PROPERTY SITE ACTION PLAN 2015

KYOGLE LANDCARE GROUP Inc.

Roseberry Street Quarry

ACKNOWLEDGEMENTS

This site action plan was produced by Angie Brace (Kyogle Landcare Group Inc.) and Emma Stone (Northern Landcare Support Services). Thanks to Trevor Bendall for providing assistance and input in developing this plan.

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Disclaimer

This plan has been prepared by Kyogle Landcare Group Inc. (KLG). The plan relies upon data and information that was current at the time of preparing this Plan. Any findings, conclusions or recommendations only apply to the aforementioned circumstances and no greater reliance should be assumed or drawn. Furthermore, the plan has been prepared solely for use by the Kyogle Landcare Group Inc. they accept no responsibility for its use by other parties. KLG accepts no responsibility or liability for changes in context, meaning, conclusions or omissions caused by cutting, pasting or editing the plan.

CONTENTS

INTRODUCTION

This action plan has been developed to assist the Kyogle Landcare Group Inc. with the rehabilitation of Roseberry Street. It will provide relevant information for the assisted natural regeneration of this site and will outline locations, site descriptions, recommendations and priorities.

BACKGROUND

To be compiled in consultation with Trevor.

To include:

- *Period of use as a quarry. Material extracted – what, how much, utilised where?*
- *When and why the quarry ceased operation*
- *Past and current ownership of the site*
- *How has it been managed up to this point*

OBJECTIVES

The main objectives of the project are;

- To undertake strategic and effective assisted natural regeneration
- To enhance the capacity of the community and local government to undertake assisted natural regeneration specifically to guide the activities of community working days
- To improve the recreation and amenity values of the site for visitation by the local community
- To monitor, evaluate and report on key elements of the project

SITE LOCATION AND DESCRIPTION

The site is located in an abandoned quarry at the end of Roseberry Street in Kyogle. The site currently hosts a mixture of vegetation as a result of natural regeneration of rainforest species and planted rainforest and eucalypt species.

Also include:

- Area
- Property boundaries connecting to? Private property / crown land?
- Usage / visitation

Neighbouring properties:

- North and East boundaries –
- West boundaries –
- South boundaries –

PREVIOUS FUNDING

SIGNIFICANCE OF SITE

This quarry represents a significant area of local history. The Kyogle Shire Council opened the quarry as a basalt quarry for the supply of road metal in the early 1900's. In 1923 it was discovered that the quarry was a prolific producer of zeolites and calcite. Specimens collected in the quarry in 1929 were considered among the finest specimens if the chabazite obtained in Australia and a specimen continues to be held at the Australian Museum. Following the closure of the quarry in this site had been gradually been restored to predominantly native vegetation and today hosts a range of native flora species and provides important habitat for a range of fauna species including breeding koalas.

It also contains

- Threatened species –*See Appendix 2*
- Weeds of National Significance (WONS) – Lantana

NATIVE FLORA

The vegetation has been extensively altered over time with the settlement of the area and the sites usage as quarry. Over the last __ years, since the quarry ceased operation, gradually revegetation of the site has occurred largely dominated by exotic plants. These exotic species, of which Arrowhead vine has been most dominant, have impacted on existing native vegetation and threated the health and integrity of the area.

There is native vegetation within the area that includes Hoop Pine (*Araucaria cunningammi),* Rough Leaved Elm (*Aphananthe philippinensi)*.

See Appendix 3 for a list of species

WEED SPECIES

Major infestations of Arrowhead vine (*Syngonium podophyllum)* is the most significant problem affecting the native restoration of the site. The Synonium forms a dense understory and is climbing and compromising some of the native canopy trees.

See Appendix 4 for a list of the predominant weeds found on the site.

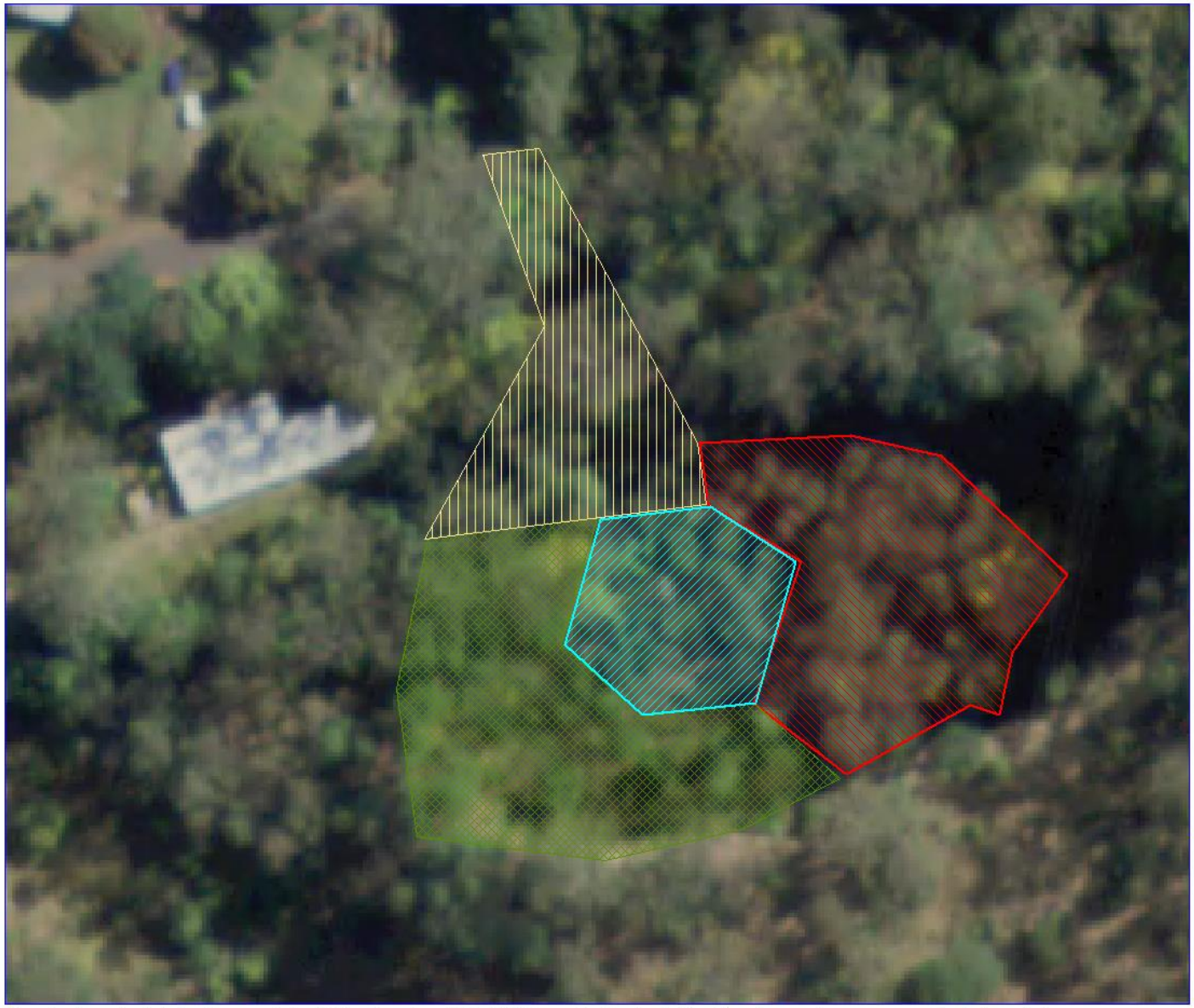
Syngonium podophyllum climbing existing trees

SOILS AND TOPOGRAPHY

Trevor

PROPERTY MAP

Roseberry Street Kyogle Quarry



LEGEND

- Photo_Point
- Zone 1
- Zone 2
- Zone 3
- Zone 4

N

Prepared By: Emma Stone

NORTHERN Landcare SUPPORT SERVICES

10 0 10 20 30 m

 7/03/2016

Scale 1: 500
When printed in A3

RESTORATION STRATEGY

The goal is to restore the riparian area to a healthy ecosystem where erosion is reduced, water quality improved and floral and faunal biodiversity is increased and resistant to future invasion from exotic plants. However landholder capacity has been considered in the development of the restoration strategy and prioritising works.

This restoration strategy has been developed using the 3 principles of restoration.

1. **Retain** remnant indigenous vegetation

2. **Regenerate** where there is any potential for natural regeneration

3. **Replant** only where there is no regeneration potential

The restoration approach for this site is assisted natural regeneration. The site has a largely healthy and functioning native plant community; native seed is stored in the ground or be able to reach the site from nearby natural areas and the natural regeneration processes are being inhibited by external factors such as weed invasion.

However targeted weed control may be necessary in some circumstances. This is the control of an identified weed in a certain area. The circumstances may be that the weed is a noxious weed, an isolated patch of highly invasive, dominating or hard to control weed, has the potential to transform the vegetation community rapidly or there are limited funds available.

An adaptive management approach should be adopted throughout the restoration process.

The property has been divided into 4 management zones to implement on-ground works (see Property Map).

Zone 1

LOCATION -. North east section on the left of the walking track

DESCRIPTION – This area contains some regrowth and planted native species in the canopy and mid story, these are being compromised by the epiphyte Arrowhead Vine (*Syngonium podophyllum)*. Large-leaf privet (*Ligustrum sinense*) occurs throughout the zone. The understory is dominated by *Syngonium spp* and Basket Plant (*Callissa fragrans)*

RECOMMENDATIONS

1. Remove Arrowhead Vine from trees using the cut and scrape method or manual removal where possible.
2. Spray *groundcover Arrowhead vine and basket plant*
3. *Cut and paint woody weeds up to 10cm DBH*

PRIORITIES – *Syngonium*

Zone 2

LOCATION - . South west section of site on right side of walking track

DESCRIPTION –. This area contains some regrowth and planted native species. The midstory is dominated by lantana (*lantana camara*), winter senna (*Senna pendula var. glabrata)* and emerging jacaranda (*Jacaranda mimosifolia)*.

RECOMMENDATIONS –

1. Removal of invasive tree species e.g. Coral tree, Chinese celtis (*Celtis sinensis)*
2. Cut and painting mid story woody weeds under 10cm DBH
3. Treatment of understory weeds by spraying

PRIORITIES – Coral tree (*Erythrina x sykesii*)

Zone 3

LOCATION - Centre of quarry area within the walking track loop

DESCRIPTION – This area has planted native species in the canopy and mid story. Understory is dominated by Billygoat weed (*Argeretum conyzoides) and* Salvia spp.

RECOMMENDATIONS –

1. Treat shrubs and understory by brushcut and follow up spray

2. Remove Cadaghis

PRIORITIES – Midstory weeds

Zone 4

LOCATION - Entrance and access path into the quarry area

DESCRIPTION – This area has regrowth pioneer native species emerging. Emerging jacaranda and annual weeds dominate this area and Glycine *(Neonotonia wightii)* is an emerging problem smothering other vegetation.

RECOMMENDATIONS –

1. Treat Glycine outbreaks

2. Treat woody weeds under 10cm DBH using cut and paint.

PRIORITIES – Climbing vines

TABLE 1 - MANAGEMENT ZONE SUMMARY

Zone	Square metres (m^2)	Description – Priority exotic Species	Priority
1	1000 m^2	North east section	1
2	1000 m^2	South west section	2
3	500 m^2	Centre of quarry area within the walking track loop	3
4	1500 m^2	Entrance and access path into the quarry area	4

Zones have been prioritised based on ecological restoration principles, the Landcare group's capacity and the available resources.

FOLLOW UP AND MAINTENANCE

Follow up management and maintenance after planting or primary weed removal is the key to all successful restoration projects.

Follow up works are conducted after the primary weed control has been completed. This generally involves the spot-spraying of newly germinating weeds and re-sprouting sections of woody weeds and vines. This will occur at intervals, which will vary according to the weed and the growing conditions. Spring and summer are peak periods for seed germination and for the growth of mature weeds. Concentrate weed efforts by visiting site during these times to determine what progress the vegetation is making and decide when to undertake follow-up work.

Maintenance occurs after there has been sufficient follow up and native plants are germinating and establishing and canopy formation is occurring and weed densities are reduced.

MONITORING

Photographic record keeping of 'before and after' time frames are a good way of measuring the success or progress of work over time. This is a good way of checking that regeneration is progressing as some work may appear to be slow and previous site conditions can be forgotten. The Landcare group can monitor and evaluate sites by setting up permanent photo monitoring points where works are to be carried out in each zone. Generally photographic points are identified by two steel posts with the photo being consistently taken from the same point. This will begin before work commences and then at set intervals in each work zone.

WORK PLAN (2016)

Zone	Task	Activity Description	Est. 8 hr day per person	Estimate Cost (for qualified contractor)	Total	Priority within Zone
1	Primary Weed Control	Removing climbing plants from trees using the scrape and paint method. Tagging native species to assist in weed treatment.	In-kind	4 volunteers in-kind for 2 hours	$240 In-kind	High
1	Primary Weed Control	Spraying of exotic ground cover weeds focusing on Syngonium	0.25	0.25 days @ $400/day	$100	High
1	Follow up Weed control	Treatment of newly germinating weeds and reshooting of woody weeds/vines 3 visits /yr for 1 years	1 In-kind	1 working bees Landcare Group	$480 In-kind	High
1	Maintenance	Visit site during peak growing times to determine what progress the vegetation is making and decide if/when to undertake maintenance work		Landcare group	In-Kind	Medium
2	Primary Weed Control	Target vine weeds and cut and paint woody weeds e.g. Privet	In-Kind	1 working bees Landcare Group	$480 In-kind	High
2	Primary Weed Control	Spraying of exotic ground cover weeds focusing on Syngonium	0.5	0.5 days @ $400/day	$200	High
2	Primary Weed Control	Treatment of large woody weeds e.g. Coral tree, Jacaranda, celtic, umbrella, camphor	1	1 day @ $400	$400	High
2	Follow up Weed control	Treatment of newly germinating weeds and reshooting of woody weeds/vines 4 visits /yr for 1 years		1 working bees Landcare Group	$480	High
2	Maintenance	Visit site during peak growing times to determine what progress the vegetation is making and decide if/when to undertake maintenance work		Landcare group	In-kind	
3	Primary weed control	Spraying understory and midstory weeds	0.25	0.1 days @ $400/day	$100	Medium
3	Infill Planting	Purchase 20 plants (includes ordering, fertiliser, water saving crystals, stakes as required) Planting and watering of 200 mixed native species at 1.5 m spacing	IN-kind	1 working bees Landcare Group 20 plants @ $2.50/plant (provided by landcare group in-kind contribution = $50	$530	High
3	Planting and Weed control Follow up	Control any weeds that have germinated and replace any plants that have died – 1 visits per year following planting (seasonally dependent) for 1 year.	0.5	1 hour at working bee Landcare Group	$200	High

3	Maintenance	Visit site during peak growing times to determine what progress the vegetation is making and decide if/when to undertake maintenance work		Landcare Group		Low
4	Primary Weed Control	Staged treatment of environmental weeds so that all weeds are controlled in a systematic and comprehensive manner to assist natural regeneration	0.5	Future works beyond scope of this plan		Low
4	Follow-up weed control	Treatment of newly germinating weeds and reshooting of woody weeds 3 visits /yr for 1 years		Future works beyond scope of this plan		Low
4	Maintenance	Visit site during peak growing times to determine what progress the vegetation is making and decide if/when to undertake maintenance work		Future works beyond scope of this plan		Low
Purchase of herbicide for working bees					$200	
TOTAL IN-KIND CONTRIBUTION FOR 2016					**$ 2410**	
TOTAL EXTERNAL FUNDING REQUIRED FOR 2016					**$ 1000**	

Costings in this work plan are estimates based on the costs and conditions that were present at the time of the site inspection.

REFERENCES

Big Scrub Rainforest Landcare Group. (2008). Common Weeds of Subtropical Rainforests of Eastern Australia. Big Scrub Rainforest Group, Bangalow.

Big Scrub Rainforest Landcare Group. 2005 Subtropical Rainforest Restoration a practical manual and data source for landcare groups, land managers and rainforest regenerators 2nd edition, Big Scrub Rainforest Landcare Group, Bangalow.

Chenoweth EPLA and Bushland Restoration Services (2012) South East Queensland Ecological Restoration Framework: Manual. Prepared on behalf of SEQ Catchments and South East Queensland Local Governments, Brisbane.

APPENDICES

APPENDIX 1 – Threatened Species

APPENDIX 2 - A history of the Quarry

APPENDIX 3 – List of Native Flora (list of trees planted?) Trevor

APPENDIX 4 – List of dominant Weeds

APPENDIX 1 – THREATENED SPECIES IN THE KYOGLE AREA

This list of Threatened species has been complied by conducting a desktop survey in a 10km radius of this site on the 10th March 2016 using data from the BioNet Atlas of NSW Wildlife website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions. Copyright the State of NSW through the Office of Environment and Heritage. Search criteria : Public Report of all Valid Records of Threatened (listed on TSC Act 1995) or Commonwealth listed Entities in selected area

SCIENTIFIC NAME	COMMON NAME	STATUS
BIRDS		
Anseranas semipalmata	Magpie Goose	V
Ptilinopus magnificus Wompoo	Fruit-Dove	**V**
Ephippiorhynchus asiaticus	Black-necked Stork	**E1**
Ixobrychus flavicollis	Black Bittern	**V**
Circus assimilis	Spotted Harrier	**V**
^Erythrotriorchis radiatus	Red Goshawk	**E4A,2**
Irediparra gallinacea	Comb-crested Jacana	**V**
Turnix maculosus	Red-backed Button-quail	**V**
^Cyclopsitta diopthalma coxeni	Coxen's Fig-Parrot	**E4A,2**
FROGS		
^Mixophyes iteratus	Giant Barred Frog	E1 ,2
MAMMALS		
Phascolarctos cinereus	Koala	V
Petaurus norfolcensis	Squirrel Glider	V
Pteropus poliocephalus	Grey-headed Flying-fox	V
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V
Mormopterus norfolkensis	Eastern Freetail-bat	V
Miniopterus australis	Little Bentwing-bat	V
Scoteanax rueppellii	Greater Broad-nosed Bat	V
PLANTS		
Desmodium acanthocladum	Thorny Pea	V
Solanum limitare	Border Ranges Nightshade	E1

NSW Status Abbreviations

2	Sensitivity Class 2 (Sensitive Species Data Policy)
3	Sensitivity Class 3 (Sensitive Species Data Policy)
E1	Endangered (Threatened Species Conservation Act 1995)
E2	Endangered Population (Threatened Species Conservation Act 1995)
E3	Endangered Ecological Community (Threatened Species Conservation Act 1995)
E4	Presumed Extinct (Threatened Species Conservation Act 1995)
E4A	Critically Endangered (Threatened Species Conservation Act 1995)
P	Protected (National Parks & Wildlife Act 1974)
V	Vulnerable (Threatened Species Conservation Act 1995)

Commonwealth Status Abbreviations

E	Endangered (Commonwealth EPBC Act 1999)
V	Vulnerable (Commonwealth EPBC Act 1999)

APPENDIX 2 – A HISTORY OF THE QUARRY

APPENDIX 3 - LIST OF NATIVE FLORA

APPENDIX 4: WEED SPECIES LIST

Appendix 4A: Predominant weeds found at Kyogle Quarry

Botanical Name	Common Name	Family	Control Class
Trees			
Celtis sinensis	Chinese Celtis	Cannabaceae	
Corymbia torelliana	Cadaghi	Myrtaceae	
Erythrina x sykesii	Coral Tree	Fabaceae	
Inga edulis	Ice cream bean	Fabaceae	
Jacaranda mimosifolia	Jacaranda	Bignoniaceae	
Ligustrum sinense	Large-leaved Privet	Oleaceae	4
Pinus radiata	Pine	Pinaceae	
Schefflera actinophylla	Umbrella tree	Araliaceae	
Syagrus romanzoffianum	Cocos Palm	Arecaceae	
Shrubs / Groundcovers			
Argeretum conyzoides	Billygoat weed	Asteraceae	
Callisia fragrans	Basket Plant	Commelinaceae	
Lantana camara	Lantana	Verbenaceae	4 WoNS
Salvia spp	Salvia		
Sansevieria trifasciata	Mother-in-law's Tongue	Asparagaceae	
Senna pendula var. glabrata	Winter Cassia	Caesalpiniaceae	
Tradescantia fluminensis	Trad	Commelinaceae	
Vines			
Asparagus aethiopicus	Asparagus Fern	Asparagaceae	
Macroptilium atropurpeum	Siratro	Fabaceae	
Neonotonia wightii	Glycine	Fabaceae	
Solanum seaforthianum	Climbing Nightshade	Solanaceae	
Syngonium podophyllum	Arrowhead Vine	Araceae	
Grasses			