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AngloGold Ashanti Australia and Independence Group NL

Report for Tropicana Joint Venture

Second Round Sandhill Dunnart Surveys of the Proposed Operational Area and Infrastructure Corridor

February 2010

INFRASTRUCTURE | MINING & INDUSTRY | DEFENCE | PROPERTY & BUILDINGS | ENVIRONMENT

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Executive Summary

This is a follow-up Sandhill Dunnart (*Sminthopsis psammophila*) survey in the Tropicana Gold Project Operational Area and proposed Pinjin Infrastructure Corridor. The Tropicana Joint Venture (TJV; comprised of AngloGold Ashanti Australia Limited and Independence Group NL) commissioned GHD Pty Ltd (GHD) and Sue Churchill (specialist wildlife consultant) to conduct the survey.

The previous surveys by Gaikhorst and Lambert resulted in the capture of a number of small mammals but no Sandhill Dunnarts. As there is suitable habitat in the area and the animal has been recorded nearby it was considered wise to extend the study with modifications of the methodology.

It was felt that the previous surveys may have been sub optimal in the trapping layout, too rigid in adherence to habitat criteria applicable to the Eyre Peninsula but not necessarily to the Great Victoria Desert, and study sites too few and too concentrated. A survey in a different season with simultaneous survey in confirmed Sandhill Dunnart areas nearby would provide additional information.

It was also felt that increased trap effort would in itself be valuable as this endangered species is rarely captured. The capture rate is only about 1 Sandhill Dunnart per 1000 trap nights.

Following discussion with the Department of Environment and Conservation (DEC) TJV decided that GHD should carry out further survey with assistance from Sue Churchill, who has particular experience with this species.

The survey was conducted in spring (16th – 24th November 2009) with broader habitat criteria used in trap site selection. Trap layout was changed so that more traps were used, over a larger area and quadrats were spread over a wider area. Additional habitat assessments were carried out over a wide area around the operational area and infrastructure corridor

In the course of this survey fourteen quadrats were trapped, for a total of 3510 trap nights (910 pit nights and 2600 Elliott nights), increasing the total trapping nights for the three Sandhill Dunnart surveys in the area to 5856.

There was reasonable trap success of small mammals and reptiles during this survey, including two species of dunnarts but no Sandhill Dunnarts were caught.

The three Sandhill Dunnart surveys undertaken in the Tropicana Operational area and along the Proposed Pinjin Infrastructure Corridor have now failed to confirm the presence of Sandhill Dunnarts. Within the Operational Area itself the habitat is considered marginal for this species but areas along the proposed Pinjin Infrastructure Corridor have more suitable habitat.

Although these surveys have not demonstrated Sandhill Dunnarts occur in these areas it is important to consider the impact of this development. The proposed alignment of the Infrastructure Corridor has been well sited to avoid disturbance to prime Sandhill Dunnart habitat and should have minimal impact on any Sandhill Dunnart populations that may subsequently use the area.

1. Introduction

AngloGold Ashanti Australia on behalf of the Tropicana Joint Venture (TJV) commissioned GHD Pty Ltd (GHD) and Sue Churchill (specialist wildlife consultant) to conduct a targeted Sandhill Dunnart (Sminthopsis psammophila) survey in the proposed disturbance footprint of the Operational Area for the Tropicana Gold Project (TGP) and the proposed Pinjin Infrastructure Corridor in the Great Victoria Desert of Western Australia (see Figure 1). The area contains potential habitat known to support the Sandhill Dunnart (Churchill 2009), and it is therefore important to determine the presence or absence of Sandhill Dunnarts in the areas that will be impacted by Project as described in the TGP Public Environmental Review document (PER 2009). This will enable TJV to minimise any adverse impacts that might as a result of the Project on this endangered species.

The TJV is a joint venture between AngloGold Ashanti Australia Ltd (70% owner; AngloGold) and the Independence Group NL (30% owner). AngloGold is the manager of the Tropicana Joint Venture and is acting as agent severally for each of the Joint Venturers in their respective percentage interests from time to time. The obligations and liabilities of the Joint Venturers are several only, in accordance with their respective percentage interests.

1.1 Survey Objectives

Previous surveys by Gaikhorst and Lambert were carried out in 2008. They did not find Sandhill Dunnarts. In discussion with the Department of Environment and Conservation (DEC) and others it was felt that there was merit in a further survey, with certain modifications in methodology.

The objective of this survey was to extend the previous survey area and increase the trap-effort while making these changes in methodology. Changes in methodology included the following:

- The survey was conducted in spring
- Habitat criteria used in trap site selection were broadened
- Trap layout was changed. More traps were used, over a larger area
- Study sites were spread over a wider area
- Additional habitat assessments were carried out over a wider area around the operational area and infrastructure corridor

1.2 Background

The Sandhill Dunnart is an endangered species under State and Commonwealth Acts: the *Wildlife Conservation Act 1950* and the *Environment Protection and Biodiversity Conservation Act 1999*, respectively.

The Sandhill Dunnart was first discovered in Western Australia in 1986 from the Mulga Rocks area of the Great Victoria Desert, Western Australia (Hart and Kitchener 1986). They have since been found in Queen Victoria Spring Nature Reserve, and north to the access track into Plumridge Lakes Nature Reserve. To date, in Western Australia, they have only been found on the yellow sand dune system and associated land systems situated at the south western edge of the Great Victoria Desert. They are known to occur in a broader range of habitats in South Australia.

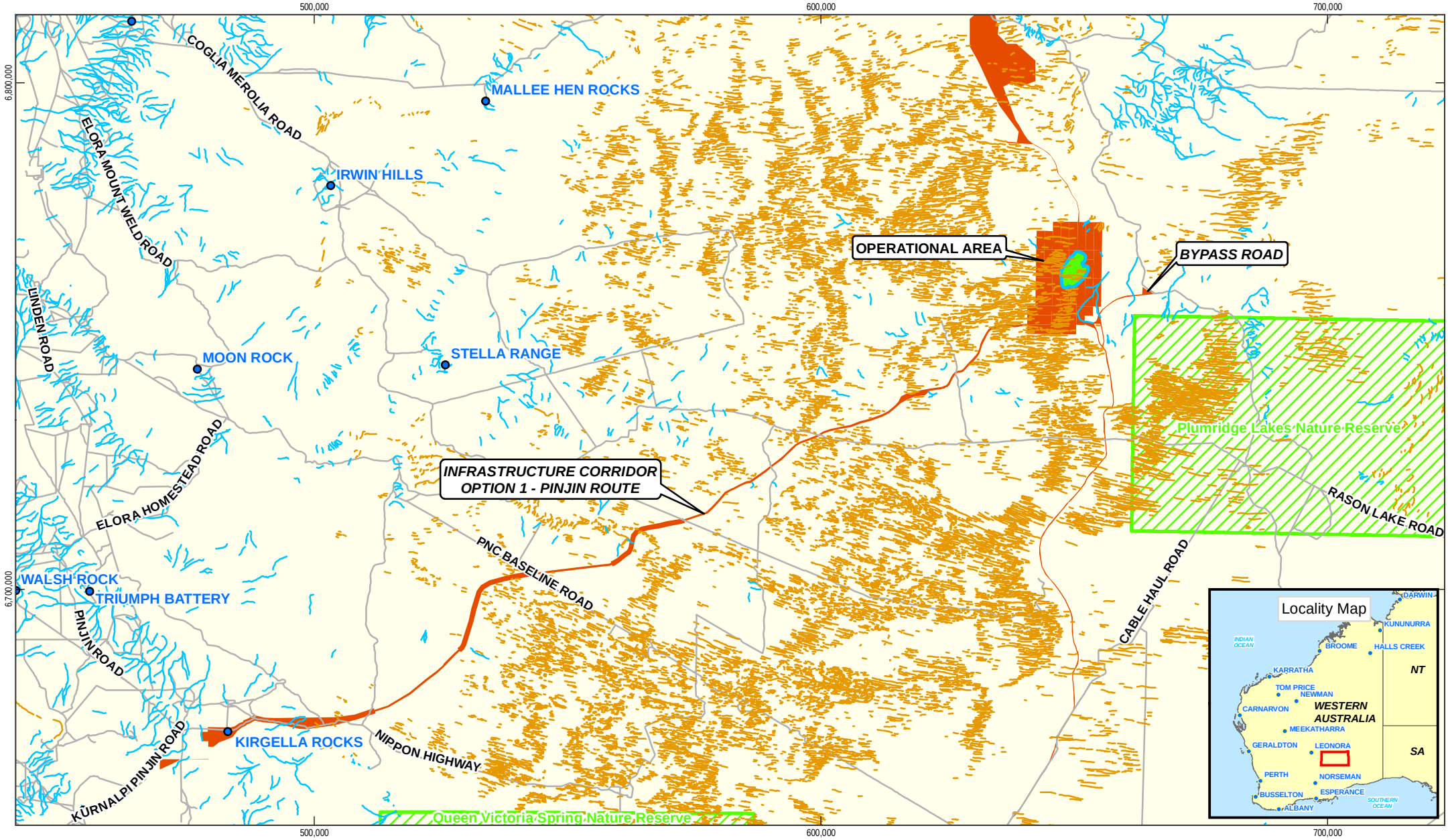
In 2008, Gaikhorst and Lambert were commissioned by the TJV to undertake a habitat assessment for Sandhill Dunnart within the Tropicana Gold Project Operational Area and within the proposed Pinjin Infrastructure Corridor and public bypass road. Gaikhorst and Lambert (2008) found the Sandhill Dunnart could potentially persist in some areas, however, the habitat within the TGP disturbance footprint of the Operational Area was significantly different to that in the southern areas known to support Sandhill Dunnarts (yellow sand dune area), or had been recently burnt and thus was unlikely to support Sandhill Dunnarts. The public bypass road had also been recently burnt and consisted primarily of Mulga woodlands making the area unsuitable for Sandhill Dunnarts.

Gaikhorst and Lambert (2008) conducted trapping in areas thought to be of suitable habitat, or the best available habitat, within the study areas. Two trips were undertaken, 5th to 14th March 2008 and 21st to 28th May 2008. In total 14 sites were trapped with 2346 trap nights conducted. No Sandhill Dunnarts were captured.

During the Public Consultation Period for the Project queries where raised on the outcomes of the previous surveys and additional information was requested on:

- habitat parameters used to assess the suitability of all survey sites, and to identify/confirm prospective areas inside the development footprint (i.e. mine area and ancillary areas building including roads and utilities corridors) that may have been overlooked;
- sampling design and effort for Sandhill Dunnart as it appeared inadequate, with site selection not appearing to have been based on a clear understanding of the Sandhill Dunnart's preferred habitat parameters;
- Trapping layout as Elliott traps were clustered close together. Typically trapping for Sandhill Dunnarts usually positions Elliott traps in excess of 20 m intervals, not 5 m as used during the 2008 surveys.
- A sample effort of 80 - 100 Elliott trap nights at one site on one occasion, as indicated during the 2008 survey, is unlikely to yield a Sandhill Dunnart. The DEC requested that the TJV justify the sampling design and clarify if further survey work is to be undertaken.

Following discussion with DEC, Sue Churchill and TJV it was decided to undertake further Sandhill Dunnart trapping within the TGP Operational Area and along the proposed Pinjin Infrastructure Corridor. To provide an independent assessment of the project, Sue Churchill was consulted to provide guidance regarding methodology and undertaking the trapping program.



1:1,000,000 (at A4)

0 5 10 20 30 40

Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 51

N

LEGEND

- PlaceNames
- Roads
- Streams
- Sand Ridge
- DEC Estate
- Tropicana Gold Project Tenements
- Impact Area

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Tropicana Joint Venture

Job Number	61-23549
Revision	0
Date	20 JAN 2010

Tropicana Gold Project
Location and Impact Area

Figure 1

G:\61\23549\GIS\mxds\6123549-G013.mxd

GHD House, 239 Adelaide Terrace Perth WA 6004 **T** 61 8 6222 8222 **F** 61 8 6222 8555 **E** permail@ghd.com.au **W** www.ghd.com.au

Data Source: Geoscience Australia: Nat Map 250k Series 3 Topographic Data - 2006; DEC: DEC Estate - 20091217; Department of Mines and Petroleum: Mining Tenements - 20100114; AngloGold Ashanti Australia: Sand Ridges near Tropicana Minesite - 20091110; GHD: Impact Area - 20100118. Created by: KDIRALU

2. Methodology

2.1 Survey Team and Timing

The GHD Sandhill Dunnart survey team comprised of:

- Glen Gaikhorst, *Masters of Captive Vertebrate Management* Senior Zoologist;
- Peter Moonie, *BSc.* (Ecology) Senior Ecologist;
- Matthew Flower, *BSc. (Hons.)* Ecologist*;* and
- Bonnie Galbraith, *BSc.* Environmental Scientist.

Two independent wildlife researchers Sue Churchill and Rogan Draper were also present to assist and give independent assessment on the trapping program and potential habitat for Sandhill Dunnart in the region. Sue also revised and modified the trapping program methodology in line with recommendations from the DEC.

The survey used two field teams of three people each. One team was led by Glen Gaikhorst and one by Sue Churchill.

A 10 day trapping program was conducted from the 16th to the 26th November 2009.

2.2 Licence

The trapping program was undertaken under licence number SF007147 “Licence to take Fauna for Scientific Purposes” issued on the 13/11/09.

2.3 Liaison with relevant Authorities

The trapping methodology (below) was developed by Sue Churchill and Glen Gaikhorst and sent to DEC (Sandra Thomas) on the 6/11/2009 for comment. No requests for alterations were received.

2.4 Habitat Assessment

2.4.1 Vegetation Description

A vegetation description of each site was undertaken according to Read (1987). Vegetation descriptions for each site included the percentage coverage for each vegetation cover type, for both woody and non-woody plants.

The dominant species present within a site were also recorded. Sandhill Dunnarts have been captured in a range of flora and vegetation communities. These are described by Hart and Kitchener (1986), Pearson and Robertson (1989), Churchill (2001b), and Gaikhorst and Lambert (2008).

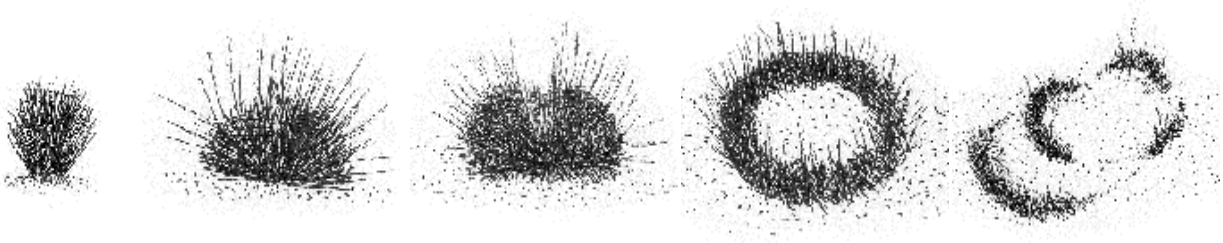
Canopy cover was also estimated for each site, recorded as a percentage.

2.4.2 Triodia

Triodia coverage and quality is the critical feature of Sandhill Dunnart habitat. *Triodia* was assessed based on the following criteria:

- *Triodia* species; Sandhill dunnarts have been found to use *T. basedowii, T. irritans, T. scariosa* and *T. lanata* across their range. In the Tropicana area the primary species associated with dune systems is *T. basedowii*. The *Triodia* species at each site was recorded and used as an indicator of suitable habitat.
- *Triodia* cover; the amount of cover that *Triodia* supplies in an area may impact on the presence of Sandhill Dunnarts. Sandhill Dunnarts have been captured in cover ranging from 1 - 70%, however, they are generally caught in *Triodia* coverage of 10 - 70%. The percentage of cover was used as an indicator of suitable habitat.
- *Triodia* quality is a very important feature of Sandhill Dunnart habitat as good quality *Triodia* supplies cover, hides, and nest sites (Churchill 2001a). *Triodia* quality is measured by its life stage (Figure 2). South Australian studies show that in the Eyre Peninsula *Triodia* in stages 2 to 4 are optimal. In areas such as Ooldea where there has been no fire for decades all the *Triodia* is older (stages 4 and 5). Sandhill Dunnarts were able to adapt, using burrows rather than nests (Churchill 2001a). This was taken into account in the current study, and some 'sub-optimal' areas with mostly senescent *Triodia* were included in the survey.

Figure 2 The life stages of *Triodia* from Churchill 2001a.



stage 1 stage 2 stage 3 stage 4 stage 5

sketches by V Reynolds

2.4.3 Fire

Sandhill Dunnarts require habitat that is long unburnt (8 - 38 years) to survive. This is due to the time frame required for re-establishment of *Triodia* to a suitable life stage (2 - 3.5) that the Dunnarts can use. Fires in the Great Victoria Desert destroy large areas of land, rendering them unsuitable for Sandhill Dunnarts. Fire age in the area is commonly used as a predictor for *Triodia* age, therefore, providing an indication of *Triodia* quality within a site. The Landgate fire scar dataset was used to determine fire age, however, the dataset is incomplete and so the fire history of some sites was estimated.

2.4.4 Sandhill Dunnart Index

The Sandhill Dunnart Index is a bit of fun that turned out to be useful. It was a concept used in this survey to give a convenient shorthand measure of the quality of a proposed or actual quadrat. It is not intended to be a reproducible scientific measurement.

For example:

Ranking	Description
10	This will vary with location and experience but represents the optimum habitat
8	Yellow sand dune and swale, stage 2 to 4 Triodia hummocks, marble gums, Callitris, and sand dune slope last burned 8-12 years previously.
6	Red or orange sand dune, fire 20 to 25 years, stage 4 to 5 Triodia. Mallee and shrubs fully recovered from fire.
4	Red dune or flat calcrete plain some mature Triodia stages 3-
2	Calcrete plain, recently extensively burned with nearly all Triodia in stage 1, and scattered patches of stage 4-5, dead trunks of mallee and mulga.
0	Still on fire

In this survey no site was considered to be a perfect 10. The best were scored at 7-8 with some at 6, and one each at 4 and 2 were surveyed as they had quite good Triodia although they were far from what we believe to be suitable habitat in other respects.

2.5 Trapping Methodology

The survey involved trapping in six (6) proposed study areas (Appendix A). Proposed study area 1 had 4 trap sites, proposed study area 2 no trap sites, proposed study area 3 had 3 trap sites, proposed study area 4 had 3 trap sites, proposed study area 5 had 1 trap site and proposed study area 6 had 3 trap sites. Based on a desktop assessment using aerial photography and burn scar assessment, these areas contained the most likely habitat for Sandhill Dunnarts. They were situated either in the Operational Area (but outside the main disturbance footprint which has minimal areas of Prime habitat [Churchill 2009]), along the proposed Infrastructure Corridor, or in sites where Sandhill Dunnarts have previously been captured (Gaikhorst and Lambert pers. comm.). Up to 10 sites were sampled simultaneously for 4 nights each.

Proposed study area 2 was not trapped in this survey. Area 2 was previously trapped by Gaikhorst and Lambert in 2008 and was not considered the best available habitat in the area as it is surrounded by a large burn scar and Mulga woodland and is therefore not likely to be suitable for Sandhill Dunnarts. Area 5 was investigated by the consultants and consists of heavy red loam soil dominated with Chenopod plain, calcrete and no dune systems. The closest available habitat was approximately 3 km north and was trapped (Site 14).

In area 4 the three sites surveyed were placed away from the impact area. This was because the immediate habitat around the impact area was too recently burnt and included Mulga woodland and was therefore considered not suitable.

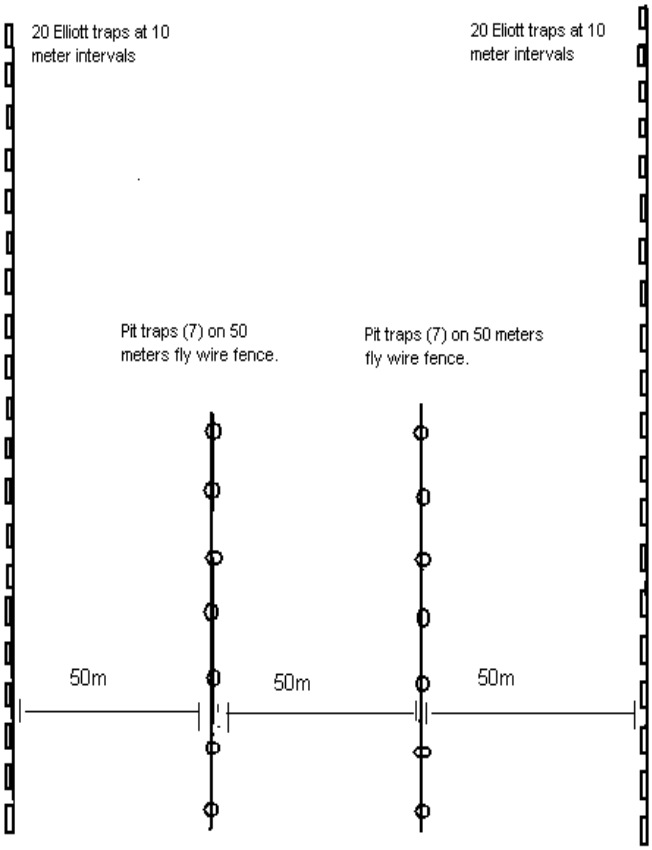
Sites surveyed included several identified by Gaikhorst and Lambert (2008). These included sites 9 to 15 in the Operational Area, and along the proposed Infrastructure Corridor. Additional sites further west along the corridor, in areas where likely habitat had survived previous fires were also sampled. Few suitable areas were found that had not been recently burnt, therefore, the study area was extended to 2 km from the proposed Infrastructure Corridor. All sites were marked using datum GDA 94.

2.5.1 Site Trapping description

Each site contained two parallel lines of pit traps 50 m apart. Each pit trap line consisted of 7 pit traps, positioned 7m apart, with a flywire drift fence 60 m long and 40 cm high dug into the ground along the entire length. Each pit trap was the recommended size for Sandhill Dunnarts (60 cm deep and 25 cm in diameter).

Each site also contained 40 Elliott traps, in two parallel lines (20 per line), situated 50 m to each side, of the pit trap lines. The traps were 10 m apart, with trap lines extending for 200 m. The trap design covered an area of 150 m x 200 m (Figure 3).

Figure 3 Trapping design at site



2.5.2 Modification of methodology from Gaikhorst and Lambert (2008).

- The Elliott trap distance was increased from 5 m to 10 m and the number of Elliott traps per site was increased from 20 to 40. The Elliott Trap lines have been repositioned to lie outside the lines of pit traps.

- The trap nights have been decreased from 5 nights to 4 nights (as a minimum).
- Sites were selected more randomly, not restrained by finding the best habitat in the study areas, rather habitat that fits most of the criteria to be suitable, such as a mix of spinifex age classes, including areas of very old spinifex adjacent to areas of moderately recent burn age.
- Locations where Gaikhorst and Lambert have captured Sandhill Dunnarts previously were trapped within the same survey project. It was felt by DEC that if Sandhill Dunnarts are captured at a known site then a failure to capture Sandhill Dunnarts at the Tropicana site would be more significant.

2.6 Opportunistic Data

The trapping was complemented with opportunistic species observations and the collection of predator's droppings for later analysis for Sandhill Dunnart hair or bone fragments. Reptile sightings were recorded. The opportunistic surveys also involved visual and aural surveys for any bird species using the survey areas.

3. Results

3.1 Weather conditions

Weather conditions were recorded for the duration of the field trip, either from direct field observation, Tropicana data, or data from the BoM website at their closest weather station Laverton (Table 1).

Table 1 Daily weather data during trapping survey

Date	Moon	Weather condition	Min Temp	Max Temp	Rainfall (mm)
17.11.09	sliver	overcast	20	33	1-2 mm
18.11.09	new	overcast/fine	13	32	0
19.11.09	new	overcast/fine	19	27	0
20.11.09	new	overcast	13	23	scattered rain
21.11.09	sliver	overcast/fine	13	24	0
22.11.09	sliver	overcast/fine	14	25	0
23.11.09	quarter	overcast/fine	14	30	0
24.11.09	quarter	clear but cool	15	32	0
25.11.09	quarter	fine	19	36	0
26.11.09	Quarter/ half	fine	17	25	0

3.2 Limitations

During the trapping program some unfavourable weather, with thunderstorms and associated lightning, was experienced. This may have adversely impacted on some trap nights, however, the majority of the trapping period was considered optimal. There were no other limitations encountered during the trapping program.

3.3 Selected sites

Fourteen sites were selected and trapped between the 16th and 26th of November 2009 (refer Appendix A for site location). Site details are provided in Table 2.

Table 2 Fourteen locations sampled in November 2009.

Site Number 1		**Vegetation Description** • Low open woodland of *E. forrestiana* and *A. aneura* (<10%) over open hummock grassland of *T.basedowii* (30%) • Spinifex life stage 1 - 2 in recently burnt areas and 4 - 5 in areas long unburnt. • Canopy cover 10%.
Reference **E.** 0632968 **N.** 6751411		
Landforms • Flat sand plain with orange/yellow soil. A calcrete layer was present at 50 cm in some places.	**Approximate years since last burnt** • Patchily burnt, some areas of long unburnt habitat approximately 20 - 30 years old amongst large areas of 2000 burn scar.	**Number of trap nights** • 4 nights opened with 56 pitfall trap nights and 160 Elliott trap nights
Comments • The site is situated along the existing Pinjin Access track - the initial section of the Pinjin Infrastructure Corridor. • Habitat and general area is given a SHD Index 4/10. • The site is situated within the “Proposed study area 1” of the methodology. • No Sandhill Dunnarts were captured.		

Site Number 2 **Reference** **E.** 0632670 **N.** 6751247		**Vegetation Description** • Low open woodland of *E. forrestiana* and *A. aneura* (<10%) with low open shrub layer of *G. juncifolia* over very open hummock grassland of *T.basedowii* (<10%). • Spinifex life stage 1 - 2 throughout the site. • Canopy cover 10%.

Landforms • Flat sand plain, yellow sand with laterite gravel and thick laterite layer at 20 - 50 cm depth	**Approximate years since last burnt** • Patchily burnt, small areas of long unburnt habitat amongst large areas of 2000 burn scar	**Number of trap nights** • 4 nights opened with 56 pitfall trap nights and 160 Elliott trap nights

Comments

- The site is situated along the existing Pinjin Access track - the initial section of the Pinjin Infrastructure Corridor.
- Habitat and general area is given a SHD Index 2/10.
- The site is situated within the “Proposed study area 1” of the methodology.
- No Sandhill Dunnarts were captured.

Site Number 3 **Reference** **E.** 0635790 **N.** 6752112		**Vegetation Description** • Low Woodland of *E. gongylocarpa* and *E. youngiana* (10 - 30%) with mixed open shrub layer dominated by *A. aneura* and *G. juncifolia* (10 - 30%) over open hummock grassland of *T. basedowii* (20%). • Spinifex life stage 4 - 5 throughout the site. • Canopy cover 40%

Landforms • Yellow sand dune system and adjoining swale.	**Approximate years since last burnt** • Long unburnt, approximately 10-15 years (1996 burn).	**Number of trap nights** • 4 nights opened with 56 pitfall trap nights and 160 Elliott trap nights

Comments

- The site is situated along the existing Pinjin Access track - the initial section of the Pinjin Infrastructure Corridor.
- Habitat and general area is given a SHD Index 6/10.
- This site is in the area of site 15 of Gaikhorst and Lambert (2008) that was not trapped as other areas in the region were regarded as more suitable habitat.
- The site is situated within the “Proposed study area 1” of the methodology.
- No Sandhill Dunnarts were captured.

Site Number 4 **Reference** **E.** 0645656 **N.** 6758365		**Vegetation Description** • Low woodland of *E. forrestiana, E. gongylocarpa*, *E. youngiana and C verrucosa* (10 - 30%) over low open shrub layer of *G. juncifolia* and *A. aneura* (10 - 30%) over open hummock grassland of *T. basedowii* (30%). • Spinifex life stage 2 - 3 in recent burn scar and 4 - 5 throughout the remainder of site. • Canopy cover 30%

Landforms • Red sand dune system and adjoining swale	**Approximate years since last burnt** Patchily burnt, small areas of long unburnt habitat 20-30 years amongst large areas of 5-10 year burn scar (1996 burn)	**Number of trap nights** • 5 nights opened with 70 pitfall trap nights and 200 Elliott trap nights

Comments

- The site is situated in the south west corner of the Operational Area along the existing Pinjin Access track.
- Habitat and general area is given a SHD Index 6/10.
- This site is site 10 of Gaikhorst and Lambert (2008) which was not trapped as other areas in the region were regarded as more suitable habitat.
- The site is situated within the “Proposed study area 3” of the methodology.
- No Sandhill Dunnarts were captured.

Site Number 5		**Vegetation Description** • Low open woodland of *E. gongylocarpa* and *E. forrestiana* (<10%) with open shrub layer of *G. juncifolia* and *H. francisiana* (<10%) over open hummock grassland of. *Triodia basedowii* (30%). • Spinifex life stage 1 - 5. • Canopy cover 20%
Reference **E.** 0636841 **N.** 6752218		

Landforms • Red/orange sand dune system and adjoining swale	**Approximate years since last burnt** • Patchily burnt, small areas of long unburnt habitat 20 - 30 years amongst large areas of 5 - 10 year burn scar (1996 burn)**.**	**Number of trap nights** • 7 nights opened with 98 pitfall trap nights and 280 Elliott trap nights

Comments

- The site is situated along the existing Pinjin Access track - the initial section of the Pinjin Infrastructure Corridor.
- Habitat and general area is given a SHD Index 7/10.
- This site is in the area of site 15 of Gaikhorst and Lambert (2008) which was not trapped as other areas in the region were regarded as more suitable habitat.
- The site is situated within the “Proposed study area 1” of the methodology.
- No Sandhill Dunnarts were captured.

Site Number 6 **Reference** **E.** 0645194 **N.** 6757282		**Vegetation Description** • Low open woodland of *E. gongylocarpa*, *C. verrucosa* and *E. forrestiana* (<10%) with mixed open shrub layer dominated by *G. juncifolia* (<10%) over open hummock grassland of. *Triodia basedowii* (30%). • Spinifex life stage 2 - 3. • Canopy cover 10%

Landforms • Red sand dune system and adjoining swale	**Approximate years since last burnt** • Unburnt for approximately 10 - 15 years (1996 burn).	**Number of trap nights** • 4 nights opened with 56 pitfall trap nights and 160 Elliott trap nights

Comments

- The site is situated in the south west corner of the Operational Area along the existing Pinjin Access track.
- Habitat and general area is given a SHD Index 7/10.
- This site is in the area of site 11 of Gaikhorst and Lambert (2008) which was not trapped as other areas in the region were regarded as more suitable habitat.
- The site is situated within the “Proposed study area 3” of the methodology.
- No Sandhill Dunnarts were captured.

Site Number 7 **Reference** **E.** 0644908 **N.** 6757038		**Vegetation Description** • Low open Woodland of *E. gongylocarpa* and *E. forrestiana* (<10%) with mixed open shrub layer (30 - 70%) over open hummock grassland of *T. basedowii* (25%). • Spinifex life stage predominantly 1 - 3 with patches of 4 - 5 on slope. • Canopy cover 20%
Landforms • Red/orange sand dune system and adjoining red swale	**Approximate years since last burnt** • Patchily burnt, approximately half of the site is long unburnt habitat (20 - 30 years) amongst burn scar of 10 - 15 years(1996 burn)	**Number of trap nights** • 7 nights opened with 98 pitfall trap nights and 280 Elliott trap nights
Comments • The site is situated in the south west corner of the Operational Area along the existing Pinjin Access track. • Habitat and general area is given a SHD Index 5/10. • This site is in the area of site 11 of Gaikhorst and Lambert (2008) which was not trapped as other areas in the region were regarded as more suitable habitat. • The site is situated within the “Proposed study area 3” or the methodology. • No Sandhill Dunnarts were captured.		

Site Number 8 **Reference** **E.** 0605970 **N.** 6729233		**Vegetation Description** • Shrubland dominated by *E. youngiana, G. juncifolia, Melaleuca spp. and C. verrucosa* (10 - 30%) over open hummock grassland of *T. basedowii* (20%). • Spinifex life stage 3 - 5. • Canopy cover 60%

Landforms • Yellow sand dune system and adjoining swale	**Approximate years since last burnt** • Long unburnt approximately 20 - 30 years.	**Number of trap nights** • 5 nights opened with 70 pitfall trap nights and 200 Elliott trap nights

Comments

- This site is on the Plumridge East/West Road (15km west of the Tropicana turn off) and was trapped because Sandhill Dunnart had previously been captured here by Gaikhorst and Lambert in 2006.
- Habitat and general area is given a SHD Index 7/10.
- The site is situated within the “Previous SHD Capture site” of the methodology.
- No Sandhill Dunnarts were captured.

Site Number 9 **Reference** **E.** 0608298 **N.** 6728916		**Vegetation Description** • Open shrubland dominated by *E. youngiana, G. juncifolia, B. elderiana and C. verrucosa* (30 - 70%) over open hummock grassland of *T. basedowii* (20%). • Spinifex life stage 3 - 5. • Canopy cover 60%

Landforms • Yellow sand dune system and adjoining swale	**Approximate years since last burnt** • Long unburnt approximately 20 - 30 years.	**Number of trap nights** • 5 nights opened with 70 pitfall trap nights and 200 Elliott trap nights

Comments

- This site is on the Plumridge East/West Road (13 km west of the Tropicana turn off) and was trapped because Sandhill Dunnart had previously been captured here by Gaikhorst and Lambert in 2006.
- Habitat and general area is given a SHD Index 7/10.
- The site is situated within the “Previous SHD Capture site” of the methodology.
- No Sandhill Dunnarts were captured.

Site Number 10 **Reference** **E.** 0610622 **N.** 6728693		**Vegetation Description** • Low open Woodland of *E. gonglycarpa* (<10%) with mixed open shrub layer of young *E. gonglycarpa, E. youngiana, G. juncifolia* and. *H. francisiana* (30 - 70%) over open hummock grassland of *T. basedowii* (50%). • Spinifex life stage 2 - 4. • Canopy cover 60%

Landforms • Elevated yellow/orange sand plain associated with dunes within 1km.	**Approximate years since last burnt** • Patchily burnt, approximately half of the site appears to be burnt within 5 - 10 years (2001 burn) amongst older burn scar of 10 - 15 years	**Number of trap nights** • 4 nights opened with 56 pitfall trap nights and 160 Elliott trap nights

Comments

- This site is on the Plumridge East/West Road (11 km west of the Tropicana turn off) and was trapped because Sandhill Dunnart had previously been captured in the area by Gaikhorst and Lambert in 2006.
- Habitat and general area is given a SHD Index 8/10.
- The site is situated within the “Previous SHD Capture site” of the methodology.
- No Sandhill Dunnarts were captured.

Site Number 11 **Reference** **E.** 0602499 **N.** 6729637		**Vegetation Description** • Open woodland of *E. gonglycarpa* (<10%) over low open mixed shrub layer dominated by *E. youngiana* and *C verrucosa* (30 - 70%) and hummock grass land of *T. basedowii* (40%). • Spinifex life stage 3 - 5. • Canopy cover 40%

Landforms • Yellow/orange sand dune system and adjoining swale	**Approximate years since last burnt** • Long unburnt approximately 20 - 30 years.	**Number of trap nights** • 4 nights opened with 56 pitfall trap nights and 160 Elliott trap nights

Comments

- This site is on the Plumridge East/West Road (~20 km west of the Tropicana turn off) and was trapped because it is within the general area where a SHD has previously been captured.
- Habitat and general area is given a SHD Index 7/10.
- The site is situated within the “Previous SHD Capture site” of the methodology.
- No Sandhill Dunnarts were captured.

Site Number 12 **Reference** **E.** 0596536 **N.** 6731312		**Vegetation Description** • Low open Woodland of *E. gongylocarpa* (<10%) with mixed shrub layer of young *E. gongylocarpa, G. juncifolia* and. *H. francisiana* (10 - 30%) over hummock grassland of *T. basedowii* (50%). • Spinifex life stage 1 - 3. • Canopy cover 20%
Landforms • Yellow sand dune system and adjoining swale	**Approximate years since last burnt** • The whole area had previously been burnt within the last 5 - 10 years (2001 burn).	**Number of trap nights** • 4 nights opened with 56 pitfall trap nights and 160 Elliott trap nights
Comments • This site is on the Plumridge East/West Road (~25 km west of the Tropicana turn off) and is within 8 km of the intersection with the new Pinjin Infrastructure Corridor. • Habitat and general area is given a SHD Index 6/10. • The site is situated within the “Proposed study area 4” of the methodology. • No Sandhill Dunnarts were captured.		

Site Number 13 **Reference** **E.** 0593376 **N.** 6734573		**Vegetation Description** • Open Woodland of *E. gongylocarpa* (<10%) with low open mixed shrub layer of *G. juncifolia, A. burkittii* (<10%) over hummock grassland of *T. basedowii* (40%). • Spinifex life stage 1 - 4. • Canopy cover 20%
Landforms • Yellow sand dune system and adjoining swale	**Approximate years since last burnt** • Patchily burnt, approximately half of the site appears to be burnt within 5 - 10 years (2001 burn) amongst older burn scar of 10 - 15 years	**Number of trap nights** • 4 nights opened with 56 pitfall trap nights and 160 Elliott trap nights

Comments

- This site is on the Plumridge East/West Road (~30 km west of the Tropicana turn off) and is within 8 km of the intersection with the new Pinjin Infrastructure Corridor.
- Habitat and general area is given a SHD Index 7/10.
- The site is situated within the “Proposed study area 4” of the methodology.
- No Sandhill Dunnarts were captured.

Site Number 14 **Reference** **E.** 0588921 **N.** 6729259		**Vegetation Description** • Low open Woodland of *E. gongylocarpa* and *C. verrucosa* (<10%) with low open shrub layer of. *H. francisiana* (<10%) over hummock grassland of *T. basedowii* (30%). • Spinifex life stage 1 - 4. Canopy cover 10%

Landforms • Elevated yellow/orange sand plain associated with dunes within 2 km	**Approximate years since last burnt** • Patchily burnt, approximately half of the site appears to be burnt within 5 - 10 years (2001 burn) amongst older burn scar of 10 - 15 years	**Number of trap nights** • 4 nights opened with 56 pitfall trap nights and 160 Elliott trap nights

Comments

- This site is on the Pinjin Access Road (~4 km south of Lizard Corner) and was trapped because it is within 8 km of the intersection with the new Pinjin Infrastructure Corridor.
- Habitat and general area is given a SHD Index 5/10.
- The site is situated within the “Proposed study area 5” of the methodology.
- No Sandhill Dunnarts were captured.

3.4 Trapping

3.4.1 Sandhill Dunnarts

No Sandhill Dunnarts were captured during the trapping program. Fourteen sites were trapped with 3510 trap nights conducted. These comprised 910 pit traps nights and 2600 Elliot trap nights.

3.4.2 Other species

The trapping and opportunistic survey recorded a total of 91 vertebrate fauna taxa. This comprised of 9 native mammals, 3 non-native mammals, 41 reptiles and 38 bird species (Appendix B).

3.4.3 Mammals

No Sandhill Dunnarts (*Sminthopsis psammophila*) were captured during the trapping program.

Seven species of mammals were caught in traps. Four species of dasyurid marsupials, the Little Long-tailed Dunnart (*Sminthopsis dolichura*), the Hairy-footed Dunnart (*Sminthopsis hirtipes*) and two species of Ningaui, the Southern Ningaui (*Ningaui yvonneae*) and Wongai Ningaui (*Ningaui ridei*). These two species are difficult to identify without euthanasing each individual to measure skull characteristics. As both species are known to be in the region it was assumed that both species were present in this study. Three species of rodents, the Spinifex Hopping-mouse (*Notomys alexis*), The Sandy Inland Mouse (*Pseudomys hermansburgensis*) and the introduced House Mouse (*Mus musculus*) were also trapped.

A further five native mammals were observed including 3 macropods, the Western Grey Kangaroo (*Macropus fuliginosus*), the Red Kangaroo (*Macropus rufus*) and the Common Wallaroo *(Macropus robustus*), the Dingo (*Canis lupus*) and the Echidna (*Tachyglossus aculeatus*).

3.4.4 Reptiles

Reptiles observed comprised of 41 species, comprising of 8 Agamids (dragons), 9 Gekkonids (Geckos), 3 Pygopods (legless lizards), 19 Scincids (skinks) and 3 Varanids (monitors).

The skinks were the most diverse group recorded, with more than double the number of species compared to other groups.

3.4.5 Birds

Thirty eight bird species were observed comprising of 5 Acanthizins (thornbill group) 2 Accipitrid (eagles), 3 Artamids (magpie group), 1 Cacatuid (galah), 2 Campephagid (shrikes), 1 Columbids (pigeon), 1 Corvid (crow),1 Cuculid (cuckoo), 1 Dicaeid (mistletoe bird), 2 Dricrurids (larks), 2 Falconids (falcons), 1 Halcyonid (kingfisher), 5 Meliphagids (honeyeaters), 1 Meropid (Bee-eater), 1 Otidid (bustard), 4 Pachycephalids (thrush and whistlers), 2 Petroicid (robins), 1 Pomatostomid (babbler), and 2 Psittacids (Parrots).

The bird assemblage comprised mostly of honeyeaters, shrike-thrush and whistlers using the small patches of flowering plants.

3.4.6 Introduced/Pest Fauna

Introduced and pest species recorded over the study period were the feral cat, one-humped camel and the house mouse. None of these species were recorded in large numbers with signs of presence (rather than direct observation) identifying the camel and cat.

3.4.7 Specially Protected Species

Two priority 4 species, the Australian Bustard (*Ardeotis australis*) and Crested Bellbird (*Oreoica gutturalis gutturalis*) were observed. Priority 4 are taxa that DEC consider to be adequately surveyed and that, whilst considered rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5 – 10 years (by authorities).

3.4.8 Migratory/Marine Species

The Brown Goshawk (*Accipiter fasciatus fasciatus*), Nankeen Kestrel (*Falco cenchroides*), Black-eared Cuckoo (*Chrysococcyx osculans*) and the Black-faced Cuckoo-shrike (*Coracina novaehollandiae*) are listed federally as Marine under the *Environment Protection and Biodiversity Conservation Act*.

The Rainbow Bee-eater (*Merops ornatus*) is listed federally as Migratory and Marine under the *Environment Protection and Biodiversity Conservation Act*.

4. Discussion

4.1 Response to Department of Environment and Conservation's concerns.

Updated information on habitat parameters should be utilised to reassess the suitability of all sites that have been surveyed, and to identify/confirm prospective areas inside the development footprint (i.e. mine area and ancillary areas building including roads and utilities corridors) that may have been overlooked.

The initial scope of works (for Gaikhorst and Lambert 2008) was to focus on the mine area (Operational Area) and both Infrastructure Corridors (Pinjin and public bypass). During the previous survey (Gaikhorst and Lambert 2008) habitat showing the most similarity with Gaikhorst and Lambert's known capture sites for SHD in the Great Victoria Desert was trapped for SHD with no animals caught from 1088 trap nights in the Operational Area, and 1258 trap nights along the Pinjin Infrastructure Corridor. Sue Churchill subsequently visited both the Operational Area and Pinjin Infrastructure Corridor, concluding that although optimal habitat had been trapped, additional areas suitable for SHD may exist. In November 2009, additional trapping was undertaken in areas identified by Sue Churchill using survey recommendations from DEC. Trapping was undertaken both in the Operational Area, and along the Pinjin Infrastructure Corridor in habitat that had potential to contain Sandhill Dunnarts according to newly updated habitat parameters. An additional 3510 trap nights were conducted with no Sandhill Dunnarts recorded, thus confirming the results of the initial work.

Sampling design and effort for Sandhill Dunnart appears inadequate. Site selection does not appear to have been based on a clear understanding of the Sandhill Dunnart's preferred habitat parameters.

In October 2009 Sue Churchill visited the Operational Area and Pinjin Infrastructure Corridor to look at the sites trapped by Gaikhorst and Lambert (2008). She concluded that site selection was appropriate and that Gaikhorst and Lambert (2008) had trapped in the best available habitat within the study areas. For added certainty, additional trapping was undertaken during the current survey (November 2009) in suitable SHD habitat but failed to capture any animals in 3510 additional trap nights.

Elliott traps were clustered close together. Trapping for Sandhill Dunnarts usually positions Elliott traps in excess of 20 m intervals, not 5 m used during the March/ May 2009 surveys.

The methodology for the current survey (November 2009) was developed by Sue Churchill and sent to DEC for comments (refer Section 2 Methodology). Additional Elliott traps were used at each site (20 to 40) and Elliott space interval was increased from 5 m to 10 m.

A sample effort of 80-100 Elliott trap nights at one site on one occasion, as indicated in Appendix 16:31, is unlikely to yield a Sandhill Dunnart. TJV need to justify sampling design and clarify if further survey work is to be undertaken.

As discussed above the methodology was altered for the current trapping survey (November 2009). The additional Elliott traps per site increased Elliott Trap nights to 160 - 280, doubling the Elliott trap night effort of Gaikhorst and Lambert (2008). No SHD were captured in this trapping period.

5. Conclusion

Currently, three field trips have been conducted to specifically target Sandhill Dunnart in and around the Tropicana Gold Projects Operational Area and along the Pinjin Infrastructure Corridor. No Sandhill Dunnarts have been captured. In total 28 trapping sites have been set up, comprising of 5856 trap nights over two seasons (March/May and November). In previous studies Sue Churchill captured one animal per approximately 1000 trap nights in South Australia, while Gaikhorst and Lambert (pers comm.) captured one animal to approximately 1500 trap night in Western Australia's Great Victoria Desert. It is therefore likely that, considering the number of trap nights conducted, approximately 4 - 6 Sandhill Dunnarts could have been recorded across the combined survey periods if an active population was present.

The habitat present in the Operational Area, particularly that of the dunes located due west of the proposed mining area and the south west corner of the Operational Area, could be considered prime habitat. The remainder of the Operational Area is either red loamy soil, rocky breakaway, or Chenopod plain areas and thus is predominantly considered to be Marginal habitat (Churchill 2009).

The habitat present along the Pinjin Infrastructure Corridor has areas that would be considered more prospective, including trapping area 19 A - D (Gaikhorst and Lambert 2008), and sites 10 - 14 of the current survey. In order to minimise impacts to the SHD, the TJV has selected the road corridor option which bypasses the majority of yellow dune systems located between the Queen Victoria Spring and Plumridge Lakes Nature Reserves which are considered to constitute Prime to Likely SHD habitat (Churchill 2009).

Sandhill Dunnarts in Western Australia appear to be restricted to the yellow sand dune portion of the Great Victoria Desert. Genetic research demonstrates the species previously had a continuous distribution between South Australia and Western Australian (Spencer *et al*. in press), and, therefore, at some point probably persisted in what are currently classed as sub optimal areas. If this were indeed the case, the current trapping regime would be expected to detect SHD if present. It can, therefore, be concluded that the species is either in very low numbers in this region or is locally extinct.

6. References

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Read, I.G., (1987). The Bush- A Guide to the Vegetated Landscapes of Australia. Reed Books Pty Ltd, NSW.

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Tropicana Gold Project. Tropicana Joint Venture.

7. Other resources

Landgate NOAA Fire Affected Areas Database 1996-2009.

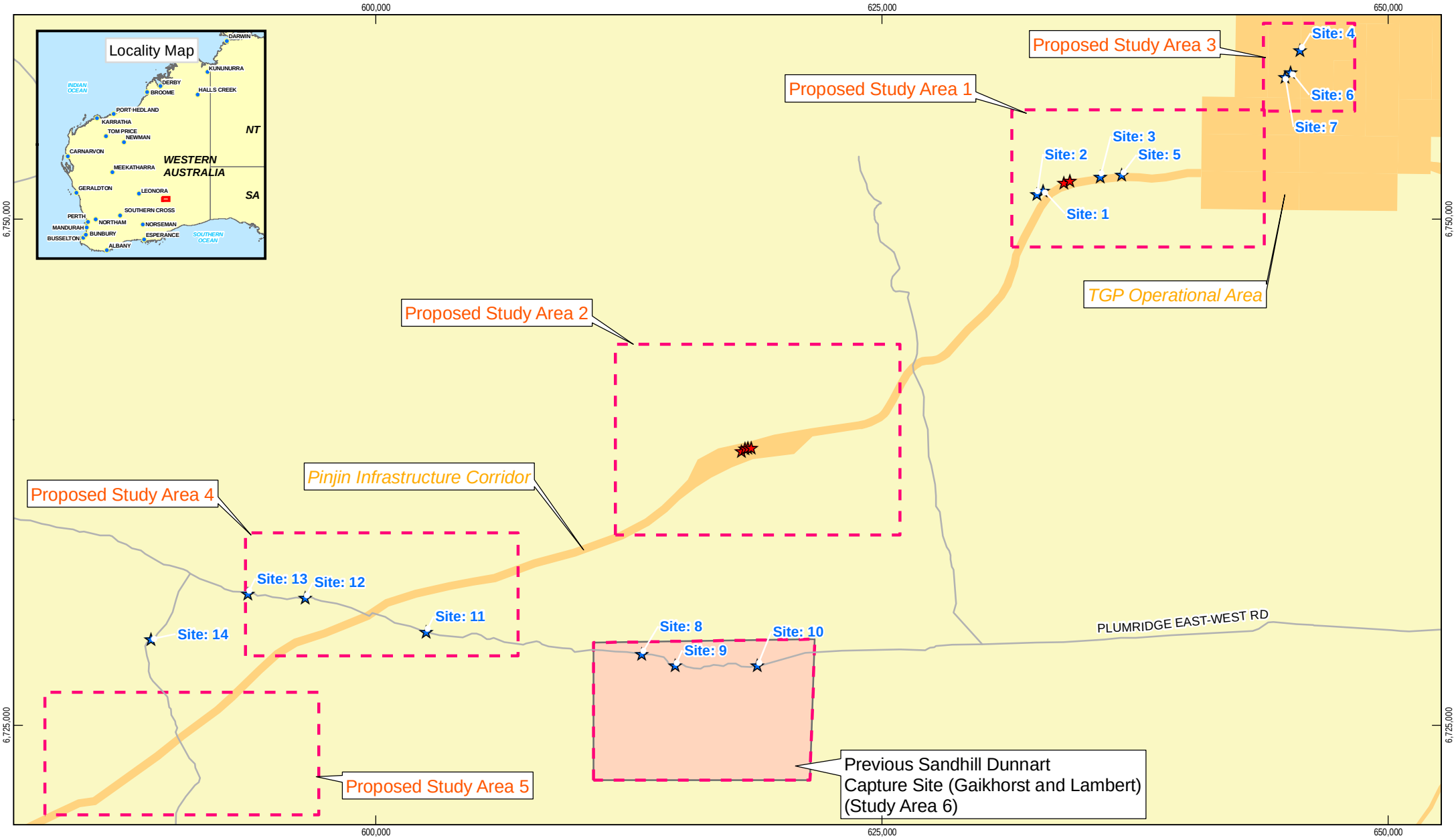
http://www.landgate.wa.gov.au/corporate.nsf/web/Customised+Images accessed 14th October 2009.

Bureau of Meteorology

http://www.bom.gov.au/climate/dwo/IDCJDW6061.latest.shtml accessed 10th December 2009.

Appendix A

Trapping sites in the Project Operational Area and proposed Pinjin Infrastructure Corridor



1:250,000 (at A4)

0 1.25 2.5 5 7.5 10

Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 51

N

LEGEND

- Trapped 2008 (Gaikhorst and Lambert)
- Trapped Nov 2009 (Gaikhorst and Lambert)
- Road
- Sand Ridge
- Tropicana Gold Project Tenements

Current and Proposed Study Areas

- Previous Sandhill Dunnart Capture Site (GHD)
- Proposed Study Areas

CLIENTS | PEOPLE | PERFORMANCE

Tropicana Joint Venture

Job Number	61-23549
Revision	0
Date	19 JAN 2010

Trap Sites for all Sandhill Dunnarts

Traps and Surveys in the Operational Area and Pinjin Infrastructure Corridor

Figure 4

G:\61\23549\GIS\mxds\6123549-G011.mxd

GHD House, 239 Adelaide Terrace Perth WA 6004 **T** 61 8 6222 8222 **F** 61 8 6222 8555 **E** permail@ghd.com.au **W** www.ghd.com.au

Data Source: Department of Mines and Petroleum: Mining Tenements - 20100114; Geoscience Australia: Nat Map 250k Series 3 Topographic Data - 2006; GHD: Sandhill Dunnart Survey Areas - 20090119, Proposed Study Areas - 20091104; AngloGold Ashanti Australia: Sand Ridges near Tropicana Minesite - 20091110. Created by: KDIRALU

Appendix B

Observed and trapped Fauna

Family	Genus	Species	Common Name	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 8	Site 9	Site 10	Site 11	Site 12	Site 13	Site 14	Conservation listing
Acanthizinae	*Acanthiza*	*apicalis whitlocki*	Inland Thornbill									X						
Acanthizinae	*Acanthiza*	*robustirostris*	Slaty-backed Thornbill										X			X		
Acanthizinae	*Gerygone*	*fusca*	Western Gerygone											X		X		
Acanthizinae	*Pyrrholaemus*	*brunneus*	Redthroat								X							
Acanthizinae	*Smicronrnis*	*brevirostris*	Weebill								X	X		X		X	X	
Accipitridae	*Accipiter*	*fasciatus*	Brown Goshawk											X				Ma
Accipitridae	*Aquila*	*audax*	Wedge-tailed Eagle	X												X		
Artamidae	*Artamus*	*cinereus*	Black-faced Woodswallow								X							
Artamidae	*Cracticus*	*nigrogularis*	Pied Butcherbird								X		X					
Artamidae	*Gymnorhina*	*tibicen*	Australian Magpie									X						
Cacatuidae	*Eolophus*	*roseicapilla*	Pink and Grey Galah									X						
Campephagidae	*Coracina*	*novaehollandiae*	Black-faced Cuckoo-shrike								X	X	X		X	X	X	Ma
Campephagidae	*Lalage*	*tricolor*	White-winged Triller	X							X							
Columbidae	*Phaps*	*chalcoptera*	Common Bronzewing								X			X				
Corvidae	*Corvus*	*orru*	Torresian Crow	X							X							
Cuculidae	*Chrysococcyx*	*osculans*	Black-eared Cuckoo											X				Ma
Dicaeidae	*Dicaeum*	*hirundinaceum*	Mistletoe Bird								X	X	X					
Dricruridae	*Rhipidura*	*fuliginosa keasti*	Grey Fantail								X							
Dricruridae	*Rhipidura*	*leucophrys*	Willy Wagtail	X								X		X		X	X	
Falconidae	*Falco*	*berigora*	Brown falcon	X							X							
Falconidae	*Falco*	*cenchroides*	Nankeen Kestrel										X			X		Ma
Halcyonidae	*Todiramphus*	*pyrrhopygia*	Red Backed Kingfisher											X		X		
Meliphagidae	*Melithreptus*	*brevirostris*	Brown-headed Honey-eater											X				
Meliphagidae	*Lichenostomus*	*penicillatus*	White-plumed Honey-eater								X			X				
Meliphagidae	*Lichenostomus*	*plumulus*	Grey-fronted Honey-eater								X							
Meliphagidae	*Lichmera*	*indistincta*	Brown Honey-eater	X									X					
Meliphagidae	*Manorina*	*flavigula*	Yellow-throated Miner								X	X		X				
Meopidae	*Merops*	*ornatus*	Rainbow Bee-eater								X			X				Ma, Mi
Otididae	*Ardeotis*	*australis*	Australian Bustard		X													P4
Pachycephalidae	*Colluricincla*	*harmonica*	Grey Shrike-Thrush								X							
Pachycephalidae	*Oreoica*	*gutturalis gutturalis*	Crested Bellbird								X							P4
Pachycephalidae	*Pachycephala*	*inornata*	Gilbert's Whistler													X		
Pachycephalidae	*Pachycephala*	*rufiventris*	Rufous Whistler								X	X						
Petroicidae	*Microeca*	*fascinans*	Jacky Winter								X							
Petroicidae	*Petroica*	*goodenovii*	Red Capped Robin									X						
Pomatostomidae	*Pomatostomus*	*superciliosus*	White-browed Babbler								X							

Psittacidae	*Barnardius*	*zonarius*	Port Lincon Parrot									X	X	X						
Psittacidae	*Neophema*	*splendida*	Scarlet-chested Parrot											X						
Reptiles																				
Agamidae	*Ctenophorus*	*clayi*	Black-collared Dragon		*X*			*X*												
Agamidae	*Ctenophorus*	*cristatus*	Crested Dragon												X		X			
Agamidae	*Ctenophorus*	*femoralis*	Dune Dragon					X								X				
Agamidae	*Ctenophorus*	*isolepis citrinus*	Central Military Dragon	X	X	X		X				X	X	X	X	X	X	X		
Agamidae	*Ctenophorus*	*nuchalis*	Central Netted Dragon		X							X								
Agamidae	*Diporphora*	*reginae*	Regin's Dragon			X	X				X			X		X				
Agamidae	*Moloch*	*horridus*	Thorny Devil	X				X				X	X			X		X		
Agamidae	*Pogona*	*minor minor*	Dwarf Bearded Dragon					X				X								
Gekkonidae	*Diplodactylus*	*granariensis granariensis*	Western Stone Gecko												X					
Gekkonidae	*Gehyra*	*purpurascens*	Central Tree Dtella		X															
Gekkonidae	*Gehyra*	*variegata*	Tree Dtella									X			X					
Gekkonidae	*Lucasium*	*damaeum*	Beaded Gecko	X	X			X			X	X	X		X	X	X	X		
Gekkonidae	*Lucasium*	*squarrosum*	Squarrose Gecko		X															
Gekkonidae	*Nephrurus*	*laevissimus*	Pale Knob-tailed Gecko	X	X	X	X	X	X	X					X		X	X		
Gekkonidae	*Nephrurus*	*levis levis*	Rough Knob-tailed Gecko		X															
Gekkonidae	*Rhynchoedura*	*ornata*	Beaked Gecko												X					
Gekkonidae	*Strophurus*	*elderi*	Jewelled Gecko										X							
Pygopodidae	*Delma*	*butleri*	Butler's Legless Lizard					X						X				X		
Pygopodidae	*Delma*	*nasuta*	Nasute Legless-lizard					X	X											
Pygopodidae	*Delma*	*petersoni*	Peterson's Legless Lizard			X						X	X							
Scincidae	*Ctenotus*	*atlas*	Atlas Skink	X		X		X	X	X			X	X	X	X	X	X		
Scincidae	*Ctenotus*	*brooksi*	Brooks Dune Skink				X	X	X			X	X		X	X				
Scincidae	*Ctenotus*	*calurus*	Blue-tailed Ctenotus														X			
Scincidae	*Ctenotus*	*dux*	Eighteen-lined Ctenotus	X	X	X	X	X	X	X										
Scincidae	*Ctenotus*	*helenae*	Helen's Ctenotus											X						
Scincidae	*Ctenotus*	*laei*	Lae's Ctenotus					X								X				
Scincidae	*Ctenotus*	*pantherinus ocellifer*	Leopard Ctenotus						X			X								
Scincidae	*Ctenotus*	*quattuordecimlineatus*	Fourteen-lined Ctenotus	X	X	X	X	X	X	X		X	X	X					X	
Scincidae	*Ctenotus*	*schomburgkii*	Schomburgk's Skink		X							X	X	X	X	X			X	
Scincidae	*Eremiascincus*	*fasciolatus*	Narrow-banded Sand-swimmer						X				X		X					
Scincidae	*Eremiascincus*	*richardsonii*	Broad-banded Sand-swimmer				X													
Scincidae	*Lerista*	*bipes*		X	X	X	X	X	X	X		X	X	X	X	X	X	X		
Scincidae	*Lerista*	*desertorum*				X	X					X	X			X	X			
Scincidae	*Lerista*	*taeniata*												X						

Scincidae	*Liopholis*	*inornata*	Desert Skink														X			
Scincidae	*Menetia*	*greyii*	Common Dwarf Skink												X					
Scincidae	*Morethia*	*butleri*				X						X				X			X	
Scincidae	*Proablepharus*	*reginae*													X					
Scincidae	*Tiliqua*	*multifasciata*	Centralian Blue-tongue						X											
Varanidae	*Varanus*	*eremius*	Pygmy Desert Monitor	X	X		X	X	X			X							X	
Varanidae	*Varanus*	*gouldii*	Gould's Goanna				X			X							X			
Varanidae	*Varanus*	*tristis*	Black-headed Monitor												X		X			
Mammals																				
Camelidae	*Camelus*	*dromedarius*	One-humped Camel		X							X							X	*
Canidae	*Canis*	*lupis dingo*	Dingo				X									X		X		
Dasyuridae	*Sminthopsis*	*dolicura*	Little Long-tail Dunnart		X	X			X				X	X	X	X				
Dasyuridae	*Sminthopsis*	*hirtipes*	Hairy-foot Dunnart	X			X		X			X	X			X	X	X		
Dasyuridae	*Ningaui*	*ridei or yvonneae*	Wongai or Mallee Ningaui	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
Felidae	*Felis*	*catus*	Cat	X		X				X	X	X						X		*
Macropodidae	*Macropus*	*fuliginosus*	Western Grey Kangaroo	X	X	X	X	X	X	X		X		X	X			X		
Muridae	*Notomys*	*alexis*	Common Hopping Mouse		X		X	X		X		X						X		
Muridae	*Mus*	*musculus*	House Mouse		X															*
Muridae	*Pseudomys*	*hermannsbergensis*	Sandy Inland Mouse		X			X				X	X	X						
Tachyglossidae	*Tachyglossus*	*aculeatus*	Echidna									X								

Western Australian *Wildlife Conservation Act 1950* Conservation Codes

Conservation Code	Description
Schedule 1	"…fauna that is rare or likely to become extinct, are declared to be fauna that is in need of special protection."
Schedule 2	"…fauna that is presumed to be extinct, are declared to be fauna that is in need of special protection."
Schedule 3	"…birds that are subject to an agreement between the governments of Australia and Japan relating to the protection of migratory birds and birds in danger of extinction, are declared to be fauna that is in need of special protection."
Schedule 4	"…fauna that is in need of special protection, otherwise than for the reasons mentioned [in Schedule 1 – 3]"

DEC Priority Fauna Codes

(Species not listed under the *Wildlife Conservation Act 1950*, but for which there is some concern).

Conservation Code	Description
Priority 1	Taxa with few, poorly known populations on threatened lands.
Priority 2	Taxa with few, poorly known populations on conservation lands. Taxa which are known from few specimens or sight records from one or a few localities on lands not under immediate threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown Land, water reserves, etc.
Priority 3	Taxa which are known from few specimens or sight records, some of which are on lands not under immediate threat of habitat destruction or degradation.
Priority 4	Rare taxa. Taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5 – 10 years.
Priority 5	Taxa in need of monitoring. Taxa which are not considered threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.

Conservation Categories and Definitions for EPBC Act Listed Flora and Fauna Species

Conservation Category	Definition
Extinct	Taxa not definitely located in the wild during the past 50 years
Extinct in the Wild	Taxa known to survive only in captivity
Critically Endangered	Taxa facing an extremely high risk of extinction in the wild in the immediate future
Endangered	Taxa facing a very high risk of extinction in the wild in the near future
Vulnerable	Taxa facing a high risk of extinction in the wild in the medium-term
Near Threatened	Taxa that risk becoming Vulnerable in the wild
Conservation Dependent	Taxa whose survival depends upon ongoing conservation measures. Without these measures, a conservation dependent taxon would be classified as Vulnerable or more severely threatened.

Conservation Category	Definition
Data Deficient (Insufficiently Known)	Taxa suspected of being Rare, Vulnerable or Endangered, but whose true status cannot be determined without more information.
Least Concern	Taxa that are not considered Threatened
Marine	Taxa that may not be considered threatened but utilise a marine system and maybe listed under one of the international agreements for protected species.
Migratory	Taxa that may migrate as part of there life cycle to other regions of the world and are protected under international conventions (such as Jamba).

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