author: GF Approved: AH Date: 08-09-2023

Grey Falcon Records

Targeted Grey Falcon Survey

MAP

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3.1

3.2. Survey Results & Discussion

No Grey Falcons or other significant fauna were recorded during the survey. A total of 46 nests were recorded from 27 locations and assessed for suitability for the Grey Falcon (Table 3.2). All nests were suitable for potential breeding activities, but none were occupied or in use during the survey. No secondary evidence of Grey Falcon breeding activities was noted. The nest locations are displayed on Map 3.2. Two examples of the nests recorded are shown in Figure 3.1.



Figure 3.1: Nest N11b.2 (left) and Nest N15.2 (right)

The Grey Falcon was not recorded during the survey despite previously being recorded within the MDIOM Project area and surrounds. None of the previous surveys recorded any breeding activities. The desktop results indicate the species may use the Survey Area and larger MDIOM Project area for foraging and potentially for breeding. The Grey Falcon is sparsely distributed, and their movements, including their home range size, are poorly understood (Schoenjahn et al., 2020). It is likely their home ranges are large, with the species travelling long distances. However, this species may also be considered, to some extent nomadic, moving to where conditions are more favourable (Schoenjahn et al., 2020).

The nests recorded in the Survey Area were considered suitable for potential breeding activities, and may be used by a Grey Falcon pair. Although, the species appears to prefer nesting on man-made structures such as repeater stations and power-pylons. This is likely due to the increased level of safety from terrestrial predators such as cats, monitors (Varianidae), and snakes (Schoenjahn, 2013). These structures were not recorded with the Survey Area but may occur at the nearby rail lines or other infrastructure.

In summary, it is likely that the Survey Area is used by the Grey Falcon, at least on an occasional basis, for foraging and potentially for breeding.

A total of 46 non-target bird species were recorded and are outlined in Table 3.3.

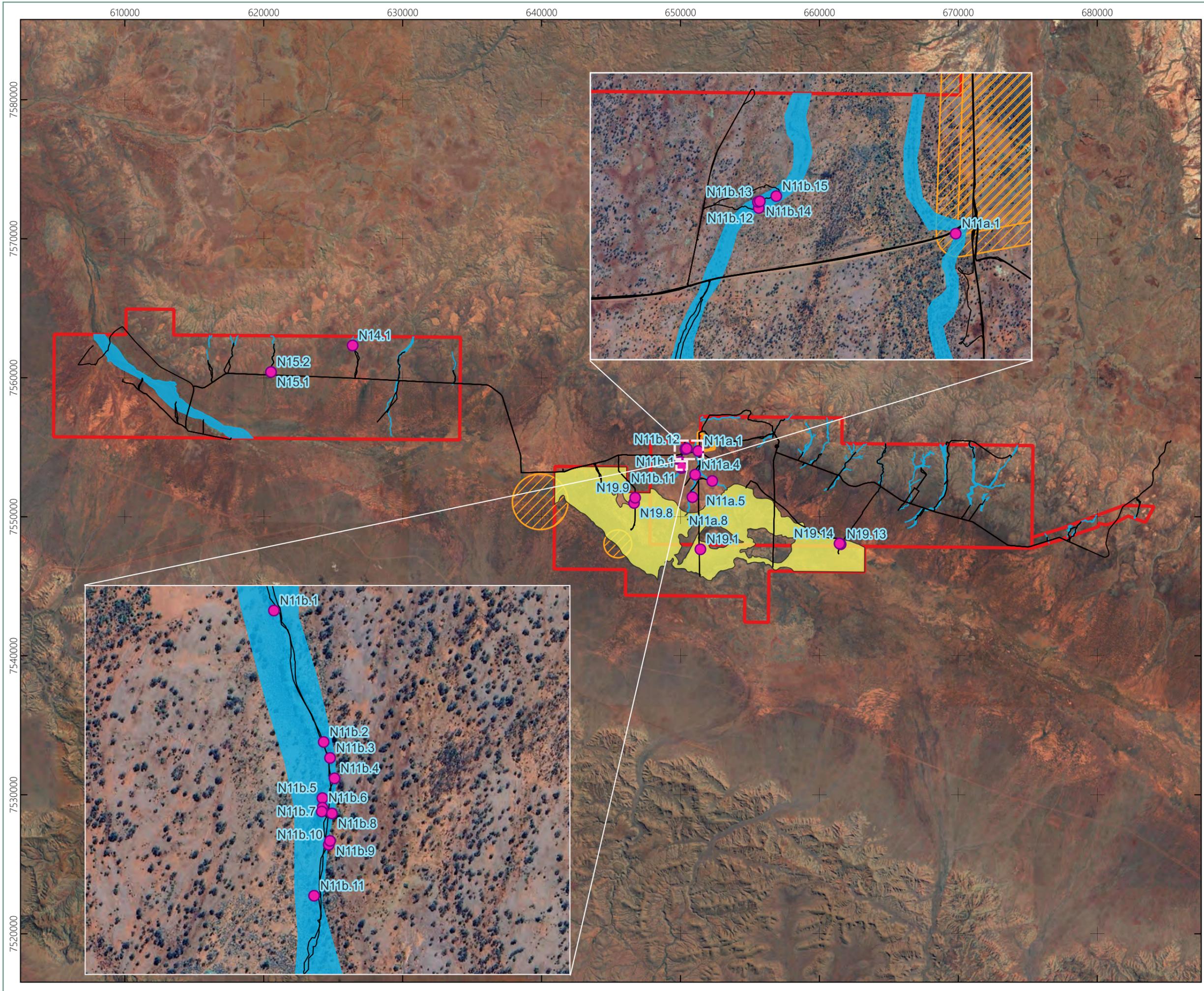
Table 3.2: Bird Nests Recorded

Nest Site ID	Coordinates		Details	Tree species
	Easting	Northing		
N14.1	626399	7562325	Small nest	<i>Eucalypt victrix</i>
N15.1	620525	7560420	Old nest	<i>Acacia</i> sp.
N15.2	620523	7560416	Suitable nest	<i>Eucalypt victrix</i>
N19.1	651431	7547662	Suitable nest	<i>Eucalypt victrix</i>
N19.13	661527	7548025	Suitable nest	<i>Acacia aneura</i>
N19.14	661444	7548077	Suitable nest	<i>Acacia aneura</i>
N19.8	646656	7550993	Suitable nest	<i>Eucalypt victrix</i>
N19.9	646734	7551369	Suitable nest	<i>Acacia aneura</i>
N11a.1	651272	7554736	Whistling Kite nest	<i>Eucalypt victrix</i>
N11a.4	651054	7553032	3 x suitable nests	<i>Eucalypt victrix</i>
N11a.5	652284	7552578	2 x suitable nests	<i>Eucalypt victrix</i>
N11a.8	650855	7551413	Suitable nest	<i>Eucalypt victrix</i>
N11b.1	650001	7553955	Medium-sized nest	<i>Eucalypt victrix</i>
N11b.10	650087	7553588	2 x suitable nests	<i>Eucalypt victrix</i>
N11b.11	650064	7553508	2 x suitable nests	<i>Eucalypt victrix</i>
N11b.12	650363	7554854	2 x suitable nests	<i>Corymbia</i> sp.
N11b.13	650359	7554882	Suitable nest	<i>Eucalypt victrix</i>
N11b.14	650368	7554885	2 x suitable nests	<i>Eucalypt victrix</i>
N11b.15	650444	7554909	3 x suitable nests	<i>Eucalypt victrix</i>
N11b.2	650079	7553749	Suitable nest	<i>Eucalypt victrix</i>
N11b.3	650089	7553724	Suitable nest	<i>Eucalypt victrix</i>
N11b.4	650096	7553692	Suitable nest	<i>Eucalypt victrix</i>
N11b.5	650077	7553661	Suitable nest	<i>Eucalypt victrix</i>
N11b.6	650077	7553646	3 x suitable nests	<i>Eucalypt victrix</i>
N11b.7	650076	7553640	5 x suitable nests	<i>Eucalypt victrix</i>
N11b.8	650092	7553637	Suitable nest	<i>Eucalypt victrix</i>
N11b.9	650089	7553594	5 x suitable nests	<i>Eucalypt victrix</i>
Total			46	

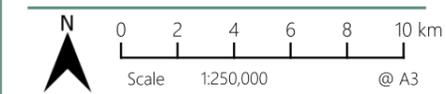
Table 3.3: Bird Species Recorded

Species Name	Scientific Name	Conservation Status		
		EPBC Act	BC Act	DBCA
Nankeen Kestrel	<i>Falco cenchroides</i>	-	-	-
Australian Magpie	<i>Gymnorhina tibicen</i>	-	-	-
Pied Butcherbird	<i>Cracticus nigrogularis</i>	-	-	-
Little Buttonquail	<i>Turnix velox</i>	-	-	-
Grey-headed Honeyeater	<i>Ptilotula keartlandi</i>	-	-	-
Western Bowerbird	<i>Chlamydera guttata</i>	-	-	-
Spinifexbird	<i>Poodytes carteri</i>	-	-	-
Brown Honeyeater	<i>Lichmera indistincta</i>	-	-	-
Red-backed Kingfisher	<i>Todiramphus pyrrhopygius</i>	-	-	-
Australian Zebra Finch	<i>Taeniopygia castanotis</i>	-	-	-
Crested Bellbird	<i>Oreoica gutturalis</i>	-	-	-
Torresian Crow	<i>Corvus orru</i>	-	-	-
Weebill	<i>Smicromis brevirostris</i>	-	-	-
Willie Wagtail	<i>Rhipidura leucophrys</i>	-	-	-
Budgerigar	<i>Melopsittacus undulatus</i>	-	-	-
Pheasant Coucal	<i>Centropus phasianinus</i>	-	-	-
Common Bronzewing	<i>Phaps chalcoptera</i>	-	-	-
Crested Pigeon	<i>Ocyphaps lophotes</i>	-	-	-
Singing Honeyeater	<i>Gavicalis virescens</i>	-	-	-
Grey Shrike-thrush	<i>Colluricincla harmonica</i>	-	-	-
Striated Pardalote	<i>Pardalotus striatus</i>	-	-	-
Red-browed Pardalote	<i>Pardalotus rubricatus</i>	-	-	-
White-plumed Honeyeater	<i>Ptilotula penicillata</i>	-	-	-
Rufous Whistler	<i>Pachycephala rufiventris</i>	-	-	-
Spinifex Pigeon	<i>Geophaps plumifera</i>	-	-	-
Magpie-lark	<i>Grallina cyanoleuca</i>	-	-	-
Ground Cuckooshrike	<i>Coracina maxima</i>	-	-	-
Chestnut-rumped Thornbill	<i>Acanthiza uropygialis</i>	-	-	-
Black-faced Cuckooshrike	<i>Coracina novaehollandiae</i>	-	-	-
Yellow-throated Miner	<i>Manorina flavigula</i>	-	-	-
Black-faced Woodswallow	<i>Artamus cinereus</i>	-	-	-
Whistling Kite	<i>Haliastur sphenurus</i>	-	-	-
Australian Ringneck	<i>Barnardius zonarius</i>	-	-	-
Rainbow Bee-eater	<i>Merops ornatus</i>	-	-	-
Purple-backed Fairywren	<i>Malurus assimilis</i>	-	-	-
Tree Martin	<i>Petrochelidon nigricans</i>	-	-	-
Black-tailed Treecreeper	<i>Climacteris melanurus</i>	-	-	-
Rufous Songlark	<i>Cincloramphus mathewsi</i>	-	-	-

Species Name	Scientific Name	Conservation Status		
		EPBC Act	BC Act	DBCA
Black-breasted Buzzard	<i>Hamirostra melanosternon</i>	-	-	-
Peaceful Dove	<i>Geopelia placida</i>	-	-	-
Brown Falcon	<i>Falco berigora</i>	-	-	-
Grey-crowned Babbler	<i>Pomatostomus temporalis</i>	-	-	-
Diamond Dove	<i>Geopelia cuneata</i>	-	-	-
Hooded Robin	<i>Melanodryas cucullata</i>	-	-	-
Little Woodswallow	<i>Artamus minor</i>	-	-	-
Horsfield's Bronze Cuckoo	<i>Chrysococcyx basalis</i>	-	-	-



- Legend**
- Nest Locations
 - Grey Falcon Survey Area - Habitat Type
 - Drainage Lines / Floodplains
 - Mixed Eucalypt / Mulga Floodplain
 - Survey Area
 - Heritage Exclusion Zones
 - Tracks



Coordinate System: GDA 1994 MGA Zone 50
 Projection: Universal Transverse Mercator
 Units: Metre

Author: SS Date: 08-09-2023

Nest Locations

Targeted Grey Falcon Survey

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