

# Appendix 7

## Bush Regeneration Annual Report 2021

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**T.E.N.T.A.C.L.E INC.**

The Education Network Training Applying Conserving Landbased Ecosystems

**Bushland Regeneration Service**

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# METROMIX TERALBA BUSH REGENERATION

*Annual Report*  
*2021*

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## INTRODUCTION

The following report details the aims, objectives, hours worked, herbicide used, observations, bush regeneration activities, and the areas worked by Tentacle incorporated at Teralba Metromix quarry during 2021.

## BACKGROUND

Works by Tentacle Incorporated were carried out in accordance with all current applicable legislation including:

- Environmental Protection and Biodiversity Conservation Act 1999
- Pesticides Act 1995
- Protection of Environment Operations Act 1997
- National Parks and Wildlife Act 1974
- NSW Biodiversity Conservation Act 2016
- Lake Macquarie City Councils Local Environmental Plan 2012

All works were compliant with the conditions of the National Parks and Wildlife Services checklist, for bush regeneration activities in the habitat of threatened species, endangered populations, and endangered ecological communities. Bush regeneration techniques applied were conformed to the best practice guidelines outlined within the Bush Regenerators handbook (National Trust of Australia, NSW 1991). The rehabilitation works aim to improve the overall natural condition of the site by controlling invasive weed species. The rehabilitation of native vegetation will increase biodiversity within the designated area. Improved native vegetation communities will also protect waterways from increased sedimentation by enhancing erosion control and protecting and conserving the habitat for native and threatened flora and fauna. The works will improve the overall site condition of the site, encouraging an increase in native biodiversity.

## AIMS

The aims of the project are to restore and maintain ecosystem health by aiding the natural regeneration of indigenous plants and their communities. To manage the habitat for increased native biodiversity across the site by decreasing the population and abundance of weed species, reducing the weed density of the site. These works are performed in the best interest of Metromix's BioBanking initiative by maintaining areas of healthy vegetative status and improving those that are degraded.

## OBJECTIVES

The objectives this year were to undertake maintenance weeding across the site to ensure the weed density in areas previously weeded stay at a manageable level and do not become overrun with weeds. To complete primary weeding across the site, removing target weed species and reducing the overall weed density across the site. To clear a 20-meter perimeter of vegetation behind the fuel pump station to reduce the risk of fires. To plant out an assortment of native plant species in the prepared revegetation area. To undertake spraying of thickets various weed species throughout the site.

## HOURS WORKED

Approximately **849.25** hours have been worked this year performing environmental restoration and bush regeneration activities at Metromix Quarries Teralba by Tentacle Inc.

## HERBICIDE USED

Approximately **5.79** liters of Roundup Biactive® Herbicide has been used for the treatment of woody and other environmental weeds this year. Roundup Biactive Herbicide was selected as the preferred form of chemical control as it designed to be used in environmentally sensitive areas.

## FAUNA OBSERVATIONS

Several observations have been made this year by the Tentacle team to show the diverse fauna living in the area. Water that has sustained in multiple areas across the revegetation areas has created habitat for large amounts of frogs and aquatic snails. Several new fauna species have been observed this year.

**Table 1:** A list of the fauna species identified on site this year.

Common Name	Scientific name
Bell Miner	<i>Manorina melanophrys</i>
Brown Hare	<i>Lepus europeaus</i>
Brush Turkey	<i>Alectura lathamii</i>
Chestnut Teal	<i>Anas castanea</i>
Dollarbird	<i>Eurystomus orientalis</i>
Eastern Grey Kangaroo	<i>Macropus giganteus</i>
Eastern Koel	<i>Eudynamys orientalis</i>
Eastern Long-necked Turtle	<i>Chelodina longicollis</i>
European Red Fox	<i>Vulpes vulpes</i>
Grey Fantail	<i>Rhipidura albiscapa</i>
Kookaburra	<i>Dacelo novaeguineae</i>
Lace Monitor	<i>Varanus varius</i>
Raven	<i>Corvus coronoides</i>
Sacred Kingfisher	<i>Todiramphus sanctus</i>
Satin Bowerbird	<i>Ptilonorhynchus violaceus</i>
Striped Marsh Frog	<i>Limnodynastes peronii</i>
Sulphur-crested Cockatoo	<i>Cacatua galerita</i>
Superb Fairywren	<i>Malurus cyaneus</i>
Swamp Snake	<i>Hemiaspis signata</i>
Swamp Wallaby	<i>Wallabia bicolor</i>
Water Dragon	<i>Intellagama lesueurii</i>
Wedge-tailed Eagle	<i>Aquila audax</i>
White-faced Heron	<i>Egretta novaehollandiae</i>
Yellow-tailed Black Cockatoo	<i>Calyptorhynchus funereus</i>

## WEEDS TREATED

Several species of weeds were treated this year, reducing the density of weeds throughout the site. Depending on the size and species of the plants, cut and painting with glyphosate, hand removing, and spraying were used.

**Table 2:** A list of the weed species treated this year.

Common Name	Scientific name
African Daisy	<i>Senecio pterophorus</i>
Arum Lily	<i>Zantedeschia aethiopica</i>
Blackberry Nightshade	<i>Solanum nigrum</i>
Cassia	<i>Senna pendula var. glabrata</i>
Castor Oil Plant	<i>Ricinus communis</i>
Costal Morning Glory	<i>Ipomoea cairica</i>
Crofton	<i>Ageratina adenophora</i>
Fleabane	<i>Conyza sp</i>
Green Cestrum	<i>Cestrum parqui</i>
Inkweed	<i>Phytolacca octandra</i>
Lantana	<i>Lantana camara</i>
Madeira Vine	<i>Anredera cordifolia</i>
Moth Vine	<i>Araujia sericifera</i>
Ochna	<i>Ochna serrulata</i>
Pampas Grass	<i>Cortaderia sp</i>
Purple Top	<i>Verbena bonariensis</i>
Scotch Thistle	<i>Onopordum sp</i>
Stinking Roger	<i>Tagetes minuta</i>
Turkey Rhubarb	<i>Rumex sagittatus</i>
Wild Tobacco	<i>Solanum mauritianum</i>



## WORK COMPLETED

A 20-meter perimeter was cleared of all vegetation around the fuel pump station to reduce the risk of fire, all plants with the exception to grasses were cut and treated with glyphosate. Once the larger plants were removed, the area was brush cut to remove grasses that were growing throughout the perimeter. The area was sprayed on two occasions to remove any seedlings and grasses that had emerged after the initial removal of vegetation was completed. Multiple areas around the main office and surrounding buildings were sprayed that were becoming overgrown during the first quarter of the year. An area was sprayed around the septic hole to allow easier access.

Maintenance weeding was completed between Dam-A and Dam-D, as well as the northeastern area adjacent to Dam-A. The weeds were removed either by hand and rafted or cut and painted and applied with glyphosate, the species removed through these areas were crofton, lantana, green cestrum, madeira vine, wild tobacco, scotch thistle, and African daisy. Multiple areas of crofton and turkey rhubarb were sprayed along the roads edge adjacent to Dam-D. Multiple areas of crofton and turkey rhubarb were sprayed along the roads edge between Dam-A and Dam-D.

Large amounts of African daisy, cassia and lantana were cut and painted north of the boom gate, sections of crofton were sprayed in this area. Maintenance weeding was done through the large are of bushland south Dam-A and Dam-D targeting lantana and crofton. An area of crofton, morning glory, arum lilies, lantana and morning glory were removed from the outlet of Dam-A, these weeds were hand removed to eliminate any risk of herbicide runoff into the water. Large amounts of the native *Typha orientalis* have started to grow in the area where the weeds were removed.

## REVEGETATION

During April of this year an area that was prepared by Metromix was planted out with an assortment of native tree, grass, and shrub species. Plant guards were placed around each plant to reduce the risk of damage from fauna. Mulch was placed around the plants to help retain moisture and reduce weed species from growing around the natives. Several days were spent watering the plants throughout the year. Maintenance weeding was completed throughout the new revegetation area and the previously planted areas to help the natives grow without competition for nutrients, space, and water. The weed species removed from the revegetation areas included lantana, crofton, ink weed, stinking roger, pampas grass, blackberry nightshade, castor oil plant, purple top, and turkey rhubarb.

The previously planted revegetation areas are doing exceptionally well, the natives planted have grown significantly in size, and have started to produce seed further increasing the density of natives in those areas. Natural regeneration has occurred with various native species emerging that weren't planted, increasing the biodiversity in the revegetation areas. The previously planted areas have minimal weed species and only require small amounts of maintenance weeding.



**Figure 1:** Photo showing the contrast of the revegetation areas planted in 2020 and 2021.

Date Taken: 15/12/2021



## TETRATHECA

Four new *Tetratheca juncea* plants have been found in proximity of the translocation area. A sweep of weeds was done throughout the translocation area, no weeds were found. Continued monitoring of the *Tetratheca* areas will be carried out in the following year to ensure no weeds emerged and to monitor the health and population of the *Tetratheca*.

Mountain bike riders continue to use a track that goes straight through the middle of the translocation area despite the area being repeatedly tapped off. The track is right next to several *Tetratheca* plants. This can potentially damage or kill plants that are in the area and stop new plants from growing, in addition to introducing weed species to the site. It is recommended that wire fence be installed around the area and that signage put in place to deter the riders from entering the area.



**Figure 2:** A cluster of flowering *Tetratheca juncea* in the translocation area.



Date Taken: 3/12/2021



## AREAS WORKED



**Figure 3:** Map showing the photo point locations and areas worked during 2021.

Key	
	Areas Worked
	Tetratheca Translocation Area
PP	Photo Point Locations

## CONCLUSION AND RECOMMENDATIONS

The maintenance and primary weeding that was completed this year has reduced the overall weed density of the site while increasing the biodiversity in the areas worked by allowing natural regeneration to take place. Continued primary and maintenance weeding will commence throughout the site next year. Lantana will need to be treated adjacent to the northern site exit before it starts to encroach onto the road. Splatter gunning and spraying will need to be completed next year where large thickets of lantana and crofton are present.

The 20-meter perimeter that was cleared behind the fuel pump station will greatly reduce the risk of fire coming into contact of the fuel station and reduce the risk of fire spreading in the event of fire at the fuel station. The area was sprayed on two occasions killing seedling that had started to grow. This area will be continually monitored in the future for any plants that grow within the 20-meter perimeter around the fuel station, these plants will be removed to keep a reduced risk of fires.

The treatment of weeds around the dams will reduce the spread of weeds leaving the site and infesting the surrounding areas downstream. Further maintenance weeding will be completed next year around Dam-A and Dam-D to stop these areas becoming reinfested with weed species. Primary and secondary weeding will be completed next year east of Dam-A to reduce the spread of weeds leaving the site in addition to reducing the area of flooding.

The natives planted this year are in good health, continued maintenance weeding of all the revegetation areas will continue next year to allow the natives to have the best chance of survival, stopping competition from weeds. It is recommended that wire fence be installed around the *Tetradlea* translocation area, and that signage be put in place to deter the mountain bike riders from entering the area.



## PHOTO DOCUMENTATION



**Figure 4:** Photo Point 1 – A before photo of the revegetation area that was planted out in 2020.  
(Looking Southeast) - Date Taken: 5/05/2020



**Figure 5:** Photo Point 1 – An updated photo of the revegetation area that was planted out in 2020.  
(Looking Southeast) - Date Taken: 15/12/2021





**Figure 6:** Photo Point 2 – Photo of the revegetation area while planting was in progress.  
(Looking North) - Date Taken: 28/04/2021



**Figure 7:** Photo Point 2 – Updated photo of the revegetation area.  
(Looking North) - Date Taken: 15/12/2021





**Figure 8:** Photo Point 2 – Photo of the revegetation area while planting was in progress.  
(Looking East) - Date Taken: 28/04/2021



**Figure 9:** Photo Point 2 – Updated photo of the revegetation area.  
(Looking East) - Date Taken: 15/12/2021





**Figure 10:** Photo Point 3 – Photo of vegetation behind the fuel pump before being removed.  
(Looking Northwest) - Date Taken: 1/06/2021



**Figure 11:** Photo Point 3 – Updated photo after vegetation behind the fuel pump was sprayed.  
(Looking Northwest) - Date Taken: 15/12/2021





**Figure 12:** Photo Point 4 – Photo of a large amount of African daisy north of the boom gate.  
(Looking North) - Date Taken: 29/11/2021



**Figure 13:** Photo Point 4 – Photo after the African daisy was removed and rafted.  
(Looking North) - Date Taken: 15/12/2021





**Figure 14:** Photo Point 5 – Photo of an area of Crofton adjacent to Dam-D.  
(Looking West) - Date Taken: 6/12/2021



**Figure 15:** Photo Point 5 – Photo after the Crofton was sprayed, starting to show signs of dying.  
(Looking West) - Date Taken: 15/12/2021





**Figure 16:** Photo Point 6 – Photo of an area of Crofton and turkey rhubarb along the road adjacent to Dam-D.  
(Looking Northeast) - Date Taken: 3/12/2021



**Figure 17:** Photo Point 6 – Photo after Crofton and turkey rhubarb was sprayed.  
(Looking Northeast) - Date Taken: 15/12/2021





**Figure 18:** Photo Point 7 – Photo of an area of Crofton and turkey rhubarb along the road between Dam-A and Dam-D. (Looking Northeast) - Date Taken: 3/12/2021



**Figure 19:** Photo Point 7 – Photo after Crofton and turkey rhubarb was sprayed. (Looking Northeast) - Date Taken: 15/12/2021





**Figure 20:** Photo Point 8 – Photo of an area of Crofton, morning glory, arum lilies and lantana at the outlet of Dam-A.  
(Looking East) - Date Taken: 24/09/2021



**Figure 21:** Photo Point 8 – Photo after weeds were hand removed and rafted, showing natural regeneration of *Typha orientalis*.  
(Looking East) - Date Taken: 15/12/2021