



Natural Area
CONSULTING MANAGEMENT SERVICES

Shire of Goomalling

Offset Site Revegetation Plan Calingiri – Goomalling Road V1 SLK 0.00 – SLK 30.32

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Ngala kaaditj Noongar moort keyen kaadak nidja boodja.

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1.0 Introduction

Natural Area Consulting Management Services (Natural Area) was contracted by the Shire of Goomalling to prepare a revegetation plan for required offset site works associated with the clearing application for the Calingiri – Goomalling Road between SLK 0.00 – 30.32. A proposed offset area of 6.62 ha is required to offset the loss of 4.56 ha of native vegetation considered significant in an extensively cleared landscape, and the loss of Carnaby's cockatoo (*Zanda latirostris*) foraging species and suitable nesting habitat comprising of four trees with four suitable sized hollows. The offset site will be restored to vegetation typical of the region. Offset location have been identified by the Shire of Goomalling to enable land to be set aside for conservation and that 6.62 ha is revegetated, with revegetation requirements described in this document.

This plan will:

- describe offset locations that will be utilised for restoration works, including location and description of key characteristics
- outline management aims and objectives
- describe rehabilitation activities, rationale, and methodology
- outline the proposed location for the installation of four artificial hollows
- provide success criteria, monitoring and reporting requirements
- describe contingency plans if success criteria are not met
- outline weed and pest control activities
- provide an indicative implementation schedule and costings.

1.1 Location – Offset Site

Berring Pit located on Berring Road East north-east of Goomalling; 10.80 ha, with 0.87 ha currently vegetated and a stand of trees (0.59 ha) with no understory requiring restoration, thus 6.62 ha is available for restoration (Figure 1).



Legend

- Revegetation Zone
- Revegetation (understory)
- Boundary



Figure 1:
Revegetation Zone
Berring Road

Client: Shire of Goomaling
Date: 21/05/2021
Created by: M. Gray
Image Source: Nearmap, 2021
Datum: GDA 94



1.2 Tenure

The proposed offset location is owned and managed by the Shire of Goomalling.

1.3 Current Condition

The Berring Road East site has previously been used as a gravel pit, however, there is 0.87 ha of remnant native vegetation on site situated in the north-west corner and along the site boundary (Figure 2). Majority of this remnant vegetation (0.69 ha) has minimal native understorey species present including Chenopodiaceae species and weedy grasses, whilst the remaining vegetation (0.18 ha) in the north-west corner has overstorey canopy although lacks vegetation structure and requires understorey restoration. The total area of the site to be used for offset purposes is 6.62 ha.



Figure 2: Current land use, Berring Road East. Top: facing north-east, Bottom: remnant vegetation in north-west corner.

2.0 Site Characteristics

Site characteristics, including soils, vegetation complexes and climate, will inform the revegetation plan, as the aim is to restore vegetation species suitable for foraging and roosting by endangered black cockatoo species (i.e. Carnaby's Cockatoo (*Zanda latirostris*), Forest Red-tailed Cockatoo (*Calyptorhynchus banksia naso*), and Baudin's Black Cockatoo (*Zanda baudinii*)) and restore areas back to vegetation that is representative of the region. Key characteristics are outlined in this section.

2.1 Biogeographic Regionalisation

The site is located within the northern portion of the Avon Wheatbelt 2 (AW2) IBRA subregion (DoEE, 2019c). This region is characterised by gently undulating landscapes, with some breakaways. Soils are generally comprised of lateritic uplands and sandplain lowlands, with formation through in situ weathering or colluvial action (Beecham, 2001). Eucalyptus woodlands with Casuarina and Jam Wattle are typical of this area (Beecham, 2001).

2.2 Climate

The climate experienced in the area is semi-arid warm Mediterranean, with dry, hot summers and cool, dry winters (Beecham, 2001). According to the Bureau of Meteorology (2021), Goomalling (Site number 010058) climate and weather averages include:

- rainfall of 363.5 mm pa, with the majority falling between May and August
- average maximum temperatures ranging from 17.3 °C in winter to 34.8 °C in summer, with the highest recorded being 46.9 °C
- average minimum temperatures ranging from 6.3 °C in winter to 17.4 °C in summer, with the lowest recorded being -1.5 °C
- winds are predominantly from the west or north-west during winter and the east or south-east during summer, with average speeds ranging from 5.9 – 10.8 km/h, with gusts of more than 100 km/h possible during storm events.

2.3 Topography and Soils

DPIRD (2021) indicates there is one soil type present across the Berring Road site, namely the 256PsCU Cunderdin subsystem that is described as yellow aeolian sand with patches of white sand and some areas of sand over gravel. The site rises gently from 300 m AHD in the east to 306 m AHD in the west.

2.4 Vegetation Type and Condition

While the majority of Berring Road is devoid of native vegetation excluding approximately 0.87 ha consisting of a small stand of vegetation in the north-west corner and along the perimeters supporting a thin strip of native vegetation (Figure 2). Vegetation consists of *Eucalyptus accedens*, *Eucalyptus camaldulensis* and *Allocasuarina huegeliana* over *Acacia multispicata* and mixed shrubs and *Amphipogon turbinatus* and other native grasses in the understory (Figure 2). Much of the site is completely degraded, with the vegetated areas in Poor to Good condition.

2.5 Hydrology

The Berring Road East site includes a depression to the north-west that is associated with water collecting after rainfall periods (Figure 3).



Figure 3: Water collecting in lower areas of the site

3.0 Revegetation Requirements

The Shire of Goomalling has committed to revegetating an approximately 6.62 ha area within the nominated offset site, restored to be consistent with vegetation within the region. In addition, five artificial hollows will be installed to replace those that will be cleared from within the road reserve.

3.1 Revegetation Aims

The aim of the revegetation activities within the Offset site are to:

- restore the site to a self-sustaining ecosystem that extends the existing area of vegetation
- restore a general Wheatbelt vegetation structure within both offset sites.

3.2 Flora Species

Flora refers to the individual plant species that are found in an area, while vegetation refers to the broader assemblage of plants associated with a habitat and ecosystem. Many Western Australian plants have a close association with one or more soils in a locality, and as a result may be found nowhere else. Desktop searches were undertaken to determine whether declared rare flora and/or threatened or priority listed ecological communities were likely to be found at the offset site.

The Shire of Goomalling's offset sites were traversed by a Natural Area Botanist/Ecologist during October 2020 to:

- ground-truth desktop information
- assess the vegetation type and condition
- assess the type and extent of weeds
- develop a floristic species list for use in revegetation activities.

Flora present in nearby vegetated areas, such as that remaining in the Berringa Road offset site and along road reserves, was reviewed to determine species that would likely be present in vegetation of good or better condition to inform this revegetation plan. Table 1 presents the aspirational flora species list based on:

- the visit to the revegetation sites and road verges in October 2020,
- previous visits to the Goomalling area since 2019
- a review of NatureMap search outcomes
- typical species listed in Appendix A of the *Approved Conservation Advice for the Eucalypt Woodlands of the Western Australian Wheatbelt* (Department of the Environment and Energy).

Consideration has also been given to the ease of growing/propagating species. It is expected that this list will be used as the basis of sourcing tubestock from suitable nurseries when revegetation commences. One species mix is provided in Table 1, to be used for to restore vegetation similar to the region. Annual herb species will be difficult to plant and are recommended to be introduced to the site via direct seeding, these species are highlighted green in Table 1. Species in the Pea family can be direct seeded in the area as opposed to planting tubestock these have also been highlighted green in Table 1.

Table 1: Proposed flora species list

Species Name	Common Name	Life form
Planting Mix 1 - General		
<i>Acacia acuminata</i>	Jam	Tree
<i>Acacia lasiocalyx</i>	Silver Wattle	Shrub
<i>Acacia lasiocarpa</i>	Panjang	Shrub
<i>Acacia microbotrya</i>	Manna Wattle	Shrub
<i>Acacia multispicata</i>		Shrub
<i>Acacia pulchella</i>	Prickly Moses	Shrub
<i>Allocasuarina huegeliana</i>	Rock Sheoak	Tree
<i>Allocasuarina humilis</i>	Dwarf Sheoak	Shrub
<i>Amphipogon turbinatus</i>		Shrub
<i>Atriplex semibaccata</i>	Berry Saltbush	Shrub
<i>Atriplex vesicaria</i>	Gimlet Saltbush	Shrub
<i>Austrostipa elegantissima</i>		Herb
<i>Banksia sessilis</i>	Parrot Bush	Shrub
<i>Bossiaea eriocarpa</i>	Common Brown Pea	Shrub
<i>Calothamnus quadrifidus</i>	One-sided Bottlebrush	Shrub
<i>Dampiera lavandulacea</i>		Shrub
<i>Dodonaea pinifolia</i>		Shrub
<i>Enchylaena tomentosa</i>	Ruby Saltbush	Shrub

Species Name	Common Name	Life form
<i>Eucalyptus accedens</i>	Powderbark Wandoo	Tree
<i>Eucalyptus loxophleba</i> subsp. <i>loxophleba</i>	York Gum	Tree
<i>Eucalyptus flocktoniae</i> subsp. <i>flocktoniae</i>	Flockton's Mallee	Tree
<i>Eucalyptus wandoo</i>	Wandoo	Tree
<i>Gastrolobium parviflorum</i>		Shrub
<i>Gastrolobium spinosum</i>		Shrub
<i>Glischrocaryon aureum</i>	Common Popflower	Herb
<i>Grevillea armigera</i>	Prickly Toothbrushes	Shrub
<i>Grevillea petrophiloides</i> subsp. <i>petrophiloides</i>		Shrub
<i>Hakea lissocarpha</i>	Honey Bush	Shrub
<i>Helichrysum leucopsideum</i>		Herb
<i>Hibbertia commutata</i>		Shrub
<i>Hibbertia exasperata</i>		Shrub
<i>Hovea chorizemifolia</i>	Holly-leaved Hakea	Shrub
<i>Lagenophora huegelii</i>		Herb
<i>Leptospermum erubescens</i>	Roadside Teatree	Shrub
<i>Maireana brevifolia</i>	Small Leaf Bluebush	Shrub
<i>Melaleuca cordata</i>	Pom Pom	Shrub
<i>Petrophile striata</i>		Shrub
<i>Podolepis lessonii</i>		Herb

Species Name	Common Name	Life form
<i>Ptilotus polystachyus</i>	Prince of Wales Feather	Shrub
<i>Rhodanthe laevis</i>		Herb
<i>Thysanotus patersonii</i>		Herb
<i>Trachymene cyanopetala</i>		Herb
<i>Trachymene pilosa</i>	Native Parsnip	Herb

4.0 Revegetation Plan

The major aim of the revegetation plan is to describe and guide revegetation activities over a five year period from site preparation works, installation and plant establishment and three years' post-installation monitoring and maintenance. The focus of the plan revolves around the restoration of a Wheatbelt vegetation community which is representative of the region.

Plan development has included the following activities:

- identification of appropriate reference sites based on soil landscape and other conditions
- identification of flora species within the offset site and nearby vegetated areas, including native and weed species
- assessment of vegetation condition
- consideration of other issues that could reduce the success of rehabilitation outcomes, such as the presence of pest species
- development of success and monitoring criteria to be implemented after the initial installation of tubestock.

4.1 Flora Species List

Based on the review process, the proposed planting mix provided in Table 1 includes species that have the highest probability of being sourced as local provenance stock from reputable nurseries and were recorded in the local remnant vegetation areas. The aim of the list is to provide an indication of species that could be included within the restoration process, with the actual list being informed by those available from the nursery (or nurseries) contracted to provide the tubestock for the site.

Plants will need to be ordered by October/November at the latest the year before planting and meet the following requirements:

- sourced from a NIASA accredited nursery
- tubestock needs to be suited to the offset site growing conditions (local provenance)
- pot size = forestry tube (50 mm x 50 mm x 120 mm tall)
- plants shall be vigorous, established and hardened off
- have a good form consistent with species and variety
- free from disease and pests
- have large healthy root systems with no evidence of having been restricted or damaged (e.g. root bound)
- any pruning, budding or grafting scars will be clean and well calloused
- trees will have a single leading shoot unless otherwise specified
- stock will be able to support their own weight, i.e. stand without staking
- containers will be free of weeds
- the root ball of the plant shall remain intact with only a minor amount of loose soil present
- if there is requirement for substitutions of one species for another it must be a locally endemic species that are present within nearby vegetated areas.

Note that the majority of species identified as being suited for the restoration works can be easily propagated from seed, with others such as *Hibbertia commutata* and *Hibbertia exasperata* grow best from cuttings. Some of the annuals such as Asteraceae (Daisy) species would be best introduced to the site via direct seeding.

4.2 Planting Zones and Ratios

The revegetation program has been designed to achieve the same targets as those outlined in the revegetation plan prepared for the proposed clearing of Calingiri – Goomalling Road, and will comprise:

- the planting of 1,200 stems per ha
 - 40% overstorey (trees)
 - 40% middle storey (shrubs)
 - 20% understorey (herbs)
- 75% success rate for all plantings
- weed cover ≤ 20%.

The number of plants to be installed is summarised in Table 2.

Table 2: Planting numbers according to offset site location

Site	Area (ha)	Planting List	Trees	Shrubs	Herbs	Totals
Berring Rd E	6.62	Table 1	3,178	3,178	1,589	7,945

4.3 Pre-planting Activities

The success of revegetation activities can be closely linked to the effective management of other activities, particularly the presence of weeds and pests. Thus, pre-planting activities will be required ahead of the tubestock planting that is expected to occur in 2022. Pre-planting activities at each site will include:

- ripping of the site
- weed control
- pest animal control (if required)
- rubbish removal (if required)
- fencing
- firebreak construction or maintenance.

4.3.1 Ripping

Ripping the site will assist with removing any areas of compaction or other obstructions that could prevent root penetration of seedlings. Rip lines will also assist with water penetration and create a microclimate that will contribute to seedling establishment. Seedlings planted into these rip lines will have some protection from wind and increased water retention due to the slope of the rip line.

4.3.2 Weed Control

The main weeds present within the site include Perennial Veldt Grass (*Ehrharta calycina*), Bearded Oat (*Avena barbata*), Great Brome (*Bromus diandrus*), and Mediterranean Turnip (*Brassica tournefortii*), Cape Weed (*Arctotheca calendula*) and Paterson's Curse (*Echium plantagineum*). Weeds will need to be treated prior to the planting of tubestock. Control methods for each of these weeds is provided in Table 3.

Depending on the density and height of weeds at the time of works commencement, slashing of weeds may be undertaken prior to or post herbicide weed control; if slashing machinery is used in hotter spring/summer months this should be accompanied by a watering unit to reduce fire risk to the site. Given the revegetation area is to be ripped, slashing has not been included in the indicative implementation costings.

Table 3: Weed control methods

Species	Common Name	Treatment Type	Treatment Timing
<i>Arctotheca calendula</i>	Cape Weed	Spot spraying glyphosate at 10 ml/L will control capeweed at all growth stages	Jun - Nov
<i>Avena barbata</i>	Bearded Oat	Fluazifop-p (212 g/L active ingredient) 10 mL/10 L or 0.5 L/ha + wetting agent	Jul - Oct
<i>Brassica tournefortii</i>	Mediterranean Turnip	Spot spray using 1% glyphosate	May - Sept
<i>Bromus diandrus</i>	Great Brome	1% glyphosate on seedlings, young plants or when flowering	Jun - Nov
<i>Echium plantagineum</i>	Paterson's Curse	Spot spray in late autumn/winter when most seed has germinated for the year with 0.5 g/10 L chlorsulfuron + wetting agent	May - Sept
<i>Ehrharta calycina</i>	Perennial Veldt	Spray - selective grass spray (will affect native grass species)	Dec - Jun
<i>Eragrostis curvula</i>	African Lovegrass	Spot spray using 2% glyphosate	Dec - Jun
<i>Lysimachia arvensis</i>	Pimpernel	Spot spray using 1% glyphosate	Jun - Oct

Source: DBCA, 2021b

4.3.3 Pest Animal Control

European Rabbit

Rabbits are a highly invasive species due to their ability to reach sexual maturity in a short period of time, their short gestation period and ability to cope with environmental variability. The direct and indirect effects of rabbits pose a threat to the ecology of local areas and the viability of rehabilitation activities as they browse on young plants and tubestock due to their high palatability and nutrient content. The grazing activities of rabbits often alter the ecology of plant communities by selecting species that are resistant to regular cropping such as grasses and reducing natural regeneration. Rabbits also have the potential to exacerbate erosion, promote weed growth as well as competing for resources with native fauna. An indirect effect of rabbit populations is to provide an increased food supply to introduced predators which in turn predate native fauna (Pech and Hood, 1998).

Signs of the European Rabbit (*Oryctolagus cuniculus*) were not observed at the at the Watson's Pit site, although their presence is probable. The European Rabbit is listed as a C3 declared pest on the Western Australian Organism List (WAOL) under the *Biosecurity and Agriculture Management Act 2007* (WA), this classification requires management by the landowner/manager to reduce the impact and spread of the species. Removal/treatment of any warrens present within the offset sites may be required ahead of planting activities.

The use of 1080 baits can occur due to the rural location of the sites as well as the fact that both sites are already fenced, meaning there would be little chance of the bait being taken by domestic animals. If signs of rabbit presence and predation on revegetation seedlings are observed during monitoring events, baiting may be required. Other means of control can also be considered, including the installation of a rabbit mesh apron to the existing fencing, providing existing fences/gates are in suitable condition.

Fox

While clearly distinguishable signs of foxes (*Vulpes vulpes*) were not apparent during the October 2020 site visit, the probability of their presence is high. If required, the use of 1080 baits that target foxes may be used to control any present during rehabilitation works.

4.3.4 Fencing

The offset site is currently fenced and gated; this will be maintained on an as required basis as a means of minimising unauthorised access during the plant establishment period.

4.3.5 Rubbish Removal

No rubbish was recorded at the offset site locations during the October 2020 site visit. If dumping of rubbish has occurred since that time, it will be removed prior to the commencement of planting activities.

4.3.6 Firebreak

A 4 m wide trafficable firebreak that complies with Shire of Goomalling specifications is present at the offset sites around the interior perimeter fence and will be maintained on an ongoing basis.

4.4 Revegetation Methodology

Revegetation activities will primarily involve infill planting at the site to restore the required species diversity. If seed is available, it will be used for direct seeding at the conclusion of all weed control activities to prevent non-target death of germinating seedlings. Table 2 (Section 4.2) indicates the number of plants to be installed in the offset site.

4.4.1 Revegetation – Tubestock

Revegetation areas will be treated for weeds prior to planting as part the weed control programme (Section 4.3.2). Plants should be installed as tubestock, rather than from smaller cells that mean less extensive root systems, with a native plant fertiliser tablet, such as Typhoon or similar, after the first major winter rains (May or June). A total of 7,945 plants will be installed in the offset site to achieve the required 6.62 ha that needs to be restored. With the allowance for a 25% death rate of plantings, it is expected that

approximately 5,959 plants will survive three years post installation; survival rates will be reviewed after the survival of year 1 plantings are known.

Indicative numbers can be based on the aspirational species list is provided in Table 1, with higher numbers of plants known to be favoured by black cockatoos to be installed. A total of 3,178 trees species are proposed to be installed. Based on DWER's Western Australia Environmental Offset Calculator, a minimum of 287 tree species are required to be a Black Cockatoo preferred foraging species (e.g., *Eucalyptus wandoo*, *Eucalyptus accedens* etc.). Planting will occur in a random pattern across the area to be revegetated rather than in clumps of the same species. Planting in excess of the final targets may also be a strategy adopted to ensure target completion criteria are achieved.

4.4.2 Revegetation – Seed

Seed collection has been undertaken by Natural Area seed collectors licensed by the DBCA from approved areas within the Shire of Goomalling. This seed is expected to be used to propagate the tubestock for the rehabilitation sites.

Any seed left over after revegetation and the conclusion of weed control works can either be direct seeded to provide further variation in the age structure of species present or used by the Shire of Goomalling to assist with other current or future restoration projects. Direct seed suitable species are indicated in Table 1. Seed is typically pre-treated according to the type collected, bulked, and blended prior to distribution. Seed can be broadcast manually using a hand seeder in locations where tubestock planting has occurred. Note that seed collection and direct seeding has not been costed in the implementation estimates provided.

4.5 Watering

With a drying climate, it is increasingly common for plants to be watered on installation and, where possible to do so, over summer months to assist with plant establishment. The typical watering rate is 2 L per plant per visit, with visits scheduled according to the number of very hot days occurring in the area that could otherwise lead to plant stress and death. Due to the amount of plants, offset site area and location, watering may not be a feasible option for this site; additional infill planting may be a more cost effective method to achieve completion criteria for plant survival.

4.6 Completion Criteria

In order to determine when desired revegetation outcomes have been achieved, it is necessary to formulate completion criteria and monitor those over time. Completion criteria for the rehabilitation of each of the offset sites three years post planting are:

- an overall 75% survival rate for all plants in each stratum
- reduction of 80% or more in weed presence
- no obvious presence of rabbits
- gates and boundary fence to be in good condition with no obvious damage.

During site visits whilst on ground works are being carried out, informal monitoring of the site will be carried out by key stakeholders, including the on-ground Project Manager/s and the works contractor to ensure that

any issue arising such as plant death, increased weed presence, or grazing can be attended to in a timely manner.

4.6.1 Contingency Measures

Monitoring activities will be carried out annually for a minimum of two years after initial planting to ensure completion criteria, particularly required numbers and planting densities are being met. In the event monitoring indicates completion criteria have not been achieved, the following will be implemented:

- assessment of potential reasons why seedlings have failed
- infill planting
- further weed and/or pest control if required.

In terms of planting numbers, the following will serve as a trigger for the need of infill planting:

- a 65% survival rate for all plants in each stratum
- patch size of bare ground is 40 m².

In the event Dieback (*Phytophthora cinnamomi* or other *Phytophthora* species) is suspected as being the cause of the decline, discussions with the Shire of Goomalling and potentially DWER will occur to review and refine the revegetation plan and completion criteria as appropriate.

4.7 Artificial Nesting Hollows

As four trees containing hollows that could eventually be utilised by endangered black cockatoos are proposed to be cleared when the Calingiri – Goomalling Road is widened, DWER has requested for the installation of five artificial black cockatoo nesting hollows to offset the loss of nesting resource, based on the offset metric calculator. Installation will occur in the following locations within the Berringa Road East offset site within the remaining mature trees (Figure 2).

All artificial hollows will be installed prior to the commencement of the next black cockatoo breeding season following the clearing of the identified habitat trees. Artificial hollows will be designed and placed in accordance with the specifications detailed in the document *How to design and place artificial hollows for Carnaby's cockatoo*, Department of Parks and Wildlife; and will be monitored and maintained in accordance with the specifications detailed in *How to monitor and maintain artificial hollows for Carnaby's cockatoo*, Department of Parks and Wildlife, for a period of at least ten years. Following clearing a fauna survey report will be provided.

4.8 Monitoring

Monitoring of revegetation activities within the rehabilitation site will occur annually in spring until completion criteria has been met and maintained for two years (i.e. three successive monitoring events at a minimum). The monitoring will consider the mix of other native species and use this information to guide species choice for infill planting activities. Monitoring will also include an assessment of weeds present and signs of pest animal species such as rabbits.

Three monitoring methods will be implemented:

1. Photo Monitoring: twelve photo monitoring points will be set up to enable comparison of the area over time, with photos taken from the north-west corner towards the south-east
2. Quadrats: twelve 5 m x 5 m quadrats will be set up, these will be traversed on foot with plant survival, vegetation health and community structure noted
3. Aerial Imagery: as revegetation activities can be of varying success within a nominated site, a review of aerial imagery showing change in vegetative coverage over time will provide a broader measure of success; this will occur at the Goomalling sites on the availability of current aerial imagery or the use of drones.

4.9 Reporting

An annual report will be provided to the Shire of Goomalling in the first instance, describing:

- weed control
- pest animal control
- revegetation activities carried out
- survival rates; including progress towards completion criteria
- any recommendations on the need for infill planting
- any recommendations on the need for pest animal control.

This document will also contribute to reporting requirements associated with approval conditions on the clearing permit issued to the Shire; particularly those outlined in the permit relating to record keeping and reporting. Note that DWER require submission of the annual report by June 30 each year.

5.0 Implementation

Initial on-ground works including those associated with weed control, ground preparation, and ripping prior to planting will occur in the lead up to site plantings in 2022, with other associated activities such as infill planting and monitoring occurring in subsequent years (Tables 4 – 6).

It should be noted that the photo monitoring points and quadrats to enable an assessment of the rehabilitation success over time will be established prior to the commencement of on ground activities. Monitoring of revegetation activities within the rehabilitation site will occur annually in spring until completion criteria has been met and maintained for two years.

Table 4: Initial works, early 2022

Activity	Month					
	Jan	Feb	Mar	April	May	June
Fencing maintenance (if required)	■					
Firebreak maintenance (if required)	■					
Rubbish removal (if required)		■				
Installation of nesting hollows			■			
Initial Weed control				■		
Rabbit control				■		
Fox control (if required)				■		
Site ripping					■	
Pre-planting weed control					■	
Direct seeding						■

Table 5: Year 1 implementation schedule for 2022 - 2023

Activity	Month											
	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	April	May	Jun
Planting Zone 1	■											
Maintenance Weed control	■		■						■			
Monitoring				■								
Order plants for following season (if required)				■								
Reporting												■

Table 6: Yearly implementation schedule for years 2 - 5

Activity	Month											
	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	April	May	June
Maintenance weed control												
Monitoring												
Order plants for following season (if required)												
Infill planting (if required)												
Reporting												

6.0 Indicative Cost Schedule

An indicative cost schedule for the planting of 6.62 ha in the nominated offset sites is provided in Table 7 for Berring Road. Note that actual costs will vary according to contractor(s) engaged to complete the works and their rates, or if the Shire or community members undertake works then certain line items can be removed. Provisional sums are provided in Table 8.

Table 7: Indicative costings for Berring Road Offset

Activity	Year 1 (Jan 2022 - Dec 2022)				Year 2 (Jan 2023 - Dec 2023)				Year 3 (Jan 2024 - Dec 2024)				Year 4 (Jan 2025 - Dec 2025)				Year 5 (Jan 2026 - Dec 2026)			
	Unit	Qty	Unit rate	Cost (\$ ex GST)	Unit	Qty	Unit rate	Cost (\$ ex GST)	Unit	Qty	Unit rate	Cost (\$ ex GST)	Unit	Qty	Unit rate	Cost (\$ ex GST)	Unit	Qty	Unit rate	Cost (\$ ex GST)
Ripping	Item	1	3,900.00	3,900.00	Item				Item				Item				Item			
Supply and installation of artificial nesting hollows	Each	5	728.20	3,641.00	Each				Each				Each				Each			
Initial weed control	Event	1	3,680.00	3,680.00	Event				Event				Event				Event			
Supply and installation of tubestock	Each	7,945	3.10	24,629.50	Each	2,384	3.10	7,390.40	Each				Each				Each			
Maintenance weed control	Event	1	9,600.00	9,600.00	Event	1	9,600.00	9,600.00	Event	1	6,400.00	6,400.00	Event	1	6,400.00	6,400.00	Event	1	6,400.00	6,400.00
Monitoring	Event	1	1,920.00	1,920.00	Event	1	1,920.00	1,920.00	Event	1	1,920.00	1,920.00	Event	1	1,920.00	1,920.00	Event	1	1,920.00	1,920.00
Reporting	Event	1	2,880.00	2,880.00	Event	1	2,880.00	2,880.00	Event	1	2,880.00	2,880.00	Event	1	2,880.00	2,880.00	Event	1	2,880.00	2,880.00
Yearly Total (ex GST)				50,250.50				21,790.40				11,200.00				11,200.00				11,200.00
GST				5,025.05				2,179.04				1,120.00				1,120.00				1,120.00
Yearly Total (inc GST)				55,275.55				23,969.44				12,320.00				12,320.00				12,320.00
Project Total (ex GST)				105,640.90																
GST				10,564.09																
Project Total (inc GST)				116,204.99																

Table 8: Provisional Sums

Activity	Unit	Qty	Unit rate
Feral animal control event (rabbits and foxes)	Event	1	3,500.00
Rubbish removal and disposal	Hourly rate		70.00
Fence maintenance (not including parts)	Hourly rate		75.00
Firebreak maintenance (tractor)	Hourly rate		150.00
Infill planting (if required)	Each	1,419	3.10
Watering	Event	1	3,900.00

7.0 References

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