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J.7

Threatened Species Translocation Plan





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THREATENED SPECIES TRANSLOCATION PLAN

*New Acland Coal Mine
Stage 3 Project*

JANUARY 2014



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1. Introduction

1.1. Revised Project

New Acland Coal Pty Ltd (NAC) currently operates the Mine, as a 4.8 million tonnes (product coal) per annum (Mtpa) open cut coal mine on Mining Lease (ML) 50170 and ML 50216 adjacent Mineral Development Licence (MDL) 244, under the approval of Environmental Authority (EA) No. EPML00335713. The Mine is forecasted to deplete its reserves by 2017. The revised Project involves the extension and operation of the Mine, increasing production from 4.8 Mtpa up to 7.5 Mtpa of thermal product coal.

The revised Project involves the extension of the Mine's operating life to approximately 2029 with the inclusion and progressive development of two new resource areas within MLA 50232. These resources areas are termed the Manning Vale and Willeroo resource areas. The revised Project will include mining in three new mine pits, namely, the Manning Vale West, Manning Vale East and Willeroo mine pits.

1.2. Purpose and objectives of the plan

The purpose and objective of this plan is to identify threatened species located within the revised Project area with reference to relevant legislation under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and/or the Queensland *Nature Conservation Act 1992* (NC Act).

Threatened species identified within the revised Project site will be subject to relocation guided by a Threatened Species Translocation Plan (TSTP). The TSTP will aim to maintain and improve the extent of threatened species through relocation and offset programs. The TSTP will document methods and actions required for successful translocation of threatened species identified within the revised Project site.

1.3. Threatened Species

The revised Project impacts three species listed as either: endangered, vulnerable, or near threatened, under the EPBC Act and/or the NC Act. The species impacted by the revised Project and their status are listed in Table 1-1.

Table 1-1 Threatened species status

Species	Common Name	EPBC Status	NCA Status
<i>Bothriochloa biloba</i>	Lobed Blue-grass	Vulnerable	not listed
<i>Homopholis belsonii</i>	Belson's Panic	Vulnerable	Endangered
<i>Digitaria porrecta</i>	Finger Panic Grass	Endangered	Near threatened

1.4. Methodology

The objectives of the TSTP are to maintain and improve the extent of the threatened species affected by the revised Project. These objectives will be achieved through the provision translocation sites within the revised Project's proposed Bluegrass ecological community offset

areas and adjacent to State significant biodiversity areas (Figure 4-1). The TSTP mitigates the impacts on the threatened species; and documents the methods and monitoring actions required for successful translocation of these plants from within the revised Project site to adjacent habitats. The TSTP will also overview the long term legal protection of the translocation sites via their inclusion within the revised Project's proposed Bluegrass ecological community offset areas.

2. Plant identification

2.1. Method

Flora and vegetation surveys were completed on six occasions between 2005 and 2013 for the revised Project area and areas within the New Acland Coal Mine. These surveys were either conducted in association with fauna surveys or were specific surveys to confirm vegetation condition and presence of threatened flora species. The survey sites were located in areas of habitat suited to the listed species, including along Lagoon Creek and in areas of vegetation within the disturbance areas of the revised Project. Table 2-1 lists the flora and vegetation surveys that have been completed for the Project. Surveys of the areas of EPBC listed threatened ecological communities that will be cleared for the revised Project have been conducted.

These surveys identified locations of threatened species listed under the EPBC Act and/or NC Act and associated habitats. Species profiles have been developed using information obtained from the field surveys and literature reviews including individual species listing advice from the Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) species profile threats database (SPRAT).

Table 2-1 Vegetation and flora surveys

Survey date	Purpose
August 2005	General flora and vegetation survey – record species and vegetation communities
February 2007	Vegetation condition assessment of bluegrass Threatened Ecological Community
February-March 2007	General flora and vegetation survey
February 2011	Vegetation condition assessment of vegetation communities in revised Project disturbance area and offset sites
June 2013	Vegetation condition assessment of vegetation communities in revised Project disturbance area and offset sites
August 2013	Confirmation of regional ecosystems and threatened species within the revised Project disturbance area.

2.2. Species profiles

2.2.1. Lobed Blue-grass (*Bothriochloa biloba*)

Description		Erect or decumbent grass to 1 m high. Lobed upper lemma (bract enclosing the flower) which remains attached to the awn when the awn is pulled out from the spikelet. Flowering occurs November to June.
Habitat		Cleared eucalypt forests and relict grasslands. Prefers heavy textured soils like brown or black clay.
Associated Regional Ecosystem		11.3.21 <i>Dichanthium sericeum</i> and/or <i>Astrebla</i> spp. Grassland on alluvial plains. Cracking clay soils. 11.3.24 <i>Themeda avenacea</i> grassland on alluvial plains. Basalt derived soils. 11.8.11 <i>Dichanthium sericeum</i> grassland on Cainozoic igneous rock
Associated Threatened Ecological Community		Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland
Status	Commonwealth	Vulnerable
	State	Not listed

Source: TSSC (2008b).

2.2.2. *Belson's Panic (Homopholis belsonii)*

Description		Perennial grass growing to 0.5 m high. Leaf blades are 2–4.5 mm wide. The common axis of the inflorescence is 8–15 cm long and the primary branches are 8–15 cm long with hairy axils. There are two or three laterally compressed spikelets measuring 8 mm long on the typical lowermost branch.
Habitat		<p>There are three general types of habitat which contain Belson's Panic:</p> <ul style="list-style-type: none"> • Rocky, basaltic hills supporting White Box (<i>Eucalyptus albens</i>) / Wilga (<i>Geijera parviflora</i>) woodland with assorted shrubs and a number of grass species. It was generally found among fallen timber, at the base of trees or shrubs, among branches and leaves of trees hanging to ground level or along the bottom of netting fences. • Flat to gently undulating alluvial areas supporting Belah (<i>Casuarina cristata</i>) forest and sometimes Brigalow (<i>Acacia harpophylla</i>) or Wilga. Understorey varied from the presence of only Belson's Panic to a mixture of shrubs, sub-shrubs and grasses. Many of the Belah sites were subject to intermittent inundation. • Drainage lines supporting Belah and sandy country dominated by Cypress Pine-Bloodwood-Ironbark-She-Oak Forest.
Associated Regional Ecosystems		<p>11.8.5a: Eucalyptus orgadophila woodland with a dense understorey of low trees species including Geijera parviflora, Callitris glaucophylla, Pittosporum angustifolium, Alectryon oleifolius, Psyrax odorata and Notelaea microcarpa.</p> <p>11.9.10 <i>Eucalyptus populnea</i>, <i>Acacia harpophylla</i> open-forest on fine-grained sedimentary rocks.</p> <p>11.3.17 <i>Eucalyptus populnea</i> woodland with <i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> on alluvial plains</p>
Associated Threatened Ecological Community		Brigalow (<i>Acacia harpophylla</i> dominant and co-dominant)
Status	Commonwealth	Vulnerable
	State	Endangered

Source: TSSC (2008d), SEWPac (2011).

2.2.3. Finger Panic Grass (*Digitaria porrecta*)

Description		Loosely tufted perennial growing to 60 cm tall. Grey leaves, 2–3 mm wide, with sharp hairs along the middle. Flowers in late summer in a cylindrical cluster along the stalk, with the lower clusters arranged in a whorl of four to six, each up to 30 cm long. Seeds from March to April. Also reproduces vegetatively by dying back to the tussock base, from which it regrows in summer. As the tussock ages, the central portion dies and the resultant ring of plantlets eventually separates and become independent tussocks.
Habitat		Grasslands on extensive basaltic plains, and in undulating woodlands and open forests with an underlying basaltic geology. It usually occurs on dark and fine textured soils with some degree of seasonal cracking and can persist in disturbed areas such as paddocks.
Associated Regional Ecosystems		11.3.21 <i>Dichanthium sericeum</i> and/or <i>Astrebla</i> spp. grassland on alluvial plains. Cracking clay soils. 11.3.24 <i>Themeda avenacea</i> grassland on alluvial plains. Basalt derived soils. 11.8.11 <i>Dichanthium sericeum</i> grassland on Cainozoic igneous rock.
Associated Threatened Ecological Community		Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland
Status	Commonwealth	Endangered
	State	Near Threatened

Source: TSSC (2008e).

3. Existing locations and habitat

The locations of threatened species records are shown in Figure 4-1. These species occur in the following habitats within the revised Project site:

- Lobed blue-grass was recorded on non-remnant roadside sites supporting natural grassland ecological communities dominated by Bluegrass (*Dichanthium sericeum*), *Austrodanthonia bipartita*, *Bothriochloa biloba*, *Themeda triandra* and *Chloris divaricata* (Plate 3-1). One isolated occurrence in eastern part of the revised Project area, near Acland-Silverleigh Road, in the Manning Vale East Pit.
- Belson's Panic was recorded in remnant and non-remnant habitats associated with *Eucalyptus orgadophila*, *E. populnea* and *Acacia harpophylla* dominated forest and woodlands with a mid-tree stratum dominated by Wilga (*Geijera parvifolia*) on basaltic hills and alluvium. For sites where Belson's Panic was recorded it was observed growing in shaded areas under the protection of trees and logs (Plate 3-2). The species was found in the bluegrass dominated grassland community in the Manning Vale West Pit and the Willaroo Pit, to the south of Lagoon Creek. This species has been found in the shelter of trees in the brigalow and poplar box vegetation communities.
- Finger Panic Grass was recorded in RE 11.8.11 dominated with Bluegrass, *Panicum decompositum*, *Digitaria divaricatissima*, *Paspalidium globoideum*, *Themeda avenacea* and *Aristida leptopoda* on basaltic hills and alluvium (Plate 3-3). It has been located in the Manning Vale West pit of the revised Project area.



Plate 3-1 Grassland with Lobed blue-grass



Plate 3-2 Roadside Poplar Box (*Eucalyptus populnea*) grassy woodland with Belson's Panic



Plate 3-3 Grassland with Finger panic grass

4. Translocation sites

Translocation sites have been identified in areas of suitable habitat based on the existing habitats where the threatened species were recorded within the revised Project site.

Translocation sites have been identified on land owned by the Acland Pastoral Company (APC), outside the mining leases, to the south of the revised Project. The APC is a subsidiary company of the New Hope Group, and therefore, a sister company to NAC.

Translocation sites are adjacent to State-significant biodiversity areas and the revised Project site (Figure 4-1).

Bluegrass translocation sites provide suitable habitat for translocation of the grassland species, Lobed Blue-grass and Finger Panic Grass (Plate 4-1). These translocation sites are located within areas that are to be used for Bluegrass community offsets. The bluegrass offsets are described in the revised Project's Bluegrass Offset Management Plan. Within these offset areas, appropriately sized relocation zones will be fenced to exclude grazing and to protect translocation sites from disturbance by stock. Two habitat patches with Brigalow dominated tree layers and Wilga dominated understorey have been identified to provide suitable shaded habitat for the Belson's Panic translocation (Plate 4-2).

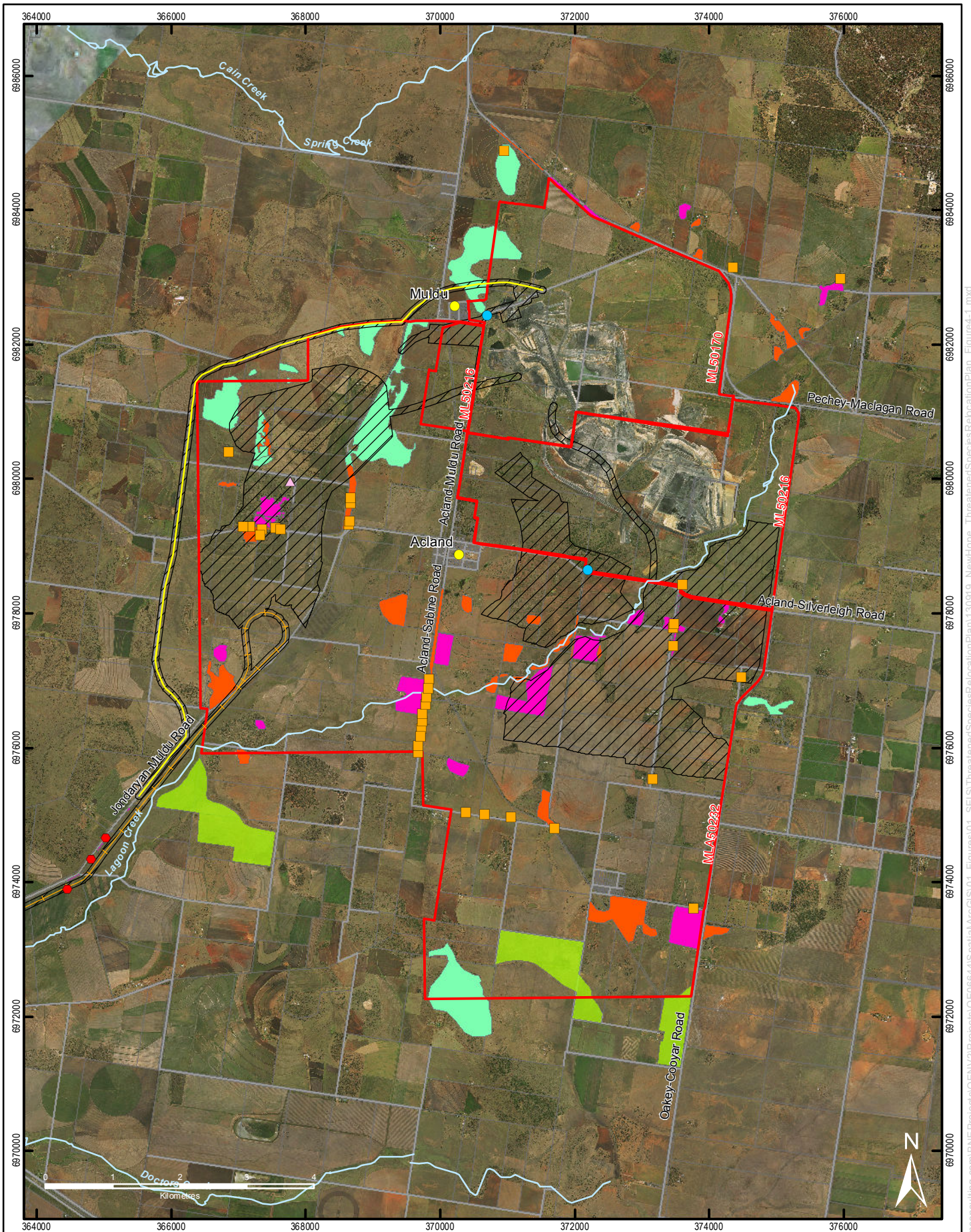
Translocation sites for grassland species (Lobed Blue-grass and Finger Panic Grass) and Belson's Panic are shown in (Figure 4-1).



Plate 4-1 Grassland species translocation site, adjacent to Oakey-Cooyar Road



Plate 4-2 *Homopholis belsonii* Translocation Site



LEGEND

- Towns and Localities
- Rail Spur
- Roads
- Creeks
- Jondaryan-Muldu Road Diversion
- Cadastre
- Mining Tenements
- Disturbance Footprint Area

Threatened Flora

- *Bothriochloa biloba*
- ▲ *Digitaria porrecta*
- *Homopholis belsonii*
- ◆ *Rhaponticum australe*

Proposed Threatened Species Translocation Sites

- Least Concern
- Of Concern
- Endangered



**NEW ACLAND COAL MINE
STAGE 3 PROJECT**

**Figure 4-1 - Threatened Species
Relocation Sites**

Scale 1:75,000 on A4
Projection: Australian Geodetic Datum – Zone 56 (AGD84)

5. Translocation implementation

This section provides a summary of the proposed translocation implementation works. The methods are based on the successful translocation of *Homopholis belsonii* undertaken by NAC for the Wetalla Water Pipeline Project in 2008 (SKM, 2009; SKM, 2011). The construction of the Wetalla Water Pipeline resulted in impacts on several populations of the threatened grass *Homopholis belsonii*. Eighteen plants were translocated on 11 December 2008, and regular maintenance (watering and weeding) and monitoring events were conducted over the subsequent 11 months. All 18 plants survived translocation, with most specimens producing stolons which formed new tussocks. Several translocated specimens also displayed evidence of new or old panicles.

For *Bothriochloa biloba* and *Digitaria porrecta*, there is little published record of translocation of these species in southern Queensland. As these species are grasses and are known to be locally common in the Acland area, it is intended to collect seed and relocate plants as part of the trial to establish the most successful method of re-establishing these species. Prior to the relocation of the *Homopholis belsonii*, there was little known how this species would respond to relocation. It has been successfully grown in new locations. A similar approach will be taken with relocation and re-establishment of *Bothriochloa biloba* and *Digitaria porrecta*.

5.1. Translocation timing

Translocation of the three threatened species will commence as soon as the SEWPaC approval of the revised Project is received, expected to be in 2014. Starting the planning and site preparation and actual translocation of the plants prior to the commencement of disturbance for the revised Project will increase the chance of success of translocation. The construction of the Manning Vale West pit and Willaroo pit is planned to commence in 2017-2018. As there are at least three years between the anticipated timing of the SEWPaC approval and the planned intended date of construction of the pits, there is time to establish the threatened species in new locations prior to an impact being caused.

5.2. Individual plant selection

Prior to relocation, sites with existing threatened species records will be searched first, and the largest clusters of tussocks and/or large individual tussocks will be selected for relocation and tagged for removal.

NAC will provide SEWPaC with a schedule of plant translocations for the revised Project's areas of threatened species prior to the commencement of translocation activities and regularly update the progress of this schedule over the life of the revised Project. The plant translocation process will be progressive to stay well in advance of the revised Project's mine path and to ensure in situ plants for seed and propagule collection should there be in the event of an unexpected failure.

5.3. Translocation

5.3.1. Translocation site identification

The selection of translocation sites involved identifying areas with microhabitat conditions as close as possible to the original site. A description of the selected translocation sites is provided in Section 4.

5.3.2. Translocation site preparation

Prior to removing tussocks, the translocation sites will be prepared. This will include removing existing groundcover and digging holes or trenches to depths that match the plants' original location. Existing groundcover will be cleared a suitable distance from around each translocation site to reduce competition from weeds and other plants in proximity to the translocation site.

5.3.3. Removal of plants

The translocated plants will be watered prior to removal to reduce transplanting shock. The plants will be removed early in the morning to avoid heat stress and will not be moved during periods of high temperature or strong drying winds. Individual tussocks or small groupings of plants, including the root mass and sufficient soil to hold the root system together, will be carefully removed using a spade or a mattock. SKM (2009) reported that Belson's Panic which experienced disturbance to the root mass did not thrive as well in the first three months post translocation. Therefore, care will be taken to minimise root damage during the translocation process. All plants to be translocated will be pruned prior to removal to reduce their potential for loss of moisture by transpiration.

The excavated plants will be protected from wind and sun exposure to minimise stress factors during transport from their original location to their translocation site. All excavated plants will be transported from their excavation site to their replanting site under the cover of wet hessian, or a similar cover. The excavated plants will also be lightly sprayed with water to maintain moisture on the leaves, roots and soil.

5.3.4. Replanting

The excavated plants will be placed in the prepared holes or trenches, backfilled with topsoil, and firmed down (gently) in a manner that creates a slight depression to enhance water retention. Mulch will be placed on bare soil to reduce wind erosion and evaporation.

The translocated plants will be marked with two stakes and flagging tape for easy identification.

All translocated clusters of plants will be watered with approximately 30 litres of water at the time of translocation.

A photograph, relevant notes and GPS coordinates will be taken for each translocated cluster of plants. A unique site identification code will also be provided for each translocated cluster of plants.

5.4. Management

5.4.1. Post planting watering

Translocated clusters of plants will be watered twice daily with approximately 10 litres of water per cluster for the first week and once a day with approximately 10 litres of water per cluster for the second week. Watering will then continue as required based on weather conditions and the progress of establishment success. Water will be applied at constant, low rates to allow for infiltration and absorption. Soil characteristics (i.e. dryness, cracking and water logging) will be assessed before each watering use to determine watering requirements. For example, if the soil is showing signs of dryness (i.e. dry, crumbly, cracking) then watering volumes will be increased, and if the soil indicates soil moisture is too high (i.e. waterlogged) then watering volumes will be reduced.

5.4.2. Groundcover vegetation management

As explained in Section 5.2.2, all groundcover vegetation (weeds and other grass species) within a suitable distance around each translocation site will be removed prior to translocation. The groundcover vegetation exclusion zone will be maintained until the translocated plants have become established. Follow-up maintenance activities (weed control) will be conducted as required such as during each watering.

Weed maintenance will be essential due to the disturbed nature of the relocation sites and the evidence of significant weed species within the Acland area. During the translocation of Belson's Panic, SKM (2009) reported that hand weeding ensured that translocated plants remained free from weed invasion. This practice was deemed to have contributed to the success of the translocation of Belson's Panic during 2009.

5.4.3. Fire management

Fire beaks will be established around each translocation site and will be slashed prior to commencement of the high fire risk season in July-August, and maintained over the growing season. If required, limited grazing may be carefully applied to these areas to reduce fire fuel loads. Grazing will only be used if plant re-establishment is well advanced.

5.4.4. General inspections

Weekly inspections of the translocated plants will be conducted by the Mine's environmental staff until the translocated plants have become establishment. More regular inspections will be conducted during the initial watering phase of the translocation process. As required, corrective and/or maintenance actions will be undertaken based on the findings of these inspections.

6. Monitoring program

A qualified ecologist will conduct regular monitoring at each translocation site, which will include the following actions.

- An assessment of soil moisture condition will be made prior to each watering by visual inspection to determine the level of watering needed.
- Weekly monitoring of individual tussock ecological health will be undertaken until establishment success is confirmed (i.e. percentage alive or dead, height, evidence of new shoots and reproductive status).
- A bi-monthly ecological condition assessment of the ground layer consistent with the biocondition method Version 2.1 will be undertaken, including assessment against benchmarks (DERM) 2011. This assessment regime will continue for a minimum of 12 months and until successful establishment of the translocated plants can be scientifically confirmed.
- A bi-monthly presence and abundance assessment of exotic plants and declared weeds as listed under the *Land Protection (Pest and Stock Route Management) Act 2002* (LP Act) will be undertaken. This assessment regime will continue for a minimum of 12 months and until successful establishment of the translocated plants can be scientifically confirmed.
- A biannual report will be provided to SEWPaC summarising the monitoring completed and any corrective and/or maintenance actions undertaken for the previous six months until successful establishment of the translocated plants can be scientifically confirmed.

7. Corrective actions

The bi-monthly ecological condition findings and the presence and abundance of exotic plants and weeds results will determine whether intervention is required during the establishment period following translocation. Competition for soil moisture, sunlight, soil nutrients and physical space from weed and exotic species pose one of the greatest risks.

This risk can be significantly reduced if care is taken with the relocation procedures, adequate follow up watering is applied until new root growth advances, and weed and other grass species competition is prevented. Appropriate management strategies for managing competition from weed and exotic species include:

- slashing or brush cutting;
- mulching around the establishing plants;
- hand weeding; and/or
- selective application of appropriate herbicides.

If the monitoring program identifies a greater than 20% loss of translocated plants, immediate action will be taken to source and collect seed or other plant propagules from the translocated plants for artificial propagation and re-planting. The progressive nature of the translocation effort over the revised Project's life should ensure that undisturbed areas of the threatened species are available within the revised Project area for seed and plant propagule collection up until the last areas of each species are relocated.

NAC does not intend to source seed and plant propagules from outside the revised Project area. If it is decided to explore this course of action, NAC will be required to assess the impacts of the seed and plant propagule collection activities and obtain the necessary Commonwealth and State approvals.

Should the translocated plants fail to become established at the translocation site, then practices will be reviewed and corrected as required (including possible updating of this plan).

8. Reporting

As outlined in Section 6, SEWPaC will be regularly advised of the progress of the revised Project's translocation activities and will receive a biannual report of the monitoring data as it is completed, including a summary of establishment success and any corrective and/or maintenance actions if implemented.

9. Legal Protection Mechanism

NAC is planning to locate the translocation sites for the threatened species within the revised Project's proposed Bluegrass ecological community offset areas to improve the overall ecological value of the offset package, to aid management activities and to ensure long term protection of the translocated threatened species.

To protect the offset areas (including the translocation sites), NAC will ensure a suitable legal protection mechanism is established over the applicable land parcels (e.g. Queensland nature refuge or covenant). This approach is aided by the fact the APC is the background land owner.

10. References

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