Clearing Assessment Report – CPS 818

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Banana Wells Gravel Pit – 2023 Northern Expansion
Budgarjook Road
Kimberley
2597

D23#914928
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1 PROPOSAL

1.1 Purpose and Justification

The proposal involves geotechnical investigation works for the potential expansion of Banana Wells Gravel Pit on the northern side of Budgarjook Road. Geotechnical investigations will be conducted from November 2023 to guide the clearing and development of this expansion in 2024. This proposal is only for the geotechnical investigation of the area, not the expansion of the Banana Wells material pit.

The proposal will involve the clearing of 6 ha of native vegetation. Total Clearing for the proposal is 6 ha and will be conducted under CPS 818.

1.1.1 Main Roads Approach to Road Safety and the Environment

Main Roads is committed to minimising the environmental impacts of all of its activities and manages the State Road network to achieve balanced economic, social, safety and environmental benefits for the community. Main Roads recognises that Western Australia's environment is significant from a global perspective and the unique conservation values that are contained within its road reserve. Main Roads' road network often adjoins natural areas and, in some locations, the reserve itself hosts remnant vegetation with high environmental values. Although the reserves were not established for this purpose, Main Roads recognises that it has a responsibility to conserve the environmental values that occur within the State's road network and minimise the impact its proposals have on the environment. In addition to providing a safe and efficient road network for all people using the roads under its control, Main Roads is also committed to protecting and enhancing the natural environment.

In accordance with National and State Government road safety policies, Main Roads is also committed to substantially reducing road trauma on the road network through Safe System principles. The Safe System approach acknowledges that more than two-thirds of all serious crashes are due to human error rather than deliberate risk-taking (e.g. speeding or drink driving) and seeks to improve behaviour through education and enforcement while managing the safety of vehicles, speeds and the road and road infrastructure. It is shown that improving sub-optimal road formation will substantially reduce the likelihood and severity of road crashes. For example, according to the Road Safety Management Guideline, increasing the sealed shoulder from 0.5 m to 2 m will reduce Killed and Seriously Injured numbers by more than 50%.

As the statutory authority responsible for providing and managing a safe and efficient main road network in Western Australia, Main Roads focuses on improving road safety by thoroughly considering all environmental, economic and community benefits and impacts. It operates on a hierarchy of avoiding, minimising, reducing and then, if required, offsetting our environmental impacts. This has been achieved through changes in proposal scope and design. Main Roads regularly reduces its clearing footprint by restricting earthworks limits for proposals, steepening batters, installing barriers, establishing borrow pits in cleared paddocks and avoiding temporary clearing for storage, stockpiles and turn-around bays to avoid and minimise its impacts.

Further details on measures to avoid, minimise and reduce are provided in Section 1.5.

1.2 Proposal Scope

The proposal involves the expansion of the existing Banana Wells Gravel Pit on the northern side of Budgarjook Road. Geotechnical investigations will be conducted from 26 November 2023 to guide the clearing and development of this expansion in 2024. Materials from this pit are planned for construction and maintenance works on the Broome-Cape Leveque Road.

Numerous tracks are required to enable investigation which will initially be at 100 m grid spacing, reducing to 50 m spacing and potentially down to 25 m spacing, depending on results. Surface vegetation will be cleared with a backhoe and test pits dug to approximately 2 metres depth. Following the bagging of samples, pits will be backfilled. Six hectares (6 ha) of native vegetation clearing is sought within a Project Development Envelope (DE) of 92.6 ha (including previously cleared areas). Of this 92.6 ha, 24.32 ha has been subject to a biological survey previously, and a further 25.66 ha has been cleared or is regrowth. Remnant vegetation accounts for 66.6 ha of the DE, of which 24.32 ha of biological survey occurred, leaving approximately 42.28 ha of remnant vegetation which has not been surveyed in the DE.

Subsequent clearing will be conducted based on the results from geotechnical investigations. This will minimise the clearing footprint by avoiding areas that do not hold significant material deposits and prioritising higher-grade areas.

1.3 Proposal Location

The Development Envelope is located on Budgarjook Rd, Dampier Peninsula, SLK REDACTED, Shire of Broome, as shown in Figure 1. The central coordinate of the proposal is REDACTED °E REDACTED °S (Decimal Degrees).

1.4 Clearing Details

Proposed Clearing to be undertaken using CPS 818:
6 ha

Areas of Native Vegetation Clearing:
The areas of native vegetation to be cleared are shown in Figure 2.

Type of Native Vegetation:
The type of vegetation to be cleared under this Proposal is a mosaic of vegetation units P1 and P2 (shown in Figure 2) described by Biota (2018) as:

- **P1**
  - *Corymbia greeniana*, *Planchonia careya*, *Brachychiton diversifolius* subsp. *diversifolius*, *Gardenia pyriformis* subsp. *keartlandii* low woodland over *Bauhinia cunninghamii*, *Ficus aculeata* var. indecora, *Hakea arborescens*, *Dodonaea hispidula* var. arida tall shrubland over *Crotalaria ramosissima*, *C. brevis*, *Gyrostemon tepperi* low open shrubland over *Sorghum plumosum* var. plumosum tussock grassland.
- **P2**
  - *Corymbia greeniana*, *C. flavescens*, *Planchonia careya*, *Brachychiton diversifolius* subsp. *diversifolius* low woodland over *Acacia tumida* var. kulparn, *Bauhinia cunninghamii*, *Hakea arborescens*, *Dodonaea hispidula* var. arida tall shrubland over *Buchnera ramosissima* (*Microstachys chamelaea*, *Galactia tenuiflora*) low open shrubland over *Chrysopogon pallidus*, *Aristida holathera* var. latifolia, (*A. hygrometrica*) open tussock grassland.

REDACTED

Figure 1. Banana Wells Gravel Pit Northern Expansion Development Envelope – Geotechnical Investigation.

REDACTED

Figure 2. Vegetation and Priority species observations within the Development Envelope and Survey Area

1.5 Alternatives to Native Vegetation Clearing Considered During Proposal Development

The following alternatives to clearing were considered during the development of the proposal:

- Do not upgrade or maintain the road, however this will potentially result in a poorer safety outcome and may result in future fatalities or serious injuries and further degradation of the State road asset.
- Reducing the speed limit to minimise clearing requirements, while still balancing safety (driver fatigue) and freight efficiency. Speed Limits are an essential mechanism to ensure the safe and efficient operation of road networks. The application of appropriate speed limits and other traffic management measures is a key mechanism in managing vehicle speeds to achieve desired safety, mobility, traffic management, local amenities, and road user expectations. There are several factors involved in road safety, including road conditions, driver behaviour and overall road design. Except in special situations, reducing speed limits below national standards on state and national roads is not typically supported as it has the potential to contribute to driver frustration, impatience, tiredness and recklessness. The environmental values protected by reducing the speed limit, do not justify the impacts on freight efficiencies nor road user safety. Accordingly, the reduction of the speed limits to avoid clearing of native vegetation for this proposal is not proposed.
- Outsourcing material from a commercial provider, which would be significantly more expensive for materials, haulage, and labour hours to provide.

1.6 Measures to Avoid, Minimise, Reduce and Manage Proposal Clearing Impacts

The design and management measures implemented to avoid and minimise the potential clearing impacts of the Proposal are provided in Table 1.

Table 1. Measures Undertaken to Avoid, Minimise, Reduce and Manage the Proposal Clearing Impacts

Design or Management Measure	Discussion and Justification
Use of existing cleared areas for access tracks, construction storage and stockpiling	• The proposal will utilise existing cleared and disturbed areas from the Banana Wells Gravel Pit where practicable. This includes utilising access tracks and cleared sections as vehicle resting areas.
Pre-clearance surveys and avoidance of significant environmental features	• The areas proposed for the geotechnical/investigative works will be walked before the commencement of the proposal by the local ranger group, and cultural monitors will be present throughout the works. If any suitable cave habitat is identified, it will be removed from the Development Envelope and flagged with a 50m buffer. • Large trees will be avoided where possible as the scope of work involves minimal impact and will take the path of least resistance (e.g., low scrub, open ground, etc). • A pre-clearing bilby survey will be conducted before ground disturbance activities commence, and any located burrows will be avoided, including a 50m buffer around the burrow being flagged for avoidance.

1.7 Approved Policies and Planning Instruments

The clearing of native vegetation in Western Australia is regulated under the EP Act and the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* (Clearing Regulations).

In addition to the matters considered in accordance with section 51O of the EP Act, Main Roads has also had regard to the below instruments where relevant.

Other Legislation potentially relevant for assessment of clearing and planning/other matters:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Country Areas Water Supply Act 1947* (WA) (CAWS Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Planning and Development Act 2005* (WA) (P&D Act)
- *Soil and Land Conservation Act 1945* (WA)
- *Rights in Water and Irrigation Act 1914* (WA)
- *Aboriginal Heritage Act 1972* (WA).

Environmental Protection Policies:

- Environmental Protection (Peel Inlet - Harvey Estuary) Policy 1992
- Environmental Protection (Western Swamp Tortoise Habitat) Policy 2011.

Other relevant policies and guidance documents:

- Environmental Offsets Policy (Government of Western Australia, 2011)
- A guide to the assessment of applications to clear native vegetation (Government of WA, December 2014)
- Procedure: Native vegetation clearing permits (Government of WA, October 2021)
- Environmental Offsets Guidelines (Government of Western Australia, 2014)
- Technical guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA, 2016)
- Technical guidance – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA, 2020)
- Approved conservation advice under section 266B of the EPBC Act for threatened flora/fauna/vegetation communities.

2 SCOPE AND METHODOLOGY ASSESSMENT OF CLEARING

Native vegetation will be cleared to accommodate this Proposal. This clearing will be undertaken using the Main Roads Statewide Clearing Permit CPS 818.

To comply with CPS 818, Main Roads must prepare a Clearing Assessment Report (CAR).

The CAR outlines the key activities associated with the Proposal, the existing environment and an assessment of native vegetation clearing. This assessment provides an evaluation of the vegetation clearing impacts associated with the Proposal using the ten Clearing Principles listed under s51 of the *Environmental Protection Act 1986* (EP Act) and strategies used to manage vegetation clearing.

2.1 Report Terminology and Sources

The following terms are used in this Clearing Report:

- **Development Envelope** – The maximum extent within which the Clearing Area (6 ha) will be located. The Development Envelope is 92.6 ha for the purposes of this assessment (shown in red in Figures 1 and 2). The Development Envelope is larger than the Clearing Area to allow for minor changes to the Proposal footprint as the design process continues, and to account for minor and unexpected changes that may occur during construction, such as working to avoid large trees or encountering buried boulders or services. This flexibility allows the site personnel to make modifications to the Proposal to avoid areas that may contain better environmental values. The CAR has assessed all environmental values within the Development Envelope as though all of these values will be impacted, up to the amount specified within the Clearing Area.

- **Study Area** – The area covered by the Desktop Assessment. The Study Area for the Proposal is confined to a local area of a 40 km radius (refer to Figure 3).

- **Survey Area**– The area covered by the Biological Survey shown in yellow in Figure 2.

2.2 Desktop Assessment

A desktop assessment of the Development Envelope was undertaken by viewing internal datasets and other government agency managed databases. Results from searches can be found in Appendix 2.

GIS layer viewing and mapping is done using ArcMap and/or Main Roads corporate mapping system known as iMaps. Referencing of the GIS layers accessed is done under the relevant methodology section of each clearing principle. Government-managed databases were searched to locate additional information, which are found under References in Section 8.

2.3 Surveys and Assessments

The following surveys were undertaken to inform this CAR:

- *Gravel Pit Expansion Biological Survey (Biota 2018)*

Biological and targeted surveys conducted for the proposal are outlined in Table 2 and a summary of the findings in these reports are presented in Sections 3.1 to 3.3 below.

Table 2. Summary of Biological and Targeted Surveys Relevant to the Proposal

Consultant & Survey Name	Survey Details
Biota (2018) Gravel Pit Expansion Biological Survey	**Survey Area:** Comprised approximately 281 ha on the northern and southern sides of Budgarjook Road located off Broome Cape Leveque Road at SLK 108. **Type:** Detailed and Targeted Flora and Vegetation Survey, a Level 1 Fauna Survey and a Targeted Bilby Survey. **Timing:** 6-11 May 2018 **Survey Results Shapefile TRIM Ref:** D18#609170 **Document TRIM Ref:** D23#722748

3 SURVEY RESULTS

In accordance with CPS 818/17 condition 8 (e) (iii), a copy of the relevant sections of the executive summary and report conclusions from the biological survey and/or field assessments are provided in Appendix 1.

3.1 Summary of Flora and Vegetation Surveys

Two vegetation units, P1 and P2, were identified for the Survey Area (as seen in Figure 2). These units occurred on the broad pindan sandplain as a complex mosaic. The mosaic covered 279.7 ha (99.6 %) and was in Excellent condition, with no introduced flora species or other disturbance being recorded. The remainder of the Survey Area comprised cleared or disturbed ground associated with narrow tracks, a short section of the Budgarjook road, and a gravel pit.

Neither of the vegetation types recorded represent Threatened Ecological Communities (TECs), Priority Ecological Communities (PECs) or Groundwater Dependent Ecosystems (GDEs). Similar vegetation is widespread on the pindan sandplain in the locality and is not considered to be of elevated conservation significance. The proposed activities within the Survey Area would affect a small proportion of the area occupied by pindan vegetation in the locality, and the Project would therefore not be expected to have any significant impacts with regard to these vegetation types.

A total of 95 native flora species were recorded from the Survey Area, all of which were typical of the locality. This total included two conservation significant flora species:

- *Jacquemontia* sp. Broome (A.A. Mitchell 3028) (Priority 1); and
- *Polymeria* sp. Broome (K.F. Kenneally 9759) (Priority 3).

Both of these species appear to be poorly collected rather than rare. The Project would therefore not be expected to affect the conservation status of these species.

3.2 Summary of Fauna Surveys

Database and literature searches yielded a total of 188 vertebrate species with the potential to occur in the Survey Area, comprising 10 amphibian species, 48 reptile species, eight non-volant (ground-dwelling) mammal species, seven volant mammal (bat) species and 115 avifauna (bird) species. A total of 40 fauna species were recorded during the Level 1 reconnaissance survey of the Survey Area, comprising 35 avifauna species, four mammal species and one reptile species.

Of the 188 vertebrate species potentially occurring in the Survey Area, 11 are listed as conservation significant species. One of these species was observed during the field survey; the Rainbow Bee-eater (*Merops ornatus*) is a listed Marine species under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Another conservation significant species was

considered likely to occur in the Survey Area; potential diggings of the listed Schedule 3 / Vulnerable Bilby (*Macrotis lagotis*) were recorded during the field survey, and this species is known to occur in the vicinity. A further five species may potentially occur in the Survey Area, while the remaining four species were considered unlikely to occur.

A single fauna habitat was present within the Survey Area: *Corymbia* low woodland. This habitat is not considered rare or restricted to the Survey Area, as it occurs widely in the locality and broader region. The conservation significant species recorded or potentially occurring within the Survey Area may utilise the habitat available for foraging, commuting or nesting on occasion, however, the habitat is not considered to be of critical importance to these species. The Project is therefore unlikely to significantly impact upon the conservation status of these species.

3.3 Summary of Targeted Bilby Survey

Bilby searches were conducted using a combination of linear foot traverses and 2 ha sign plot searches. Sign evidence (e.g., tracks, scats, diggings and burrows) were recorded, and were assigned a criteria of certainty (High, Moderate or Low) based on the strength of the evidence indicating that the sign was attributable to the Bilby. Prospective Bilby habitat was also mapped based on a joint appraisal of mapped vegetation units and fire history mapping.

Seven diggings were recorded during the transect searches, and one digging was located during the sign plot searches, however these were assigned a Low to Moderate certainty and could not reliably be attributed as positive evidence of Bilby presence within the survey area. Results obtained from this survey suggest that the Bilby is currently absent from the Survey Area. However, the Bilby has been recorded historically in close proximity, and 164.7 ha of High prospective habitat was mapped for the Survey Area; this suggests that the Bilby has the potential to occur within the Survey Area given optimal conditions for the species.

The Project is unlikely to directly impact on the Bilby in the immediate future, given its absence from the Survey Area at the time of writing. However, if the Bilby does move into the Survey Area in response to a renewal in resources, the Project is likely to reduce available suitable habitat as a result of clearing for construction activities. The scale of this impact is considered marginal within the context of regional Bilby distribution and their nomadic nature of habitat use at the landscape level.

4 VEGETATION DETAILS

4.1 Proposal Site Vegetation Description

Table 3 and Table 4 provide details of the vegetation types and their condition within the Survey Area (which partly includes the Development Envelope) and the remaining pre-European extent of the Beard Vegetation Association mapped for the Survey Area. For a full description of the existing vegetation, refer to the Biological Report found at D23#722748.

Vegetation within the Survey Area consists of two vegetation units, P1 and P2. These units occurred on the broad pindan sand plain as a complex mosaic but could not be mapped individually due to their small scale. In some places, they occurred in patches as narrow as 10 m across, which although distinct in the field (see Plate 1) were not apparent on aerial imagery. These units together comprised 279.7 ha of the Survey Area (99.6% of the Survey area when excluding cleared habitat). Biota (2018) described these units as:

- **P1** was widespread throughout the entire survey area, occurring on the extensive pindan sandplains.
    - *Corymbia greeniana*, *Planchonia careya*, *Brachychiton diversifolius* subsp. *diversifolius*, *Gardenia pyriformis* subsp. *keartlandii* low woodland over *Bauhinia cunninghamii*, *Ficus aculeata* var. indecora, *Hakea arborescens*, *Dodonaea hispidula* var. arida tall shrubland over *Crotalaria ramosissima*, *C. brevis*, *Gyrostemon tepperi* low open shrubland over *Sorghum plumosum* var. plumosum tussock grassland.
- **P2** was widespread throughout the entire survey area, occurring on the extensive pindan sandplains.
    - *Corymbia greeniana*, *C. flavescens*, *Planchonia careya*, *Brachychiton diversifolius* subsp. *diversifolius* low woodland over *Acacia tumida* var. kulparn, *Bauhinia cunninghamii*, *Hakea arborescens*, *Dodonaea hispidula* var. arida tall shrubland over *Buchnera ramosissima* (*Microstachys chamelaea*, *Galactia tenuiflora*) low open shrubland over *Chrysopogon pallidus*, *Aristida holathera* var. latifolia, (*A. hygrometrica*) open tussock grassland.

Plate 1: Boundary between vegetation unit P1 (left) and P2 (right).

Due to the mosaic of synonymous vegetation identified in Biota's Survey Area which wraps around the Development Envelope on the southern, eastern, and northern sides, it's likely the unsurveyed vegetation within the Development Envelope is the same vegetation as identified in the Survey Area, P1 and P2. Biota has mapped 24.32 ha of the P1/P2 veg types, and if the rest of the vegetation in the Development Envelope is the same as suggested by surrounding mapping, up to 66.6 ha of P1/P2 vegetation is present within the Development Envelope.

Table 3. Summary of Vegetation Types within Survey Area

Vegetation Type	Veg Condition	Total Extent Mapped (ha) within Survey Area
P1 - pindan sand plain *Corymbia greeniana*, *Planchonia careya*, *Brachychiton diversifolius subsp. diversifolius*, *Gardenia pyriformis subsp. keartlandii* low woodland over *Bauhinia cunninghamii*, *Ficus aculeata var. indecora*, *Hakea arborescens*, *Dodonaea hispidula var. arida* tall shrubland over *Crotalaria ramosissima*, *C. brevis*, *Gyrostemon tepperi* low open shrubland over *Sorghum plumosum var. plumosum* tussock grassland.	Excellent	279.7 ha
P2 – pindan sand plain *Corymbia greeniana*, *C. flavescens*, *Planchonia careya*, *Brachychiton diversifolius* subsp. *diversifolius* low woodland over *Acacia tumida* var. *kulparn*, *Bauhinia cunninghamii*, *Hakea arborescens*, *Dodonaea hispidula* var. *arida* tall shrubland over *Buchnera ramosissima* (*Microstachys chamelaea*, *Galactia tenuiflora*) low open shrubland over *Chrysopogon pallidus, Aristida holathera* var. *latifolia,* (*A. hygrometrica*) open tussock grassland.	Excellent	279.7 ha

*P1 and P2 were mapped as one unit, and as such are unable to discern exact hectares of either veg type.

Table 4. Pre-European Vegetation Representation

Pre-European Vegetation Association (Beard, 1979)	Scale	Pre–European Extent (ha)	Current Extent (ha)	% Remaining	% Current Extent in DBCA Managed Land (proportion of pre-European Extent)
Veg Assoc No. 750 Shrublands, pindan; *Acacia tumida* shrubland with grey box and cabbage gum medium woodland over ribbon grass and curly spinifex.	**Statewide** *Vegetation Association 750*	1,231,155	1,225,687	~99	~3
	IBRA Bioregion *Dampierland*	1,229,182	1,225,280	~99	~3
	IBRA Sub-region *Pindanland*	1,221,734	1,217,843	~99	~3
	Local Government Authority *Shire of Broome*	1,115,559	1,110,131	~99	~3

5 ASSESSMENT AGAINST THE TEN CLEARING PRINCIPLES

In assessing whether the Proposal's proposed clearing is likely to have a significant impact on the environment, the Proposal was assessed against the ten Clearing Principles (EP Act, Schedule 5).

Each principle has been assessed in accordance with the former Department of Environment Regulation (now Department of Water and Environmental Regulation (DWER) '*A Guide to the Assessment of Applications to Clear Native Vegetation*' (Department of Environment Regulation, 2014) and other relevant clearing permit application decision reports prepared by DWER.

The proposed clearing is not likely to be at variance with the ten Clearing Principles.

(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

Proposed clearing is not likely to be at variance to this Principle.

The following metrics are considered to be indicators of high biological diversity (as described in DER 2014):

Biodiversity hotspots

The proposed clearing is not located in a Biodiversity Hotspot (DER 2014).

Flora and Fauna species diversity, including presence of conservation significant flora and fauna

A total of 95 native flora species were recorded in the Survey Area which were typical of the locality. This total included two conservation significant flora species which are discussed further below:

***Jacquemontia sp. Broome* (A.A.Mitchell 3028) (Priority 1)**

Biota identified 33 individuals from 13 locations, of which five individuals were in the Development Envelope. Although currently only represented by a small number of collections in the WA Herbarium, a total of 743 individuals were recorded from 47 locations during another survey completed by the Biota field team to the south (Biota 2018). Similar pindan habitat is widespread and abundant on the Dampier Peninsula, and given the number of recent records, it is likely that this taxon is poorly collected rather than rare. The species is relatively widespread, with records in the Development Envelope being 110km north-north east from a cluster of other records in and around the township of Broome (Western Australian Herbarium 1998). The Survey Area encompasses a very small proportion of the suitable habitat present even at a local scale. It is therefore considered unlikely that the relatively small amount of clearing proposed would affect the conservation status of this species (Biota, 2018). As such, no significant impact to the species is anticipated from the proposed clearing.

***Polymeria sp. Broome* (K.F.Kenneally 9759) (Priority 3)**

Biota (2018) identified 100 individuals from 32 locations, of which six individuals were in the Development Envelope. The broad range of documented locations and the abundance of suitable pindan habitat suggest that *Polymeria* sp. Broome (K.F. Kenneally 9759) is poorly collected rather than rare (Biota 2018). The species is widespread, and the Survey Area encompasses a very small proportion of the suitable habitat present even at a local scale. It is therefore considered unlikely that the relatively small amount of clearing proposed would affect the conservation status of this species (Biota 2018). As such, no significant impact to the species is anticipated from the proposed clearing.

Biota (2018) concluded that the P1 and P2 vegetation units mapped within the Survey Area would not be considered to be of particular conservation significance for *Jacquemontia* sp. Broome (A.A.Mitchell 3028) or *Polymeria* sp. Broome (K.F.Kenneally 9759).

A number of other priority flora species have previously been recorded in the broader locality or have distributions that encompass the Study Area. None of these species were recorded during Biota's 2018 field survey and none are considered likely to occur in the Survey Area, either because they are strongly linked to specific habitats that are absent from the Survey Area or because they would be expected to have been recorded during the field survey, if present (Biota, 2018).

Biota's desktop assessment identified 188 terrestrial vertebrate fauna species with potential to occur in the Study Area (including 11 conservation significant species). The fauna reconnaissance field survey of the Survey Area recorded a total of 40 fauna species (either directly observed or recorded from signs or calls), comprising 35 avifauna species, four mammal species and one reptile species. The species recorded included two conservation significant species; Rainbow Bee-eater; *Merops ornatus* (listed as Marine under the Commonwealth *EPBC Act 1999*) and the Bilby; *Macrotis lagotis* (listed as Vulnerable under both the EPBC Act and State *EP Act 1986*). The significance of the habitat within the proposal area for these and other conservation significant species is further discussed in principle (b). However, noting that the Survey Area consists of one fauna habitat type that is not rare, not restricted to the Survey Area and occurs widely through the region, the Development Envelope is unlikely to be representative of an area of high fauna diversity in comparison to other areas locally or regionally.

Ecological Community Diversity, including presence of conservation significant communities

No Threatened Ecological Communities (TECs), Priority Ecological Communities (PECs) or declared Environmentally Sensitive Areas (ESAs) were identified in, or adjacent to, the Development Envelope (Biota, 2018).

The nearest significant ecological community is the Commonwealth and State-listed Monsoon (vine) thickets on the coastal sand dunes of Dampier Peninsula TEC (Endangered), located approximately 7.5 km north of the Development Envelope.

No impact to either a listed TEC, PEC or ESA is anticipated due to the proposal's distance from the nearest receptors.

Biota's 2018 biological survey identified two vegetation types, P1 and P2, in the Survey Area. These units occurred on the broad pindan sandplain as a complex mosaic. The mosaic covered 279.7 ha (99.6 % of the Survey Area) and was in Excellent condition, with no introduced flora species or other disturbance being recorded. The remainder of the Survey Area comprised cleared or disturbed ground associated with narrow tracks. There is no information available to suggest the P1 or P2 vegetation types are representative of higher ecological diversity than other areas locally or regionally.

Vegetation Condition

Whilst Biota (2018) described most of the vegetation in the Survey Area to be in Excellent condition, and 25.66 ha (approximately 28% of the 92.6 ha Development Envelope) has been previously cleared for activities associated with the Banana Wells Gravel Pit or consists of regrowth vegetation (refer to Figure 1). The proposed clearing will utilise existing cleared areas and avoid large trees where practicable. The proposed clearing is unlikely to impact on vegetation in better condition than surrounding areas locally or regionally.

Conclusion

On the balance of information available, the Development Envelope likely consists of existing disturbed areas associated with the Banana Wells Gravel Pit, common and widespread vegetation types (P1 and P2) and a single fauna habitat that is not rare, restricted or unique in a local or regional context. The area is unlikely to comprise a high level of flora, fauna or ecological community diversity and the proposed clearing of 6 ha of native vegetation within a Development Envelope of 92.6 ha is unlikely to result in significant impacts to biological diversity.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology

- Biota (2018)
- DCCEEW Protected Matters Search Tool Report
- Department of Natural Resources and Environment (2002)
- Government GIS Shapefiles:
  - DBCA Threatened and Priority Ecological Community database search (Accessed September 2023)
  - DBCA Threatened and Priority flora database search (Accessed September 2023)
- Statewide Vegetation Statistics (Government of Western Australia 2018)
- Western Australian Herbarium (1998)

(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna.

Proposed clearing is not likely to be at variance to this Principle.

Based on the biological survey undertaken by Biota (2018), the Development Envelope likely consists of one fauna habitat, Corymbia Low Woodland, described as *Corymbia spp.* low woodland over mixed shrubland dominated by *Bauhinia cunninghamii*, *Hakea arborescens* and *Dodonaea hispidula* over a mosaic tussock grassland dominated by *Sorghum plumosum* and/or *Chrysopogon pallidus*. Whilst not all of the Development Envelope was surveyed by Biota (2018), the Survey Area wrapped around the Development Envelope to the north, east and south. Analysis of aerial imagery indicates the vegetation and landform types present in the Development Envelope are consistent with the surrounding Survey Area, therefore the fauna habitat mapped by Biota (2018) would likely extend into the Development Envelope.

Biota (2018) noted that this single fauna habitat type is not rare or restricted to the Study Area and occurs widely through the region. Whilst a range of fauna species (including some conservation significant species) may utilise the habitat available for foraging, commuting or nesting on occasion, the habitat is not considered to be of critical importance given the habitat availability in the region, known species distributions and the minor scale and nature of the proposed clearing (Biota, 2018).

Further discussion is provided below on the conservation significant fauna species recorded during the field survey, or deemed likely or possible to occur, based on desktop assessment findings and field survey observations:

Rainbow Bee-eater, *Merops ornatus* (Listed Marine, EPBC Act)
The Rainbow Bee-eater was sighted in the Survey Area during the field survey, but is a very widespread and common species within Western Australia. The small extent of proposed clearing is unlikely to impact on significant habitat either locally or regionally, given the wide-ranging nature of this species and the abundance of suitable habitat available outside the Development Envelope.

Bilby, *Macrotis lagotis* (Vulnerable EPBC Act and BC Act)
No direct observation or confirmed secondary evidence (tracks, scats, diggings or burrows) of the Bilby was recorded in the Survey Area by Biota (2018). However, suitable habitat is known to occur within the Development Envelope and eight potential diggings were recorded from the Survey Area. The diggings were of Low or Moderate certainty and could not be reliably attributed to the Bilby (Biota 2018). At the time of the survey (May 2018), the results suggested that the Bilby was absent from the Survey Area. Given the Survey Area did not entirely overlap with the Development Envelope, it cannot be certain if the species is absent from the entire Development Envelope, nor the proportion of suitable habitat present. Given the Development Envelope is situated in the same pre-European vegetation type and soil type as Biota's 2018 survey, it is likely to be suitable because the habitat is synonymous with that from the Survey Area.

Noting that the Bilby has been recorded historically in the Development Envelope, and 164.7 ha of high prospective habitat was mapped within Biota's 2018 Survey Area, it is considered likely that the Bilby would utilise habitat in the Development Envelope under optimal conditions. The proposed clearing of 6 ha of vegetation may result in a very small reduction of locally available habitat for the Bilby. However, the scale of this impact is likely to be minor considering the lack of use of the Survey Area by the species at the time of the survey, its regional distribution, and its nomadic habitat use at the landscape level in the bioregion (Biota 2018).

To minimise the potential for Bilby mortality, a pre-clearing Bilby survey will be conducted before ground disturbance activities commence, and any located burrows will be avoided, including a 50m buffer around the burrow being flagged for avoidance.

Yellow-lipped Cave-bat, *Vespadelus douglasorum* (Priority 2 listed by DBCA)

The species may potentially occur within the Development Envelope as it occurs in woodland habitat which may be present in the Development Envelope. The species roosts in caves or buildings, however, there are no known caves in the Development Envelope. Whilst aerial imagery does not indicate the presence of suitable roosting habitat (in the form of caves), this cannot be ruled out as approximately 42.48 ha of the Development Envelope has not been subject to a biological survey. However, the highly flat landscape suggests there is a low potential for a cave system in the Development Envelope. As a precaution, the areas proposed for clearing will be walked before the commencement of the proposal by the local ranger group, and cultural monitors will be present throughout the works. Whilst unlikely, if any suitable cave habitat is identified, it will be removed from the Development Envelope and flagged with a 50m buffer. Based on the above, the proposed clearing is unlikely to significantly impact this species.

Gouldian Finch, *Erythrura gouldiae* (Endangered: EPBC Act, Priority 4 listed by DBCA)
The species inhabits Savannah woodland with grassy understorey on the Dampier Peninsula and was identified as "may potentially occur" in the adjacent (and overlapping) survey area (Biota 2018). Large trees will be avoided where possible as the scope of work involves minimal impact and will take the path of least resistance (e.g., low scrub, open ground, etc). In addition, further efforts to avoid large trees will be implemented as per heritage recommendations . Because of this, potential breeding trees are unlikely to be removed by the proposal. Due to the wide availability of this habitat and relatively small impact of 6 ha across a 92.6 ha Development Envelope , it is unlikely that the proposed clearing will significantly impact this species.

Peregrine Falcon, *Falco peregrinus* (Other Specially Protected Species, BC Act)
This species occurs in forests, woodlands, wetlands and open country. As there is likely to be suitable woodland habitat in the Development Envelope, this species may potentially occur. However, habitat within the Development Envelope is unlikely to be significant for the Peregrine Falcon in a local or regional context, given its wide-ranging nature and extent of available habitat beyond the Disturbance Envelope.

Red-rumped Swallow, *Cecropis daurica* (Migratory, EPBC Act and BC Act)
The Red-rumped Swallow is a vagrant to Australia and occurs in a wide range of terrestrial habitats (Biota 2018). Being a migratory and marine species that breeds in Europe, it is unlikely that the Development Envelope contains significant habitat for this species.

Fork-tailed Swift, *Apus pacificus* (Migratory, EPBC Act and BC Act)
The Fork-tailed Swift is exclusively aerial in Australia and does not rely on terrestrial environments (Biota 2018). As such, the Development Envelope is unlikely to constitute significant habitat for this species clearing.

In addition to the above species from Biota, the following five species were identified to potentially occur from a Desktop Protected Matters Search Tool search in a 40 km radius of the Development Envelope:

Ghost Bat, *Macroderma gigas* (Vulnerable, EPBC Act and BC Act)
The species may occur within the Development Envelope as it occurs in woodland habitat which may be present in the Development Envelope. The species roosts in caves or buildings, however, no known caves are in the Development Envelope. Whilst aerial imagery does not indicate the presence of suitable roosting habitat (in the form of caves), this cannot be ruled out as approximately 42.48 ha of the Development Envelope has not been subject to a biological survey. However, the highly flat landscape suggests there is a low potential for a cave system in the Development Envelope. As a precaution, the areas proposed for the works will be walked before commencement of the proposal by the local ranger group, and cultural monitors will be present throughout the works. Whilst unlikely, if any suitable cave habitat is identified, it will be removed from the Development Envelope and flagged with a 50m buffer. Based on the above, the proposed clearing is unlikely to significantly impact this species.

Bare-rumped Sheath-tailed Bat, *Saccolaimus saccolaimus nudicluniatus* (Priority 3 listed by DBCA)

The species was not identified from the 2018 Biological survey; however, the species has been observed roosting in trees such as *Eucalyptus miniata*, which occurs in the Survey Area (DCCEEW 2023). The species has been observed in caves overseas, however, there are no Australian records of cave use. The nearest observation from the Atlas of Living Australia is over 52 km south-west of the proposal area from 1977. Whilst potential roosting *Eucalyptus* trees may be present in the Development Envelope, large trees will be avoided during clearing. Given the paucity of records of this species near the Development Envelope, and the commitment to avoid clearing large trees, no significant impact to this species is anticipated.

Night Parrot, *Pezoporus occidentalis* (Endangered: EPBC Act and Critically Endangered: BC Act)
Most Night Parrot records come from *Triodia* hummock grassland or chenopod shrublands (Higgins, 1999). The Atlas of Living Australia's nearest observation is over 350 km south-west of the Development Envelope. Due to the lack of *Triodia* species identified in adjacent (and partially overlapping) Survey Area, this species is considered unlikely to occur in the Development Envelope.

Northern Brushtail Possum, *Trichosurus vulpecula arnhemensis* (Vulnerable, EPBC Act and BC Act)
This species occurs mainly in tall eucalypt open forests with large hollow-bearing trees, particularly where the understorey includes some shrubs that bear fleshy fruits. The nearest record from the DBCA TPFA layer is from 2015, approximately 100 km south of Banana Wells on the Roebuck Plains. Whilst suitable tall *Eucalyptus* trees can be found in the Development Envelope, there are no records with 99 km of the Development Envelope and no tall trees will be impacted by the proposed clearing. As such, no significant impact to the species is anticipated.

Water Mouse, *Xeromys myoides* (Vulnerable, EPBC Act)
This species is known to require mangroves and the associated salt marsh, sedgelands, clay pans, heathlands and freshwater wetlands and is primarily known from Queensland and the Northern Territory (DCCEEW 2023). As this habitat is not likely to be present in the Development Envelope, no significant impact to the species is anticipated.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology

- Biota (2018)
- DCCEEW Protected Matters Search Tool Report
- Government GIS Shapefiles:
  - DBCA Threatened flora database search (Accessed September 2023)
- Species-specific conservation listing advice and recovery plans

(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.

Proposal is not likely to be at variance to this Principle.

Desktop searches (Threatened and Priority Flora, WA Herbarium, Atlas of Living Australia and EPBC Protected Matters Search Tool) identified no records of Threatened flora species in the Study Area (40 km buffer around the Development Envelope).

Biota (2018) did not record any Threatened flora species during a Detailed and Targeted Vegetation and Flora survey of the Survey Area and no Threatened flora species were expected to occur.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology

- Biota (2018)
- Government GIS shapefiles:
  - DBCA Threatened flora database search (Accessed September 2023)
- Species-specific conservation listing advice and recovery plans

(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.

Proposed clearing is not at variance to this Principle.

The Desktop database searches (EPBC Protected Matters Search Tool report and DBCA Shapefiles) show no known records of Threatened Ecological Communities (TECs) located within, or in close proximity to, the Development Envelope.

The nearest TEC is a stand of the Commonwealth and State-listed Monsoon (vine) thickets on the coastal sand dunes of Dampier Peninsula TEC (Endangered), located approximately 7.5 km north of the Development Envelope. No impact to this TEC is anticipated.

Vegetation mapped from the 2018 biological survey is widespread and is not associated with a TEC (Biota, 2018)

Based on the above, the proposed clearing is not at variance to this Principle.

Methodology

- Biota (2018)
- Community-specific conservation listing advice and recovery plans
- Government GIS shapefiles:
  - DBCA Threatened Ecological Community database search (Accessed September 2023)

(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

Proposed clearing is not at variance to this Principle.

As evident from

Table 4, the current extent of the vegetation association occurring in the proposed clearing area (Beard Vegetation Association 850) is more than the 30% "National Threshold Level" at all scales (State IBRA Bioregion, IBRA Subregion, LGA). Over 99% of the pre-European vegetation extent of this association remains. This proposal is a relatively small clearing footprint, which will be spaced in small pockets across the Development Envelope. The vegetation types and fauna habitat in the Development Envelope are not considered rare or restricted and are likely to be well represented locally and regionally. The Development Envelope is not significant as a remnant of vegetation in an area that has been extensively cleared.

Based on the above, the proposed clearing is not at variance to this Principle.

Methodology

- Aerial photography
- Biota (2018)
- Statewide Vegetation Statistics (Government of Western Australia September 2023)

(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

Proposed clearing is not at variance to this Principle.

A desktop search of ArcGIS shapefiles indicates no watercourses or wetlands are located within or in close proximity to the Development Envelope.

Similarly, Biota (2018) noted that no major watercourses or drainage lines occur within the Survey Area, and no permanent or semi-permanent waterbodies were observed in the Survey Area (Biota, 2018). The nearest watercourse is located over 120 m north-west of the Development Envelope and is a minor, non-perennial watercourse. This minor drainage feature is not mapped to connect with any major watercourse or systems and flows towards the north-east as it follows the natural elevation of the terrain.

Biota (2018) noted that none of the vegetation recorded within the Survey Area is dependent on groundwater.

Based on the above, the proposed clearing is not at variance to this Principle.

Methodology

- Biota (2018)
- Government GIS shapefiles:
  - Ramsar Wetlands (Accessed September 2023)
  - Important Wetlands (Accessed September 2023)
  - Watercourses (Accessed September 2023)
  - RIWI Act Rivers (Accessed September 2023)

(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

Proposed clearing is not at variance to this Principle.

The Development Envelope is mapped as occurring in the Yeeda Land System, characterised by deep red and yellow sands, which are generally not prone to degradation or erosion with the control of grazing pressure (Payne & Schoknecht, 2011).

There is little to no risk of water erosion in the Development Envelope, as there are no watercourses within 100m and the relatively flat terrain (approximately 40m above sea level) is unlikely to generate fast-flowing water from rain events.

The DWER/ASRIS Acid Sulfate Soil (ASS) risk mapping indicates that the area is classified as Cq(p4), with an extremely low probability of acid sulfate soil occurrence. As no dewatering or excavation below the water table in the Development Envelope is planned, the risk of the proposal disturbing acid sulfate soils is further reduced.

Based on the above, the proposed clearing is not at variance to this Principle.

Methodology

- Payne & Schoknecht (2011)
- Biota (2018)
- Government GIS Shapefiles:
  - Acid Sulfate Soil Risk Map (Accessed September 2023).
  - Medium Scale Topo Contour (Line) (LGATE-015) (Accessed September 2023)

(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

Proposed clearing is not at variance to this Principle.

A search of ArcGIS shapefiles indicates the Development Envelope is not located within, or in close proximity to, any conservation areas.

The nearest conservation areas to the Development Envelope are as follows:

- National Heritage Place - The West Kimberley (Place ID 106063), located approximately 5.5 km north;
- DBCA Managed Land - Coulomb Point Nature Reserve, located approximately 28.6 km south-west;
- Nationally Important (Ramsar) Wetland – Bunda-Bunda Mound Springs, located approximately 26.9 km south-west;
- Wetland of international importance - Roebuck Bay (site ID 33), located approximately 107 km south-west ;
- Mapped geomorphic wetland - Approximately 1,590 km south-west.

The minor scale and nature of the proposed clearing is not expected to impact on the environmental values of any conservation areas, particularly noting the distances to the nearest areas outlined above.

Based on the above, the proposed clearing is not at variance to this Principle.

Methodology

- Biota (2018)
- Environmental Offsets Register
- Government GIS Shapefiles:
  - DBCA Legislated Lands and Waters & Lands of Interest (Accessed September 2023)
  - Geomorphic Wetlands (conservation category wetlands only) (Accessed September 2023)
  - Ramsar Wetlands (Accessed September 2023)
  - Important Wetlands (Accessed September 2023)

(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

Proposed clearing is not at variance to this Principle.

No watercourses or wetlands are located in the Development Envelope. The nearest watercourse is located over REDACTED m north-west and is a minor, non-perennial watercourse. The proposed works will occur in dry conditions (in the dry season), further mitigating the potential for interactions with surface water receptors.

The Development Envelope is in the Canning-Kimberley Groundwater Proclamation Area and a licence would be required to take groundwater. However, no groundwater is proposed to be taken and the gravel pit investigation works will involve shallow excavations (to a depth of up to 2m below ground level) which are not expected to encounter groundwater.

The DWER/ASRIS Acid Sulfate Soil (ASS) risk mapping indicates that the area is classified as Cq(p4), with an extremely low probability of acid sulfate soil occurrence. As no dewatering or excavation below the water table in the Development Envelope is planned, the risk of the proposal disturbing acid sulfate soils is further reduced.

As there is little to no potential for interaction with surface and underground water from the proposal, no impact to these receptors is anticipated. Based on the above, the proposed clearing is not at variance to this Principle.

Methodology

- Biota (2018)
- Government GIS Shapefiles:
  - RIWI Act, Surface Water Areas and Irrigation Districts (Accessed September 2023)
  - CAWSA Part 2A Clearing Control Catchments (Accessed September 2023)
  - RIWI Act, Groundwater Areas (Accessed September 2023)
  - Soil Mapping (Accessed November 2023)
  - Acid Sulfate Soil risk mapping (Accessed September 2023)

(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

Proposed clearing is not at variance to this Principle.

The proposed clearing presents nil to negligible risk of causing or exacerbating the incidence or intensity of flooding, as there are no watercourses within 100m of the Development Envelope and it is relatively flat at approximately 40m above sea level.

Furthermore, the proposed six hectares of clearing will be conducted during the dry season and will consist of small, isolated pockets of clearing across the 92.6 ha Development Envelope.

Based on the above, the proposed clearing is not at variance to this Principle.

Methodology

- Government GIS Shapefiles:
  - Soil Mapping (Accessed September 2023)
  - Medium Scale Topo Contour (Line) (LGATE-015) (Accessed September 2023)

6 REHABILITATION, REVEGETATION & OFFSETS

6.1 Revegetation and Rehabilitation

No temporary clearing will be undertaken as part of the Proposal activities.

6.2 Offset Proposal

No offset proposal is required as the proposed clearing will not result in significant residual impacts to native vegetation within the region.

7 COMPLIANCE WITH CPS 818

Table 5 summarises what further pre-clearing impact assessment is required in accordance with CPS 818.

Table 5. Summary of Additional Management Actions Required by CPS 818

Impact of Clearing	Yes/No or NA	Further Action Required
1. The CAR indicates that the clearing is 'At Variance' or 'May be at Variance' with one or more of the Clearing Principles.	**No**	No further action required.
2. Clearing is at variance or may be at variance with Clearing Principle (g) land degradation, (i) surface or underground water quality **or** (j) the incidence of flooding.	**No**	No further action required.
3. Clearing is at variance with Clearing Principle (g) land degradation, (i) surface or underground water quality **and** (j) the incidence of flooding.	**No**	No further action required.
4. The Proposal involves clearing for temporary works (as defined by CPS 818).	**No**	No further action required.
5a. Proposal is within a Region that: • has rainfall greater than 400mm; and, • is South of the 26th parallel; and, • works are necessary in 'Other than dry conditions'; and, • works have potential for **uninfested** areas to be impacted.	**No**	Vehicle Hygiene Checklist actions from CEMP D22#1270748 (Appendix 9), actions from EWI's: Topsoil Management and Vegetation Clearing will be applied.
5b. Do the proposed works require clearing within or adjacent to DBCA managed lands in non-dry conditions?	**No**	No further action required.
6. Main Roads has been notified by DWER or an environmental specialist that the area to be cleared is susceptible to a pathogen other than dieback.	**No**	No further action required.

Impact of Clearing	Yes/No or NA	Further Action Required
7. Weeds are likely to spread to and result in environmental harm to adjacent areas of native vegetation that are in good or better condition.	**No**	No further action required.
8. Did an environmental specialist conduct the survey or field assessment?	**Yes**	The Environmental Specialist undertaking the biological assessments was suitably qualified and had more than three years experience.
9. Did an environmental specialist prepare the Assessment Report and any other associated documentation including the VMP, Dieback Management Plan or Offset Proposal?	**Yes**	The Environmental Specialist preparing the Assessment Report and any other associated documentation was suitably qualified and had more than three years' experience.

8 REFERENCES

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9 APPENDICES

Appendix 1: CPS 818/17 condition 8 (e) (iii) Biological Surveys and Field Assessment Executive Summary and Report Conclusions

Gravel Pit Expansion Biological Survey (2018)

Available at D23#722748

Appendix 2: Desktop Assessment

Study Area Desktop Search (40 km) (ALA & PMST)

Available at D23#1149768

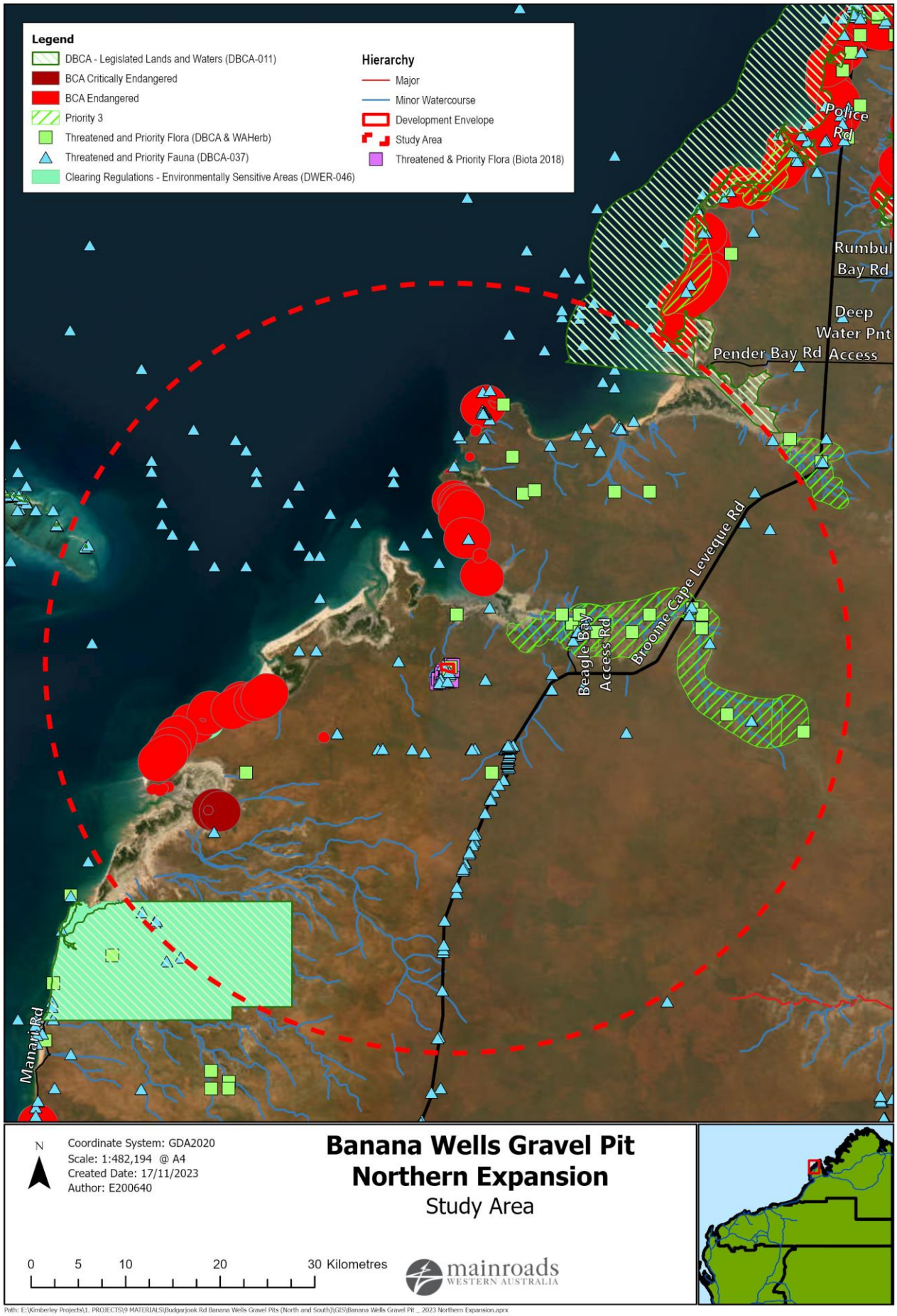

Figure 3. Proposal Desktop Study Area (40 km buffer of Development Envelope).