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JBS&G

**MULGA DOWNS IRON ORE PROJECT
DESKTOP RISK ASSESSMENT FOR THE GREY FALCON**

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ecologia Environment

463 Scarborough Beach Rd

OSBORNE PARK WA 6017

Phone: 08 6168 7200

Email: admin@ecologia.com.au

TABLE OF CONTENTS

1	INTRODUCTION	1
1.1	PROJECT BACKGROUND	1
1.2	SCOPE OF WORK	1
1.3	DEFINITIONS.....	2
1.3.1	Protection of Fauna (MNES)	2
1.3.2	Assessment Area.....	2
2	DESKTOP ASSESSMENT	3
2.1	GREY FALCON (<i>FALCO HYPOLEUCOS</i>) SPECIES PROFILE.....	3
2.2	DATABASE SEARCH RESULTS.....	4
2.3	LITERATURE REVIEW	4
3	HABITAT ASSESSMENT	6
4	POTENTIAL IMPACTS.....	10
4.1	HABITAT LOSS AND FRAGMENTATION	10
4.1.1	Nest shortages (high threat status and priority for action).....	10
4.2	DIRECT MORTALITY	10
4.2.1	Collision with traffic (Moderate threat status and priority for action)	10
5	MITIGATION OF RISKS.....	10
6	CONCLUSIONS	11
7	REFERENCES	12

TABLES

Table 2.1: Vertebrate fauna surveys previously undertaken in the vicinity (60 km) of the MDIOM area.....	4
Table 3.1: Habitat types that have the potential to provide nesting habitat for the grey falcon.....	7
Table 4.1: Extent of potential habitat to be impacted by the Proposal.....	10

FIGURES

Figure 2.1: Grey falcon records.	5
Figure 3.1a: Grey falcon habitat and impact areas.	8
Figure 3.1b: Grey falcon habitat and impact areas.	9

ABBREVIATIONS

BC Act	<i>Biodiversity Conservation Act 2016</i>
DAWE	Department of Agriculture, Water and the Environment
DBCA	Department of Biodiversity, Conservation and Attractions (previously DPaW)
DCCEEW	Department of Climate Change, Energy, the Environment and Water (previously DAWE)
DPaW	Department of Parks and Wildlife
DIWA	Directory of Important Wetlands Australia
EPA	Environment Protection Authority
EP Act	<i>Environmental Protection Act 1986</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
ESA	Environmentally Sensitive Area
HPPL	Hancock Prospecting Pty Ltd
JBS&G	JBS&G Pty Ltd
MDIOM	Mulga Downs Iron Ore Mine
PER	Public Environmental Review
WA	Western Australia

1 INTRODUCTION

1.1 PROJECT BACKGROUND

The Mulga Downs Iron Ore Mine (MDIOM, the Proposal) is currently being assessed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (EPBC 2022/9255) and the State *Environmental Protection Act 1986* (EP Act) (Assessment Number 2326).

JBS&G Pty Ltd (JBS&G), on behalf of Hancock Prospecting Pty Ltd (HPPL), the proponent for the MDIOM, engaged Ecologia Environment (*ecologia*) to conduct a desktop risk assessment for the Threatened grey falcon (*Falco hypoleucos*, EPBC Act and *Biodiversity Conservation Act 2016* (BC Act): Vulnerable) within the proposed MDIOM. The risk assessment is required to support the Commonwealth and State environmental impact assessments for the Proposal.

As part of the Commonwealth assessment of the Proposal, the Department of Climate Change, Energy, the Environment and Water (DCCEEW) provided the '*Guidelines for the Content of the Draft Public Environment Report (PER) for the MDIOM*' (PER Guidelines). In reference to Part B, Section 3.1.2, Table 2, information supporting the adequacy of surveys undertaken to date on the grey falcon, applicable to the MDIOM, is provided in this report.

1.2 SCOPE OF WORK

ecologia was engaged by JBS&G to conduct a desktop risk assessment for the grey falcon, with respect to the MDIOM, to address the additional survey requirements requested by DCCEEW in Section 3.1.2, Table 2 of the PER Guidelines.

The desktop assessment report is intended to identify and inform the requirement for additional surveys by assessing potential habitat and reviewing the most recent specific research which has been undertaken for the grey falcon. The desktop assessment report will address DCCEEW's justification for requesting further surveys for the grey falcon, as outlined in Table 2 of the PER Guidelines.

The scope of work for this desktop risk assessment includes the following, to address the additional survey requirements requested by DCCEEW within the PER Guidelines:

1. A review of recent surveys undertaken for the MDIOM for inclusion in the assessment report;
2. An assessment of the areas which have the potential to support grey falcon breeding trees/nests;
3. An assessment of the potential impacts of the Proposal to the grey falcon;
4. In the event additional surveys are recommended, include a proposed survey scope, methodology and timing;
5. Provide any advice on mitigation of risks to this species; and
6. Provide any supporting spatial data for inclusion in the environmental assessment reports to both Commonwealth (DCCEEW) and State regulators in the Roy Hill Data Delivery Standard.

The report will include:

1. A review of recent surveys undertaken for the MDIOM for inclusion in the assessment report;
2. An assessment of the areas within the Proposal which have the potential to support grey falcon breeding trees/nests;
3. An assessment of the potential impacts of the Proposal to the grey falcon;
4. Provide any advice on mitigation of risks to this species; and
5. Provide any supporting spatial data for inclusion in the environmental assessment reports to both Commonwealth (DCCEEW) and State regulators in the Roy Hill Data Delivery Standard.

1.3 DEFINITIONS

1.3.1 Protection of Fauna (MNES)

Specific fauna are afforded special protection under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and/or the State *Biodiversity Conservation Act 2016* (WA) as a listed 'Threatened' species of fauna.

'Threatened' Species –

Threatened species of fauna may be declared by the Commonwealth Minister for Environment for special protection under the EPBC Act as a matter for national environmental significance (MNES) for the taxon being extinct, facing a risk of extinction, or in need of a conservation program to prevent the species from a risk of extinction. Threatened species are allocated a category of 'extinct', 'extinct in the wild', 'critically endangered', 'endangered', 'vulnerable' or 'conservation dependent', which is generally in accordance with the criteria of the International Union for Conservation of Nature (IUCN 2012). The listed Threatened species of fauna are outlined within DAWE (2023).

Threatened species of fauna may also be declared by the Western Australian Minister for Environment for special protection under the *Biodiversity Conservation Act 2016* for it facing a risk of extinction in the wild in the future. Threatened species are allocated a category of 'critically endangered', 'endangered', or 'vulnerable', which is generally in accordance with the criteria of the International Union for Conservation of Nature (IUCN 2012). The listed Threatened species of fauna are outlined within WA Minister for Environment (2022).

'Migratory Species' –

Migratory Species may be declared by the Commonwealth Minister for Environment for protection under the EPBC Act as a MNES for being a migratory species listed under the *Convention on the Conservation of Migratory Species of Wild Animals 1979* (also commonly referred to as the Bonn Convention), *Japan – Australia Migratory Bird Agreement 1974*, *China – Australia Migratory Bird Agreement 1986* or the *Republic of Korea – Australia Migratory Bird Agreement 2007*. The listed Migratory Species of fauna are outlined by DAWE (2023). As outlined above under 'Specially Protected Species', Migratory Species may also be declared by the Western Australian Minister for Environment under the *Biodiversity Conservation Act 2016* due to it being a 'Migratory Species'.

1.3.2 Assessment Area

The Mulga Downs Iron Ore Mine (MDIOM) is located approximately 210 km south of Port Hedland and approximately 180 km north-west of Newman in the Pilbara region of Western Australia. The MDIOM Development Envelope is incorporated within the Mulga East tenements and the Mulga West Borefield as shown in Figure 2.1. The MDIOM includes supporting infrastructure and a series of pits.

The Desktop assessment area is defined as the MDIOM area, tenements and up to 40 km surrounding the MDIOM as shown in Figure 2.1.

2 DESKTOP ASSESSMENT

2.1 GREY FALCON (*FALCO HYPOLEUCOS*) SPECIES PROFILE

The grey falcon (*Falco hypoleucos*) is a stocky, elusive species endemic to mainland Australia and is the rarest of the Australian members of the *Falco* genus (Marchant and Higgins 1993); (Schoenjahn 2011b). The total population size is accepted to be <1,000 mature individuals (Schoenjahn 2011a) and as a result, this species was listed as Vulnerable under the EPBC Act in September 2019. The grey falcon is also listed as Vulnerable under the BC Act.

The grey falcon is a medium-sized raptor, with average body mass for males around 390 grams and for females around 560 grams (Schoenjahn 2011b). A sleek, grey plumaged falcon with a swift, direct flight pattern, patrolling low over groundcover below treetop level with shallow wing beats and brief glides (Morcombe 2022). Soars with wings held close to level with dark tipped primaries slightly spread to give a blunt wingtip (Morcombe 2022).

Grey falcons of all ages feed almost exclusively on birds including doves, pigeons, parrots, cockatoos and finches (Schoenjahn *et al.* 2020). Grey falcons hunt predominantly in open country, often over treeless grassland, which is also a key feeding habitat of prey species (Schoenjahn 2013) and are well known for hunting over natural and artificial water sources (Schoenjahn 2018).

The grey falcon is distributed sparsely over parts of Australia's arid and semi-arid zone with climate characteristics appearing to play a crucial role in the species' distribution (Schoenjahn *et al.* 2020). This species occurs in low densities across inland Australia and is considered to comprise a single, monotypic population (Marchant and Higgins 1993). The species frequents timbered lowland plains, particularly acacia shrublands that are crossed by tree-lined water courses (Garnett *et al.* 2011); (Ehmann and Watson 2008); (Schoenjahn 2013). The species has been observed hunting in treeless areas and frequents tussock grassland and open woodland, especially in winter (Schoenjahn 2018); (Olsen and Olsen 1986).

Grey falcons do not build their own nests and use old stick-nests of other birds, mainly corvids and other raptors in trees or on artificial structures such as telecommunication towers and powerline poles (Schoenjahn *et al.* 2020); (Johnstone and Storr 1998). Nesting usually occurs high in the tallest trees in the area usually along watercourses or river pool (Morcombe 2022) particularly in *Eucalyptus camaldulensis* and *Eucalyptus coolabah* (Threatened Species Scientific Committee 2020). Breeding takes place between June and November with a clutch size of 2-4, a nestling number of 1-4 and a nestling period of >38 days (Schoenjahn 2013).

2.2 DATABASE SEARCH RESULTS

DBCA Threatened and Priority Fauna database search results identified a total of eight grey falcon records occurring within 70 km of the MDIOM (Figure 2.1).

2.3 LITERATURE REVIEW

Five vertebrate fauna surveys and assessments, including avifauna surveys, have been undertaken within the vicinity of the MDIOM (Table 2.1, Figure 2.1). *ecologia* (2021) opportunistically recorded a single grey falcon individual approximately 100 m to the north of the MDIOM during the basic fauna assessment conducted in 2018, perched in a tree adjacent to a drainage line (Figure 2.1). No targeted grey falcon surveys have been conducted within the MDIOM, as the field surveys undertaken by *ecologia* occurred prior to the grey falcon being listed 'Vulnerable' under the EPBC Act (9 July 2020).

The Biologic (2022) survey of the Mulga West Borefield within the MDIOM Development Envelope considered the grey falcon as "Likely" to occur. The grey falcon was also previously recorded by Terrestrial Ecosystems (2013); however, the exact location of this record was unable to be extracted from the report or associated data, and therefore, this record is not presented on Figure 2.1.

Although significant avifauna survey effort has been undertaken since 2013 within the MDIOM area (Table 2.1), this species has only been recorded on two occasions, indicating intermittent visitation to the MDIOM and surrounding areas which aligns with the habits of this nomadic species.

Table 2.1: Vertebrate fauna surveys previously undertaken in the vicinity (60 km) of the MDIOM area.

Survey	Year	Company	Grey falcon records	Grey falcon assessment type	Avifauna survey effort
Level 2 Fauna Assessment for the Mulga Downs Project Area	2013	Terrestrial Ecosystems	One grey falcon recorded	Bird surveys, habitat assessments	702 habitat assessments, 92 bird survey sites (1,800 minutes)
Investigator Project Terrestrial Vertebrate Fauna Assessment	2014	Ecologia Environment	Assessed as having a "Medium" likelihood of occurrence	Bird surveys, habitat assessments	6 habitat assessments, 24 sites (1,230 minutes)
Mulga East Baseline Terrestrial Fauna Assessment	2021	Ecologia Environment	One grey falcon recorded	Systematic bird surveys, active and opportunistic searches using dedicated ornithologists, habitat assessments	42 habitat assessments, 107 set time surveys at 36 sites (2,140 minutes), 19 opportunistic surveys
RHIL Mulga Downs Hub and Rail Spur Basic and Targeted Terrestrial Fauna Assessment	2022	Spectrum Ecology	Historical record (2014) within survey area	Bird surveys, habitat assessments, active searches (bird survey), opportunistic searches	32 habitat assessments and six active search locations
MDIOM: Mulga West Borefield and Mulga East Southern Corridor Terrestrial Fauna Survey	2022	Biologic	Not recorded, considered "likely" to occur	Bird surveys, habitat assessments	105 habitat assessments, 12 bird census locations (546 minutes)



DBCA database record
● Grey falcon
Ecologia 2020 record
▲ Grey Falcon

Biologic (2022) Mulga West Borefield and Southern Corridor
Ecologia (2021) Mulga East Baseline Vertebrate Fauna

Pits
Supporting Infrastructure
Development Envelope

Figure 2.1: Grey falcon records.

3 HABITAT ASSESSMENT

The tendency of grey falcons to utilise the nests of other birds (corvids and raptors) in largest eucalypts restricts suitable nesting habitat presence within the MDIOM area to two main habitat types (Figure 3.1):

- Drainage Line; and
- Mixed Eucalypt/Mulga Floodplain.



Both of these habitat types are not restricted to impact areas and are considered common on a local and regional scale. The remainder of the habitat types within the MDIOM are unlikely to provide suitable nesting habitat for the grey falcon.

Drainage Lines within the MDIOM Development Envelope generally flow in a southerly direction out of the Chichester Ranges into the Fortescue Valley as well as areas within Mulga West Borefield associated with the Fortescue River. The banks of some Drainage Lines support *Eucalyptus victrix* trees that have the potential to be used for nesting if they possess previously built nests. The grey falcon recorded by *ecologia* (2021) was in close proximity to a drainage line in the western portion of the Mulga East survey area (Figure 2.1) which is generally surrounded by stony plains and acacia shrubland with some areas of chenopod shrubland. The drainage lines intersecting the impact areas in the east of the MDIOM flow into Mulga Woodlands which are less likely to support grey falcon foraging and nesting habitat.

The Mixed Eucalypt/Mulga Floodplain habitat type is associated with the Fortescue Marsh Environmentally Sensitive Area (ESA)(WA0066) as identified by the Directory of Important Wetlands in Australia (DIWA) and supports trees (*Eucalyptus victrix*) of a suitable size for nesting if they possess previously built nests. Majority of this habitat type occurs outside of the proposed clearing footprint (Figure 3.1).

Grey falcons have the potential to nest in any large tree containing previously built stick nests associated with these habitat types and forage in surrounding habitat types including Chenopod/cracking clay floodplains, Calcrete stony plains and within the Claypans. The vast majority of open country surrounding tree lined creeks known to be utilised by the grey falcon occurs to the south and west of the proposed impact areas.

Table 3.1: Habitat types that have the potential to provide nesting habitat for the grey falcon.

Broad habitat type	Habitat extent within Development Envelope	Habitat extent to be impacted (ha)	Vegetation description	Habitat description	Representative photos
Drainage Line	946.6 ha	157.36 ha	Scattered <i>Eucalyptus victrix</i> or <i>Corymbia hamersleyana</i> over an open shrubland of <i>Acacia tumida</i> and <i>A. pyrifolia</i> over hummock and tussock grasses.	Drainage lines support tall trees with the potential to provide nesting opportunities for the grey falcon if they possess suitably built stick nests. This habitat is considered widespread in the Pilbara	
Mixed Eucalypt/Mulga Floodplain	3465.37 ha	293.64 ha	Isolated to dense <i>Eucalyptus victrix</i> and <i>Acacia distans</i> over scattered understory over low grasses.	Open woodland with scattered tall trees with grasses and woody debris around the base and expanses of red sandy/clay soils. Woody debris is present, and the large mature trees provide large hollows for nesting and shelter. This habitat type is considered widespread within the Fortescue Valley.	



Ecologia 2020 record Potential grey falcon nesting habitat (Ecologia 2020)

▲ Grey Falcon

— Drainage Line

▨ Mixed Eucalypt/Mulga Floodplain

Western Borefield and Southern Corridor potential grey falcon nesting habitat (Biologic 2022)

— Drainage Line

■ Development Envelope

■ Pits

■ Supporting Infrastructure

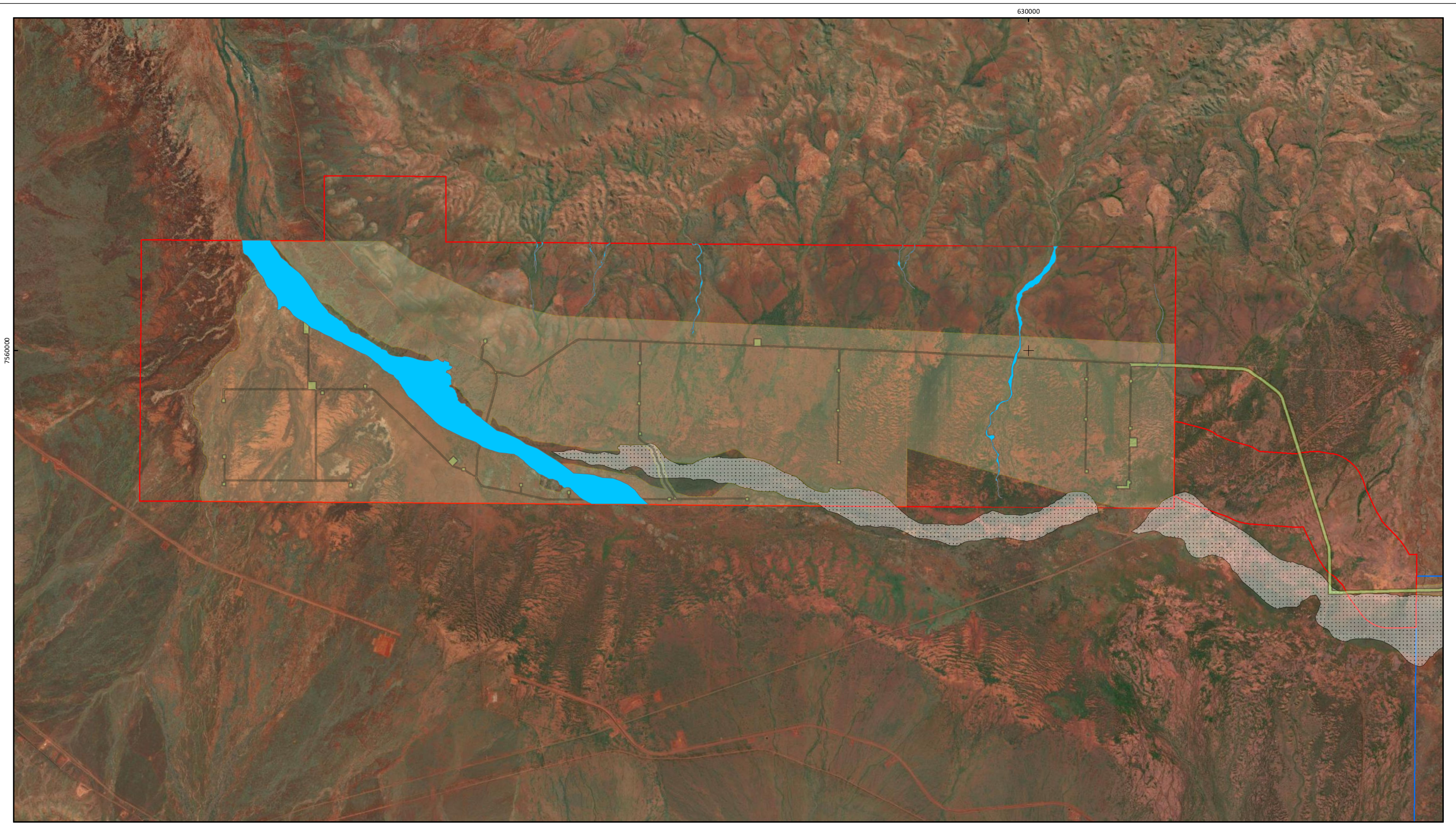
■ Fortescue Marsh ESA (WA066)

■ Biologic (2022) Mulga West Borefield and Southern Corridor

■ Ecologia (2021) Mulga East Baseline Vertebrate Fauna

Figure 3.1a: Grey falcon habitat and impact areas.





Ecologia 2020 record

▲ Grey Falcon

Western Borefield and Southern corridor potential grey falcon nesting habitat (Biologic 2022)

■ Drainage Line

■ Development Envelope

■ Pits

■ Supporting Infrastructure

■ Fortescue Marsh ESA (WA066)

■ Biologic (2022) Mulga West Borefield and Southern Corridor

■ Ecologia (2021) Mulga East Baseline Vertebrate Fauna

Figure 3.1b: Grey falcon habitat and impact areas.



4 POTENTIAL IMPACTS

According to the conservation advice for the grey falcon (Threatened Species Scientific Committee 2020), the two threats to the species posed by the Proposal include nest shortages (as a result of land clearing) and collision with traffic. The extent of potentially suitable habitat to be impacted by the Proposal can be seen in Table 4.1.

Table 4.1: Extent of potential habitat to be impacted by the Proposal.

Survey	Disturbance type	Habitat type	Area to be impacted (ha)
Ecologia (2021)	Pits	Drainage Line	39.88
Ecologia (2021)	Supporting Infrastructure	Drainage Line	100.36
Biologic (2022)	Supporting Infrastructure	Drainage Line	17.12
Ecologia (2021)	Pits	Mixed Eucalypt/ Mulga Floodplain	126.21
Ecologia (2021)	Supporting Infrastructure	Mixed Eucalypt/ Mulga Floodplain	167.43
Total			451.00

4.1 HABITAT LOSS AND FRAGMENTATION

4.1.1 Nest shortages (high threat status and priority for action)

Possible threats to the grey falcon include nest shortages due to land clearing of the arid zone and the overgrazing of saplings restricting the recruitment of new nesting trees. The loss of artificial structures (telecommunication poles and repeaters) may also contribute to a loss of nesting habitat (Threatened Species Scientific Committee 2020).

Potentially suitable nesting habitat is not restricted to the MDIOM impact areas, with majority of suitable nesting habitat located outside of the proposed pits and supporting infrastructure footprint, especially within the Fortescue Marsh ESA (WA0066) (Figure 3.1). Seven species that produce nests known to be used by the grey falcon have been recorded within the MDIOM including five raptors and two corvids (*ecologia* 2021; Biologic 2022).

4.2 DIRECT MORTALITY

4.2.1 Collision with traffic (Moderate threat status and priority for action)

The potential increased vehicle traffic during construction and operation of the MDIOM poses an additional threat to the grey falcon.

5 MITIGATION OF RISKS

To mitigate the potential risks to the grey falcon within the MDIOM, the following measures are outlined in the conservation advice (Threatened Species Scientific Committee 2020):

- Targeted surveys be conducted to identify known nesting trees and protect known nesting trees with buffers. Survival of replacement nest trees should be prioritised in areas where grey falcons are known to breed;
- Protect known nesting trees and include adequate exclusion buffers with regard to proposed developments and land clearing activities;
- Avoid impacts to suitable nesting habitat (large trees) when building roads and tracks;
- Support improved fire and grazing management in areas where grey falcons are known to occur;

- Support the establishment and survival of replacement nest trees in areas where grey falcon are known to breed;
- Retain artificial structures with known or potential grey falcon nests; and
- Control invasive cats in areas where grey falcons are known to occur, especially in known roosting and nesting areas.

6 CONCLUSIONS

To address concerns surrounding the habitat usage and potential impacts to the grey falcon within the MDIOM area, *ecologia* has reviewed data collected to date and makes following conclusions:

- Considerable survey effort has been conducted within the survey area over a nine-year period and the grey falcon has only been recorded on two occasions, indicating intermittent visitation to the MDIOM area rather than permanent occupancy of this area.
- Trees of a suitable size for grey falcon nesting are present within the Drainage Lines and Mixed Eucalypt/Mulga Floodplain habitat types. Prospective habitat for foraging occurs in treeless, open country to the south and west of the proposed pit impact areas. The availability of nests built by corvids or other raptor species is a limiting factor when identifying suitable nesting habitat within the MDIOM. Supporting infrastructure within the borefields including roads and pipelines are likely to have minimal impact to nesting or foraging habitat for this species, provided no known nesting trees are impacted.
- The ESA (WA0066) associated with the Fortescue River supports habitat suitable for both grey falcon nesting and foraging. The ESA, however, is outside of proposed impact areas and will not be directly impacted by the development of the MDIOM.
- The mitigation of direct impacts to this species should follow the conservation advice and targeted surveys should be undertaken during the breeding season (June – November) within Drainage Lines and Mixed Eucalypt/Mulga Floodplain habitat types to search for active nest within impact areas.

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