



NEW ACLAND COAL MINE

CONSERVATION ZONE MONITORING AND REHABILITATION MONTHLY REPORT

DECEMBER 2023

**Prepared for
New Hope Group Pty Ltd**

**Biodiversity Assessment and Management Pty Ltd
PO Box 1376
CLEVELAND 4163
November 2023**

Specialised ecological knowledge that reduces your risk

15 January 2024

Michael Law
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New Hope Group Pty Ltd
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Dear Michael

RE: Conservation Zone Monitoring and Rehabilitation Monthly Report – December 2023

BAAM was commissioned by New Hope Group to monitor rehabilitation progress and undertake maintenance works in the Bottle Tree Hill and Lagoon Creek conservation zones at New Acland Coal Mine from June to December 2023. The following report describes the monitoring and rehabilitation activities undertaken during the December 2023 monitoring event, 20th-21st December.

Works during this period focused on assessing the recent planting at Bottle Tree Hill and completing the primary treatment of Tree Pear (*Opuntia tomentosa*) along Lagoon Creek.

Please do not hesitate to contact BAAM if you require further information.

Yours sincerely,



Emma Green
Project Ecologist
Biodiversity Assessment and Management Pty Ltd



File No	Author	Reviewer
0412-005h		

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1.0 CONSERVATION ZONE MONITORING

1.1 BOTTLE TREE HILL PLANTING

Conservation monitoring during the December 2023 site visit included visual assessment of the planting area at Bottle Tree Hill, where 690 plants were installed into prepared beds on 30-31 October 2023. The CZMP requires that revegetation areas are visually monitored monthly for the first six months (or until plants are self-sufficient), including presence of any active rill/gully erosion, weed species, general assessment of seedling establishment, and quantification of any general failure of rehabilitation works.

The visual assessment found minimal erosion present, despite significant rainfall events preceding the site visit. A total of 120 mm of rainfall was recorded for the month of December (Oakey Airport weather station, WillyWeather 2023).

Weed presence within the planting site has continued to increase since the November 2023 inspection, with greater cover of Green Panic and other weeds recorded in November (**Photos 1 and 2**).

Seedling establishment was assessed through two sample counts taken on opposite sides of the planting (same rows counted in November 2023). The survival of planted trees and shrubs decreased from an estimated 79% in November 2023 to 55% in December 2023. In contrast, groundcover survival increased from 69% on November 2023 to 72% in December 2023. The causes are unclear; however, there appeared to be more impact of grazing on the planted trees and shrubs in comparison to the grass species. The planted grasses had grown significantly between the November and December monitoring events, with many beginning to form seedheads (**Photo 3**).

Of concern was the apparent off-target damage to three existing Bottle Trees (*Brachychiton rupestris*) and a *Eucalyptus sideroxylon* tree around the outside of the planting, which were found to have suffered significant defoliation since the November 2023 monitoring event (**Photo 4 and 5**). It is possible that the defoliation is a delayed response to the application of Tordon® (applied by a contractor approx. 12 weeks ago) to the mulched stems of Cape Honeysuckle and Thuja Pines in the vicinity of these trees. Given that Tordon® is a residual herbicide known to impact native vegetation, and with the extensive rainfall which has occurred since the application, it is likely that the herbicide has leached into the soil and been absorbed through the roots of the affected trees resulting in plant damage. On-going planting monitoring will aim to assess the recovery of these trees and the requirement for replacement should plant death occur.



Photo 1: Eastern side of BTH planting



Photo 2: Western side of BTH planting



Photo 3: Planted *Heteropogon contortus* producing seedheads.

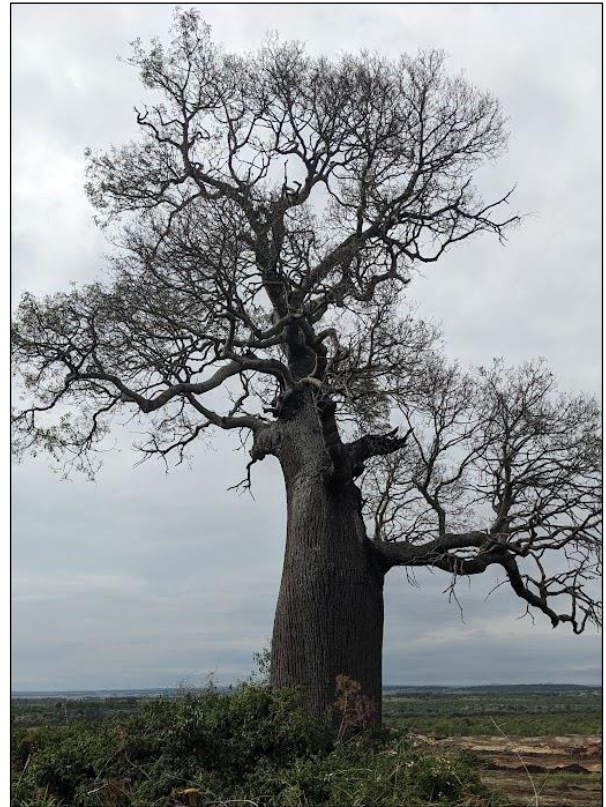


Photo 4: Defoliated Bottle Tree



Photo 5: Defoliated *Eucalyptus sideroxylon*

1.2 LAGOON CREEK

A rapid visual assessment of the northern section of Lagoon Creek was undertaken during the December 2023 visit. Natural regeneration, particularly of Poplar Box, was found to be doing very well in the more open areas and there was also a noticeable increase in native Solanum presence. Preventing cattle access to this area will further encourage the natural regeneration of native vegetation.

An infestation of the invasive weed 'Mother-of-millions' (*Bryophyllum delagoense*) was located in the southernmost portion of the Lagoon Creek conservation area. This was the first record of the species at Lagoon Creek.

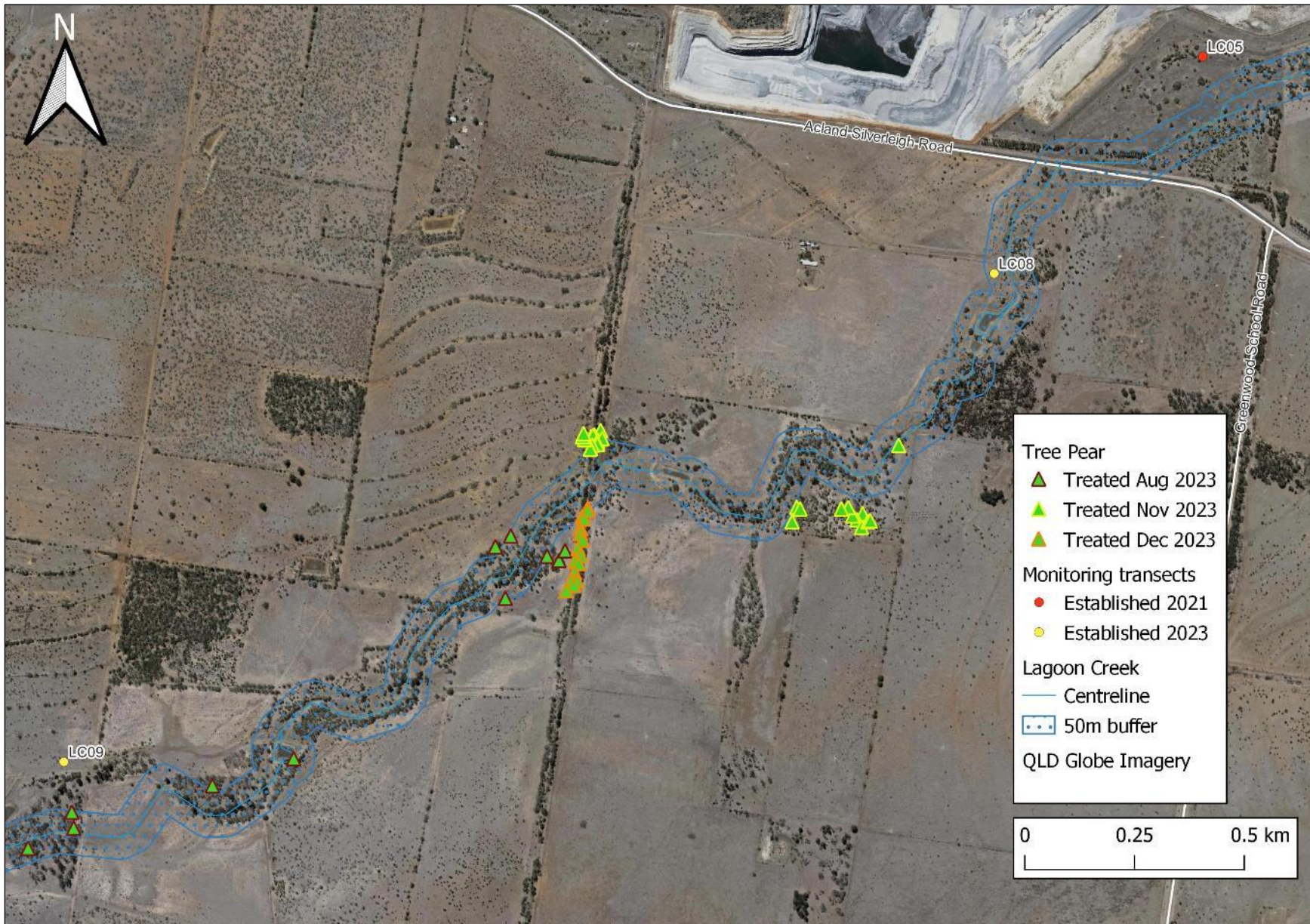
2.0 REHABILITATION AND MAINTENANCE WORKS UNDERTAKEN

2.1 BOTTLE TREE HILL

A foliar spray treatment using Glyphosate between the planted rows and a mixture of Glyphosate and Grazon® around the outside of the planting on Cape Honeysuckle regrowth was undertaken on 18 December 2023. These treatments were observed to be taking effect with wilting and discolouration evident on the foliage of sprayed weeds.

2.2 LAGOON CREEK TREE PEAR TREATMENT

During the December 2023 visit, BAAM personnel continued stem injection treatment of mature Tree Pears within the Lagoon Creek Conservation Area in the vegetated fence line connecting to Willeroo Mine Road and in the southern portion of the conservation area. About 66 plants were stem injected, completing the primary treatment of all *Opuntia* within the Lagoon Creek conservation zone (see **Figure 1** and **2**).



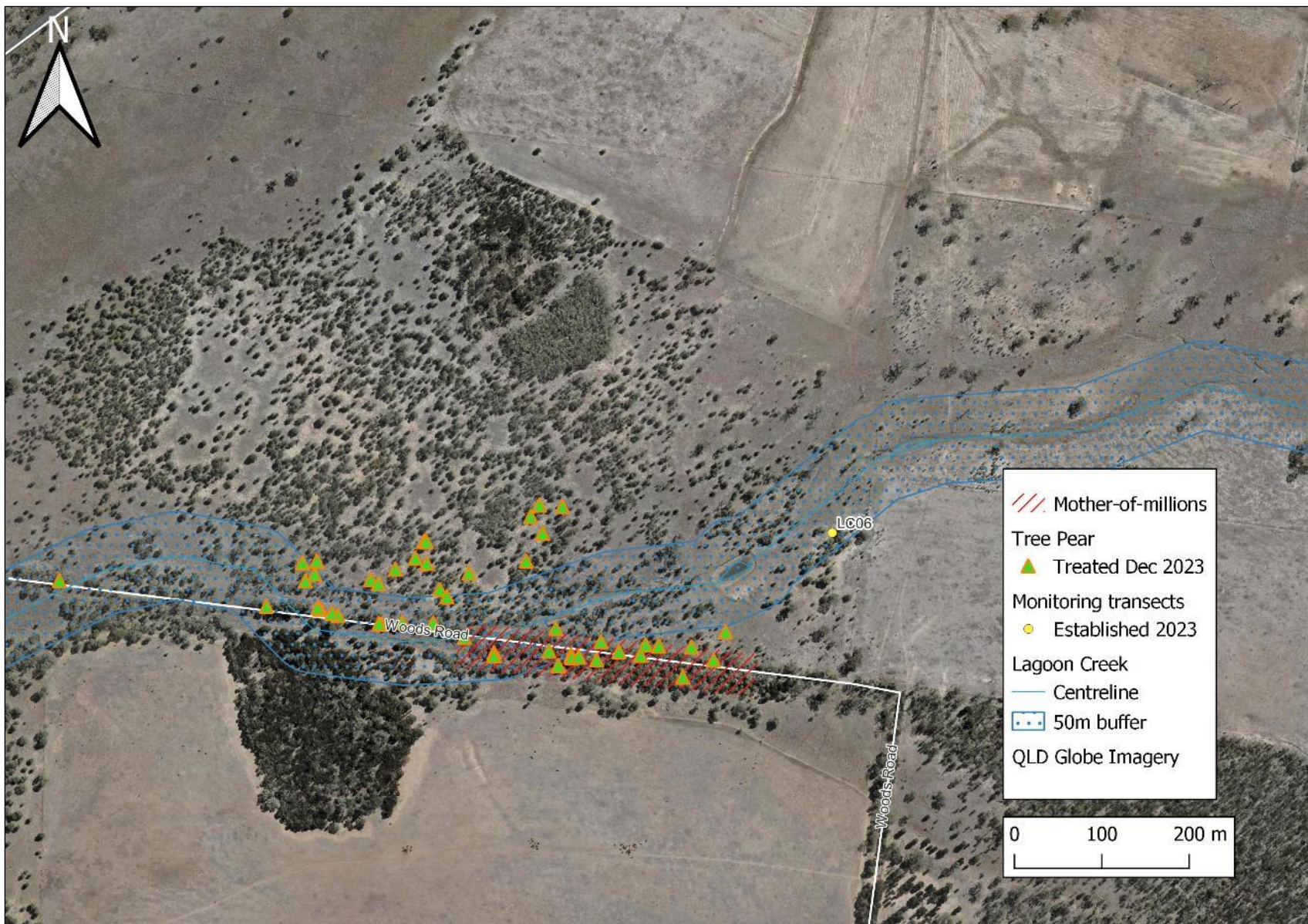


Figure 2. Tree Pear treatment locations and Mother-of-Millions in southern portion of Lagoon Creek

3.0 FUTURE REHABILITATION AND MAINTENANCE

3.1 BOTTLE TREE HILL REVEGETATION

On-going weed maintenance is recommended to control weed regrowth and emerging weeds within and surrounding the planting area. Targeted spot spraying is recommended to avoid off-target damage to emerging native species. Weeds growing within tree guards should be hand-weeded to reduce competition. Spreading mulch between the planted beds may also assist in weed suppression. This should ideally follow ground cultivation, which will be required for additional revegetation.

Due to the off-target impacts of Tordon®, this herbicide is NOT to be applied within the Bottle Tree Hill or Lagoon Creek conservation zones. The use of other residual herbicides (including Grazon®) must be carefully considered in the context of the landscape (e.g. proximity to waterways, natural regeneration presence) and prevailing weather conditions, and in strict accordance with the product label and SDS to avoid environmental damage.

Grazing by wallabies and hares appears to be restricted to planted trees and shrubs and surrounding non-native grass species rather than the planted native grasses. As such, it is recommended that the tree guards around planted grasses be removed to encourage outward growth of these groundcovers. Removed guards may be placed around naturally regenerating plants (e.g. Acacia species) within the planting area to prevent grazing.

3.2 LAGOON CREEK WEED CONTROL

As a Category 3 restricted invasive plant under *Queensland's Biosecurity Act 2014*, it is strongly recommended that NAC incorporate the control of Mother-of-millions into the maintenance program for Lagoon Creek to prevent any further spread. A rough depiction of the infestation area noted during stem injection of Tree Pear is given in **Figure 2**.

In addition to Mother-of-millions, African Boxthorn and emerging *Opuntia* spp. should be targeted for treatment throughout the creek corridor in the coming months. Engagement of a suitable contractor in early 2024 is recommended to ensure these weeds receive initial treatment in a timely manner.