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# Offset Management Plan

[redacted]

Northern Midlands Irrigation Scheme, Tasmania (EPBC 2022/09295)

**Client:** Tasmanian Irrigation
**Prepared by:** Josie Kelman

August 2025

**Document preparation information**

| | |
|---|---|
| Project | EPBC 2022/09295: Offset Management Plan |
| Site Address | [redacted] |
| Project Manager | Dr Josephine (Josie) Kelman – Managing Director and Principal Ecologist |
| Other Enviro-dynamics Staff | Fiona Walsh – Consultant ecologist<br>Stephanie Horwood- GIS and data consultant |
| File Name | TI_[redacted]_OffsetMgmtPlan20240920v1.7 |
| Client | Tasmanian Irrigation |
| Local Government Area | Southern Midlands |

**Version control table**

| Version | Date | Person responsible | Revisions |
|---|---|---|---|
| V1 | 31/05/2024 | Dr Josie Kelman | Initial Submission |
| V1.1 | 22/07/2024 | Dr Josie Kelman | Minor Changes – TI Review |
| V1.2 | 5/08/2024 | Dr Josie Kelman | Minor Changes – TI Review |
| V1.3 | 9/08/2024 | Dr Josie Kelman | Map changes – TI Review |
| V1.4 | 16/08/2024 | Dr Josie Kelman | Minor Changes – TI Review |
| V1.5 | 27/08/2024 | Dr Josie Kelman | Changes – DCCEEW review 1 |
| V1.6 | 20/09/2024 | Dr Josie Kelman | Changes – DCCEEW review 2 |
| V1.7 | 29/08/2025 | Dr Josie Kelman / Charles Livesey | Changes – DCCEEW review 3 |

**Approval information**

| | |
|---|---|
| EPBC number & project name | Northern Midlands Irrigation Scheme, Macquarie River Catchment (Northern Midlands Council Region, between Poatina, Powranna, and Mona Vale), Tasmania (EPBC 2022/09295) |
| Person to whom the approval is granted (approval holder) | Tasmanian Irrigation Pty Ltd<br>ACN 133 148 384 |
| Proposed Action | To construct and operate a pipeline and associated infrastructure to deliver irrigation water to the Northern Midlands region, Tasmania [See EPBC Act referral 2022/09295]. |
| Location of the action | Northern Midlands Council Region, between Poatina, Powranna, and Mona Vale |
| Date of preparation of the environmental management plan | 29/08/2025 |
| Person accepting responsibility for the environmental management plan | Tasmanian Irrigation Pty Ltd |

**Declaration of accuracy**

In making this declaration, I am aware that section 491 of the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) makes it an offence in certain circumstances to knowingly provide false or misleading information or documents to specified persons who are known to be performing a duty or carrying out a function under the EPBC Act or the Environment Protection and Biodiversity Conservation Regulations 2000 (Cth). The offence is punishable on conviction by imprisonment or a fine, or both. I am authorised to bind the approval holder to this declaration and that I have no knowledge of that authorisation being revoked at the time of making this declaration.

Signed: 

Full name: Sophie Grace

Organisation: Tasmania Irrigation

Date: 29/08/2025

**Draft conditions of approval reference table**

| Ref | Cond. | Condition Requirement | Plan reference | Demonstration of how the plan addresses condition requirements and commitments made in the plan to address condition requirements: |
|---|---|---|---|---|
| **OFFSET MANAGEMENT PLAN** | | | | |
| 1 | 19 | To compensate for the residual significant impacts of the Action on **Tasmanian Devil**, **Eastern Quoll** and **Spotted-tail Quoll**, prior to **commencement of the Action** and no later than 6 months following the date of this approval, the approval holder must submit to the **department** for approval by the **Minister** an Offset Management Plan (OMP) for the **offset site**. | Appendix 2 – Offset Management Strategy | The Offset Management Plan for EPBC Act Referral: 2022/09295 Northern Midlands Irrigation Scheme [redacted] V1.4 was submitted for approval on 16/08/2024. V1.7 was submitted on the 29/08/2025 incorporating review and feedback from DCCEEW. |
| | | The approval holder must not commence **operation** unless the OMP has been approved in writing by the **Minister**. | See Executive Summary | No operations will commence until approval of this OMP is received in writing from the Minister. |
| | | The approval holder must continue to implement the approved OMP at least until the expiry date of this approval. | See Executive Summary and Section 4.6 including Table 4.7 | The OMP will be maintained for the period of approval. The term of this Offset Management Plan is 20 years with an evaluation and revision of the plan required at the end of 5 years. |

| | | | | |
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| 2 | 20 | The OMP must meet the requirements of the **Environmental Offsets Policy** and the **Environmental Management Plan Guidelines** to the satisfaction of the **Minister**. All commitments, including environmental outcomes, management measures, corrective actions, trigger values and performance indicators in the OMP must be **SMART** and based on referenced or included evidence of effectiveness. | Sections 4.6 and 5.1 | The table of actions defines the mitigation measures/actions which are specific and designed to be practical and implementable, the timeline and the KPIs provide a measurable comparison point/target. The mitigation measures are based on current best practice guidelines and expert knowledge with the aim of creating a positive outcome for the target species. |
| 3 | 21 | The Offset Management Plan must be prepared by a **suitably qualified ecologist** and must include: | See document preparation information on page 2 | Dr Josie Kelman, the author of this plan, has a PhD in Environmental Management with over 20 years experience in the field. Her specialist skills are in ecology, strategic conservation planning, restoration and monitoring and evaluation. |
| 4 | 21a | Detailed information on the residual impacts to **protected matters** that will be compensated for by the offset (**Note**: the offset comprises the **securement** of the **offset site** and the **habitat quality** improvements to be achieved at the **offset site**). This must include the area(s) of habitat for **protected matters** and its **habitat quality** at all locations impacted by the Action which the offset is to address. | See Section 1.1 and Appendix 2 | Section 1.1 describes the impact site and the protected matters that will be compensated. A detailed analysis is provided in Appendix 2 (approved Offset Strategy) which provides detailed information on the habitat quality of impacted areas. |
| 5 | 21b | The relevant **protected matters** and a reference to the **EPBC Act** approval conditions to which the Offset Management Plan refers. | Approval information table, Executive Summary, Section 1.1 | This OMP has been developed to meet the requirement of approval Condition 19 – 21 (EPBC 2022/09295) and is designed to offset both permanent and temporary impacts to Tasmanian devil and eastern and spotted tail quoll denning and foraging habitat. |
| 6 | 21c | detailed information and a shapefile specifying the location, area and boundaries of the proposed **offset site**. | Section 1.2, Figure 1.1 and Figure 1.2 | In addition to information within the OMP, shapefiles have been provided with the submission of the OMP. |
| 7 | 21d | detailed baseline information on the areas of habitat, their condition, and the presence (or not) of the **protected matters** on the **offset site.** | Section 4.1, Appendix 1 and 2 | Section 4-1 provides information on the quality of the habitat and strategies to improve habitat |

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| | | | | quality. Appendix 1 and 2 provide evidence of the protected matters found on site. |
| 8 | 21e | commitments to achievable ecological benefits (completion criteria) at the **offset site** and the timeframes in which they will be achieved. | Section 4.6 and Table 4.8 | Section 4.6 and Table 4.8 set out achievable actions and commitments to achieve actions in a time-bound and measurable way to ensure delivery of outcomes. |
| 9 | 21f | a table summarising all commitments to achieve the ecological benefits for **protected matters** at the **offset site** and a reference to where each commitment is detailed in the OMP. | Table 4-8 | Table 4-8 provides a list of commitments and links to detailed action. |
| 10 | 21g i. | reporting and review mechanisms to inform the **department** annually regarding compliance with the management and environmental outcome commitments, and attainment and maintenance of the ecological benefits specified in the OMP. | Section 4.6 | Annual mechanisms for reporting are built into the actions in Table 4-8 |
| 11 | 21h | an assessment of risks to achieving the ecological benefit(s) and what risk management measures and/or strategies will be applied to address these. | Table 5-1 | Risk likelihood is listed as 'unlikely' or 'possible' for each risk, with residual risk after management response 'low'. |
| 12 | 21i | a monitoring program, which must specify: | Section 4.4 | As below |
| 13 | 21i i. | measurable performance indicators and the timeframes for their achievement to gauge attainment of the ecological benefit(s) for the **protected matters.** | Section 4.6 | Annual mechanisms for reporting are built into the actions in Table 4-8 whilst Table 5-1 determines KPI measures considered to be successful. |
| 14 | 21i ii. | trigger values for corrective actions, and | Table 5-1 | Table 5-1 includes KPI measures which if not achieved trigger correction action measures. |
| 15 | 21f iii. | the proposed timing (including season/time of day/frequency) methods and effort, and an explanation of how these will be effective for this purpose, of monitoring to detect trigger values, changes in the performance indicators and to gather evidence that effectively demonstrates actual progress towards, attainment of and maintenance of the ecological benefits for the **protected matters.** | Section 5 | Section 5 provides an explanation of the method for achieving effective outcomes which reflects an epistemological approach that is adaptive. Timeline measures and KPIs in Table 4-8 and in Table 5-1 Risk Management, triggers and mitigation actions are designed to implement that approach. |

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| 16 | 21j | corrective actions to be implemented to ensure ecological benefits for the **protected matters** are achieved or maintained if trigger values are reached or performance indicators not achieved in the specified timeframes. | Table 5-1 | See last column on corrective actions. |
| 17 | 21k | links to relevant referenced plans or conditions of approval (including state/territory approval conditions), and | Appendix 2 | Approved offset strategy provided in Appendix 2. |
| **OFFSET SITE SECUREMENT** | | | | |
| 18 | 21l | how the **offset site** will be **secured**, and the ecological benefits maintained, at least until the expiry of the approval. | Section 3 | The offset site will be protected by a conservation covenant and managed according to the OMP. |
| 19 | 22 | To compensate for the residual significant impacts of the Action on **Tasmanian Devil**, **Eastern Quoll** and **Spotted-tail Quoll**, the approval holder must **secure** the **offset site**. The approval holder must not commence **operation** unless the **offset site** has been **secured**. The approval holder must submit to the **department** evidence of the securement of the **offset site** within 5 **business days** of the **securement** of the **offset site.** | Section 3 | Property has been purchased and the covenant process/completion is a timebound action in this OMP. |
| **ACHIEVEMENT OF OFFSET OUTCOMES** | | | | |
| 20 | 23 | The approval holder must achieve the completion criteria specified in the approved Offset Management Plan at the **offset site** by the time specified for each completion criteria specified in the approved Offset Management Plan. Once achieved, the approval holder must maintain or exceed the offset outcomes at least until the expiry date of this approval. | Table 4-8 and Table 5-1 | The offset site will be managed according to the OMP to deliver actions which are designed to achieve the outcomes required under the approval. The risk management framework will be applied to ensure outcomes are met within specified timelines. |
| 21 | 24 | The approval holder must, within 40 **business days** of the 20th anniversary of the **commencement of the Action**: | See below | |

| | | | | |
|---|---|---|---|---|
| 22 | 24a | have the **offset site** assessed by a **suitably qualified ecologist** to determine if the completion criteria specified in the approved Offset Management Plan have been achieved, and | Table 4-8 | Table 4-8 specifies a requirement for review of effectiveness every 5 years by a suitably qualified ecologist. |
| 23 | 24b | submit to the **department** a report prepared by a **suitably qualified ecologist** detailing the areas and condition of **Tasmanian Devil, Eastern Quoll and Spotted-tail Quoll habitat** present in the month prior to the 20th anniversary of the **commencement of the Action** in the **offset site**, and | Table 4-8 | Table 4-8 specifies an evaluation be provided of monitoring data and a strategy for on-going management articulated based on the findings of the evaluation/review. This includes the expiry of OMP at 20 years. |
| 24 | 24c | notify the **department** in writing of any completion criterion that has not been achieved and the likely reasons that this/these completion criteria have not been met. | Table 4-8 | Annual reporting of progress is included in the actions. |

# Executive Summary

This Offset Management Plan has been prepared to meet the requirement of approval Condition 19 – 21 (EPBC 2022/09295) for the Northern Midlands Irrigation Scheme.

The offset strategy for Northern Midlands Irrigation Scheme is to secure a parcel of land that contains equal or higher quality Tasmanian devil, eastern and spotted tail quoll habitat than will be impacted by the Northern Midlands Irrigation Scheme project. The property at [redacted] is provided as the offset. The area provides higher quality habitat for these species than the impact site. The area suitable for the proposed offset covers an area of 143.8 ha within the property. [redacted]. Several conservation covenants, conservation areas and nature reserves are present within the broader region providing good landscape scale connectivity.

The key objectives of the offset are to offset the loss of Tasmanian devil, eastern and spotted tail quoll habitat. This Offset Management Plan sets out the management actions required to improve the habitat quality for the target species and ensure its maintenance into the long term.

The key actions identified to improve the offset quality are to:

- register a conservation covenant on title to provide protection in perpetuity;
- undertake works to provide additional denning habitat and to improve the quality of foraging habitat thereby improving the quality of functional habitat available for the target offset species;
- manage biosecurity and pest animal species on site to reduce potential risks and associated impacts; and
- implement controls to prevent illegal activities identified as increasing risk to the survival of target species.

This Offset Management Plan also sets out the monitoring and evaluation actions which include photo point monitoring, camera trapping and vegetation condition assessments. The monitoring and evaluation is designed to inform an adaptive management approach to conservation that is tangible and transparent in its approach. Regular reporting is a key component to ensure compliance and to measure the success of management interventions/actions. The term of this Offset Management Plan is 20 years with an evaluation and revision of the plan required at the end of 5 years.

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## Glossary

| | |
|---|---|
| **DCCEEW** | Commonwealth Department of Climate Change, Energy, the Environment & Water |
| **KPIs** | Key Performance Indicators |
| **NMIS** | Northern Midlands Irrigation Scheme |
| **NRE** | Department of Natural Resources and Environment Tasmania |
| **Offset site** | The proposed offset site within the Property |
| **OMP** | Offset Management Plan |
| **Operation** | Operation means the transport of water through any irrigation pipeline for any reason other than testing |
| **Property** | [redacted] |
| **RHD** | Rabbit Haemorrhagic Disease |
| **Secure** | Secure, secured or securement means to provide enduring conservation protection on the title of land under Section 34 of the Tasmanian Nature Conservation Act 2002 (Tas), or another enduring protection mechanism agreed to in writing by the department, to provide protection for the site against development incompatible with conservation. |
| **Target species** | Tasmanian devil *Sarcophilus harrisii,* eastern quoll *Dasyurus viverrinus,* spotted-tail quoll *Dasyurus maculatus* |
| **TI** | Tasmanian Irrigation Pty Ltd |

## TASVEG 4.0 Vegetation Communities

| | |
|---|---|
| **DAD** | *Eucalyptus amygdalina* forest and woodland on dolerite |
| **DGL** | *Eucalyptus globulus* dry forest and woodland (listed as threatened under the Tasmanian *Nature Conservation Act 2002*) |
| **DOB** | *Eucalyptus obliqua* dry forest |
| **DPU** | *Eucalyptus pulchella* forest and woodland |
| **FPH** | Plantations for silviculture - hardwood |

| | |
|---|---|
| **FRG** | Regenerating cleared land |
| **GSL** | Lowland grassy sedgeland |
| **WOB** | *Eucalyptus obliqua* forest with broad-leaf shrubs |

# 1 Background

Enviro-dynamics were engaged by Tasmanian Irrigation (TI) to prepare this Offset Management Plan (OMP) for [redacted] This OMP has been prepared to meet the requirement of approval Condition 19 – 21 (EPBC 2022/09295) for the Northern Midlands Irrigation Scheme. This OMP must be read in conjunction with the NMIS Offset Management Strategy (North Barker 2024) provided in Appendix 2.

## 1.1 Impact site

The Northern Midlands Irrigation Scheme (NMIS) is part of the Pipeline to Prosperity (Tranche 3) suite of schemes proposed by Tasmanian Irrigation Pty Ltd (TI). The scheme covers the regions of Cressy, Powranna, Barton, Conara, Epping Forest, the Lower Macquarie and Isis Rivers, Campbell Town, and Ross.

The pipeline network consists of approximately 138 km of pipeline. Approximately 94 % of the proposed impact area (both permanent and temporary) is within agricultural or other modified lands, and habitat modelling for the Tasmanian devil and the eastern and spotted-tail quolls determined that there may be disturbance to 17.47 ha of optimal denning (and foraging) habitat. Of this 17.47 ha, 0.66 ha is expected to be permanent loss of habitat, the remainder will be rehabilitated post-works and will remain viable for denning and foraging after the completion of construction.

Quality of optimal habitat varies throughout the NMIS project area. Of the 17.47 ha of optimal denning habitat, 12.46 ha (71.31 % of the construction corridor) is forested vegetation, 2.58 ha (14.76 %) is non-forest vegetation, and the remaining 2.43 ha (13.93 %) is softwood plantation.

No evidence of the Tasmanian devil, eastern or spotted tail quoll in the form of scats, carcasses, footprints, or other identifiable features were recorded during surveys, and no burrows suitable for denning were recorded within the project area over the duration of field surveys (refer to the NMIS Offset Management Strategy (North Barker 2024)).

## 1.2 The offset site

The intention of the proposed offset is to secure a parcel of land that contains equal or higher quality habitat values than will be impacted by the NMIS project. The property at [redacted] is provided as an offset. The area suitable for the proposed offset (the offset site) covers an area of 143.8 ha within the property (Figure 1-1). [redacted] Several conservation covenants and conservation areas and nature reserves are present within the broader region (refer to the NMIS Offset Management Strategy (North Barker 2024)).

The property covers 209.8 hectares and is accessible via [redacted]. The northern, southern and western boundaries are adjacent to privately owned land. The eastern boundary borders [redacted]. The land is comprised of small hills and gullies with an elevation range of 300 – 455 m a.s.l. The geology is primarily Jurassic dolerite.

An indicative area building envelope has been designated. This is required by the State covenant process if the property is sold in the future. The building envelope falls within an area of

regenerating cleared land which is not included in the offset site. A 10 m wide easement (1.60 ha) on the main access road to the property has been excluded from the offset site to accommodate an existing private right-of-way to another property immediately north and to allow access to the proposed building envelope.

A range of different vegetation communities form a mosaic across the property (Table 1-1). The gullies are dominated by *Eucalyptus obliqua* forest with broad-leaf shrubs (WOB) and the ridges by *Eucalyptus pulchella* forest and woodland (DPU). *Eucalyptus amygdalina* forest and woodland on dolerite (DAD) seems to occupy mainly the mid slopes where it grades into DPU at the higher elevations.

*Table 1-1 Vegetation on the property and in the Tasmanian Reserve Estate*

| Vegetation Community | Extent within property (ha) | Total extent in all Tasmanian Reserves % |
|---|---|---|
| *Eucalyptus amygdalina* forest and woodland on dolerite (DAD)* | 68.52 | 31% |
| *Eucalyptus globulus* dry forest and woodland (DGL) | 34.76 | 31% |
| *Eucalyptus obliqua* dry forest (DOB)* | 8.32 | 45% |
| *Eucalyptus pulchella* forest and woodland (DPU)* | 34.25 | 37% |
| Plantations for silviculture – hardwood (FPH) | 3 | - |
| Regenerating cleared land (FRG) | 24.28 | - |
| Lowland grassy sedgeland (GSL) | 1.59 | 7% |
| *Eucalyptus obliqua* forest with broad-leaf shrubs (WOB)* | 32.72 | 44% |

**indicates a vegetation community located within the offset site*

The property has been selectively logged in the past. Selective logging of dry forest communities is a common practice in Tasmania. Selective logging has ensured that there are still cohorts of very large old trees remaining across the property. These trees provide good quality habitat for arboreal nesting species. Some of the locations targeted for logging across the property are actively regrowing as pole regrowth whilst others have limited recruitment and large piles of debris are a common feature. The debris provides important habitat for the Tasmanian devil, eastern and spotted tail quoll as well as other more common species. The many tracks used for snigging logs are now used by vertebrate species inhabiting the property. There are only a few tracks which have been maintained for 4WD access, see Figure 1-2.

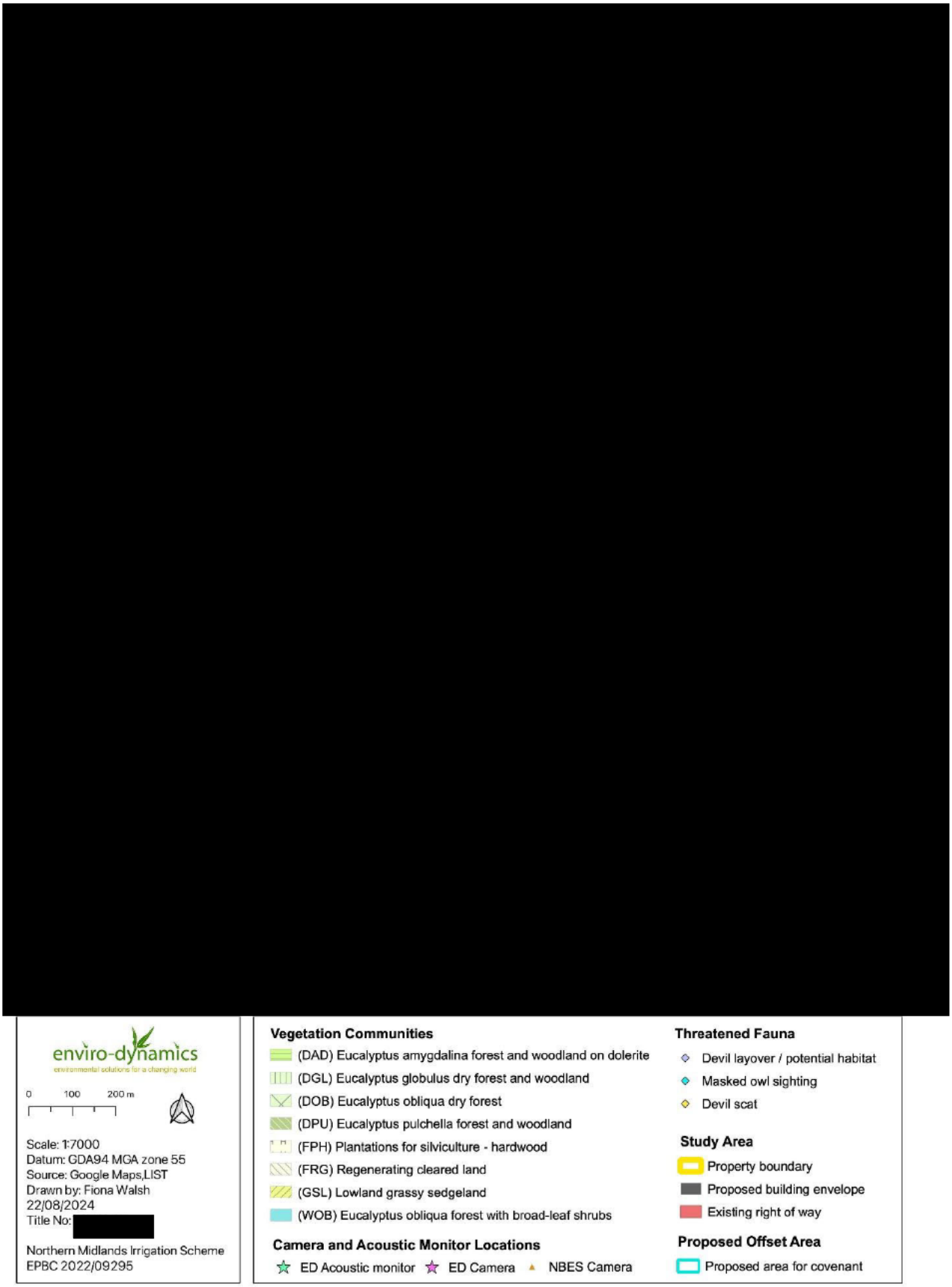



*Figure 1-1 Map of property vegetation*

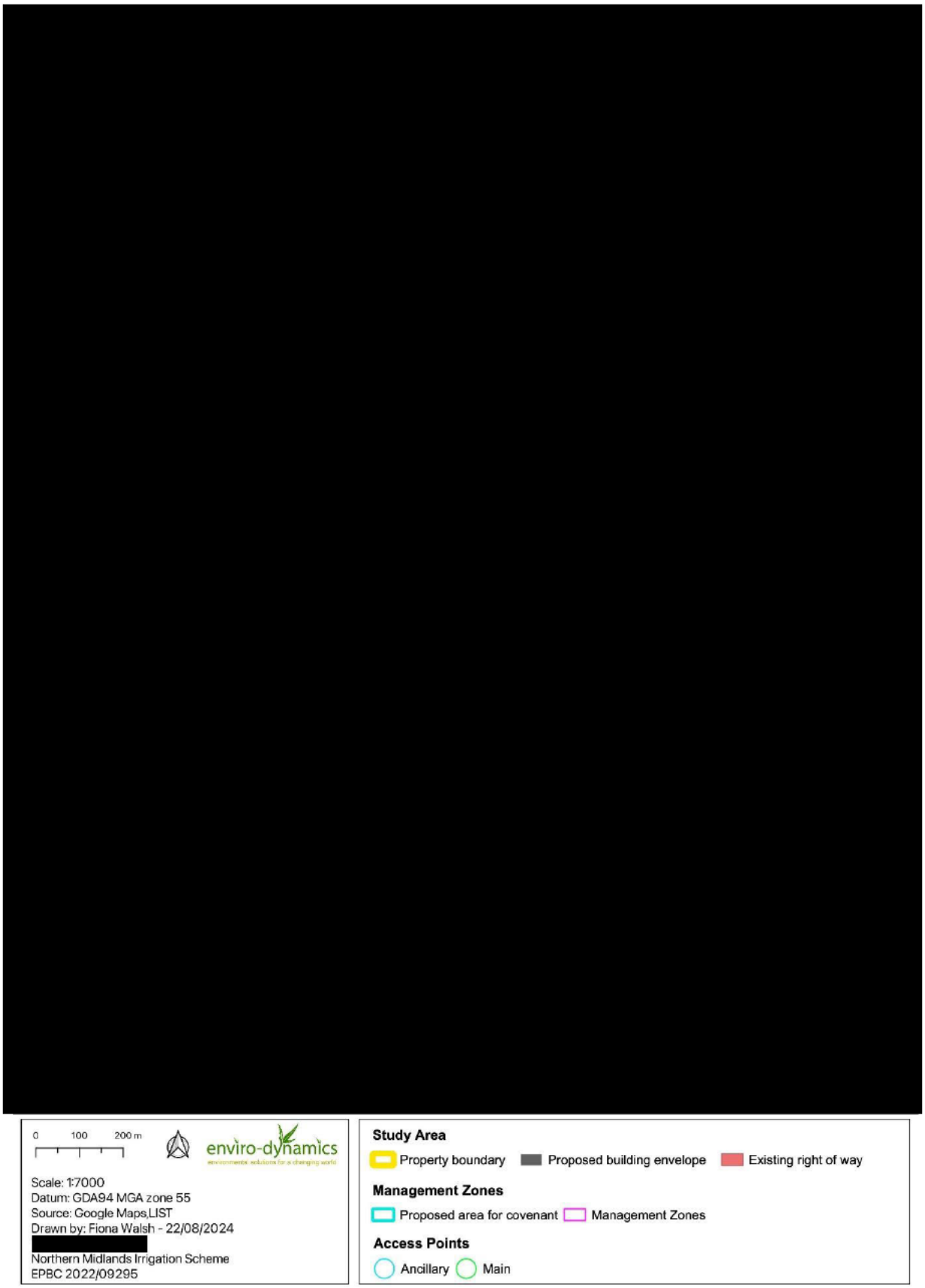



*Figure 1-2 Access roads and management tracks*

## 1.3 Objectives of the offset

The following objectives provide overarching guidance to this OMP:

1. Offset the loss of Tasmanian devil, eastern and spotted tail quoll habitat (referred to hereafter as the target species) from the NMIS project; and
2. Set out the management actions required to improve the habitat quality for the target species at the offset site and ensure maintenance of the offset site in the long term (see Table 4-8).

# 2 Offset strategy

A NMIS Offset Strategy (Appendix 2) was prepared by North Barker Ecosystem Services on 2 of May 2024 (approval Condition 18 EPBC 2022/0929). This strategy provides detailed calculations on the comparisons between the offset and impact site using the EPBC Act Offset Calculator, assessment guide and policy documents. This management plan does not duplicate this information but rather focuses on the management actions required to improve the quality of the habitat. The documents must be read in conjunction with one another.

The offset site provides an already better habitat quality than the impact site. Tasmanian devils and spotted-tail quolls were recorded via camera trapping in April & May 2024. Additional evidence of scats, fur and other traces were also recorded unlike at the impact site where no physical evidence was found.

Core components of the offset strategy include management actions that address the following:

- Improvement and creation of denning opportunities;
- Prevention of illegal activities including trespassing, hunting and vandalism;
- Prevention of wood hooking; and
- Management of feral species.

# 3 Ongoing land-use commitments

The property has been purchased by TI with the intent of providing oversight and management of the land for conservation purposes. This has resulted in an immediate conservation gain. The offset site will be further protected by a conservation covenant in perpetuity. The process for incorporating a land parcel into a conservation covenant will occur before commencement of operation of the NMIS.

Conservation gains through the implementation of the actions identified in this OMP are likely to take some time to achieve full effect. It is anticipated that the actions designed to improve the habitat quality and ensure its maintenance, will begin to take affect within 5 years of implementation. A review of the OMP will occur after 5 years at which time an evaluation of the effectiveness of the actions will be conducted. It is anticipated that active management will be most important for the first 5 years and that this time period will contain the greatest effort to improve habitat quality. Ongoing maintenance of the offset site will still be required to maintain the habitat quality in perpetuity. Ongoing maintenance actions are likely to include fire management, prevention of illegal activities and biosecurity management.

# 4 Offset Management Plan actions

## 4.1 Improvement and creation of denning opportunities

### 4.1.1 Background

Devils and quolls are known to occasionally share dens and have many of the same requirements for habitat. It has also been suggested that eastern quolls are indirectly protected by Tasmanian devils from other predators (Hollings et al. 2013).

Tasmanian devils are primarily nocturnal, but they will come out during the day to sunbathe (DPIPWE 2010). Devils may occupy several dens or resting sites and change dens every 1-3 days. Tasmanian devils are mostly solitary, but do not defend territories. They have overlapping home ranges of 4-27 $km^2$ and travel on average of 8.6 km per night (Pemberton 1990), mostly using well-defined trails to find food (Guiler 1978). Spotted-tail quolls follow similar patterns using multiple dens and moving every 1-4 days (DELWP 2016). Habitat use is thought to be directly related to prey density and den availability (Belcher 2000). Eastern quolls are associated with more open understoreys than Tasmanian devils (Jones et al. 2023).

Table 4-1 provides a description of denning habitat characteristics taken from a detailed description of Tasmanian devil dens produced by Nick Mooney (Australian conservationist, biologist and wildlife expert best known for his work with the Tasmanian devil) in 2020. This information is provided to support explanation of the key management actions identified to increase habitat quality.

*Table 4-1 Den types*

| TERM | PURPOSE | DESCRIPTION |
|---|---|---|
| Lay-ups | Temporary but perhaps regular refuge | Security of the place chosen depends on the vulnerability of the individual(s) using it, e.g. a dispersing juvenile (very vulnerable) may want a secure place but not be able to use it because of a resident, unrelated adult. For adults (especially without large joeys), lay-ups may simply be sheltered grass tussocks, sedges or bracken, an overhang of wood, rock or under a building. Lay-ups need a balance of security and escape routes. The most regular are probably dry in most conditions. |
| Social Den | Where extended socialising and mating may occur | Needs a higher degree of security in terms of exposure and defensible entrances and more sheltered space than lay-ups. A sheltered cave or under building where there is no secure place for rearing young is typical. |
| Natal Den | Refuges near the maternal den which young devils increasingly use as they explore their surroundings. | These tend to be more secure than social dens and may be less so than maternal dens but typically share many of their characteristics. |

| | | |
|---|---|---|
| Maternal Den | The refuge where a nest is made and young are dropped from the pouch and reared | Typically include:<br>1. a dry, defendable inner chamber which contains the natal nest where the very young are reared after being dropped from the pouch and where there are tight hiding places for young when the mother is absent<br>2. a reasonably dry larger, less sheltered outer chamber where socialising and play occurs.<br>3. a defensible 'choke point' in between these chambers.<br>4. some isolation from potential predators.<br>Often a place is chosen such that the mouth of the den gets some direct sun; devils of all ages love to sunbake (perhaps because of their heavy bone structure, devils may have an unusually high need for Vitamin D, typically generated from direct sun)<br><br>Depending on structure, substrate and dryness in all conditions, maternal dens may be<br>• very long term (e.g. small, deep caves at the base of cliffs),<br>• very short term (e.g. a fragile, hollow log) or<br>• anywhere in between (e.g. wombat burrows, under buildings or log piles)<br>Hollow logs are not commonly used as maternal dens because their hollow core is usually cone shaped (i.e. wider at the base narrowing to a point) and lacks a choke point and therefore has no inner chamber.<br>It is likely that successful breeding (to the point young disperse) engenders subsequent use. |
| Den Site | The area within 50 m of a natal den where young regularly play and forage during early/mid weaning | Aside from the maternal den, this area typically contains a number of lay-ups and perhaps also natal dens and social dens all of which get variously used as the young expand their activities. |

The offset requirements are to improve the habitat quality of the offset site with particular reference to the target species requirements. A key feature of functional habitat is that there are both denning opportunities and suitable foraging habitat. All target species are carnivores but have different niche requirements. Spotted-tail quolls and Tasmanian devils prefer medium sized prey such as pademelons and bettongs. Devils are active hunters when young but become more reliant on scavenging as they mature. Eastern quolls rely on smaller prey and a large part of their diet is composed of insects. A common feature of these species is their reliance on prey that inhabit grasslands and open woodland areas as well as riparian zones (Jones & Barmuta 2000). The density of these species is typically greatest on the edges of farmlands where larger expanses of grasslands/pastures are available, although devils are not selective in their habitat use for denning (Anderson et al. 2020).

The camera traps placed during survey of the natural values in April and May 2024 over a period of 4 weeks showed the site was particularly active for the Tasmanian devil with more than half of the cameras recording devils. Only 1 spotted tail quoll was recorded and no eastern quolls were recorded during this time. Prey species were also common with pademelons and bettongs recorded at ~40% of camera sites (Table 4-6).

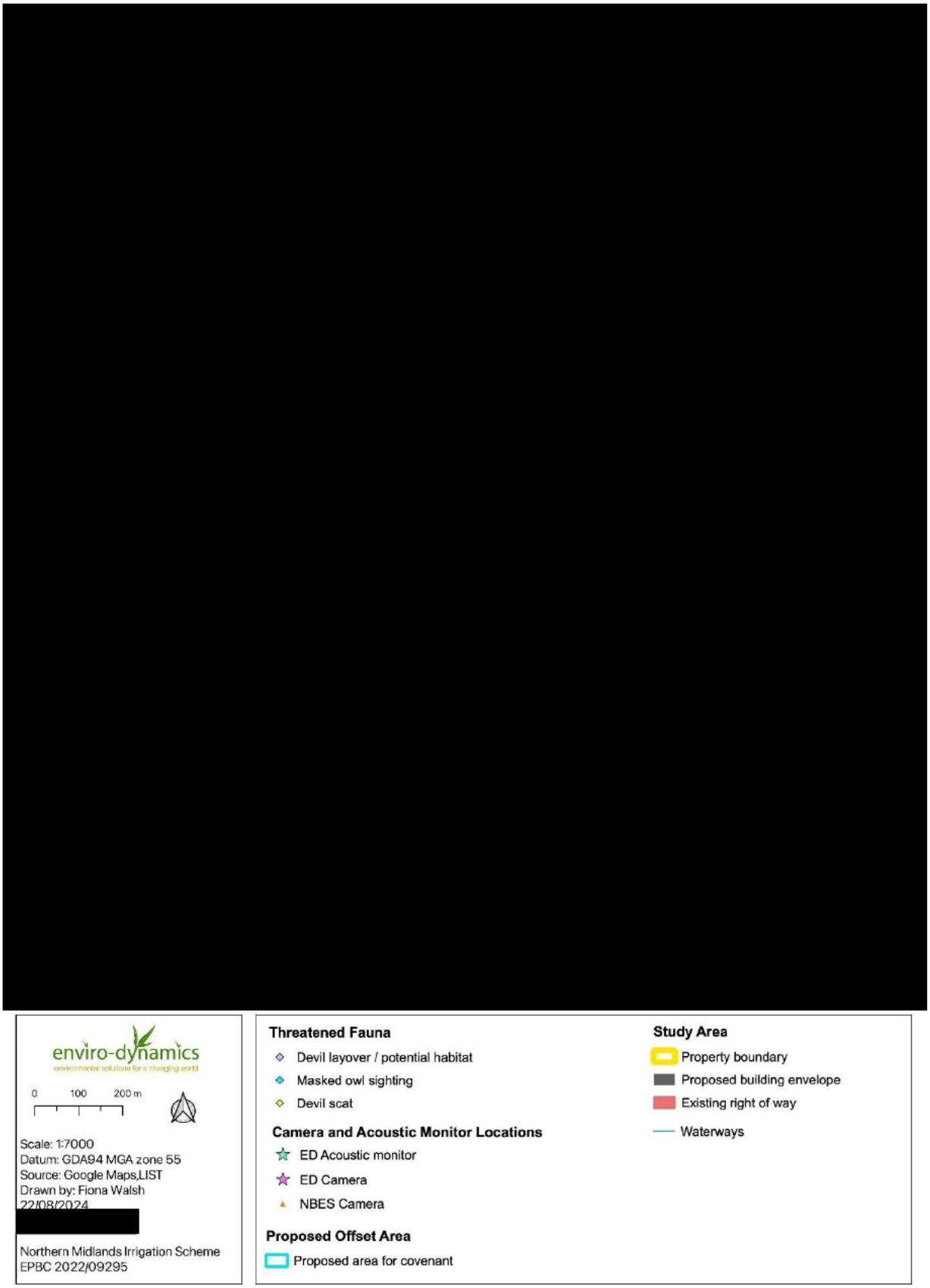



*Figure 4-1 Threatened Fauna Monitoring for Natural Values Assessment*

### 4.1.2 Management strategy for improving habitat quality for the target species

The property has been surveyed to understand the level of activity of the target species and the quality of the habitat and opportunities for improving long-term outcomes for the target species. This information has been used to identify priority zones for habitat improvement for both denning and foraging habitat (see Figure 4-2). The entire offset site will be managed but the priority zones are identified to maximise the benefit of actions for the target species. The characteristics of optimal habitat used to develop the priority zones are:

1. Protective sites for lay-ups, social, natal and maternal dens;
2. Nearby foraging areas;
3. Available water; and
4. Locations with less climatic variability (opportunities to access sun but also avoid extreme temperature fluctuations).

Three priority zones have been identified: [redacted]. [redacted] This area contains an open area suitable for foraging and has high levels of Tasmanian devil activity.

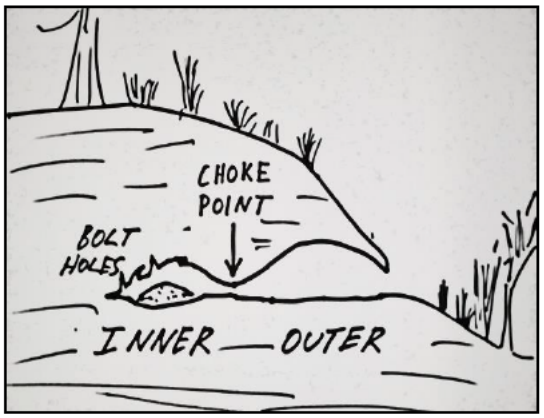
The [redacted] lies adjacent to areas of regenerating cleared land and plantation. The plantation provides suitable denning habitat due to windrows of debris. The plantation is Tasmanian blue gum which provides potential foraging habitat for swift parrots and is nearby to trees with large hollows suitable for nesting. This scenario provides what is considered functional habitat within the core habitat range of this threatened species. This area will be managed with an aim to protect natural values in the [redacted] and the adjoining areas. The adjacent cleared land has recorded high levels of activity for Tasmanian devils and prey species (bettongs and pademelons).
The [redacted] has been included as a site that provides ready access to water, foraging habitat and has recorded devil activity. Access to these sites is available and increases the capacity to provide ongoing management with minimal disturbance.

#### *4.1.2.1* Dens

The lay-ups and variety of den sites across the offset site are considered to have a short to moderate life span being composed of fallen logs and vegetation. There are also occasional wombat burrows that provide longer-term den sites. No large social dens were observed during the survey although one of the most active sites with ample evidence of use was the old hunting camp hut which is used by a variety of individuals. This site would be best repurposed as an artificial den. Due to the large/cavernous area of this structure there is an opportunity to provide all the characteristics of a maternal and social den.

Artificial den creation is part of the strategy for improving the habitat quality. This will involve utilisation of existing structures and creating larger log piles and associated minor movement of

soil to offer greater protection to log pile dens. As described in Table 4-1 dens are variable but maternal dens have some very specific requirements and are the focus of artificial den creation. The following is a stylized illustration provided by Nick Mooney on the key features of a maternal den. The larger outer chamber with a small inner chamber, a choke point and even small crevices for very young joeys are all key features.




The artificial den created at [redacted] will focus on creating these features and duplicating them in at least 3 instances. [redacted] also provides an excellent opportunity to construct a debris den within 200 m to the northeast of [redacted] There is excess logging debris across the property which can be utilised for den creation. The existing debris will be moved to align with the devil den management guidelines recommendations through pushing several 3-5 m logs (> 50 cm DBH) into a pile at least 25 m long, 10 m wide, and 4 m high, which will include pushed topsoil. A layer of branches, bark, and off-cuts will be put around all sides of the pile. No native trees will be felled to achieve this, and only naturally fallen features will be used, ensuring that the fallen trees are not providing habitat for any other species prior to moving. This approach to creating debris dens will also be applied in [redacted] (see Table 4-2).

*Table 4-2 Den creation*

| Zones | Den type | Material |
|---|---|---|
| [redacted] | Maternal/social long-term | [redacted] smaller wooden maternal dens constructed.<br>Nearby log piles to be consolidated and packed with earth |
| [redacted] | Maternal medium term | Additional log piles consolidated and packed with earth (in a flood resilient site) |
| [redacted] | Maternal medium term | Additional log piles consolidated and packed with earth (in a flood resilient site) |

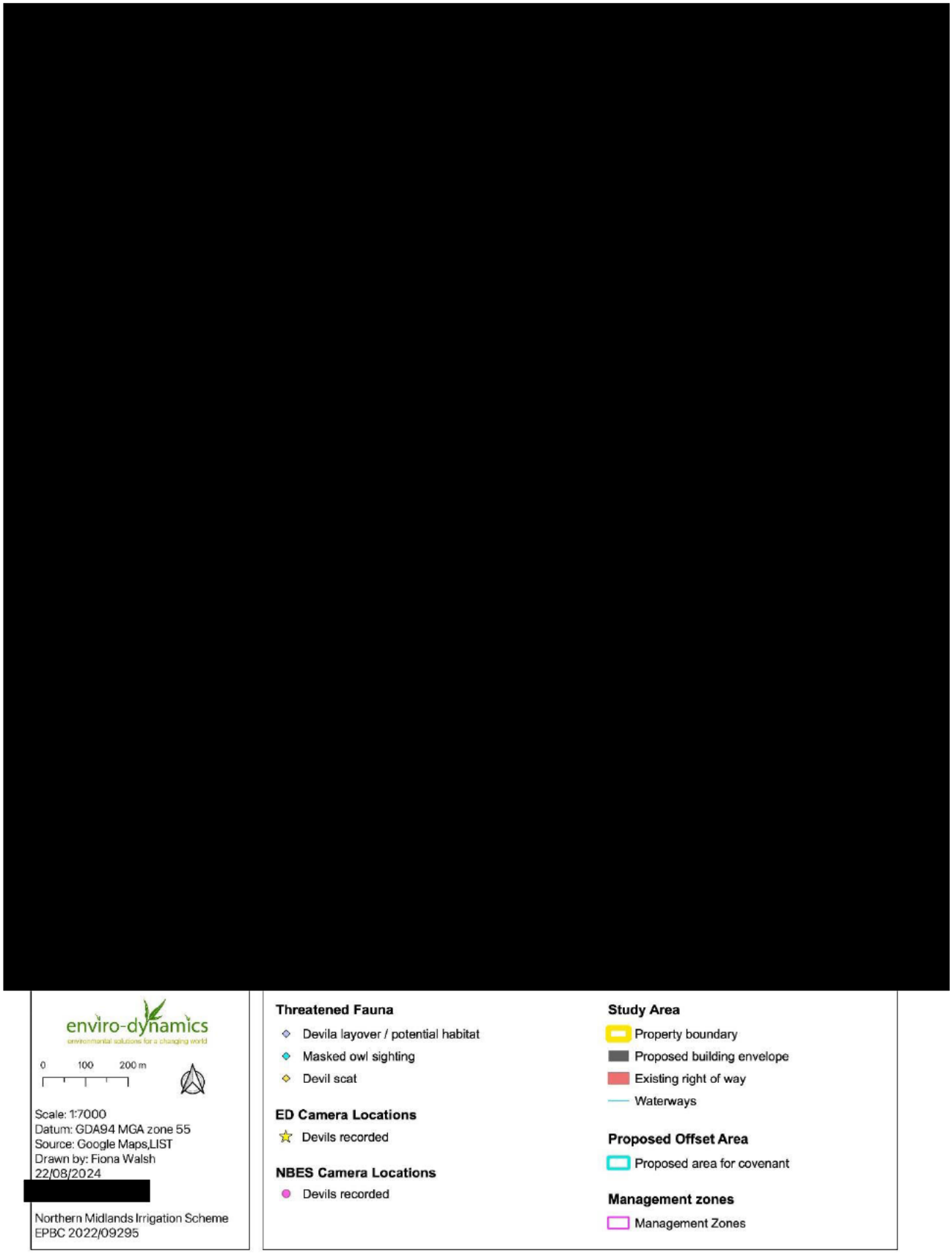



*Figure 4-2 Proposed Priority Management Zones for improving target species habitat quality*

#### 4.1.2.2 Foraging habitat

The offset site contains several areas which have a grassy understorey and there are ephemeral waterways and wetter gullies. [redacted], the southernmost waterway, has some grassy areas of Poa dominated understorey along the floodplain terrace that offer good foraging opportunities. Elsewhere within the property are other waterways adjacent to forests with grassy understorey. The most active camera trap sites for grazing marsupials were associated with the most open areas.

Foraging areas will be prioritised for active management that facilitate better foraging for prey species. In the locations identified in Table 4-2 for artificial den creation the habitat will be managed to allow sufficient vegetative cover of den sites but maintain adjacent open areas to encourage grass growth. A focus will be to undertake an annual mechanical control, program that focuses on providing a mosaic of habitat protection and foraging opportunities within predominately brushcutting, 50 m around den sites. This will have the benefits of reducing the risk of loss by fire and increasing potential foraging habitat for juveniles.

#### 4.1.2.3 Fire management

A key risk to the target species and their habitat is wildfire. Wildfire has been associated with local extinctions and severe reductions in density for all species (Legge et al. 2020). The intensity of the fire is a major factor in the survival of both the species and their habitat (Jolly et al. 2022). Proactive fire management is critical for managing the risk of wildfire (Morgan et al. 2020; Collins et al. 2023 and others). The offset site has some evidence of past fire but most of the evidence appears old, estimated to be more than 20 years since past fire from field observations. The Tasmanian State fire history spatial layer does not record any known fire events on the offset site (NRE 2023).

An ecological fire management plan is important given the likely long time since past fire and the importance of log debris habitat on site. The ecological fire management plan will evaluate risk and consider strategies which will prioritise den habitat protection and optimise foraging habitat quality. For example, small scale cool burning program that helps to build fire resilience could be undertaken across the site with areas in open grassy and/or sedgy forest prioritised. The plan will incorporate both mechanical and fire strategies to mitigate risk. The fire management plan will define the timing and scale of actions. The ecological fire management plan will require the approval of the Department of Natural Resources and Environment Tasmania (NRE) to ensure it aligns with the conservation covenant requirements.

#### 4.1.2.4 Monitoring of mitigation measures

Monitoring and evaluation of the success of recommended mitigation measures is a core component in the management of the offset site. The actions are timed for an initial 5 years with a review of the plan and the success of implementation to be conducted at the end of those 5 years. Annual monitoring of the overall implementation and tracking of trends in species occupation of habitat will be conducted and provided to the Department of Climate Change, Energy, the Environment & Water (DCCEEW). Monitoring Key Performance Indicators (KPIs) are provided for each action and will be used to track the effectiveness of the management strategies and overall outcomes across the site. Section 4.4 provides a detailed description of the monitoring strategy for the offset site.

*Table 4-3 Denning and habitat management key actions and monitoring program*

| Mitigation Measure/action | Location | Implementation timeframe | KPI |
|---|---|---|---|
| Creation of artificial den [redacted] | 1 site [redacted] | Within 3 months of approval of this OMP | Artificial denning options created and being utilised by 2030 |
| Creation of debris denning habitat | 3 sites [redacted] | Within 3 months of approval of this OMP | Debris denning habitat created and being utilised by 2030 |
| Fire Management Plan | Whole of site | Within 6 months of approval of this OMP | Fire management plan finalised and adopted in 2025 |
| Fire Management implementation - forage habitat management | Whole of site | Annual program | Fire Management Plan with at least 80% of action implemented annually.<br>Camera trap monitoring of prey and target offset species will be undertaken to determine occupancy rates as a measure of effectiveness for habitat management. |
| Fire Management implementation- strategic management of known den sites | Strategic management of known den sites – (brush-cutting) | Annual program | Fire Management Plan with at least 80% of actions implemented |
| Monitoring | Known den sites<br>Forage habitat surveys | Annual program – over a 4-6 week period between Oct – December | Annual program implemented and trends analysed from baseline collected |

## 4.2 Management of illegal activities and prevention of wood hooking

Access to the property provides opportunities for illegal activities in particular hunting, vandalism and illegal timber collection. There is one main entrance point to the property. Entrance to the property is currently managed by a locked gate and access is limited to authorised people. There are several other potential access points and these are currently controlled with chains and padlocks or blocked with large rocks. This strategy appears to be largely effective and very little evidence of illegal activity is evident on the site. The access points will be permanently closed unless the tracks are identified as important for habitat maintenance (see Figure 1-2). All padlocks will be replaced where access is required. Signage prohibiting access will be installed at the main access point. Cameras will be used if monitoring reveals evidence of illegal access such as track usage and/or padlock breaches. Inspections of all access points will be conducted as part of property maintenance at least twice a year.

If illegal activities become a problem on the property, measures to ameliorate impacts will be undertaken. These may include: more regular property inspections and increased presence on the property; enforcement actions in partnership Tasmanian Police, NRE covenanting program and/or the wildlife branch.

*Table 4-4 Illegal activity risk management key actions and monitoring program*

| Mitigation Measure/action | Location | Implementation timeframe | KPI |
|---|---|---|---|
| All access points have restricted access | See Figure 1-2 | Within 3 months of approval of this OMP | All access points have management restrictions and effectiveness is monitored |
| Signage prohibiting access | See Figure 1-2 | Within 3 months of approval of this OMP | Signage erected |
| Monitoring with cameras if illegal activity is identified at the site during infield monitoring | See Figure 4-1 | Annual | The main access point has at least 2 periods of recording access annually |
| Monitoring with physical inspection | Whole of site | Every 3 months (or as required) | Inspections have been conducted and illegal activity and mitigation measures applied if required |

## 4.3 Management of pest species

A feral cat was recorded on camera at 1 location. Whilst cats are not known to impact the Tasmanian devils or spotted tail quolls there is potential they could prey on the young of eastern quolls (Fancourt et al. 2015; Moseby et al 2020). Cats also appear to temporally adapt their foraging behaviour to avoid devils (Fancourt et al. 2015).

Research (McGregor et al. 2020) on the relationship between cats and rabbits shows a direct correlation to cat abundance. The removal of rabbits was linked to a rapid decline in cat numbers. The loss of rabbit from an area did not have the same impact on native carnivores (McGregor et al. 2020). Rabbits were recorded on the offset site at 2 camera locations. Rabbits

are a declared pest under the Tasmanian *Vermin Control Act 2000* and under the Commonwealth's *Threat abatement plan for competition and land degradation by rabbits* (Department of the Environment and Energy 2016). Rabbits impact native vegetation communities by changing species composition and degrading land especially in open foraging areas.

The most suitable strategy for managing rabbits on site is to release Rabbit Haemorrhagic Disease (RHD, previously known as rabbit calicivirus disease). Due to the low numbers and the complexity of managing the offset site for conservation purposes poisoning and shooting are not recommended at this stage. The release of RHD must be done in cooperation with NRE and Biosecurity Tasmania and is dependent on availability of the virus for release. Monitoring of rabbits and cats will be conducted to measure the reduction in impacts to both habitat and target species abundance.

Fallow deer were also recorded on site. Deer can impact on native vegetation by damaging plants and ring-barking young trees. Deer are difficult to manage without a landscape scale approach (Invasive Species Council 2024). There is a single camera trap observation of fallow deer on site but there is limited evidence of site occupancy. It is recommended that deer numbers are monitored but a direct management program on site is unlikely to be effective due to the low numbers present. If the population were observed to be having an increasing impact on the target species and associated habitat a game management plan would need to be developed with neighbouring properties.

### 4.3.1 Biosecurity management – hygiene

Hygiene to prevent the spread of weeds, pests and diseases is a critical component of environmental management. The site is weed free with no declared weeds found on site. Weeds can reduce the quality of habitat and have well known impacts on biodiversity. Disease in the fauna species was not observed in the preliminary investigations. Disease prevention is an important component of maintaining habitat quality.

Emerging infectious diseases can cause severe declines in wild animal populations, increase population fragmentation and reduce gene flow (Glassock et al. 2021). Although faunal diseases are more complex to manage than weed species, hygiene is still an important component for conservation management.

The following biosecurity measures will be adopted and formalised as a site induction process to manage hygiene at the property:

- Good vehicle hygiene practices will be followed with management vehicles and equipment to arrive clean at the property.
- All equipment and personal protective equipment will also be cleaned before entering the property so they are free of all soil and plant materials.
- No work will be undertaken within 50 m of any known areas of soil or water borne disease without environmental advice.
- All vehicle movement will be restricted to existing roadways and access tracks. Entering and leaving the property via the one main access point.
- No fill is to be brought onto the property.
- All workers to be made aware of any biosecurity issues and requirements near the work property during pre-job briefings. This includes methods for treating equipment and maintaining written records of compliance.

*Table 4-5 Pest management key actions and monitoring program*

| Action | Location | Implementation timeframe | KPI |
|---|---|---|---|
| Monitor pest population | Whole of property | Annually | Populations of rabbits, cats and fallow deer are monitored to determine occupancy and relative abundance |
| Release RHD virus | Targeted to known rabbit occupancy areas | In consultation with NRE and Biosecurity Tasmania | RHD has been released if suitable and population is in decline |
| Hygiene induction training | Prior to access the property | Ongoing implemented to new personnel | Induction records kept and aligned to access records |
| Hygiene measures implemented | When entering the property | Every time the property is accessed | Access record show machinery and equipment has been subject to hygiene measures |

## 4.4 Monitoring and reporting

This section covers the general considerations of the monitoring strategy which will be adopted, including key methods and timing.

### 4.4.1 Camera trapping

Camera trapping provides a cost effective and low intervention means of monitoring fauna species. It is however an imperfect method and does not reflect a complete census of a site. The detectability of species directly influences the capacity to accurately calculate population abundance. The initial sites surveys provide an initial baseline. However, this will need to be built upon with additional data to create a more representative time series of data capture for a robust baseline.

For abundance estimation cameras should be located where there is the greatest chance of detection. At the offset site this will be taken to be known den sites both observed during natural values surveys (April and May 2024) and at artificial denning sites created by works. Initial baseline data for the property has been collected from the locations specified in Figure 4-1; note these camera locations may be altered for ongoing monitoring to be located near known den sites and artificial denning sites with a new baseline established for the ongoing camera locations. Ideally camera trapping should also occur when species are most seasonally active, for the target species this is between October – December each year. A minimum of 3 weeks of continuous data will be collected annually. Cameras will be deployed across the offset site to capture use of key habitat areas and after the baseline of the new locations is collected the same locations will be reused annually. An even representation of cameras will be deployed to adequately capture the use of den sites and tracks and trails which are used for dispersal across the site, and key foraging sites. The same collection camera settings and heights and bearings of capture will be used to ensure replicability. Output from the initial collection is provided in Table 4-6.

*Table 4-6 Initial fauna camera collection output*

| Date period camera out for | *Species name* / Camera | *Sarcophilus harrisii* / Tasmanian devil | *Dasyurus maculatus* / spotted-tail quoll | *Macropus rufogriseus* / Bennett's wallaby | *Trichosurus vulpecula* / common brushtail possum | *Vombatus ursinus* / bare-nosed wombat | *Bettongia gaimardi* / eastern bettong | *Thylogale billardierii* / Tasmanian pademelon |
|---|---|---|---|---|---|---|---|---|
| 22/4/24- 10/5/24 | ED03 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 22/4/24- 10/5/24 | ED05 | 0 | 0 | 2 | 0 | 3 | 2 | 0 |
| 22/4/24- 10/5/24 | ED06 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 22/4/24- 10/5/24 | ED10 | 0 | 0 | 4 | 1 | 3 | 2 | 1 |
| 22/4/24- 10/5/24 | ED11 | 6 | 0 | 0 | 0 | 3 | 0 | 1 |
| 22/4/24- 10/5/24 | ED13 | 0 | 0 | 16 | 10 | 0 | 1 | 1 |
| 22/4/24- 10/5/24 | ED14 | 7 | 0 | 1 | 5 | 0 | 0 | 0 |
| 22/4/24- 10/5/24 | ED16 | 2 | 1 | 3 | 0 | 0 | 3 | 1 |
| 9/4/24 - 25/4/24 | NB046 | 0 | 0 | 64 | 5 | 0 | 0 | 0 |
| 9/4/24 - 25/4/24 | NB044 | 0 | 0 | 8 | 42 | 14 | 0 | 52 |
| 9/4/24 - 25/4/24 | NB041 | 71 | 0 | 28 | 34 | 24 | 0 | 0 |
| 9/4/24 - 25/4/24 | NB037 | 0 | 0 | 18 | 0 | 4 | 0 | 0 |
| 9/4/24 - 23/4/24 | NB031 | 6 | 0 | 14 | 4 | 2 | 2 | 2 |
| 9/4/24 - 25/4/24 | NB036 | 6 | 0 | 98 | 0 | 28 | 0 | 6 |
| 10/4/24- 23/4/24 | NB040 | 10 | 0 | 0 | 0 | 4 | 0 | 0 |
| 10/4/24- 23/4/24 | NB042 | 8 | 0 | 4 | 0 | 4 | 4 | 0 |
| 10/4/24- 23/4/24 | NB034 | 6 | 0 | 28 | 0 | 6 | 2 | 14 |
| 10/4/24- 23/4/24 | NB045 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

Note: This camera data provides an initial baseline data for the property but is designed to be augmented with follow up monitoring to build rigour into the dataset

### 4.4.2 Photo point monitoring

Two permanent photo point monitoring sites will be established within each of the 3 priority management zones. The focus of these photo monitoring sites will be to capture the foraging habitat quality around 50 m of each artificial and debris denning sites created. The sites will be permanently marked and clear instruction on the bearing and scale of the photo will be elucidated to ensure consistency in capture. Photos will be captured in the same season during annual monitoring.

### 4.4.3 Vegetation monitoring

Rapid condition assessments of the vegetation (based on the Tasmanian Vegetation Condition Assessment Method) will be used to capture change in habitat quality. This will be conducted in vegetation with a grassy and sedgy understorey to capture change over time. A baseline will be collected in 2024 followed by a sample collected at around the 3 year mark and at the end of the 5 years. The assessments will be timed to occur in spring to capture the peak growing season.

### 4.4.4 Reporting

The intent and purpose of reporting is to demonstrate the implementation of mitigation measures and their effectiveness. The reporting will be provided annually to the DCCEEW for this Offset Management Plan. A comprehensive evaluation will be provided in the 5$^{th}$ year of implementation. The plan is intended to be in place for 20 years but may be revised dependant on the finding of the evaluation and the effectiveness of the mitigation measures. An adaptive approach to management will be taken with the intent of the offset (to improve habitat quality) as the key focus of management.

The annual reports for the first 5 years will address the commitments in this Offset Management Plan and the offset strategy to improve onsite habitat quality and protection of values. The reports will include detail of the actions completed within the reporting period, evidence of habitat creation and outcomes associated with habitat creation, population monitoring of all target, key prey and all pest species, vegetation condition assessment and identification of any problems experienced and any corrective actions required. Photos and location information is to be provided as supporting evidence.

The 5 year review will provide a comparative analysis of the site from baseline to 5 years of planned actions implemented. This will include an evaluation of the performance against KPIs and habitat quality objectives identified in the offset strategy and management plan.

The first 5 years of the plan are designed to be more intensive with works on the creation of denning habitat and management of foraging areas. After the 5 year review process the key aspects of management that will continue include: restriction of access and monitoring of the property for illegal activities; fauna monitoring and implementation of biosecurity measures. Fire management plan implementation and activities will be dependent on the findings of the review. The review will determine appropriate time frames of activities dependant on the success of measures implemented.

## 4.5 Roles and responsibilities

All people performing an action for the Offset Management Plan must have appropriate expertise for the role they are providing. All people involved with the project are to receive relevant environmental training to ensure they understand their responsibilities when implementing the OMP.

People to be trained include Tasmanian Irrigation staff, contractors, subcontractors and visitors to the offset site. Relevant site inductions must be performed that include identification of target species den locations, threatened vegetation communities, explanation of the requirements of the OMP, emergency procedures, and an outline of the potential consequences of not meeting the environmental responsibilities of the offset site.

Role and responsibilities for implementing this OMP are described in Table 4-7.

*Table 4-7 Roles and responsibilities*

| Role | Activities | Responsibility |
|---|---|---|
| General Manager People, Culture and Sustainability (TI) | Securing the offset site and overall responsibility for the OMP | • Oversee the implementation of commitments and actions made in the OMP |
| Environmental Advisor/Officer (TI) | Implementation of the OMP | • Secure the offset site using a conservation covenant<br>• Monitoring requirements of this OMP including den and forage areas for the target species (under training and guidance of Suitably Qualified Ecologist)<br>• Coordinate external consultants and Suitably Qualified Ecologist<br>• Reporting requirements of the OMP<br>• Site inductions<br>• Annual reporting<br>• OMP updates as required |
| Operations (TI) | Operational aspects associated with implementation of this OMP | • Site inductions<br>• Access management<br>• Signage<br>• Coordination of onsite works where required |
| Suitably Qualified Ecologist (External) | Specialist advice, training and 5 yearly evaluations | • Management of artificial den at hut<br>• Management of debris denning habitat<br>• Training TI Environmental Advisor/Officer for monitoring requirements of this OMP including den and forage areas for the target species |

| Role | Activities | Responsibility |
|---|---|---|
| | | • Advice in relation to monitoring and reporting as required<br>• Undertake the evaluation of the plan and review activities against planned outcomes |
| External contractor | Fire management planning | • Develop an ecological fire management plan for the site with a focus on habitat management<br>• A suitably qualified team of conservation works practitioners will be responsible for implementing the fire management plan with direction from the fire management consultant |

## 4.6 Table of actions

The following table (Table 4-8) provides a list of planned actions/mitigation measures and associated timelines and Key Performance Indicators (KPIs) for delivery of the OMP. The table is a summary of the actions with links to the previous sections. The timeframes are provided on an annual basis over 5 years. Due to the timing of the offset and financial consideration the years have been listed as financial years. The final due dates for the actions are listed in the table. NMIS Operations are anticipated to commence in October 2026.

*Table 4-8 Table of planned actions/mitigation measures with associated timelines and KPIs*

| Mitigation Measure/action | Document Section for detailed information on mitigation measures | Year 1 (from OMP approval date) | Year 2 (from OMP approval date) | Year 3 (from OMP approval date) | Year 4 (from OMP approval date) | Year 5 (from OMP approval date) | KPI |
|---|---|---|---|---|---|---|---|
| Secure the offset site using a conservation covenant | Section 4.1.2.1 | Covenant application process underway | Conservation covenant secured | | | | Conservation covenant placed on title prior to Operations commencing |
| Creation of artificial den at hut | Section 4.1.2.1 | Within 3 months of approval of this OMP | | | | | Artificial denning options created in Year 1 and being utilised by 2029 |
| Creation of debris denning habitat | Section 4.1.2.3 | Within 3 months of approval of this OMP | | | | | Debris denning habitat created in Year 1 and being utilised by 2029 |
| Monitoring of den and forage areas for the target species | Section 4.1.2.4 | To be undertaken between October and December annually | Annual between October and December annually | To Annual between October and December annually | Annual between October and December annually | Annual between October and December annually | Monitoring data is prepared and reported upon annually providing a measure of occupancy by the target species |
| Fire Management Plan development | Section 4.1.2.3 | Plan developed ready for implementation | | | | | Fire Management Plan developed and adopted in Year 1 |

| Mitigation Measure/action | Document Section for detailed information on mitigation measures | Year 1 (from OMP approval date) | Year 2 (from OMP approval date) | Year 3 (from OMP approval date) | Year 4 (from OMP approval date) | Year 5 (from OMP approval date) | KPI |
|---|---|---|---|---|---|---|---|
| Fire Management implementation – forage habitat management actions | Section 4.1.2.3 | | Annual program implemented actions are most likely to occur in late autumn or early winter | Annual program implemented actions are most likely to occur in late autumn or early winter | Annual program implemented actions are most likely to occur in late autumn or early winter | Annual program implemented actions are most likely to occur in late autumn or early winter | Fire Management Plan with at least 80% of action implemented annually |
| Fire Management implementation – forage habitat management monitoring | Section 4.1.2.4 | | Annual between October and December | Annual between October and December | Annual between October and December | Annual between October and December | Camera trap monitoring of key prey and pest species will be undertaken to determine occupancy rates |
| All access points have restricted access | Section 4.2 | Completed | Annual maintenance | Annual maintenance | Annual maintenance | Annual maintenance | All access sites have management restrictions, maintenance performed annually where required |
| Signage prohibiting access | Section 4.2 | Completed | Annual maintenance | Annual maintenance | Annual maintenance | Annual maintenance | Signage erected, maintenance performed annually where required |
| Monitoring with of illegal access with cameras | Section 4.2 | To be undertaken during likely incursion periods i.e. Feb-March and May - August | Annual | Annual | Annual | Annual | The main access point has at least 2 periods of recording access annually |
| Monitoring with physical inspection | Section 4.2 | To be undertaken biannually | Annual | Annual | Annual | Annual | Inspections have been conducted and illegal |

| Mitigation Measure/action | Document Section for detailed information on mitigation measures | Year 1 (from OMP approval date) | Year 2 (from OMP approval date) | Year 3 (from OMP approval date) | Year 4 (from OMP approval date) | Year 5 (from OMP approval date) | KPI |
|---|---|---|---|---|---|---|---|
| | | | | | | | activity mitigation measures applied if required |
| Monitor pest population | Section 4.3 | Annual between October and December annually | Annual between October and December annually | Annual between October and December annually | Annual between October and December annually | Annual between October and December annually | Populations of rabbits, cats and fallow deer are monitored to determine occupancy and abundance |
| Release RHD virus | Section 4.3 | Dependant on RHD availability and approval by NRE | | | | | RHD has been released if suitable in 2025 and population is in decline by 2029. Timeframe is dependent on a third party |
| Hygiene measures implemented | Section 4.3.1 | Every time the site is accessed | Every time the site is accessed | Every time the site is accessed | Every time the site is accessed | Every time the site is accessed | Access records show machinery and equipment have been subject to hygiene measures |
| Annual reporting provided to DCCEEW | Section 4.4.4 | To be provided by September 30 each year | To be provided by September 30 each year | To be provided by September 30 each year | To be provided by September 30 each year | To be provided by September 30 each year | Reporting provided annually which includes photo-points, camera traps and vegetation condition assessments |
| 5 year review of effectiveness provided to DCCEEW | Section 4.4.4 | | | | | To be provided within 2 months of the completion of | Evaluation provided of monitoring data and a strategy for on-going management articulated |

| Mitigation Measure/action | Document Section for detailed information on mitigation measures | Year 1 (from OMP approval date) | Year 2 (from OMP approval date) | Year 3 (from OMP approval date) | Year 4 (from OMP approval date) | Year 5 (from OMP approval date) | KPI |
|---|---|---|---|---|---|---|---|
| | | | | | | the 5 year time frame | based on the findings of the evaluation/review |

# 5 Adaptative management

Adaptive management is an approach to management in which policies are treated as hypotheses and management actions as experiments, often described as learning by doing (Holling 1978, Walters 1986). The concept of adaptative management is widely applied in conservation due to the inherent uncertainty in ecological systems and understanding of those systems (Peterson 2005). It is important to ensure that adaptative management is not implicit in its assumptions but that decisions are structured and measured to build understanding.

The actions proposed in this OMP reflect the current state of knowledge for the target species and current management techniques and resources available. The monitoring and evaluation is designed to clearly articulate and critically review the implementation of actions and their outcomes. If the actions are not achieving the desired outcome of improving habitat management and the associated resilience of the local populations of the target species this will be documented and acknowledged. If the implementation of actions does not achieve the outcomes expected then the relative success of each action will be independently assessed and external influences considered.

It is considered essential that the reporting be factual and not constrained by fear of failures. All outcomes will be reported. If a revised approach is required at anytime due to observations that management responses are ineffective the reporting will identify limitations and proposed adaptations. This is particularly so for the 5 year evaluation report. If there is significant detrimental impact within the offset site, Tasmanian Irrigation will notify DCCEEW with the aim of updating the Offset Management Plan and/or the review periods and extend periods if required.

## 5.1 Risk Assessment

A risk management framework has also been developed to address areas of potential management response failures and or limitations. Table 5-1 summarises key mitigation measures and management of potential risk that will be evaluated annually as part of monitoring and evaluation.

*Table 5-1 Risks, triggers, and mitigation actions*

| Mitigation Measure/action | Potential risk factor and triggers for intervention | Relevant management response | Risk | | | KPI | Corrective action |
|---|---|---|---|---|---|---|---|
| | | | Likelihood | Consequence | Residual risk with management response | | |
| Register conservation covenant with NRE | Covenant proposal is not accepted and or progressed prior to operations of the NMIS | Negotiations have been initiated and covenant has been accepted in principle by NRE | unlikely | minor | low | Conservation covenant placed on title prior to Operations commencing | Other legal options investigated for long-term on title agreements for management and can be facilitated if required to insure protection of the site until the expiry date of the approval |
| Creation of artificial den at hut | Site remains unoccupied after construction | Design has considered current best available information for den creation | unlikely | moderate | low | Artificial denning options created and being utilised by Year 3 | Additional denning provided and alternative designs utilised |

| Mitigation Measure/action | Potential risk factor and triggers for intervention | Relevant management response | Risk | | | KPI | Corrective action |
|---|---|---|---|---|---|---|---|
| | | | Likelihood | Consequence | Residual risk with management response | | |
| Creation of debris denning habitat | Sites remain unoccupied after construction | Design has considered current best available information for den creation | unlikely | moderate | low | Debris denning habitat created and being utilised Year 3 | Additional denning provided in new sites to increase the habitat availability |
| Fire Management Plan | Fire management plan does not adequately cover fire risk | Expert fire consultant engaged | unlikely | moderate | low | Fire management plan finalised and adopted in Year 1 | Expert review of plan via a second consultant |
| Fire Management implementation – forage habitat management | Plan actions are not implemented | Annual review and monitoring of actions to ensure alignment with plan | possible | moderate | low | Fire Management Plan with at least 80% of actions implemented annually | Management resources increased if implementation targets are not met |
| | Occupancy rates of prey and or offset target species are in decline (over multiple years) with no obvious external factor driving decline (i.e. drought) | Small areas of treatment to minimise risk | unlikely | moderate | low | Camera trap monitoring of target prey and pest species will be undertaken to determine occupancy rates. | Additional areas of treatment added to plan. |

| Mitigation Measure/action | Potential risk factor and triggers for intervention | Relevant management response | Risk | | | KPI | Corrective action |
|---|---|---|---|---|---|---|---|
| | | | Likelihood | Consequence | Residual risk with management response | | |
| Illegal activities are controlled | Access increases despite intervention | Camera monitoring, signage and site inspection conducted | unlikely | minor | low | All access sites have management restrictions and effectiveness is monitored. Signage erected; access recorded; site inspections conducted. | Access restrictions are reinforced and monitoring increased |
| Monitor pest population | Populations increase | Hygiene measures implemented, active annual monitoring and release of RHD virus for rabbits | possible | minor | low | Populations of rabbits, cats and fallow deer are monitored to determine occupancy and abundance. | Additional pest management plans developed to address threat |

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# 7 Appendix 1: [redacted] Offset Management Plan - photos


Figure 1: Spotted-tailed quoll (*Dasyurus maculatus)* observation on 3/5/24, camera 16


Figure 2: Tasmanian devil (*Sarcophilus harrisii)* observation on 4/5/24, camera 14


Figure 3: Tasmanian devil (*Sarcophilus harrisii)* observation on 23/4/24, camera 11


Figure 4: Bare-nosed wombat *(Vombatus ursinus)* observation on 1/5/24, camera 11


Figure 5: Eastern bettong *(Bettongia gaimardi)* observation on 23/4/24, camera 16


Figure 6: Eastern bettong *(Bettongia gaimardi)* observation on 25/4/24, camera 13

Figure 7: Masked owl *(Tyto novaehollandiae castanops)* observed on site

Figure 8: Coarse woody debris pile and potential habitat den

Figure 9: Coarse woody debris

Figure 10: Potential den habitat in a large fallen tree

[redacted]

Figure 12: *Eucalyptus amygdalina* woodland with scattered *E. pulchella* trees.

Figure 13: Vegetation community FPH - hardwood plantation

# 8 Appendix 2: Northern Midlands Irrigation Scheme Offset Strategy