Sandhill Dunnart Conservation Plan

Mulga Rock Project

EPBC 2013 / 7083, Shire of Menzies, Western Australia

Narnoo Mining Pty Ltd ACN 084713100

16 November 2022

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1. VERSION HISTORY AND DECLARATION OF ACCURACY

1.1 Authors and Revisions

Table 1 Version History

Revision Number	Author	Date	Reviewer	Signature
Draft	E Rivers, M Baetge, G Gaikhorst	15 December 2021	Xavier Moreau	
A0	E Rivers, M Baetge	18 March 2022	Paula Arthur	
A1	E Rivers, M Baetge, D Major	12 May 2022	Paula Arthur	
A2	E Rivers, M Baetge, P Arthur	11 July 2022	Paula Arthur	
A3	M Baetge, G Gaikhorst	10 November 2022	Xavier Moreau	

1.2 Location on Vimy Server

https://vimyresourceslimited.sharepoint.com/sites/MRP-CommonwealthApprovals/Shared Documents/General/2 - Sandhill dunnart/2 - SHD Conservation Plan/2 - Conservation Plan/12563122-REP_Rev0_EPBC 2013-7083 Sandhill Dunnart Conservation Plan.docx

1.3 Declaration of Accuracy

In making this declaration, I am aware that section 491 of the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (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 Commonwealth *Environment Protection and Biodiversity Conservation Regulations 2000*. 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 (please print):

Steven Michael

Organisation (please print):

Vimy Resources Limited

Date: 11 November 2022

2. EXECUTIVE SUMMARY

Vimy Resources Limited is proposing to develop the Mulga Rock Uranium Project located 240 km east-northeast of Kalgoorlie, Western Australia.

As a result of the Project having a significant residual impact to the Sandhill Dunnart, listed as 'Endangered' under the *Environment Protection and Biodiversity Conservation Act 1999*, the Project was referred to the Commonwealth Department of Agriculture, Water and the Environment (EPBC 2013/7083).

EPBC 2013/7083 Condition 2 necessitates the preparation of a Sandhill Dunnart Conservation Plan (**the Plan**) to reduce the threat to the Sandhill Dunnart posed by feral animals within the Defined Area. The Plan addresses EPBC 2013/7083 Condition 2.

The Conservation Plan outlines the conservation objectives, and actions required to implement, measure and monitor the conservation objectives, to reduce the threat to the Sandhill Dunnart posed by feral animals within the Defined Area (Table 2).

Feral animal management measures to be implemented within the Defined Area include the installation of threat abatement devices including the Felixer cat grooming trap and feral animal baiting. Felixers use rangefinder sensors to distinguish target cats and foxes from non-target wildlife and humans, and spray targets with a measured dose of toxic 1080 gel. This is important since occupancy modelling on feral cat population from conventional baiting show only modest effects using a high intensity baiting protocol (~10 baits/km^2, Doherty *et al.*, 2021).

Monitoring quadrats will be established in key locations to determine baseline populations of Sandhill Dunnart and feral animals, with ongoing monitoring to understand population trends and whether potential decline in Sandhill Dunnart population numbers is related to the presence of feral animals. A systematic monitoring methodology, derived from recognised principles, practices and guidelines, is proposed to determine the presence of the Sandhill Dunnart and feral animals within the Defined Area, on ongoing population dynamics.

Various contingency responses and corrective actions are proposed within the Plan as management measures are implemented and triggers detected.

3. INTRODUCTION AND PURPOSE OF THE PLAN

3.1 Background

Vimy Resources Limited (**Vimy**) is proposing to develop the remote Mulga Rock Project (**MRP**) which is located 240 km east-northeast of Kalgoorlie in dune fields on the western flank of the Great Victoria Desert (**GVD**), Western Australia (**WA**). The area of the GVD to be mined is located within a region representative of Priority Ecological Community (**PEC**) 'yellow sandplain vegetation of the Great Victoria Desert with diverse vertebrate fauna' listed as Priority 3 by Department of Biodiversity, Conservation and Attractions (**DBCA**). The yellow sandplain PEC is characterised by diverse shrubs and very high vertebrate diversity.

MRP will involve open pit mining of four polymetallic deposits with commercial grades of uranium hosted in carbonaceous material. The disturbance footprint originally approved for the project was 3,787 ha under Ministerial Statement No. 1046 which was revised and amended via *Environmental Protection Act 1986* (**EP Act**) Section 45C to 3,558 ha. The location of MRP, project boundary and development envelope are shown in Figure 1 and Figure 2.

On 28 November 2013 MRP was referred under the *Environment Protection and Biodiversity Conservation Act 1999* (**EPBC Act**) to the Department of Agriculture, Water and the Environment (DAWE) (EPBC 2013/7083). On 7 January 2014, DAWE determined MRP a "controlled action", with the controlling provisions being "listed threatened species and communities" and "nuclear actions", to be assessed under the bilateral agreement with the WA State Government. The MRP received approval under the EPBC Act on 2 March 2017 with a condition attached to offsetting the residual impact to the Sandhill Dunnart (**SHD**) (*Sminthopsis psammophila*).

Monitoring of the SHD within the GVD has been conducted over several decades. Historic surveys used a combination of Elliot and Pitfall traps whereas more recent surveys have used cameras traps. Vimy has undertaken conventional trapping surveys dating back to 1985. Although the monitoring areas targeted by Vimy were outside of the Defined Area these monitoring efforts have developed and refined a survey/sampling methodology which will be employed for this Conservation Plan.

3.2 Project Description

Mulga Rock Project (**MRP**) involves the development of an open pit uranium mining operation, the construction and operation of associated ore processing facility consisting of uranium extraction and uranium concentrate packing facilities, and the necessary supporting infrastructure.

The ore zones are up to 38 m thick at Mulga Rock East with an average thickness of 4.5 m, and up to 8 m in thickness at Mulga Rock West with an average of 2.3 m. Uranium mineralisation is hosted by flat-lying, carbonaceous clastic sediments, which are in turn overlain by weathered, oxidised sediments that range in thickness from 19 m to 62 m forming the waste overburden. Dewatering will be required to mine some of the orebody; where possible, dewater will be used on-site, and any excess water will be disposed of by reinjection. Owing to the nature of the host rock and overburden, over 90% and possibly all of the mining will be done by free digging.

The deposits will be mined using large-scale open pits to produce at an annualised peak capacity of 2,180 t/a (4.8 Mlbs) U_3O_8, but averaging 1,590 t/a (3.5 Mlbs) U_3O_8. Due to the large lateral extent and horizontal geometry of the deposit in the Ambassador pit, Vimy is proposing to use 'strip' mining techniques like those used in mineral sands and coal mining. Strip mining commences with the excavation of an initial box cut to expose the ore, with the initial overburden placed in a surface landform. After mining the first ore exposed by the initial box cut, the resulting pit void will be used for in-pit tailings deposition. In general, the rest of the Ambassador pit will be strip-mined one strip at a time, with previously mined areas progressively backfilled with overburden and rehabilitated.

This mining method will result in 'real-time rehabilitation', including a smaller environmental footprint at any given time and significant savings in waste movement and rehabilitation costs.

There are also several smaller high-grade and secondary satellite pits within the MRP. A conventional truck and shovel mining method will be utilised for these pits where mining proceeds bench-by-bench in a vertical direction from the surface with disposal of overburden material ex-pit on overburden surface landforms. This method will also be applied within the larger deposits where pit geometries do not support strip mining.

Tailings will be generated as a by-product of processing the ore, which will involve the following stages:

- Beneficiation of the ore to remove sand (quartz) particles using conventional gravity/ screening techniques
- Milling
- Extraction of the uranium from the ore using acid leach (H_2SO_4), in tanks
- Capturing the released uranium using Resin-In-Pulp
- Stripping of uranium from the loaded resin
- Uranium conditioning (ultra and nano-filtration, precipitation, drying and packaging).

Tailings will be deposited into sterilised pits with an above ground tailings storage facility available as a contingency.

The drummed uranium oxide concentrate will be transported by road from the mine site in containers to a suitable port (expected to be Port Adelaide) for export. Transport options have not been finalised and the necessary approvals will be sought from the appropriate decision-making authorities, following consultation with stakeholders. At the end of the mine's life, the areas disturbed by mining activities will be decommissioned and rehabilitated to the required regulatory standards and in accordance with the approved closure plan.

Required project infrastructure will include:

- Aerodrome for fly in fly out workforce
- Accommodation Village for up to 358 personnel
- Access roads and tracks
- Bulk earthworks (activities will include clearing all required areas, installations including culverts, box cuts, backfill, hardstands, dams, drains, catchments, services trenching, and water storage ponds)
- Communications system
- Transportable buildings including offices, change rooms, crib rooms and ablutions
- Steel framed buildings including workshops, warehouse and storage
- Fuel storage and distribution facility
- Chemical storage and make up facility
- Power station
- Site fencing and security
- Processing facility
- In-pit tailings storage facilities

- Borefield water supply including raw water for processing and potable supplies
- In-Pit dewatering infrastructure
- Reinjection borefield
- Potable and wastewater treatment plant
- Landfill and land farm.

Transport to site for consumables, bulk materials and general supply items will be via existing public road systems linked to dedicated site roads.

The design of project infrastructure has taken into account the known location of areas where conservation significant flora/fauna are likely to occur and, in particular, areas containing complex interlinked dunes.

Ground disturbing activities associated with MRP require the clearing of 3,515 ha SHD suitable habitat (prime and sub-prime) which was determined to represent a significant residual impact to the species. EPBC 2013/7083 conditional approval necessitates the preparation of a SHD Conservation Plan (**the Plan**) to reduce the threat to the SHD posed by feral animals within the defined area. The Plan addresses EPBC 2013/7083 Condition 2.

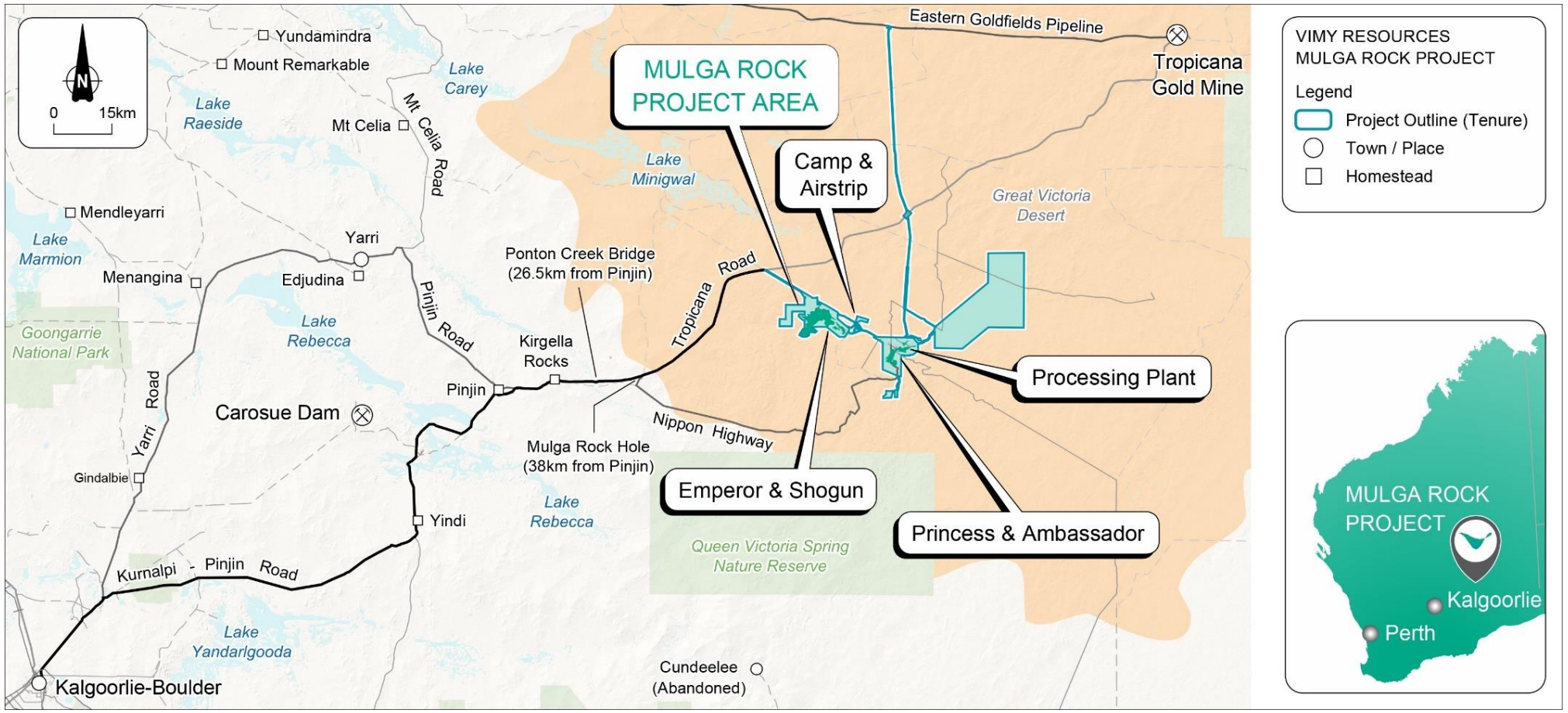


Figure 1 MRP Regional Location

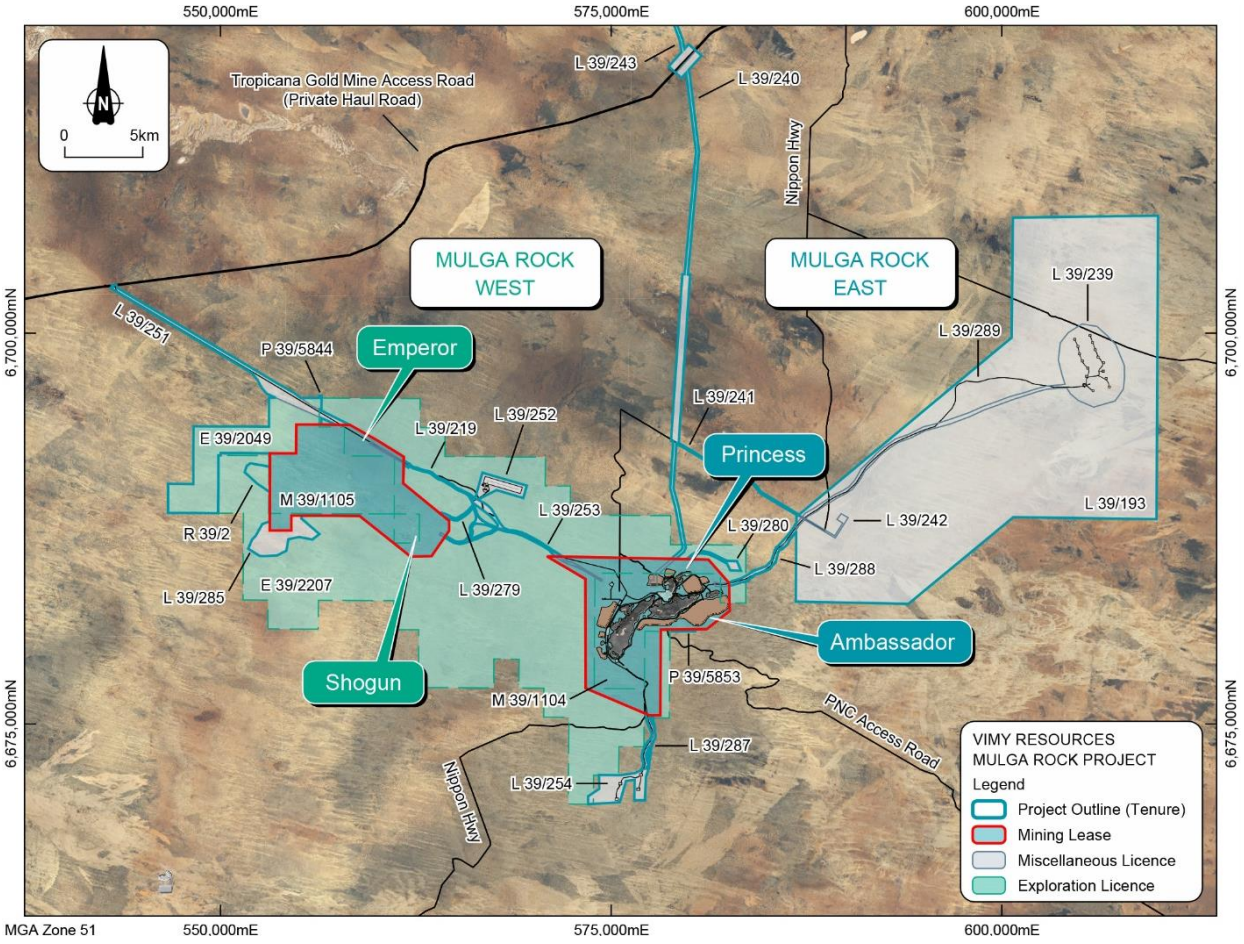


Figure 2 MRP Layout

3.3 Purpose of the Plan

EPBC 2013/7083 Condition 2 requires the preparation of a SHD Conservation Plan to reduce the threat to the SHD posed by feral animals within the Defined Area (Figure 3 and Figure 4).

The overall purpose of the Plan is to comply with EPBC 2013/7083 Condition 2. The Plan outlines the conservation objectives, and actions required to implement, measure and monitor the conservation objectives, to reduce the threat to the SHD posed by feral animals within the Defined Area.

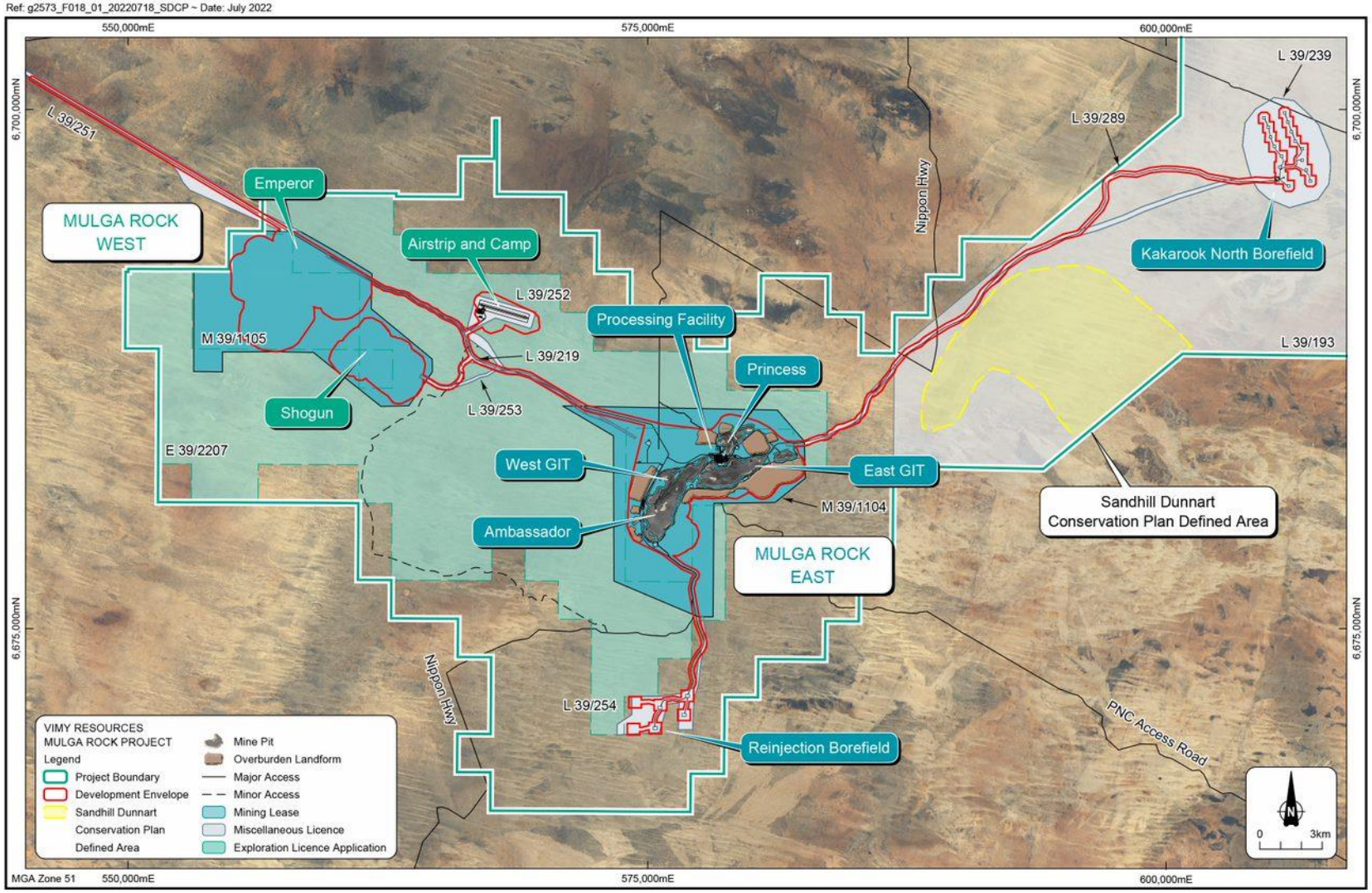


Figure 3 Sandhill Dunnart Conservation Plan Defined Area

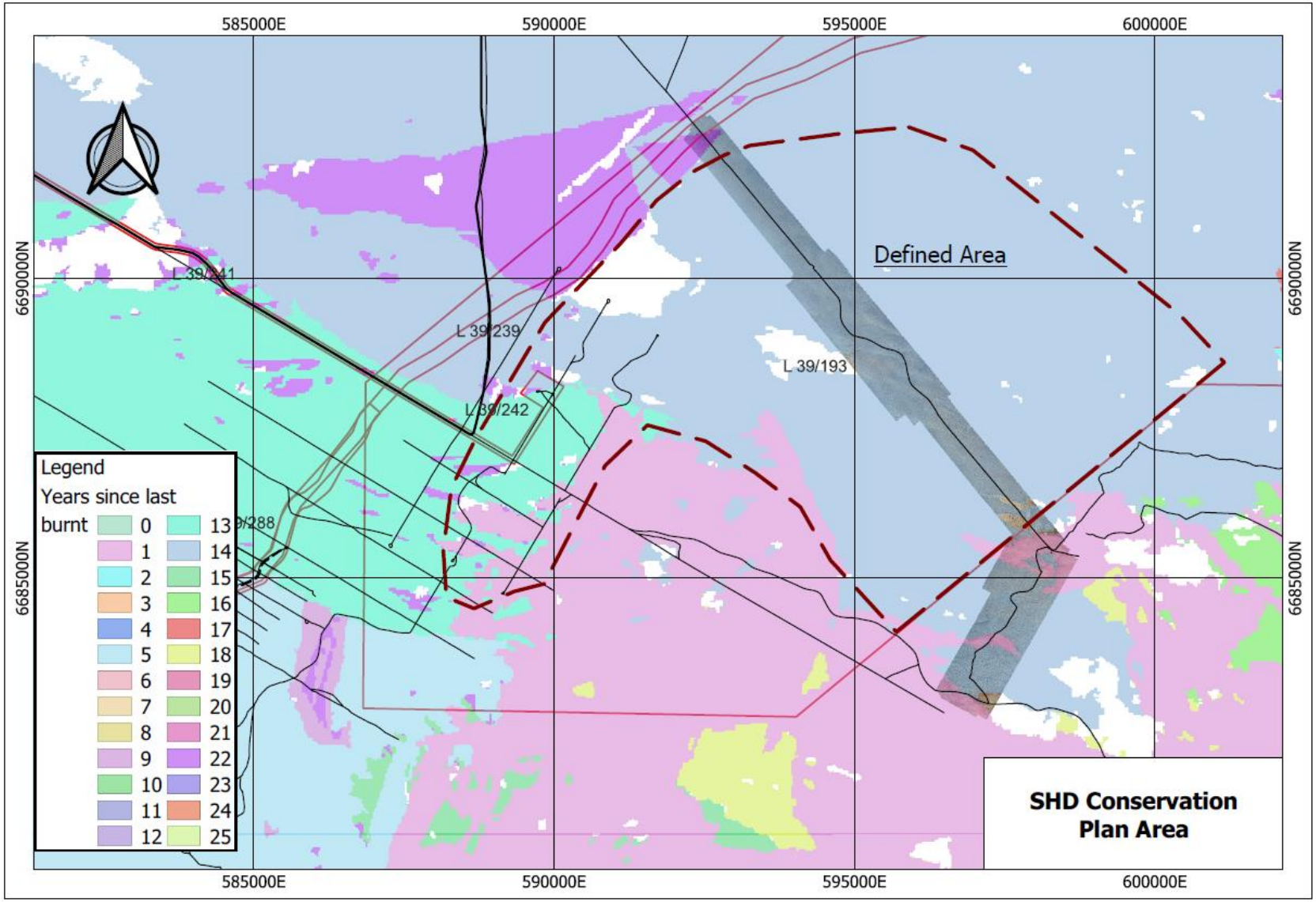


Figure 4 Sandhill Dunnart Conservation Plan Defined Area Fire history

4. CONDITIONS OF APPROVAL

Table 2 below summarises the requirements of EPBC 2013/7083 Condition 2 and the sections within the Plan that satisfy the conditional requirements.

EPBC 2013/7083 Condition 2 states the following:

To offset the residual significant impact to the Sandhill Dunnart (Sminthopsis psammophila), the person taking the action must prepare a Sandhill Dunnart Conservation Plan (the Plan) to reduce the threat to the Sandhill Dunnart posed by feral animals within the defined area. The Plan must be prepared by a ***suitably qualified expert*** *and in consultation with the WA Department of Park and Wildlife.*

The Plan has been prepared by suitably qualified experts with relevant tertiary qualifications and a minimum of ten years demonstrated experience developing management plans to satisfy the conditions of EPBC approval requirements.

Glen Gaikhorst, GHD zoologist with over 23 years' experience in fauna survey, has been involved in SHD trapping in the GVD since 2001. The aim of the trapping program was to locate and map the distribution of SHD in the GVD and study the species' ecology and reproductive biology. Glen has identified all the mammal species in the south-western portion of the GVD.

Following the release of EPBC 2013/7083 conditional approval, further specific "Environmental Management Plan Guidance" was provided by DAWE directly to Vimy. Refer to Appendix 1 for the EMP Guidance; Table 2 links the specific EMP Guidance requirements to the EPBC 2013/7083 approval conditions.

Table 2 EPBC Approval Condition Requirements

Approval Condition	Section in Plan	Key Commitments (Appendix 1)
(a) define the area over which the Plan applies (the defined area). The defined area must: (i) be located outside of the **MRP development envelope**, but within the **project boundary** (ii) contain at least 6,000 ha of suitable habitat for Sandhill Dunnart (iii) contain a local population of Sandhill Dunnart	Section 9; Figures 1, 2 and 3	Please see guidance items 4, 6, 7 and 22
(b) detail objectives and measurable performance indicators for implementing the Plan and managing threats to the Sandhill Dunnart within the defined area relating to feral animals	Section 6; Section 11; Section 12	Please note the uplift in habitat condition/feral animal/predator control is to be achieved at Year 5 and maintained for the life of the impact (taken as life of approval). Therefore, the Plan must achieve the performance indicator/s by Year 5 following commencement, and maintain. Please see guidance items 5, 6 and 8

Approval Condition	Section in Plan	Key Commitments (Appendix 1)
(c) detail the methodology that will be implemented for determining the baseline condition of the defined area including estimated baseline local population of Sandhill Dunnart and feral animals	Section 15	Please explain how you will establish the baseline condition prior to project commencement and/or during initial years of the project, relationship to performance indicators and statistical power/reliability. Please see guidance items 5 and 14-16
(d) detail management actions that will be implemented to achieve the Plan's objectives	Section 12; Section 13	Please see guidance items 10-12
(e) identify and manage risks associated with achieving the Plan's objectives	Section 6	Please see guidance items 9, 10, 12 and 13
(f) detail contingency responses and corrective actions should performance indicators not be achieved. This includes triggers values for implementing contingency responses and corrective actions, and the timeframes in which corrective actions will be implemented	Section 6; Section 13	Please note contingency response is to confirm an event/circumstance or determine that it is due to the approved action and the cause of the event etc. Corrective actions are subsequently implemented, as appropriate. Please see guidance item 10
(g) detail a monitoring program, including a monitoring methodology, to review effectiveness of management actions and to support an adaptive management approach to implementation of the Plan	Section 15	Please see guidance items 14-19
(h) provide the timing and frequency of management actions, monitoring and reporting programs and the person/s responsible for implementing the actions and programs	Section 6; Section 11; Section 15; Section 16; Section 17	Please see guidance items 11, 14-17, 20 and 21

5. OBJECTIVES AND CONTEXT OF THE CONSERVATION PLAN

5.1 Context of the Conservation Plan

A draft National Recovery Plan (**NRP**) for SHDs was developed in 2019 (DEW), within which the overall objective is to:

- secure and enhance the conservation status of the SHD in the wild through on-ground management actions outlined in the draft Recovery Plan.

The specific objectives of the draft Recovery Plan are to:

- Develop and implement appropriate threat management strategies to protect and conserve all known sub-populations
- Expand the knowledge of the distribution, status, and population trends of the SHDs
- Increase understanding of the biology and ecology of SHDs
- Identify habitats critical to survival and map potential habitat of SHDs
- Promote awareness of the status of SHDs and required conservation actions to landholders and the wider public
- Manage the recovery process

The environmental objectives of the Plan, summarised in Section 5.2, aim to complement the specific objectives of the draft Recovery Plan, and assist in achieving the overall objective through the implementation of on-ground threat management actions. Whilst the Plan is written primarily in compliance with the conditions of EPBC 2013/7083, it is intended that where practicable and appropriate the Plan will also deliver actions in keeping with the objectives of the draft Recovery Plan.

5.2 Objectives of the Conservation Plan

EPBC 2013/7083 Condition 2 requires the preparation of a SHD Conservation Plan to reduce the threat to the SHD posed by feral animals within the Defined Area.

Implementation of the Plan aims to achieve the following conservation objectives for the SHD:

- To understand the threat to the SHD posed by feral animals within the Defined Area
- To reduce the threat of feral animals within the Defined Area
- To expand the knowledge of the distribution and status of the SHD in the Defined Area

Collection of baseline SHD and feral animal population data within the Defined Area, and continued monitoring of population numbers, will assist in understanding population trends and whether potential decline in population numbers are related to the presence of feral animals. Implementation of threat management within the Defined Area specifically targeting known threatening species, will aim to reduce threats to the SHD. As baseline population data is consolidated and ongoing monitoring data is captured, the monitoring approach will be refined and improved, ultimately expanding the knowledge of distribution and status of the SHD in the Defined Area.

5.3 Status and Ecology of Sandhill Dunnart

5.3.1 Sandhill Dunnart Status

There are estimated to be approximately 5,000-10,000 mature individuals within populations across Australia, but numbers are decreasing. The SHD is listed as ‘Endangered’ under the EPBC Act and ‘Endangered’ under the *Biodiversity Conservation Act 2016* (BC Act). Under the EPBC Act the SHD

was deemed eligible for Endangered status due to its range declining significantly (TSSC 2015). There is an inferred decline in the area of occupancy, in the area, extent and quality of habitat, and in the number of mature individuals (TSSC 2015). Monitoring of the SHD within the GVD, conducted over several decades, has been successful in regularly identifying the species. Recent species distribution modelling suggests the area of occupancy of the species is much larger than initially determined, with the discrepancy a reflection of a lack of survey intensity (Riley and Turpin 2019).

5.3.2 Sandhill Dunnart Presence at Mulga Rock

The presence of SHD within the Development Area has been captured during camera trap monitoring programs; these programs have been ongoing since 2014 both within the Development Area and surrounding areas. The purpose of the program was to identify taxa and determine the presence / absence of SHD.

The program included the capture of digital images from infra-red cameras, which were subsequently analysed, and taxa identified by a suitably qualified ecologist with specialist experience in small mammal (e.g. Dasyuridae) identification in the GVD, GHD December 2021. As part of the monitoring program, three separate projects have been undertaken including a trial project, the Mulga Rock Project and a regional project.

The trial project was undertaken from July to September 2014. During the trial two types of cameras were used, the Reconyx 550 Hyperfire white flash and the Bushnell motion infrared camera. The trial was limited to the proposed Mulga Rock Project operational area with eight sites established in the field. The trial project did not record any SHD.

At the conclusion of the trial, the Mulga Rock Project was commenced with 15 new sites established in the Mulga Rock Project operational area from September 2014 to November 2015. Data from these sites was collected using Reconyx 550 Hyperfire white flash cameras. Five SHD events were recorded at camera MR11a in January 2015, three separate events at camera MR14a in March and April 2015 and one event at camera MR5a in August 2015. The three events from MR14a are likely the same individual moving within its home area and appears to be an adult. The MR11a individual appears slightly smaller and is a 2014 offspring not yet fully grown.

In November 2015 a regional project was commenced with 23 sites established in areas identified as prime SHD habitat and where SHD had been previously recorded. Data was collected using Reconyx 550 Hyperfire white flash cameras from November 2015 to August 2018. During this time, two sites were removed due to fire and camera theft.

From the images analysed from the MRP and Regional program prior to July 2017, approximately 10,644 had a small mammal present, with the remaining 212 images excluded from this assessment due to being too difficult to determine confidence or having no animal present. Eleven species were identified from the images, this included ten native mammals and one introduced mammal from all camera trapping projects.

5.4 Evidence

Since the commencement of the camera trapping program in November 2021, camera traps have recorded several SHD individuals (Figure 6 - Figure 8) within the Defined Area. Camera trap locations within the Defined Area are detailed in Figure 5. A complete list of all recorded SHD and feral animals will be provided in the Annual Environmental Report to DAWE and in accordance with Ministerial Statement No.1046 Condition 10 to Department of Water and Environmental Regulation (DWER) and Department of Biodiversity, Conservation and Attractions (DBCA).

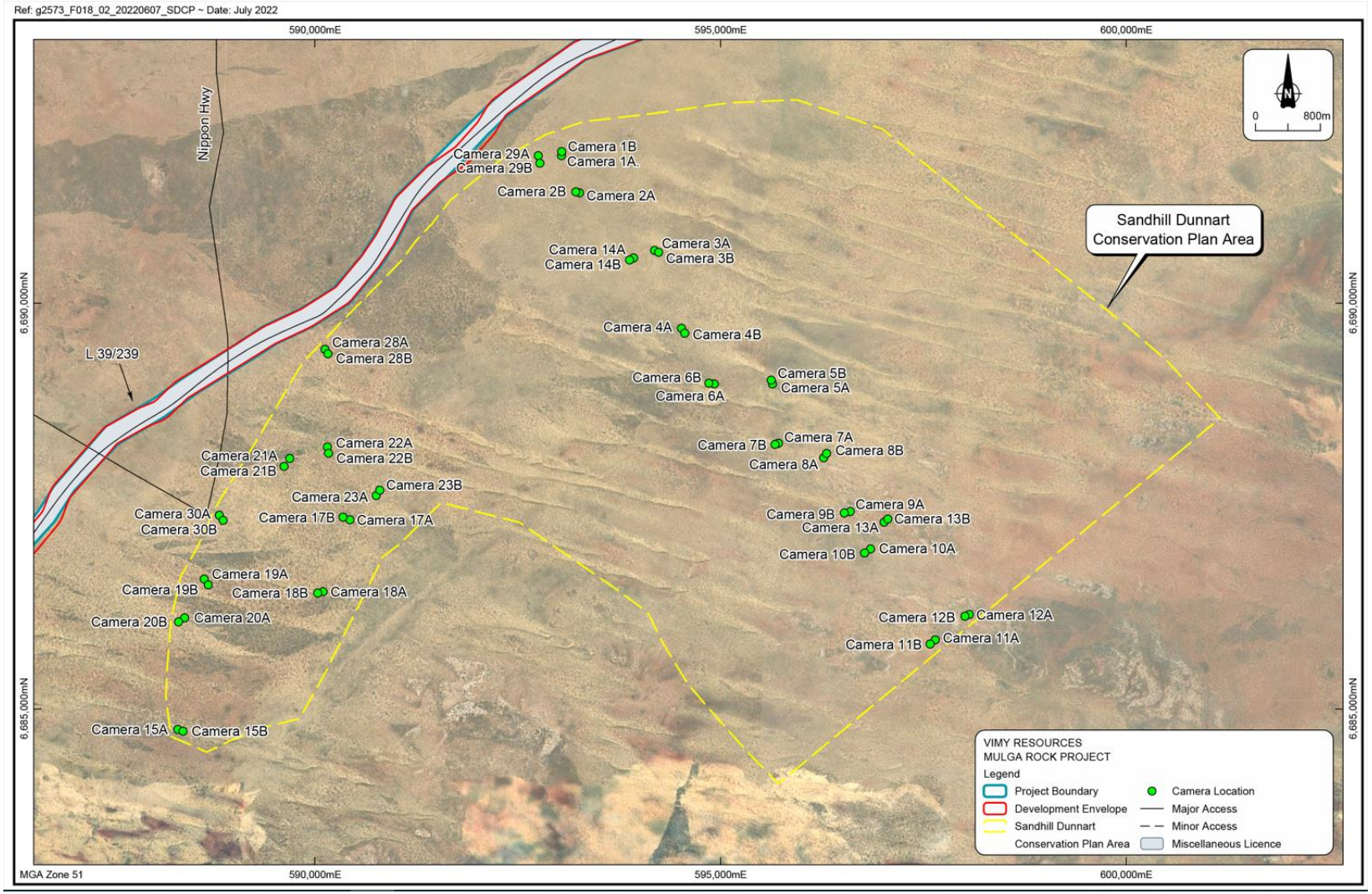


Figure 5 Camera Trapping Locations in the Defined Area

Figure 6 SHD at Camera 17B on 11 January 2022

Figure 7 SHD at Camera 17B on 25 January 2022

Figure 8 SHD at Camera 17B on 10 April 2022

5.4.1.1 Feral Animal Species at Mulga Rock

Feral animals recorded in the MRP area during the camera trap monitoring program, visual observations from field staff or fauna consultants, and their status under the Biosecurity and Agriculture Management (BAM) Act, include:

- Cat (*Felis catus*) – Permitted – s11
- Dog (*Canis lupus* subsp. *familiaris*) – Permitted – s11; Feral - Declared Pest – s22(2)
- One-humped Camel (*Camelus dromedarius*) – Declared Pest – s22(2)
- Donkey (*Equus asinus*) - Declared Pest – s22(2)
- House Mouse (*Mus musculus domesticus*) – Permitted – s11
- Rabbit (*Oryctolagus cuniculus*) (Feral) – Declared Pest – s22(2)
- Common (Indian) Myna Bird (*Acridotheres tristis*) – Declared Pest – s22(2)
- Red Fox (*Vulpes vulpes*) – Declared Pest – s22(2).

5.4.2 Sandhill Dunnart Ecology

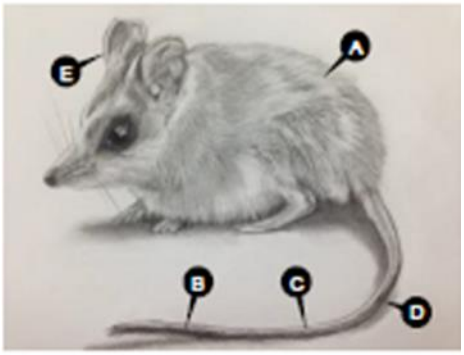
5.4.2.1 Description

Like other Dunnarts, the SHD is a nocturnal and insectivorous species and is characterised by a long pointed snout, large eyes, and large ears (DEW 2019). The SHD has a head to body length that ranges between 85-114 mm in length, and a tail length in the range of 107-128 mm. The colouring of the SHD is predominantly grey to a buff/sand which changes to white on the underside and feet. The eyes are

ringed black, and they possess a distinctive tail with stiff black hairs on the underside. In WA some specimens have a distinctive tail banding which is not seen in other populations (DEW 2019).

The distinct characteristics of the Sandhill Dunnart which aid identification are shown in Table 3.

Table 3 Sandhill Dunnart Physical Characteristics (Vimy Resources 2015)

Species	Physical Characteristics and Identifying Features			
	Head / ears / feet	Tail	General body	
S. psammophila 	Large eyes, black eye rings E Large ears with black anterior bristles.	C tail thin and tapered, longer than head/body length (mean 118 mm) B Black grey ventral hair fin in final quarter D Tail bi-colour – dorsal light grey/buff, with darker grey base	Weight:	36 g
			Head / Body length:	97 mm
			Body size:	A Larger body than any other Dunnart recorded in the region
			Colour:	Dorsal fur grey to brindle, underside white

5.4.2.2 Reproduction

Male and female SHD reach sexual maturity ~11 months of age, breed in spring and early summer, with a 16-19 day gestation period (Lambert *et al*. 2011; McLean *et al*. 2019). Mating typically occurs in September with young born September/October and weaned from the pouch by December/January (Pearson & Churchill 2008). Availability of food resources can delay the breeding season (McLean 2015). SHD typically produce a single litter per year but have been known to produce a second litter during favourable conditions (Churchill 2001). SHD have a life span of approximately two years (Lambert *et al*. 2011; McLean 2015) and linked to resource availability.

5.4.2.3 Distribution

Historically, SHD range extended from the south-west of the GVD in WA, across to the Eyre Peninsula, South Australia, and up to Lake Amadeus in the Northern Territory (Spencer 1896). The species has not been captured in the Northern Territory since 1894 and, at present, is now only known from three core populations across Australia. The three core populations of SHD consist of five known sub-populations (DEW 2019), located in the following areas:

1. South-western GVD, Western Australia
2. Yellabinna Regional Reserve, GVD, South Australia
3. Pinkawillinie Conservation Park, north-central Eyre Peninsula, South Australia
4. Middleback dunefields, north-eastern Eyre Peninsula, South Australia
5. Hincks Conservation Park, central Eyre Peninsula, South Australia

A sixth sub-population identified was recently to the east of Laverton, representing a 150km range extension (Riley and Turpin 2019).

The SHD estimated extent of occurrence is estimated at about 150,000km^2, while its overall occupancy area is conservatively estimated at between 500 to 2,000 square kilometres (DEW 2019). Recent

species distribution modelling suggests the WA GVD population occupancy area exceeds 15,000km^2, with the discrepancy largely a reflection of a lack of survey intensity (Riley and Turpin 2019).

Though the general region they live in is known, there is a lack of research into the distribution of the SHD in WA due to the inaccessibility and vastness of the GVD. Increased understanding of the habitat variables affecting the distribution of the species will help identify possible additional populations in WA and help refine population estimates.

5.4.2.4 Habitat

Home range

Studies have been conducted to understand the home range of SHD and results suggest variability in home range extent, largely as a function of resource availability. One study found an estimated home range of 7.8 ha, while a study of SHD on the Eyre Peninsula found variation between sites with the home range of SHD at one site between 16.1 to 41.5 ha and at the second between 3.2 and 6.2 ha (DPAW 2016).

There is little to no data for home range of SHD in WA. In general individuals may traverse 200-300 m per foraging period and have the ability to travel long distances in short periods with studies recording 1,960 m covered in 2 hours (Churchill 2001).

Habitat type

The SHD habitat is most significantly associated with the presence of spinifex hummocks (*Triodia spp*) in association with sand dunes. In WA, the SHD have been found exclusively in vegetation association 84 (Beard 1974) which is comprised of Mable gum (*Eucalyptus gongylocarpa*), Mallee and *Triodia spp*. (Gaikhorst and Lambert 2014). Although the habitat across the GVD has not been surveyed in detail there appears to be large tracts of potentially suitable habitat through the southern desert area.

Habitat availability has not been identified as a limiting factor to the SHD, at least in the southwest GVD (which largely coincides with the Yellow Sand Plain community). Despite the known resilience of the SHD to habitat fragmentation (Riley and Turpin 2019), large areas of suitable habitat are necessary to protect populations due to the high mobility of the species (McLean 2015, Churchill 2001). Recent research in WA and SA points to SHDs shelters being preferentially located in less open ground and more dense lower stratum habitats, with burrows and spinifex the two dominant types of shelters (Riley & Turpin, 2019).

SHD shelters classified by underlying landforms (Riley & Turpin 2019) show a dominant association with sandplains, dune slopes (with the north-facing slopes being dominant) followed by woodland, dune crest and Mulga dominated landforms (typically more clayey substratum).

Further research is required to identify and map key habitat key to the stabilisation of SHD numbers across the southwest GVD.

Triodia of varying sizes have been found at all SHD sites and comprise 10-70% of groundcover. SHD appear to prefer large hummocks as nest sites. Post-fire age of spinifex potentially plays an important role in preferred habitat for the SHD due to its influence on the extent of ground cover and *Triodia* structure.

Too frequent fires result in hummocks that are too small, and too infrequent fires result in hummocks that provide inadequate cover from predators (DEW 2019). In WA, SHD captures have predominantly occurred in habitat that was 17-26 years post-fire with an optimum age structure recommended of 10-30 years (Gaikhorst and Lambert 2014).

Another study found important habitat characteristics were numbers of logs, average height of *Triodia* hummocks and complexity of vegetation (Moseby *et al*. 2016). Moseby *et al.* (2016) found that SHD tended to populate habitats which were ≥10 years post-fire and *Triodia* had at least 10% coverage and a minimum height of 330 mm. Moseby *et al*. (2016) recommended that fire be used as a management tool for the maintenance of SHD habitat where *Triodia* cover declines below 10% rather than using 'post fire age' as an independent indicator.

5.4.2.5 Diet

As an insectivore, the SHD feeds on invertebrates such as ants, beetles, termites, spiders, centipedes, grasshoppers, and wasps (DEW 2019, Riley and Turpin 2019). Additionally, the SHD has been observed to be opportunistic as small reptile bones and vegetable material have been recorded in scat (DEW 2019). The SHD does not need to drink water as it is obtained from their diet (DPAW 2016). The variety of species suitable as feeding for the SHD suggests that diet is unlikely to play a significant role in their distribution (Churchill 2001).

The foraging behaviour of the SHD is influenced by temperature (DEW 2019) and also lunar phases (Read *et al*. 2015). The species is known to emerge from their nest within minutes of sunset and participate in more foraging in the early evening and less foraging on colder nights (DEW 2019). The SHD has been found to travel further on darker nights and may be impacted by the moon cycle and cloud cover (DPAW 2016).

5.4.3 Potential threats to the Sandhill Dunnart's survival

Despite the limited research on SHDs, their home range and isolated populations make them susceptible to a number of threats. In addition, the SHD lies within the Critical Weight Range (35 500 g) which encompasses the Australian mammals which have seen the highest rate of decline and extinction (Johnson and Isaac 2009). Changes to fire regimes are thought to be the greatest threat to the species but they are also threatened by feral animals, introduced herbivores, and loss of habitat.

5.4.3.1 Fire

A change in fire regimes is considered a significant threat to SHDs (DEW 2019). In the past, traditional Aboriginal fire management produced diverse vegetation mosaics of varying ages. Such practices encouraged new vegetation, increased structural diversity, increasing food availability in unburnt areas (DEW 2019). The threat of changing fire regimes is of particular importance in the western part of the GVD, where one wildfire event has the potential to destroy large amounts of SHD habitat or an entire subpopulation of SHD (DEW 2019). Fires also cause habitat fragmentation which further threatens the survival of the SHD.

Studies in north-eastern GVD have shown the fire patterns to be changing. Aerial imagery from 1960-61 compared to imagery between 2000-2016 showed difference in mean size of fire of 11.2 ha and 3,699 ha respectively (DBCA 2018). The low level of fire management in that section GVD influences the pattern of large, hot bushfires that threaten biodiversity and potentially the continued survival of the SHD (DBCA 2018).

Given the lack of occupancy of the Yellow Sand Plain community by Aboriginal People since the 1920s (Warranup, 2015), this variable is deemed to be of less recent relevance to the SHD population in the southwest GVD.

5.4.3.2 Feral animals (predation)

Predation from feral cats and foxes is listed as a Key Threatening Processes under the EPBC Act, recognised for their major role in the decline in many native species (DEW 2019), with SHD ranked fifth highest of all Australian mammals threatened by cat predation (Woolley *et al*., 2019), with

predation efficacy known to increase in open habitats, such as those that persist in the YSP after extensive bushfires. There is little data on the impacts of cats and foxes on the SHD. Extinction risk is heightened as the species are ground dwelling, periods of low-rainfall areas result in sparse vegetation which limits cover from predation by cats and foxes.

In the GVD, the number of foxes is low, and particularly so in the Yellow Sand Plain community, but cats are present in moderate numbers (DPAW 2016). Data from other populations suggests the SHD can persist in areas with high predator numbers, but this could be the result of an ideal habitat abundant in foraging resources and habitat cover (DPAW 2016). Further research is needed in the GVD to understand the impact of predators to SHD.

5.4.3.3 Introduced herbivores

Introduced herbivores such as cattle, goats, sheep, rabbits, and camels indirectly present a potential threat to the survival of SHD as a result of the following impacts:

- Damage to spinifex hummocks
- Removal of biomass altering fire regimes
- Reducing flora diversity
- Soil disturbance and compaction (DEW 2019).

In the GVD, feral camels are the largest threat to the SHD. Surveys undertaken in the eastern part of the GVD found high densities of camels and evidence of camel population growth (DPAW 2016b). Research shows that feral camel populations are highly influenced by water availability, with numbers growing significantly after periods of high rainfall (DPAW 2016b). Though feral camels generally avoid grazing on spinifex, they can broadly impact vegetation and habitat decreasing the abundance of invertebrates which is the SHDs main food source, consequently impacting species survival.

5.4.3.4 Loss of habitat

The SHDs range has been reduced due to clearance for agriculture and mining activities. Additionally, remaining areas of preferred habitat are highly fragmented. The fragmentation of habitat makes SHD populations vulnerable to extreme weather events and makes it difficult to recolonise suitable areas (DEW 2019).

In the GVD, loss of SHD preferred habitat is identified as a key threat and is associated with mining and exploration activities (DPAW 2016b). The direct act of exploration and clearing can flatten nests and habitat (DEW 2019). In addition, mining activities have the potential to spread weeds, and increase predator and introduced herbivore activity (DPAW 2016b).

5.4.3.5 Climate change and cumulative impacts

Effects of climate change in the GVD, and subsequent potential impact to SHD, are difficult to measure due to lack of data, but available studies suggest a number of cumulative impacts, including:

- Alteration to the life cycle of plants and habitat structure: Fragmentation of SHD habitat, loss of preferred habitat and changes in habitat structure can impact the survival of SHD due to the high mobility of the species and the requirement for protection from habitat
- Changes in rainfall: Native fauna in the Australian arid and semiarid zones are uniquely adapted to the current climatic conditions, often occurring in naturally low densities and increasing significantly in numbers following major rainfall events (McLean *et al*. 2019). Increased rainfall increases foliage subsequently providing more food for introduced herbivores such as camels. Camels indirectly threaten SHD through grazing on spinifex and

reducing the abundance of invertebrates which are SHD primary food source (GVD Biodiversity Trust 2017)

- Fire risk: Rainfall has increased in the GVD in recent decades (ca. +2.5 mm/a per decade since 1970), which combined with higher CO_2 atmospheric concentrations leads to higher fuel loads, increasing the risk of fire. It appears that the frequency and intensity of fires is increasing due to the elevated fuel loads (DEW 2019). More frequent fires increase SHD predation as protection from foliage cover is reduced
- Extreme weather events: Recolonisation of suitable habitat is impacted by extreme weather events (McLean 2019).

5.4.4 Previous surveys

Several surveys have been conducted within the vicinity of the Defined Area. Historic surveys used a combination of Elliot and Pitfall traps whereas more recent surveys have used cameras traps, a summary of the surveys is shown in Table 4, surveys within the Mulga Rock area are highlighted in dark blue and surveys specific to the project in light blue. The first SHD was discovered in 1985 during baseline impact studies.

Table 4 Summary of Survey Work within the Vicinity of the Defined Area (Vimy Resources 2015, updated)

Year	Location	Trap efficiency			
		No. Elliot	No. Pitfall	No. Cam (Trap nights)	SHD capture
1975	Queen Victoria Spring Nature Reserve	No Record	No Record	-	0
1985	Mulga Rock – Shogun, Emperor and Ambassador	1,520	1,520 (Est)	-	5
1987-1989	Northern Boundary of Queen Victoria Spring Nature Reserve	2,700	7,400	-	6
1990-1998	North of Queen Victoria Spring Nature Reserve	No record	No record	-	12
1999	Queen Victoria Spring Nature Reserve	390	0	-	0
1999	Mulga Rock – Shogun – Emperor	714	204	-	0
2000	25 km NNE of Queen Victoria Spring	No record	No record	-	1
2000-2008	Pinjin, West MR, East MR – Rason Rd, Plumridge Nature Reserve	9,957 (480 in Mulga Rock area)	5,427 (680 in Mulga Rock area)	-	17 (2 in Mulga Rock area)
2007	Tropicana Gold Mine Operations Area – Pinjin Infrastructure Targeted Survey #2	640	320	-	0
2008	Tropicana Gold Mine Operations Area – Pinjin Infrastructure Targeted Survey #1	1,100	939	-	0
2009	Tropicana Gold Mine Operations Area – Pinjin Infrastructure Targeted Survey #2	2,600	910	-	0

Year	Location	Trap efficiency			
		No. Elliot	No. Pitfall	No. Cam (Trap nights)	SHD capture
2009	Mulga Rock Project Area Targeted Survey #1	1,336	710	-	0
2010	Tropicana Group 2/3 Exploration Area – East of Mulga Rock SHD Habitat Assessment	Field survey	Field survey	-	-
2014	Sunrise Dam -Tropicana Gas Pipeline Corridor	1,680	693	-	4
2012-2014	Vimy Mulga Rock – Pilot Camera Trapping	-	-	9 (5,163)	0
2014-2015	Vimy Mulga Rock – Targeted Camera Trapping	-	-	30 (10,795)	7
2015-2016	Vimy Rock - Regional	-	-	34 (5,057)	94
2017-2019	Vimy – Regional (Post PER)	-	-	15 (8,188)	> 20 (Analysis ongoing)
2021-Today	Vimy Mulga Rock – Defined Area	-	-	50 (5,864)	Analysis pending

Overall survey effort in Western Australia averages one SHD capture per 1,103 trap nights, suggesting the species is difficult to trap, in low abundance and exhibit patchy distribution or seasonal fluctuations in response to wildfires or other influences (Vimy Resources 2015).

5.4.4.1 Vimy's Survey Work

Vimy has undertaken monitoring within the project boundary (Figure 1) using both conventional methods and developing camera trapping. Camera trapping with the purpose of identifying taxa and determining the presence/absence of SHDs occurred from October 2012 to June 2016 (Vimy Resources 2015).

Camera trapping was conducted in association with the MRP at 15 sites over 840 trap nights from 10/10/2014 to 8/11/2014. No SHD were detected. A bushfire burnt the area in November 2014, including all the camera trap locations.

A second phase of camera trapping was conducted, at the same 15 sites as previously used, between November 2014 and September 2015. Four SHDs were detected at two sites; one site had been burnt and the other was unburnt and described as a 'post-fire refugia'.

In November 2015 a regional project commenced across 23 sites (46 cameras) placed in areas identified as prime SHD habitat and where the species had been previously recorded, this project recorded 60 SHD events, event meaning a SHD was detected on 60 days (only one sighting per day counts). Data was collected using Reconyx 550 Hyperfire white flash cameras from November 2015 to June 2016. Data from two of the fifteen sites in the MRP operational area were also collected during this period. The Vimy Camera Trap Protocol (2015) was submitted to DPaW for comment and to the Office of the Environmental Protection Authority (OEPA) as part of the Mulga Rock Project Public Environmental Review documentation.

Although the monitoring areas targeted by Vimy were outside of the Defined Area, these monitoring efforts have developed and refined a survey/sampling methodology which will be employed for this Conservation Plan, outlined further in Section 15.

5.4.5 Current conservation actions

The draft Sandhill Dunnart Recovery Plan outlines a number of conservation actions underway (DEW 2019). A summary of the conservation actions is shown in Table 5.

Table 5 Summary of Ongoing SHD Conservation Actions

Conservation action	Summary of activities
Surveys and monitoring	Several surveys and monitoring work have been conducted in the GVD, the work is being used to develop standardised survey methods and long-term monitoring protocols.
Recovery team	Established in 2010 with members from a various conservation, research and industry groups. More recently, activities have been more State-based with focus on the Great Victoria Desert in WA; and the Yellabinna and Middleback dunefields areas.
National Recovery Plan and review	A draft recovery plan was prepared by the South Australian Department of the Environment in 2001 and was reviewed in 2007.
Sandhill Dunnart Project	The Alinytjara Wilurara Natural Resource Management Board has been working with communities across the region to implement the draft Sandhill Dunnart Recovery Plan. This has included undertaking Sandhill Dunnart surveys in the Maralinga Tjarutja Lands and training in sand-plot tracking through the Oak Valley Land Management Engagement program.
Captive breeding research	In 2005, five Sandhill Dunnarts (3 males and 2 females) were collected from the Great Victoria Desert in Western Australia and transferred to Perth Zoo for captive breeding research. A total of six litters were produced over three seasons, with 41 animals bred. Research was published on their oestrus cycle, gestation period, and the growth and development of their young and a Husbandry Manual was also produced.
The Great Victoria Desert Biodiversity Trust	The Great Victoria Desert Biodiversity Trust (GVDBT) was established in 2014 as an independent not-for-profit entity as part of the approval process for the Tropicana Gold Mine. The GVDBT aims to establish a bioregional plan (for 2 GVD sub-regions in WA), undertake priority research and management (including research on the Sandhill Dunnart), and facilitate the involvement of Traditional Owners.
Habitat protection – Fire Management	in WA, land managers have developed Guiding Principles or fire management in the region which includes areas of Sandhill Dunnart Habitat. The principles recognise that prescribed burns which create mosaics of post-fire vegetation growth stages, including long unburnt vegetation, will benefit biodiversity and buffer against large wildfires.
Habitat protection – formal	70,000 km (about one fifth) of the Great Victoria Desert is in conservation parks and reserves.

6. RISK ASSESSMENT

A risk assessment has been undertaken to identify and manage the potential risks of failing to achieve the Conservation Plan performance indicators. The risk assessment adopts likelihood and consequence criteria in Table 6 and Table 7 respectively, and a risk matrix is presented in Table 8. Table 9 presents the risk assessment results, incorporating management objectives, triggers and corrective actions for each identified risk.

Table 6 Likelihood Criteria

Likelihood	Criteria
Highly likely	Is expected to occur during the conservation period
Likely	Will probably occur during the conservation period
Possible	Might occur during the conservation period
Unlikely	Could occur during the conservation period but considered unlikely or doubtful
Rare	May occur in exceptional circumstances

Table 7 Consequence Criteria

Likelihood	Criteria
Minor	Minor risk of failure to achieve the Plan's objectives. Results in short term delays to achieving Plan objectives, implementing low coast, well characterized corrective actions
Moderate	Moderate risk of failure to achieve the Plan's objectives. Results in short term delays to achieving Plan objectives, implementing well characterized, high cost/effort corrective actions
High	High risk of failure to achieve the Plan's objectives, implementing uncertain, high cost/effort corrective actions
Major	The Plan's objectives are unlikely to be achieved, with significant legislative, technical, ecological and/or administrative barriers to attainment that have no evidenced mitigation strategies
Critical	The Plan's objectives are unable to be achieved. With no evidenced mitigation strategies.

Table 8 Risk Rating Matrix

Likelihood	Consequence				
	Minor	Moderate	High	Major	Critical
Highly likely	**Medium**	**High**	**High**	**Severe**	**Severe**
Likely	**Low**	**Medium**	**High**	**High**	**Severe**
Possible	**Low**	**Medium**	**Medium**	**High**	**Severe**
Unlikely	**Low**	**Low**	**Medium**	**High**	**High**
Rare	**Low**	**Low**	**Low**	**Medium**	**High**

Table 9 Risk Assessment and Management

Conservation objective/desired outcome	Event or circumstance	Relevant management actions/measures	Responsibility for implementation	Residual risk			Trigger detection	Monitoring activity	Feasible/effective corrective actions
				Likelihood	Consequence	Risk Rating			
To understand the threat to the SHD posed by feral animals within the Defined Area	Stochastic event (e.g., wildfire, severe weather) prevents monitoring activities from occurring or damages the Defined Area	Move monitoring quadrats to alternate locations within the Defined Area.	Vimy / sub-consultant	Unlikely	Moderate	**Low**	Extensive fire damage within the Defined Area	Review damage and suitability of existing assets to continue the monitoring program	Relocation of monitoring quadrats within the Defined Area
	No SHDs found within the Defined Area	Extension of Defined Area baseline monitoring time period	Vimy / sub-consultant	Possible	Moderate	**Medium**	No SHDs found within 12 months from commencement of monitoring	Review SHD monitoring data	Review and adapt Monitoring Plan (GHD 2021)
		Move monitoring quadrats to alternate locations within the Defined Area	Vimy / sub-consultant						
To reduce the threat of feral animals to the SHD within the Defined Area	Increase in feral animals within the Defined Area	Determination of the estimated baseline population of SHD and feral animals within the Defined Area	Vimy / sub-consultant	Likely	High	**High**	Three consecutive departures (standard deviation) of cat numbers over the Defined Area estimated baseline level (seasonally adjusted)	Review success of Felixer hits	Review the location/layout of the Felixers and relocate if required
		Installation of Felixers within the Defined Area and bi-monthly or quarterly monitoring of data	Vimy / sub-consultant						
	New feral animal species becomes prevalent in the Defined Area which poses a threat to the SHD	Determination of the estimated baseline population of SHD and feral animals within the Defined Area	Vimy / sub-consultant	Unlikely	High	**Medium**	Three consecutive departures (standard deviation) of fox numbers over the Defined Area estimated baseline level (seasonally adjusted)	Monitoring of camera trapping data	Deploy 1080 baits to areas of known fox activity within the Defined Area
		Feral animal control measures taken (i.e. baiting) within the Defined Area	Vimy / sub-consultant				Three consecutive departures (standard deviation) of rabbit numbers over the Defined Area estimated baseline level (seasonally adjusted)	Monitoring of camera trapping data	Locate warrens within the Defined Area and deploy 1080 baits
	Insufficient funding of Defined Area feral animal management	Regular budget reviews	Vimy / sub-consultant	Unlikely	High	**Medium**	Decline in feral animal management practices within the Defined Area when feral animal numbers are not within or below the estimated baseline	Monitoring of feral management actions	Emergency fund GVD trust
To expand the knowledge of the distribution and status of the SHD within the Defined Area	Limited baseline data on SHD populations and feral animals within the Defined Area is extrapolated	Continued monitoring program within the Defined Area	Vimy / sub-consultant	Possible	High	**Medium**	No SHDs or feral animals identified within the Defined Area	Review SHD monitoring data	Review and adapt Monitoring Plan (GHD 2021)
		Move monitoring quadrats to alternate locations within the Defined Area							
		Monitor invasive weed presence in Defined Area							

7. RESIDUAL SIGNIFICANT IMPACT AND OFFSET OBLIGATIONS

Under Ministerial Statement 1046 Condition 8-1(2) Vimy is not permitted to clear more than 3,474 ha of vegetation community E3 and 200 ha of vegetation community S6 within the project development envelope. The extent of these communities within the MRP was mapped by Mattiske (2015) which found 10,407 ha of E3 and 964 ha of S6. Clearing associated with MRP accounts for up to 13.41% (1,395 ha) and 7.36% (70.98 ha) of these vegetation communities respectively.

The direct and indirect impacts of proposed disturbance for the MRP is shown in Table 10.

The backfilled and revegetated inpit-tailings facilities (maximum of 172 ha, of which ~40% might represent prime SHD habitat) are likely to be the only long-term (100-year timeframe) residual impact affecting the viability of SHD occupancy, due to the prevalence of salt-tolerant chenopod-dominated vegetation communities, in artificial depressions in the landscape (akin to kopaï lakes present throughout the region, Mattiske Consulting 2015).

Table 10 SHD Habitat within the Development Envelope as mapped by Mattiske (2015)

Vegetation Community	Description	Total Mapped Area (ha)	Area Mapped within Development Envelope (ha) (Direct + Indirect Impacts)	Proportion of Mapped Community within Development Envelope (%) (Direct + Indirect Impacts)	Area Mapped within Disturbance Footprint (ha) (Direct Impacts)	Proportion of Mapped Community within Disturbance Footprint (%) (Direct Impacts)	Proportion of Disturbance Footprint (%) (Direct Impacts)
E3	Low open woodland of *Eucalyptus gongylocarpa* over *Eucalyptus youngiana*, *Eucalyptus ceratocorys*, *Grevillea juncifolia*, *Hakea francisiana* and *Callitris preissii* over *Acacia helmsiana*, *Cryptandra distigma* and mixed low shrubs over *Triodia desertorum*, *Chrysitrix distigmatosa* and *Lepidobolus deserti*. This community occurs on yellow and yellow-orange sands on flats, slopes and between dunes. It resembles Pre European Vegetation Association 84 and is therefore widespread throughout this region. Eleven Priority flora species recorded.	10407.01	3,315.72	31.86	1,395.93	13.41	36.86
S6	Low shrubland of *Thryptomene biseriata*, *Allocasuarina spinosissima*, *Allocasuarina acutivalvis* subsp. *acutivalvis*, *Jacksonia arida*, *Calothamnus gilesii*, *Acacia fragilis*, *Conospermum toddii* (P4), *Pityrodia lepidota*, *Lomandra leucocephala*, *Anthotroche pannosa* and mixed low shrubs over *Triodia desertorum* with *Lepidobolus deserti* with emergent *Eucalyptus gongylocarpa*, *Eucalyptus youngiana*, *Eucalyptus ceratocorys* and *Eucalyptus mannensis* subsp. *mannensis*. This community occurs on yellow sand dunes. Vegetation community S6 has affinities with the broadly defined “Yellow sand Plain Communities of the Great Victoria Desert” Priority 3 (ii) ecological community. Eight Priority species recorded.	964.92	199.49	20.67	70.98	7.36	1.87

8. APPLICATION OF THE EPBC OFFSET POLICY

Environmental offsets are conservation actions that provide environmental benefits intended to counterbalance the significant residual environmental impacts associated with a proposal (GoWA 2011). The Plan has been prepared in accordance with the WA Government's Environmental Offset Policy (GoWA 2011). Implementation of the Plan intends to counterbalance the impact of the project to SHD by reducing the threat to the SHD posed by feral animals within the Defined Area.

Mitigation of impacts to the SHD have been assessed through a hierarchy of avoid, minimise, reduce and rehabilitation of SHD habitat. This hierarchy is achieved primarily through changes in scope and design to avoid and minimise impacts; development and implementation of management plans in order to mitigate and manage environmental impacts during construction and operation and finally, implementation of this Plan.

9. PROPOSED DEFINED AREA

The Defined Area has been identified by Vimy and is located outside the MRP development envelope but within the project boundary. The Defined Area is 6,000 ha and is located within the SHD known distribution.

(a) Climate

The Defined Area is located in the GVD, an area which experiences hot summers and cool-mild winters. Temperatures range from an average of 4-14°C in July to 17-37°C in January. Rainfall is not variable in the area, with approximately 20-40 mm/month in the summer months between November – March and 10-30 mm/month in winter months between April – October. The region exists in a water deficit condition throughout the year.

(b) Geology and Soils

The Defined Area is located within the Northern Foreland metagranitic unit. The soil system is the Southern Great Victorian Desert Zone (124), characterised by sandplains and dunes (with some gravelly plains and calcrete plains) on sedimentary rocks of the Officer Basin and the southern extent of the Canning Basin with Red deep sands and Red sandy earths with some Red loamy earths (GoWA 2021).

(c) Vegetation

Broad scale (1:250,000) pre-European vegetation mapping of the area indicates that the Defined Area occurs within vegetation association 84; Tree and shrub steppe hummock grassland with scattered eucalypts over wattle scrub or mallee *Triodia spp*. *Acacis spp Corymbia dichromophloia, Eucalyptus leucophloia*, *E. youngiana* (Beard 1975; GoWA 2021). No Threatened Ecological Communities (TECs) are known to occur in or near to the MRP and Defined Area. One Priority Ecological Community (Priority 3(iii)) is likely to occur in the area, described as the 'Yellow Sand Plain Communities of the Great Victoria Desert' containing very diverse mammalian and reptile fauna, with distinct plant communities (GoWA 2021).

(d) Tenure

The Defined Area is vested as unallocated Crown land (type V 3) upon which there is an overlaying mining tenement. The mining tenement (L 3900193) is active and assigned to Narnoo Mining Pty Ltd – a 100% subsidiary of Vimy, valid until October 2030 and can be extended by another 21 years.

(e) Connectivity

There are no nature reserves that connect to the Defined Area. The closest Conservation Reserves are the Queen Victoria Spring Nature Reserve and the Plumridge Nature Reserve.

(f) Size and location

The Defined Area is 6,000 ha in size, located to the east of the MRP.

(g) Suitability as Sandhill Dunnart Habitat

The Defined Area is comprised of vegetation association 84 which includes *Triodia spp*, a key habitat type for Sandhill Dunnarts. Based on the known habitat types the CA has been assessed as suitable. Additionally, the site has been selected as it is close to nearby trapping sites.

10. LONG-TERM MANAGEMENT ARRANGEMENTS FOR THE DEFINED AREA

The Defined Area will be managed for the life of the EPBC Approval (until 2041), upon closure of the MRP and licence relinquishment sign-off by the relevant regulator.

A Conservation Land Management Plan will be put in place, which will include:

- Maintenance of access tracks
- Review of the condition of the land
- Measures to limit car strikes
- Staff communication on the location and purpose of the conservation.

11. CONSERVATION OUTCOMES AND PERFORMANCE INDICATORS

The conservation outcomes developed for the Defined Area and the accompanying performance indicators are summarised in Table 11.

Table 11 Conservation Outcomes Implementation Schedule

Conservation objective/outcome	Performance target	Management measure/s	Where	When	Related monitoring activity
To understand the threat to the SHD posed by feral animals within the Defined Area	Agreement of monitoring methodology with the regulator	Use developed methodology for monitoring quadrats established within the Defined Area	Within the Defined Area	November 2021 – November 2023 (commenced)	Monitoring Plan (GHD 2021), refer to Section 15
	Develop an estimated baseline of the SHD population within the Defined Area	Installation of 25 monitoring quadrats (2 cameras per site) within the Defined Area	Within the Defined Area		Monitoring data collected and analysed and incorporated into the Monitoring Plan (GHD 2021)
	Develop an estimated baseline of feral animal population within the Defined Area	Installation of 25 monitoring quadrats (2 cameras per site) within the Defined Area			
To control the threat of feral animals within the Defined Area	Reduction of feral animal numbers below estimated baseline within the Defined Area	Install 2x Felixer within the Defined Area	Within the Defined Area	Q1 2024	Record of Felixer installation and locations (incorporated within the Monitoring Plan (GHD 2021))
					Review of Felixer data (data incorporated within the Monitoring Plan (GHD 2021))
		If foxes are sighted through camera trapping, deploy targeted baiting program (1080)	Known fox active areas within the Defined Area	If sighted in baseline monitoring period deploy Q1 2024	Records of baiting activities (quantities/locations) if detected within the CA (incorporated into the Monitoring Plan)
		If rabbits are sighted through camera trapping, deploy targeted baiting program (1080)	Warrens within the Defined Area	If sighted in baseline monitoring period deploy Q1 2024	
		If camels, donkeys, goats, cattle or sheep are sighted through camera trapping investigate aerial shooting with ranger programs in collaboration with the Great Victoria Desert Biodiversity Trust (GVDBT)	Within the Defined Area	If sighted and population reside in the area	Records of sightings and aerial shoot success
To expand the knowledge of the distribution and status of the SHD within the Defined Area	Develop an estimated baseline of the SHD population within the Defined Area	Installation of 25 monitoring quadrats (2 cameras per site) within the Defined Area	Within the Defined Area	November 2021 – November 2023 (commenced)	Monitoring of efficacy of data collection techniques
	Finalise Monitoring Plan	Installation of 25 monitoring quadrats (2 cameras per site) within the Defined Area		By May 2024	
		Provide Defined Area SHD population data to relevant government bodies			
	Explore and research alternative monitoring techniques where available	Explore and research alternative monitoring techniques where available	Desktop searches for actions viable within the Defined Area	By May 2024	To compliment the Monitoring Plan (GHD 2021)

12. MANAGEMENT MEASURES

Feral animal management measures, to be implemented within the Defined Area for each objective, are listed in Table 11 and summarised as follows:

- Installation of 30 monitoring quadrats within the Defined Area
- Assessment of data from the 30 monitoring quadrats
- Installation of 2 x Felixer within the Defined Area
- Deployment of 1080 targeted baiting program (if necessary) within the Defined Area
- Engage local rangers in collaboration with GVBT to undertake aerial shooting
- Develop and utilise monitoring methodology (Monitoring Plan)
- Dissemination of monitoring data and methodology to relevant stakeholders.

Feral animal species which pose a threat to the SHD and their presence captured to date within the Defined Area are shown in Table 12

Table 12 Summary Threat Abatement, Control and Monitoring Activities of Feral Animal Species

Feral Animal Species	Threat to SHD	Control Measures	Monitoring Activity	Threat Abatement Plan	Sighted in the Defined Area 2021-2022
Cat (*Felis catus*)	Direct predation. See Section 5.3.4.2	Felixer 1080 Poison Program (Further information provided in Section 12.1).	Recording and review of Felixer 1080 baiting activity	Threat abatement plan for predation by feral cats	
Dog (*Canis lupus* subsp. *familiaris*)	Direct predation. See Section 5.3.4.2	Felixer 1080 Poison Program (Further information provided in Section 12.1).	Recording and review of Felixer installation and locations	National Wild Dog Action Plan 2020 - 2030	None sighted to date within the Defined Area
One-humped Camel (*Camelus dromedarius*)	Habitat degradation. See Section 5.3.4.3	Introduced pest control program – shooting	Recording	National Feral Camel Action Plan: A national strategy for the management of feral camels in Australia	

Donkey (*Equus asinus*)	Habitat degradation. See Section 5.3.4.3	Introduced pest control program – shooting	Recording	Not available.	None sighted to date within the Defined Area
House Mouse (*Mus musculus domesticus*)	Habitat degradation. See Section 5.3.4.3	Introduced pest control program - baiting	Recording	Not available.	One sighted, no image available.
Rabbit (*Oryctolagus cuniculus*) (Feral)	Habitat degradation. See Section 5.3.4.3	Felixer 1080 Poison Program (Further information provided in Section 12.1).	Recording and review of Felixer 1080 baiting activity	Threat abatement plan for competition and land degradation by rabbits	
Common (Indian) Myna Bird (*Acridotheres tristis*)	Habitat degradation. See Section 5.3.4.3	Introduced pest control program - baiting	Recording	Not available.	
Red Fox (*Vulpes vulpes*)	Direct predation. See Section 5.3.4.2	Felixer 1080 Poison Program (Further information provided in Section 12.1).	Recording and review of Felixer 1080 baiting activity	Threat Abatement Plan for predation by the European Red Fox	
Cattle	Habitat degradation. See Section 5.3.4.3	Introduced pest control program – shooting	Recording	Not available.	None sighted to date within the Defined Area

Goats	Habitat degradation. See Section 5.3.4.3	Introduced pest control program – shooting	Recording	Threat Abatement Plan for competition and land degradation by unmanaged goats	None sighted to date within the Defined Area
Sheep	Habitat degradation. See Section 5.3.4.3	Introduced pest control program – shooting	Recording	Not available.	None sighted to date within the Defined Area

Felixers, developed by Thylation, use rangefinder sensors to distinguish target cats and foxes from non-target wildlife and humans, and spray targets with a measured dose of toxic 1080 gel (Thylation 2021). The solar-powered Felixer which can hold 20 sealed cartridges of toxic 1080 gel, resets automatically after firing. Felixers photograph all animals detected (including non-targets that are not fired upon) and can be programmed to play a variety of audio lures to attract feral cats and foxes. A choice of software settings controls the sensitivity and likelihood of firing on target cats and foxes.

Deployment of 1080 poison baiting remains the best method for pest animal control as it is the only poison to which Australian native wildlife have some tolerance. The baiting program will be used in a way that minimises the opportunity for native wildlife to encounter the bait or eat it. The 1080 program, if necessary, will be developed in consultation with an established ecologist/zoologist and will be targeted around known rabbit, cat and fox frequented areas (e.g. rabbit warrens, fox dens).

The above management measures aim to protect and enhance SHD habitat and populations. Table 11 provides timeframes for implementation of each management measure. Each management measure is described sufficiently to minimise ambiguity and is related to performance objectives.

Historic and current monitoring methodology (described in Sections 5.3.4 and 15.1) have guided the feral animal management measures. Historic and current monitoring methodology are derived from recognised principles, practices and guidelines and justified technically and scientifically.

12.1 1080 Poison Program

Deployment of 1080 poison baiting remains the best method for pest animal control as it is the only poison to which Australian native wildlife have some tolerance. The baiting program will be used in a way that minimises the opportunity for native wildlife to encounter the bait or eat it. The 1080 program, if necessary, will be developed in consultation with an established ecologist / zoologist and will be targeted around known rabbit and fox frequented areas (e.g. rabbit warrens, fox dens).

The 1080 poison program will adhere to the guidelines set out in the Department of Health's *Code of Practice for the Safe Use and Management of Registered Pesticides containing 1080, PAPP and Strychnine* (DoH 2018).

Method

The baiting program will comprise the installation of threat abatement devices, including the Felixer trap and feral animal baiting. Felixers use rangefinder sensors to distinguish target cats and foxes from non-target wildlife and humans, and spray targets with a measured dose of toxic 1080 gel. This is important since occupancy modelling on feral cat populations from conventional baiting show only modest effects using a high intensity baiting protocol (~10 baits/km^2, Doherty *et al.* 2021).

Scale

Control of fox and rabbit species will be most effective over a large area. This will reduce the potential of re-infestation and subsequently the best result for native wildlife and SHD populations (GoA 2019).

When

To reduce the impact of predator species on native wildlife, regular, frequent and on-going control is required. The most successful season for the baiting program is expected to be during spring, as predator species will be less mobile and in high demand for food during their rearing season. Additionally, during mid-January to April, fox cubs are dispersing, which will increase their movements across the landscape. Further control will also be required to remove invading foxes throughout the year (GoA 2019).

Frequency

The Department of Biodiversity, Conservation and Attractions' Western Shield program baits four times per year. Frequency should therefore be established, using the Western Shield program as a guide (GoA 2019).

Secondary baiting

In areas where foxes and rabbits are both present, it is recommended that 1080 baiting first be directed towards rabbit populations. Once poisoned, foxes that feed on rabbits that have been killed by 1080 will often be poisoned (GoA 2019).

13. CONTINGENCY RESPONSES AND CORRECTIVE ACTIONS

Contingency responses and corrective actions may arise as management measures listed in Table 9 are implemented and triggers detected. The current contingency responses and corrective actions for the Defined Area are:

- Relocation of monitoring quadrats within the Defined Area
- Extension of Defined Area baseline monitoring time period
- Review and adaptation of the Monitoring Plan
- Review of the location/layout of the Felixers
- Deployment of 1080 baits to known fox active areas in the Defined Area
- Deployment of 1080 baits to rabbit warrens within the Defined Area.

Corrective actions may also arise from audits and management reviews. Corrective actions are to be reviewed and endorsed by Vimy before the action is implemented. Audits will follow to confirm satisfactory completion.

14. MANAGING UNCERTAINTY AND ADAPTIVE IMPLEMENTATION

Managing Uncertainty

The Plan has aimed to manage uncertainty by using reputable data and information sources as its basis. An assessment of the information sources is shown in Table 13.

Table 13 Reputability of Information and Data Sources

Information source	Information used	Limitations/uncertainty	Contribution to risk of Plan failure
Vimy monitoring program (2012 – 2016)	Historic baseline understanding of SHD presence/absence in the surrounding area Understanding of monitoring techniques	Based outside of the Defined Area	Low risk – monitoring program built/improved upon
Vimy camera trapping protocol (2015)	Understanding of camera trapping and monitoring techniques	Based on work outside of Defined Area	Low risk – monitoring protocol was peer reviewed
Sandhill Dunnart Camera Trap Monitoring Motion Camera, Small Mammal Identification and analysis 2017	Historic baseline understanding of SHD presence/absence in the surrounding area	Based outside of the Defined Area	Low risk – monitoring program built/improved upon

Information source	Information used	Limitations/uncertainty	Contribution to risk of Plan failure
Survey and monitoring guidelines for the Sandhill Dunnart in Western Australia 2016	Guidance on the SHD biology and ecology	Based outside of the Defined Area	Low risk – monitoring guidelines developed by Senior Zoologist who is working on current monitoring efforts
Survey and monitoring guidelines for the Sandhill Dunnart in Western Australia 2021	Updated research and guidance into surveying and monitoring the Sandhill Dunnart.	Based outside of the Defined Area	Low risk – monitoring guidelines developed by Senior Zoologist who is working on current monitoring efforts
Great Victoria Desert Adaptive Management Implementation Plan Part A: Strategic Plan Part B: Work Plan	Threats to species across the Great Victoria Desert	Threats are general and not specific to the SHD	Low risk – provides general consideration of threats
Draft National Recovery Plan for the Sandhill Dunnart *(Sminthopsis psammophila)* 2019	Information on threats, species survival, conservation actions and recovery objectives	Recovery Plan is in draft form and may be altered	Low risk – considered plans objectives in this Conservation Plan

Adaptive Implementation

The adaptive implementation of the Plan will involve:

- Review of trapping methodology as additional insight in SHD ecology is gained
- Monitoring of bushfire regime and ground cover and condition using multi-spectral high-resolution drone imagery
- Review of Felixer monthly target strike data, to allow for the movement of Felixers if there is a low number of strikes
- Review of non-target species from Felixers, to allow for the implementation of baiting programs if there is a high number of rabbits and/or foxes
- Review of academic literature and policy statements to ensure current techniques are being used

  Audit to review collection of data for adaptive management triggers.

15. MONITORING

15.1 Monitoring Methodology within the Defined Area

A monitoring methodology to determine SHD baseline populations, has been developed and refined over a number of years.

GHD (2021) has developed a Monitoring Plan, provided in Appendix 1, which describes a systematic method to identify potential locations for remote camera installation to best determine the presence of the SHD and feral animals within the Defined Area.

Monitoring quadrats are to be established in 25 locations within the Defined Area. Each monitoring quadrat is to be approximately 25 m x 25 m. The criteria for site selection (for quadrat locations) include the following parameters:

- The high-resolution drone imagery search area was restricted to the main access track in the Defined Area and extending 300 m each side of the track. Sites to be located within 300 m of established tracks to allow ease of access to sites within the Defined Area.
- Sites to be within long unburnt areas (> 8 years since burn) to allow appropriately sized *Triodia* clumps for the species to persist. *Triodia* life stages are required to be at Stage 2 (youngest) to Stage 5 (oldest), ideally a dominance of Stage 3 and 4 clumps if preferred. From fire scar mapping three fire scar ages are present. The most dominant fire scar is 16 years since last burn (2005) with a small area of long unburnt (30 + years) and recently burnt within 5 years. The recent burn scar has been excluded from location placement. Further refinement of the location selections was undertaken by utilising high resolution drone imagery (to 2 cm resolution) to allow selections of sites within known desirable *Triodia* presences.
- Sites positioned close to or within dune systems or elevated sand plain systems. Additionally, dune swales merging into sandplain or minor clay pan verges are also desirable as they provide larger *Triodia* clumps. Where appropriate and ensuring monitoring locations are not close to each other, approximately half of the locations have been placed within dune systems or elevated sand plain.
- Independence of sites is an important consideration. GHD (GHD 2020) recommends a minimum distance of approximately 2 km between sites due to access and number of study sites to be established. The separation of proposed sites will be approximately 800 m apart.
- Sites should not be placed within vegetation structure not conducive to the *Triodia* hummock grasslands present on the yellow sand plain i.e. Mulga woodlands.
- Site should be placed as close to possible areas where SHD have previously been captured. SHD have been captured as part of Gaikhorst and Lambert (2014) project (site 3 and 5), approximately 800 m south east and 8 km north of the Defined Area respectively. The Defined Area lies between two previous SHD capture areas.

The co-ordinates of the Defined Area monitoring quadrats are provided in Table 14.

Table 14 SHD Monitoring Quadrat Co-Ordinates

Area	Date established	Site	Camera ID	Easting (51)	Northing (51)
Defined Area	2021-11-23 1:28	Site 1	Camera 1A	593040	6691820
Defined Area	2021-11-23 1:28	Site 1	Camera 1B	593043	6691869
Defined Area	2021-11-23 2:52	Site 2	Camera 2A	593262	6691360

Area	Date established	Site	Camera ID	Easting (51)	Northing (51)
Defined Area	2021-11-23 3:31	Site 2	Camera 2B	593216	6691373
Defined Area	2021-11-23 5:05	Site 3	Camera 3A	594186	6690651
Defined Area	2021-11-23 6:25	Site 3	Camera 3B	594237	6690628
Defined Area	2021-11-23 7:01	Site 4	Camera 4A	594519	6689692
Defined Area	2021-11-23 7:01	Site 4	Camera 4B	594559	6689632
Defined Area	2021-11-24 0:26	Site 5	Camera 5A	595641	6689006
Defined Area	2021-11-24 1:53	Site 5	Camera 5B	595625	6689053
Defined Area	2021-11-24 0:26	Site 6	Camera 6A	594925	6689006
Defined Area	2021-11-24 0:26	Site 6	Camera 6B	594856	6689015
Defined Area	2021-11-24 3:07	Site 7	Camera 7A	595714	6688275
Defined Area	2021-11-24 3:07	Site 7	Camera 7B	595672	6688261
Defined Area	2021-11-24 4:57	Site 8	Camera 8A	596271	6688096
Defined Area	2021-11-24 4:57	Site 8	Camera 8B	596308	6688150
Defined Area	2021-11-24 6:19	Site 9	Camera 9A	596599	6687433
Defined Area	2021-11-24 6:19	Site 9	Camera 9B	596527	6687416
Defined Area	2021-11-24 22:19	Site 10	Camera 10A	596849	6686973
Defined Area	2021-11-25 0:40	Site 10	Camera 10B	596776	6686924
Defined Area	2021-11-25 1:29	Site 11	Camera 11A	597646	6685853
Defined Area	2021-11-25 3:37	Site 11	Camera 11b	597585	6685801
Defined Area	2021-11-25 1:29	Site 12	Camera 12A	598067	6686165
Defined Area	2021-11-25 1:29	Site 12	Camera 12B	598014	6686144
Defined Area	2021-11-24 6:19	Site 13	Camera 13A	597016	6687303
Defined Area	2021-11-24 6:19	Site 13	Camera 13B	597062	6687341
Defined Area	2021-11-23 4:33	Site 14	Camera 14A	593929	6690559
Defined Area	2021-11-23 5:05	Site 14	Camera 14B	593879	6690533
Defined Area	2021-11-26 1:12	Site 15	Camera 15A	588312	6684749
Defined Area	2021-11-26 1:12	Site 15	Camera 15B	588374	6684727
Defined Area	2021-11-26 21:51	Site 17	Camera 17A	590431	6687332
Defined Area	2021-11-27 1:04	Site 17	Camera 17B	590347	6687365
Defined Area	2021-11-25 3:37	Site 18	Camera 18A	590101	6686447
Defined Area	2021-11-25 6:21	Site 18	Camera 18B	590035	6686429
Defined Area	2021-11-25 6:53	Site 19	Camera 19A	588636	6686602
Defined Area	2021-11-25 7:28	Site 19	Camera 19B	588686	6686531
Defined Area	2021-11-26 23:20	Site 20	Camera 20A	588394	6686124
Defined Area	2021-11-26 23:20	Site 20	Camera 20B	588320	6686074
Defined Area	2021-11-26 2:45	Site 21	Camera 21A	589690	6688087
Defined Area	2021-11-26 2:45	Site 21	Camera 21B	589621	6687990
Defined Area	2021-11-26 2:45	Site 22	Camera 22A	590155	6688229
Defined Area	2021-11-26 2:45	Site 22	Camera 22B	590168	6688152
Defined Area	2021-11-26 5:51	Site 23	Camera 23A	590756	6687631

Area	Date established	Site	Camera ID	Easting (51)	Northing (51)
Defined Area	2021-11-26 6:19	Site 23	Camera 23B	590800	6687697
Defined Area	2021-11-26 18:45	Site 28	Camera 28A	590125	6689433
Defined Area	2021-11-26 18:45	Site 28	Camera 28B	590161	6689378
Defined Area	2021-11-27 5:13	Site 29	Camera 29A	592754	6691819
Defined Area	2021-11-27 5:45	Site 29	Camera 29B	592774	6691726
Defined Area	2021-11-25 23:35	Site 30	Camera 30A	588822	6687388
Defined Area	2021-11-25 23:35	Site 30	Camera 30B	588869	6687325

The remote camera set up adheres to the following methodology:

- Two camera types are currently used as part of the Mulga Rock Targeted Camera Trapping Program. These include the Bushnell Trophy Cam HD MAX with passive infra-red flash and the Reconyx Hyperfire with white LED flash for colour day/night photo capture at close range
- Cameras are to be set up in a location that is flat or gently sloping with limited vegetation in the field of view to reduce false triggers. However, the location chosen for placement of cameras has to provide a balance between being able to capture images unimpeded and the habitat preference of the species
- Lure stations will be located approximately 1.5–2.0 m from the camera. Any vegetation between the camera and the lure, and either side of the lure is to be cleared or trimmed. Where possible, any objects that may obstruct the camera's field of view will be removed. Lures are required to be anchored via wire rope to prevent stealing by dingos
- Lure station markers have a reference scale placed on them (2 x 1 cm grid pattern) to allow animal size comparisons and identification markings to ensure that any pictures can be easily attributed to a specific site
- Where possible the background (area behind the lure) should be uniform to help reduce temperature differentials between objects (i.e. where possible create the optimal homogenous background temperature)
- Cameras must be fixed to a stake that will not move in the wind, and the unit should face south to avoid direct sunlight on the lens. Camera settings are as follows:
  - to produce five images/trigger
  - rapid fire
  - high sensitivity
  - 24-hour operation
- Two cameras (same model) are to be set up at the same site. Cameras should be set at approximately 30 – 50 m apart from each other to ensure a reasonable area is surveyed and to maintain conformity with quadrat areas utilized in previous successful surveys. A drift fence will be setup between cameras to guide animals into view
- The height of the camera should be set at a height that is specific to the target species of the survey. For SHD's, horizontal cameras are located 20 to 30 cm above the ground.

15.2 Data Collection, Reporting and Handling

15.2.1 Baseline SHD and Feral Predator Populations

The data collection, reporting and handling for the baseline surveys will adhere to the following methodology. Information from each quadrat will be collected and transferred to Data Sheets. The camera's exact location should be recorded as a GPS co-ordinate on the Data Sheet.

Camera images from each of the quadrats will be analysed to determine SHD and feral animal baseline populations within the Defined Area.

The data will be compiled in excel format and organised daily, per month, per species for the duration of each camera deployment. Data will be analysed using excel data analysis tools and MATLAB programming software. Data analysis will include descriptive statistics, accumulation curves and univariate statistical tests including two sample t-tests.

The baseline metrics to be collected are:

- Numbers of SHD observed
- Numbers of feral predators observed
- Numbers of other feral species observed

From which, a baseline population estimate for SHDs, feral predators and other feral species will be generated.

15.2.2 Baseline Habitat Quality

Baseline habitat assessment is undertaken when the camera traps are installed. Habitat quality is assessed and scored against a benchmark, which determines the quality of vegetation within a particular ecosystem to support threatened species and their ecological habitat. The assessment includes the consideration of site condition, site context and species stocking rate. The habitat quality assessment can then be conducted, which categorises each vegetation type against a habitat quality score (DSEWPaC 2012; Table 15 and Table 16).

Table 15 Habitat Quality Assessment

Site condition	Site context	Species stocking rate
a1. What is the structure and condition of the vegetation on the site?	b1. What is the connectivity with other suitable / known habitat or remnants?	c1. What is the presence of the species on the site? (i.e. confirmed / modelled).
a2. What is the diversity of relevant habitat species present (including both endemic and non-endemic)?	b2. What is the importance of the site in relation to the overall species population or the occurrence of the community?	c2. What is the density of species known to utilise the site?

a3. What relevant habitat features are on the site?	b3. What threats occur on or near site?	c3. What is the role of the site population in regard to the overall species population?
$A = (a1 + a2 + a3) \ / 3 \ x \ 0.4$	$B = (b1 + b2 + b3) \ / 3 \ x \ 0.4$	$C = (c1 + c2 + c3) \ / 3 \ x \ 0.2$
Habitat Quality Score = A + B + C		

Table 16 Habitat Quality Assessment Score

Habitat Quality Score	Definition
Poor: 0 - 3	• Site condition - Poor vegetation condition and structure - Low number of ecological requirements (lacks presence of *Triodia* spp. in association with sand dunes, exclusively in vegetation association 84) - Lack of habitat features present (e.g. large hummocks as nest sites) • Site context - Low connectivity to similar suitable habitat types in the landscape - Large number of threats at the site - Low importance of site in relation to overall species population • Species stocking rate - Low density of species at the site - Low value of the site for SHD, including condition and / or context
Moderate: 4 - 5	• Site condition - Low to medium vegetation condition and structure - Low to medium number of ecological requirements (lacks presence of *Triodia* spp. in association with sand dunes, exclusively in vegetation association 84) - Moderate habitat features present (e.g. large hummocks as nest sites) • Site context - Moderate connectivity to similar suitable habitat types in the landscape - Medium number of threats at the site

	- Moderate importance of site in relation to overall species population • Species stocking rate - Medium density of species at the site - Medium value of the site for SHD, including condition and / or context
Good: 6 - 8	• Site condition - High vegetation condition and structure - High number of ecological requirements (lacks presence of *Triodia* spp. in association with sand dunes, exclusively in vegetation association 84) - Good number of habitat features present (e.g. large hummocks as nest sites) • Site context - Good connectivity to similar suitable habitat types in the landscape - Low number of threats at the site - High importance of site in relation to overall species population • Species stocking rate - High density of species at the site - High value of the site for SHD, including condition and / or context
Excellent: 9 - 10	• Site condition - Excellent vegetation condition and structure - Excellent ecological requirements present (lacks presence of *Triodia* spp. in association with sand dunes, exclusively in vegetation association 84) - High number of habitat features present (e.g. large hummocks as nest sites) • Site context - Excellent connectivity to similar suitable habitat types in the landscape - Few threats present at the site - High importance of site in relation to overall species population • Species stocking rate - High density of species at the site - High value of the site for SHD, including condition and / or context

15.2.3 Ongoing

Felixers take a photo every time their sensors are triggered, and images are classified as target or non-target. Data capture also includes a log of key attributes such as date, time, the lure played, sensor activation and temperature. The data gathered from the Felixers will be extracted and collected within Data sheets and stored on Teams or equivalent cloud-based storage program. The data will be analysed against the baseline levels set in the initial monitoring period. Any recordings that are a standard deviation away from the baseline will be reported.

15.3 Achieving Conservation Objectives

Monitoring of the management actions towards achieving the conservation objectives is outlined in Table 17.

Table 17 Monitoring Activities

Monitoring activity	Management needs/ questions addressed	Parameter/s measured	Survey/monitoring guidelines	Where	When	Reliability
Establishing baseline monitoring quadrats	Baseline data on the estimated numbers of SHDs and feral animals in the Defined Area	Feral animal numbers SHD numbers	Vimy SHD Trapping Protocol (2015) SHD Camera Trap Monitoring (2017) Survey and monitoring guidelines for the SHD *(Sminthopsis psammophila)* in Western Australia (2020)	Within the Defined Area	November 2021 – November 2023	Baseline monitoring methodology previously developed (Section 5.3.4) and refined for current monitoring methodology (Section 15.1)
Analyse monitoring data	Baseline data on the estimated numbers of SHDs and feral animals in the Defined Area	Feral animal numbers SHD numbers	Vimy SHD Trapping Protocol (2015) SHD Camera Trap Monitoring (2017) Survey and monitoring guidelines for the SHD *(Sminthopsis psammophila)* in Western Australia (2020)	Within the Defined Area	November 2021 – May 2024	Baseline monitoring methodology previously developed (Section 5.3.4) and refined for current monitoring methodology (Section 15.1)
Recording of Felixer installation and locations	Implementation of cat control measures	Locations of 30 monitoring quadrats and dates of installation	GHD Monitoring Plan (2021)	Within the Defined Area	Q1 2024	Felixer has high target specificity and reliability (Moseby *et al* 2020)
Review of Felixer data	Efficacy of cat control	Number of strikes (target) Number photos (target and non-target)	GHD Monitoring Plan (2021)	Within the Defined Area	Q1 2024	Felixer has high target specificity and reliability (Moseby *et al* 2020)
Recording of 1080 baiting activity	Implementation of fox/rabbit control measures when necessary	Quantities of baits and locations placed	GHD Monitoring Plan (2021)	Within the Defined Area	Reactive	Government provided guidance High reliability

16. REPORTING

Data collected from the 30 monitoring quadrats will be collected and consolidated into a Monitoring Report. The Monitoring Report will refer to camera images, habitat within the Defined Area, trapping layout and moon phase information to determine key trends and / or conclusions.

The draft and final Monitoring Report will be submitted as part of the EPBC2013/7083 Condition 6 compliance reporting requirements as follows:

*"Within three (3) months of every twelve (12) month anniversary of the **commencement** of the action, the person taking the action must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of the Plan. Documentary evidence providing proof of the date of publication must be provided to the **Department** at the same time as the compliance report is published. Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval must be provided to the **Department** at the same time as the compliance report is published."*

17. ROLES AND RESPONSIBILITIES

The Vimy Project Director and Vimy Environmental Representative are responsible for complying with this Conservation Plan. Roles and responsibilities of personnel are detailed in Table 18.

Table 18 Conservation Plan Roles and Responsibilities

Role	Conservation Plan Responsibilities
Vimy CEP and Registered Manager	• The overall management and control of the Conservation Plan • Reviewing and approving the Conservation Plan • Assisting with implementation of the Conservation Plan • Assisting with the auditing of the Conservation Plan • Providing the necessary resources to ensure the Conservation Plan is properly implemented • Ensuring all personnel are made aware of Conservation Plan objectives and requirements prior to commencement of works on-site • Taking strategic actions to continuously improve the Conservation Plan • Management, implementation, monitoring and compliance of the Conservation Plan and any approval conditions • Reviewing the Conservation Plan performance and implementation of correction actions
Vimy Environmental Representative	• Reviewing the Conservation Plan • Developing monitoring programs required to achieve the objectives of the Conservation Plan • Being the primary contact point in relation to the Conservation Plan • Assisting with the management and control of the Conservation Plan • Reviewing and approving the Conservation Plan • Managing the implementation of the Conservation Plan • Managing the auditing of the Conservation Plan • Managing the necessary resources to ensure the Conservation Plan is properly implemented • Ensuring all personnel are made aware of Conservation Plan objectives and requirements prior to commencement of works on-site • Taking strategic actions to continuously improve the Conservation Plan • Management, implementation, monitoring and compliance of the Conservation Plan and any approval conditions

Role	Conservation Plan Responsibilities
	• Reviewing the Conservation Plan performance and implementation of correction actions • Acting as main point of contact between the regulatory authorities and the proposal on conservation issues • Providing advice and liaison with the project personnel to ensure that conservation risks are identified and appropriate controls are developed.

18. EMERGENCY CONTACTS AND PROCEDURES

18.1 Emergency Contacts

Vimy Head of Sustainable Development phone number: +61 8 8286 6999

Vimy Environmental Representative email and phone number:

- Vimy Environmental Representative: Niv Reddy, Principal Environment
- Email: niv.reddy@deepyellow.com.au
- Phone: +61 8 8286 6999

18.2 Emergency Procedures

Reviewing the Conservation Plan performance and implementation of management measures to achieve the conservation objectives will be the responsibility of the Vimy Project Director and Vimy Environmental Representative. Contingency responses and corrective actions will be implemented as triggers are recognised. Corrective actions are to be reviewed and endorsed by Vimy before the action is implemented. Audits will follow to confirm satisfactory completion.

19. REVIEW AND AUDIT

19.1 Review Committee

Review of performance will occur at least annually, where monitoring data, activities, incidents and positive findings etc. will be collated and summarised. Summary information will be reviewed and where areas of non-compliance or performance are identified, then appropriate remedial actions should be made. Where amendments are required, they should be incorporated into a new revision of the Plan.

An audit process would involve:

- Establishing an audit frequency
- Assessing if key activities, actions, records and outputs required by the Plan are carried out as specified
- Where failings are identified, develop corrective actions to remedy
- Include audit findings and results in any annual review.

If in the event management actions are shown to be ineffective then Vimy will review and revise the Plan and if necessary implement the following adaptive management procedure:

- Review and revise the risk register
- Review and revise the management measures
- Investigate the potential cause for the trigger
- Implement adaptive management measures.

The SHD Conservation Plan will have a defined schedule for review but will also have triggers for review for unforeseen events, as outlined in Table 19.

Table 19 Review and Audit Schedule for the SHD Conservation Plan

Review event	When
Initial review of SHD Conservation Plan	1 year following DAWE approval of SHD Conservation Plan
Second review of SHD Conservation Plan	3 years following DAWE approval of SHD Conservation Plan
Subsequent reviews	5 yearly intervals
Contingency trigger	After 3 contingency detection triggers
Risk event occurs	Immediate trigger for review
Unintended outcome from a management measure or corrective outcome	Triggered after 3 consecutive Standard Deviation departures from estimated baseline

19.2 Review of Management Measures

Environmental performance monitoring and auditing will be prepared and submitted regularly to the Environment Manager, to review the effectiveness of the management actions specified in Section 12.

Any non-conformances identified during routine audits will be documented as incidents and included in audit reporting.

Environmental performance, monitoring and auditing will be reported where required, to external stakeholders and in annual Compliance Assessment Reporting.

20. GLOSSARY OF TERMS

BC Act	*Biodiversity Conservation Act 2016*
DAWE	Department of Agriculture, Water and Environment
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
GVD	Great Victoria Desert
MRP	Mulga Rock Uranium Project
NRP	National Recovery Plan
SHD	Sandhill Dunnart
The Plan	Vimy Sandhill Dunnart Conservation Plan
Vimy	Vimy Resources Limited
WA	Western Australia

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Appendix 1

Sandhill Dunnart Monitoring Plan

Technical Memorandum

03 November 2021

To	Xavier Moreau, Paula Arthur (Vimy)	**Tel**	08 9389 2725
Copy to		**Email**	xmoreau@vimyresources.com.au parthur@vimyresources.com.au
From	Glen Gaikhorst	**Ref. No.**	12563122
Subject	Remote Camera installation - Site Plan		

1. Background

Vimy Resources Limited (Vimy) are currently seeking to develop the Mulga Rock Uranium Project (MRP) located 240 km north east of Kalgoorlie.

On 28 November 2013 MRP was referred under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) to the Department of Agriculture, Water and the Environment (DAWE) (EPBC 2013/7083). On 7 January 2014, DAWE determined MRP a “controlled action”, with the controlling provisions being “listed threatened species and communities” and “nuclear actions”, to be assessed under the bilateral agreement with the Western Australian State Government. The MRP was federally approved on the 2 March 2017 with a condition attached to offsetting the residual impact to the Sandhill Dunnart (*Sminthopsis psammophila*).

Condition 2 of the EPBC 2013/7083approval requires the preparation of a Sandhill Dunnart Conservation Plan (SDCP) to reduce the impact to the Sandhill Dunnart posed by feral animals within a defined conservation area. The SDCP is based around a 6000 ha portion of land within the Sandhill Dunnarts known distribution. In order to implement the SDCP an understanding of the presence of the species and feral animals is required including an understanding of baseline data.

1.1 Purpose and scope

The purpose of the remote camera installation - site plan is to develop a systematic method to identify potential locations to site remote cameras to confirm the presence of the Sandhill Dunnart and feral animals within the conservation area. The following scope of works was implemented to achieve the purpose:

– Desktop assessment
– Develop a map of 30 potential camera establishment locations based on relevant criteria to establish 25 remote camera sites (five sites as spare in case of on the ground unsuitability)
– Document the criteria utilised (this document) to select the 30 locations.

1.2 Memorandum limitations and assumptions

This memorandum has been prepared by GHD for Vimy and may only be used and relied on by Vimy for the purpose agreed between GHD and Vimy as set out in section 1.2 of this memorandum. GHD otherwise disclaims responsibility to any person other than Vimy arising in connection with this memorandum. GHD also excludes implied warranties and conditions, to the extent legally permissible. The services undertaken by GHD in connection with preparing this memorandum were limited to those specifically detailed in the memorandum and are subject to the scope limitations set out in the memorandum.

GHD has prepared this memorandum on the basis of information provided by Vimy and others who provided information to GHD (including Government authorities and private individuals), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the letter report which were caused by or omissions in that information.

Site conditions may change after the date of the field survey. GHD does not accept responsibility arising from, or in connection with, any change to the site conditions. GHD is also not responsible for updating this memorandum if the site conditions change.

2. Method for determining potential camera locations

2.1 Desktop Searches

The desktop assessment was used to gather contextual information on the conservation area to identify fauna habitat types and the likelihood of the Sandhill Dunnart to occur within those habitat types to refine the camera establishment locations (30 locations).

The following environmental data (via searches and government and client spatial data) was considered for the conservation area:

– Search of DBCA Threatened and Priority Fauna database (DBCA) for current records of Sandhill Dunnart
– *NatureMap* database for Sandhill Dunnart previously recorded with a focus on datasets from; Threatened Fauna, Fauna Survey Returns Database (New), Western Australian Museum database for mammals
– Broadscale vegetation types and vegetation condition
– Geology and Soils, Land Use Systems and Hydrology information to provide background information on the variability of the environment and likely vegetation and habitat types present.
– Access tracks
– Fire scar ages
– Where data exists size of Triodia spp. Based on fine scale mapping
– Desktop Searches.

2.2 Conservation Area

The conservation area proposed by Vimy is approximately 6000 ha and lies within the project boundary but outside of the proposed operational area. It is positioned on the yellow sand plain priority ecological community and has a mix of dunes, elevated sand plains, swales, clay pans and plain. The area has a primary access road running north west to south east with a number of smaller tracks positioned in the south west. Figure 1, Appendix A shows the location of the proposed conservation area.

2.3 Map development

For best success of recording Sandhill Dunnart within the conservation area 30 locations were identified. By identifying 30 locations allows for 5 area to be excluded while in the field subject to recent environmental factors i.e. fire or other disturbance. Each location identified is a 50 m x 50 m area.

Site selection criteria for proposed camera establishment locations included consideration of:

– Sites to be within 300 m of established tracks to allow ease of access to sites within the conservation area for routine maintenance and collection of data.
– Sites to be withing areas that are long unburnt (> 8 years since burn) to allow the appropriately sized Triodia clumps for the species to persist. Triodia life stages are required to be at Stage 2 (youngest) to stage 5 (oldest), ideally a dominance of stage 3 and 4 clumps is preferred. From fire scar mapping three fire scar ages are present. The most dominant fire scar is 16 years old (2005), with a small area of long unburnt (30 + years) and recently burnt within 5 years. The recent burn scar has been excluded

from proposed camera establishment locations. Further refinement of the location selections was undertaken by utilising high resolution drone imagery (to 2 cm blocks) to allow selections of sites within known desirable Triodia presences. The area of high resolution was restricted to the main access track in the conservation area but extending 300 m each side of the track.

– Sites positioned close to or within dune systems or elevated sand plain systems. Additionally dune swales merging into sandplain or minor clay plan verges are also desirable as they provide larger Triodia clumps. Where appropriate and to not clump locations to close to each other approximately half of the proposed camera establishment locations have been placed within dune systems or elevated sand plain.
– Independence of sites is an important consideration. (GHD 2020) recommends a minimum distance of approximately 2 km between sites, for this study due to access and number of study sites to be established separation of proposed camera establishment locations is much less and lie approximately 800 m apart.
– Sites should not be placed within vegetation structure not conducive to the Triodia hummock grasslands present on the yellow sand plain i.e. Mulga woodlands.
– Site should be placed as close to possible areas where Sandhill Dunnart have previously been captured. Sandhill Dunnart have been captured as part of Gaikhorst and Lambert (2014) project (site 3 and 5) approximately 800 m south east and 8 km north of the conservation area respectively. The conservation area lies between two previous Sandhill Dunnart capture areas.

Figure 2, Appendix A presents some of the criteria utilised and proposed camera establishment locations.

2.4 Field installation and refinement

The desktop selection of proposed camera establishment location will guide the in-field placement of sites. Experienced and trained Zoologists and Ecologists will install the cameras, with consideration to the site selection criteria.

If identified sites are determined not to be suitable, this will be documented, and an alternative site will be considered for the five additional proposed sites.

3. Remote camera setup protocol

Vimy Resources has previously documented their remote camera trapping protocol in Vimy Resources Limited (2014), Camera Trapping Protocol - Sandhill Dunnart (*Sminthopsis psammophila*) – Mulga Rock Uranium Project (2014).

The below method is an extraction of this:

– Two camera types are currently used as part of the Mulga Rock Targeted Camera Trapping Program. These include the Bushnell Trophy Cam HD MAX with passive infra-red flash and the Reconyx Hyperfire with white LED flash for colour day/night photo capture at close range.
– Cameras should be set up in a location that is flat or gently sloping with limited vegetation in the field of view to reduce false triggers. However, the location chosen for placement of cameras has to be a balance between being able to capture images unimpeded and the habitat preference of the species.
– Lure stations will be located approximately 1.5–2.0m from the horizontal camera. Any vegetation between the camera and the lure, and either side of the lure should be cleared or trimmed. Where possible, any objects that may obstruct the camera's field of view will be removed. Lures are required to be anchored via wire rope to prevent stealing by Dingos.
– Lure station markers have a reference scale stuck on it externals (2 x 1 cm grid pattern) to allow animal size comparisons and to ensure that any pictures can be easily verified to a specific site.
– Where possible the background (area behind the lure) should be uniform to help reduce temperature differentials between objects i.e. where possible create the optimal homogenous background temperature.

– Cameras must be fixed to a stake that will not move in the wind, and the unit should face south to avoid direct sunlight on the lens. Cameras are set up (a) to produce five images/trigger, (b) rapid fire, (c) high sensitivity and (d) 24 hour operation.
– Two cameras are setup (same model) at the same site, cameras should be set at approximately 30 - 50 m apart from each other to ensure a reasonable area is surveyed and to maintain conformity with quadrat areas utilized in previous successful surveys. A drift fence will be setup between cameras to guide animals into view.
– The height of the camera should be set at a height that is specific to the target species of the survey and for SHD's horizontal cameras are located 20 to 30 cm above the ground.
– Completion of the site information on the Data Sheet should be done in the field on the setup day. The camera's exact location should be recorded as a GPS coordinate on the data record sheet.
– In all situations, details will be entered onto the Data Sheet for each camera site and incorporate both cameras data.

An example of the data sheet is provided in Appendix B.

4. Interrogation of data

The aim of utilising remote cameras within the conservation area is to:

– Identify the presence/absence of Sandhill Dunnart in the conservation area
– Identify the presence/absence of feral species in the conservation area, with specific focus on feral cat, fox and rabbit. Other species will also be recorded (e.g. camel).
– If Sandhill Dunnart are present, establish baseline levels, for long term monitoring if controls of impacts are undertaken
– If feral species are detected, establish baseline levels for long term monitoring if controls are undertaken
– Gather ecological data on the Sandhill Dunnart (and other species) to aid in greater understanding of the species.

5. References

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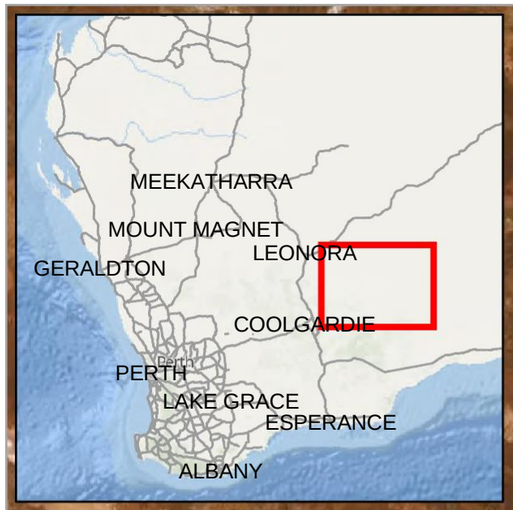
Regards

Glen Gaikhorst
Zoologist

Appendix A

Figures



Legend

- Conservation Area
- Environmetally Sensitive Areas
- Timber Reserve

Plumridge Lakes Nature Reserve

Queen Victoria Spring Nature Reserve

Majestic Timber Reserve

Randell Timber Reserve

Cardunia Rocks Nature Reserve

Coonana Timber Reserve

Emu Rocks Timber Reserve

DRAFT

SLIP

Paper Size ISO A3
at Scale: 1:900,000

0 5 10 15 20

Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 51

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GHD

Vimy Resources Limited
Sandhill Dunnart Conservation Plan Field Survey

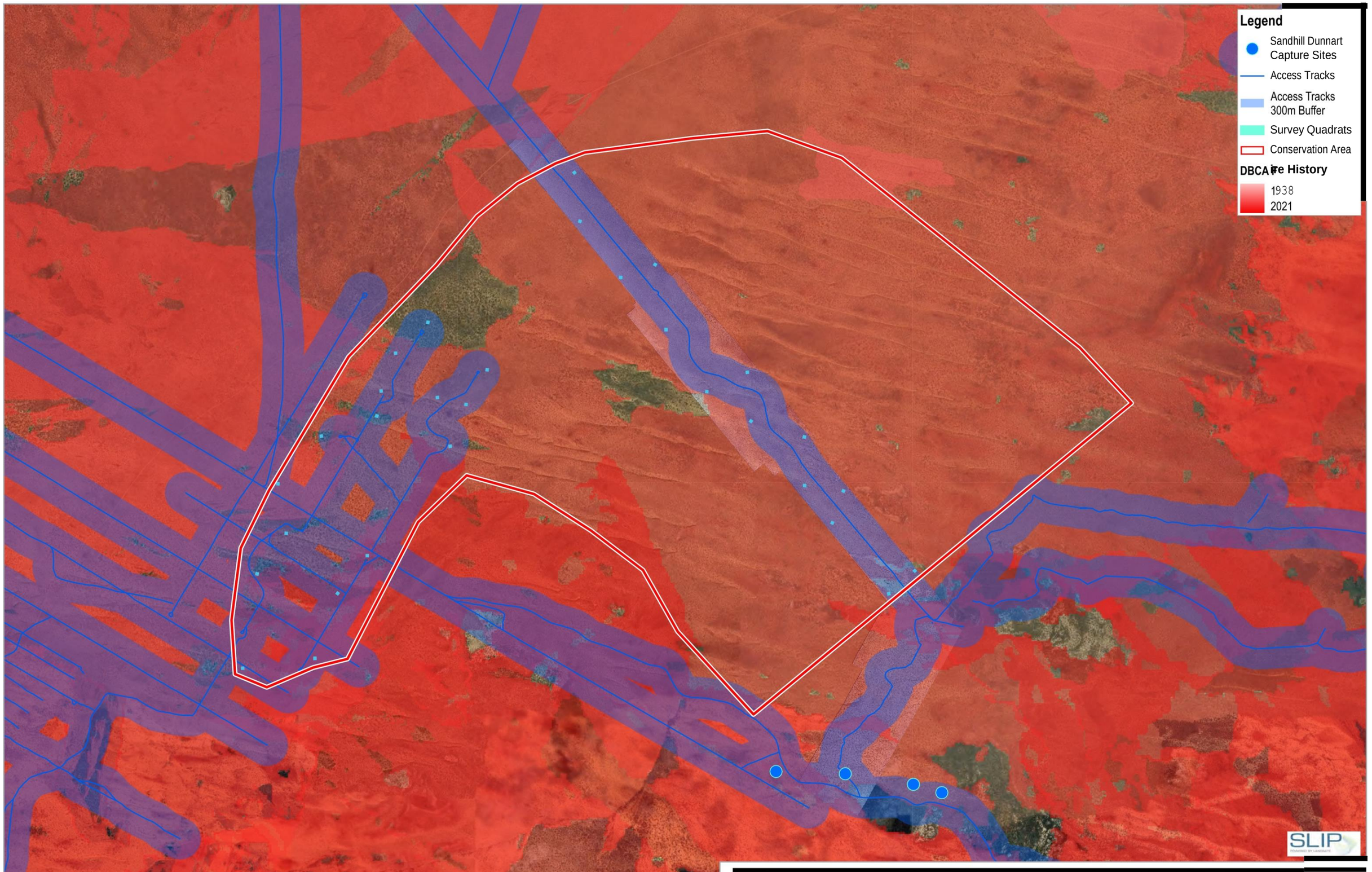
Location

Project No. 12563122
Revision No. A
Date 11/11/2021

FIGURE 1

\\ghdnet\ghd\AU\Perth\Projects\61\12563122\GIS\Maps\Working\12563122_Figures\12563122_Figures.aprx\12563122_001_Location_RevA
Print date: 11 Nov 2021 - 15:07

Data source: Conservation area: GHD; Environmentally sensitive areas, DBCA legislated lands and waters: SLIP / Landgate (2021/11/11) World Imagery: Earthstar Geographics
World Ocean Base: Esri, GEBCO, DeLorme, NaturalVue



Paper Size ISO A3
at Scale: 1:50,000
250 500 750 1,000
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 51

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Vimy Resources Limited
Sandhill Dunnart Conservation Plan Field Survey

Survey Methods

Project No. 12563122
Revision No. A
Date 11/11/2021

FIGURE 2

tghdnet\ghd\AU\Perth\Projects\61\12563122\GIS\Maps\Wor\(ing\12563122_Figures\12563122_Figures.aprx\12563122_001_SurveyMethods_RevA Data source: Capture sites, access tracks and buffers, surveyquadrats, conservation area: GHD; DBCAfire history: SLIP; World Imagery: Maxar. Created by: jabaygar
Print date: 11 Nov 2021-15:01

Appendix B

Camera data sheet example

CAMERA MONITORING DATA SHEET

Fill out a data sheet for each station and record data by circling relevant information

Location and Site Code:	Date Set:	Date Retrieved:
PEARSON-1	18/12/2017	
		No of Observation Days:

OBSERVER/S Morris Wu / Karen Larsen

LOCATION DESCRIPTION:

Landscape Photopoint: Orientation: Photo File No:

MGA COORD (GDA 94 - Zone 51)	
	Easting: 565605
	Northing: 6656371
	RL:
	Accuracy:

Landform Type	Soils	Drainage	Vegetation Community	Fire History	Spinifex Stage and % Cover
☐ Longitudinal Dune ☐ Complex (Tuning Fork) ☐ Network Dune ■ Sandsheet ☐ Crest ☐ Flank ☐ Swale Dune Height: m Dune Separation: m	☐ Red Sands ☐ Orange Sands ■ Yellow Sands ☐ Kopi ☐ Red Earth ☐ Other	☐ Claypan ☐ Lunette ☐ Kopi ☐ Mounds ☐ Swale ☐ Other	☐ Open Woodland ☐ Woodland ☐ Low Woodland ☐ Thicket ☐ Shrubland ■ Hummock Grasslands ☐ Mechanically Disturbed	☐ > 30 years unburnt ☐ Burnt in last 20 to 30 years ☐ Burnt in last 10 to 20 years ☐ Burnt in last 1-10 years ■ Burnt in last year Distance to nearest burn area Reference:	Stage 1 10%

HABITAT DESCRIPTION

VEGETATION TYPE from attached legend

Camera Type: Reconyx 550	Camera Code:	Lock Key: #
ASPECT TO TARGET ZONE	CAMERA HEIGHT: 20 cm	DISTANCE TO TARGET ZONE: 1 m
FACING DOWN: ☐ Yes ■ No	CAMERA ORIENTATION: 140°	LURE RECIPE: PBRO
LANDSCAPE: ■ Yes ☐ No	ANGLE TO GROUND: 15°	LURE TYPE/PLACEMENT :

CAMERA SETTINGS: ☐ Animal Trail ■ Fence Gap ☐ Other Lens Cleaned: ■ Yes ☐ No

BATTERY TYPE: Li-Th NO:AAx8	BATTERY REPLACEMENT DATE: 12/2017
CARD TYPE: SD CAPACITY: 8G	REPLACEMENT DATE: No. of IMAGES:

Camera Type: Reconyx 550	Camera Code:	Lock Key: #
ASPECT TO TARGET ZONE	CAMERA HEIGHT: 20 cm	DISTANCE TO TARGET ZONE: 1 m
FACING DOWN: ☐ Yes ■ No	CAMERA ORIENTATION: 140°	LURE RECIPE: PBRO
LANDSCAPE: ■ Yes ☐ No	ANGLE TO GROUND: 15°	LURE TYPE/PLACEMENT :

CAMERA SETTINGS: ☐ Animal Trail ■ Fence Gap ☐ Other Lens Cleaned: ■ Yes ☐ No

BATTERY TYPE: Li-Th NO:AAx8	BATTERY REPLACEMENT DATE: 12/2017
CARD TYPE: SD CAPACITY: 8G	REPLACEMENT DATE: No of IMAGES:

GENERAL COMMENTS: Presence of tracks, scats, significant sand disturbance and positioning of trap in respect to animal passage.