



Lake
Baroon
Catchment
Care
Group

Working with our community...for our waterways

Projects 2014-15

Alcorn Creek Off Stream Watering (Crick)



PROJECT PLAN

Project No. 1415-022

This Project Plan has been prepared by:

Mark Amos
Project Manager
Lake Baroon Catchment Care Group
PO Box 567, Maleny, Qld, 4552

Phone (07) 5494 3775
Email info@lbccg.org.au
Website www.lbccg.org.au

Disclaimer

While every effort has been made to ensure the accuracy of this Project Plan, Lake Baroon Catchment Care Group makes no representations about the accuracy, reliability, completeness or suitability for any purpose other than this particular project and disclaims all liability for all expenses, losses, damages and costs which may be incurred as a result of the Plan being inaccurate or incomplete in any way.

Terms used in this Plan

Lake Baroon and Baroon Pocket Dam are used interchangeably, although *Lake Baroon* is usually used when referring to the catchment and *Baroon Pocket Dam* refers to the dam as commercial water storage.

PROJECT VERSIONS & APPROVALS

Version	Date	Version/Description	Result
1.0	Apr-May 2015	Draft LBCCG Project Plan	n/a
1.0	14/5/2015	Project presented to LBCCG Committee	Approved (Minutes)
1.0	tbd	Project Proposal forwarded to Seqwater for approval (email)	tbd

TABLE OF CONTENTS

Part A	Executive Summary	3
Part B	Project Plan	5
<i>i.</i>	Introduction	5
<i>ii.</i>	Background	5
<i>iii.</i>	Landslips	6
1.0	What	7
2.0	Where	7
3.0	Why	8
4.0	How	9
	4.1 Weed management	9
	4.2 Fencing	9
	4.3 Off stream watering	9
5.0	When	9
6.0	Budget	10
7.0	Project Map	11
8.0	References	12

Cover photo: Crick property (eastern paddocks) with extensive weed areas and landslips.

PART A EXECUTIVE SUMMARY

PROJECT NUMBER & TITLE: 1415-022 Alcorn Creek Off Stream Watering (Crick)

Maintaining water quality is critical to providing safe bulk drinking water to the population of South east Queensland. All of the raw water storages managed by Seqwater are located in catchments which are developed to varying extents; supporting active and growing communities, including important industrial and rural economic activity. To provide a multi-barrier approach to the supply of drinking water, Seqwater must influence the management of land not owned by, but which exert an influence on Seqwater's core business. The Lake Baroon Catchment Care Group (LBCCG) was formed by original Dam managers AquaGen and the local community to address water quality issues in the recently completed storage in 1991.

The Crick property is one of the largest properties (104 hectares) in the Lake Baroon catchment and lies in one of the most unstable areas – the mid to upper reaches of Bridge (Alcorn) Creek. More than 95% of samples between 1994 and 2005 exceeded ANZECC guidelines with very high nutrients and faecal coliforms detected (Dunstan 2007; Traill 2007). Although not captured by the sampling program it is known that the catchment, including the Crick property delivers a huge sediment load to Bridge Creek and due to the high faecal coliforms the pathogen risk would be significant.

The property has been identified as high priority for the Seqwater Landslide Remediation program and with extensive weed management and a change in grazing management will enable direct landslip intervention on the site (targeted drainage, revegetation and temporary fencing) in 2015-16.

Without LBCCG intervention a farm dam would have been constructed on the landslip envelope – high risk in unstable areas. By providing off stream watering infrastructure instead and developing a longer term plan we can, in future years, not only greatly improve hill slope stability but improve grazing management which will provide a flow on reduction in water quality risk.

The project aims to complete four components:

1. Complete weed management over ten hectares;
2. Install off stream watering system to provide livestock water (two points);
3. Install fencing to improve grazing management; *and*
4. Decommission one farm dam and drain several areas of water storage on the unstable hill-slope.

The project will:

- Remove heavy infestation of lantana and other environmental and pasture weeds enabling identification of the areas most prone to slippage;
- provide access for Seqwater programs;
- improve stability of land slip areas by improving upper-slope drainage;
- improve livestock management on the Crick property;
- provide alternative watering points for livestock enabling removal of a destabilising farm dam;
- build land manager capacity and improve land manager engagement; *and*
- establish demonstration site.

Project will be completed by June 30, 2015.

LANDMANAGER & PROPERTY DETAILS

Names	[REDACTED]				
Phone Number					
E-mail					
Property Address				RP Number (Lot)	SP120150 (285)
Property Size	104 ha	Land-use	Livestock grazing	Stock Carried	100+
Latitude/longitude	-26.741088 / 152.834812				
Sub-Catchment	Bridge Creek (Alcorn Ck)		LBCCG Management Unit	BR1	
M.U. Priority (LBCCG IP)	Low		M.U. Priority (Pollution)	Very High	
Water Quality	More than 95% of samples between 1994-2005 exceeded ANZECC guideline levels				

PROJECT PARTNERS/STAKEHOLDERS & ROLES/CONTRIBUTIONS

Lake Baroon Catchment Care Group (Seqwater 2014-15 Project Funding)	On ground project implementation cash \$14,297
Lake Baroon Catchment Care Group (Seqwater 2014-15 Administration Funding)	Project coordination, administration, reporting, monitoring & evaluation \$3,200
Garry Crick	Landowner, labour, funding \$18,360 cash & in-kind

PROJECT DETAILS

Start Date	May 2015	On-ground Complete	Jun 2015	Monitor Complete	Dec 2015
OUTPUTS					
Off stream watering infrastructure	2 points				
Weed management	10 hectares				
Fencing	300 metres				
Drainage	1 dam decommissioned				
OUTCOMES					
Area of weeds controlled	10 hectares				
Area of landslip stabilised (+ or -5%)	5 hectares				
Area of improved grazing management	25 hectares				
Landholder engagement	1 landowner				

supporting the **Sunshine Coast Rivers Initiative**

PART B PROJECT PLAN

i. INTRODUCTION

Lake Baroon Catchment Care Group (LBCCG) is a not for profit community group focussed on reducing the risks to water quality in the Lake Baroon catchment - primarily through the implementation of on-ground remediation projects. This aim is consistent with Seqwater's objectives of efficiently producing high quality potable water for the Sunshine Coast (and greater South east Queensland) region.

Maintaining water quality is critical to providing safe bulk drinking water to the population of SEQ. All of the storages managed by Seqwater involve catchments which are developed (to varying extents) and support active and growing communities, along with important industrial and rural economic activity (Murton & Keys 2012). This is particularly true of the Lake Baroon catchment.

LBCCG was formed in 1991 by the local community and AquaGen in response to ongoing water quality issues in the recently completed Baroon Pocket Dam. It was recognised that engaging landholders and stakeholders in the local community was best achieved through a local grassroots organisation that could develop long term relationships and build trust within the community – an outcome not easily achieved by governmental organisations. Furthermore LBCCG is able to source a range of funding opportunities not available to government, resulting in significant leverage on Seqwater investment (typically 3 to 1).

LBCCG implements varied projects in the Lake Baroon catchment with landholders and partners that directly address water quality and broader environmental issues. The proposed project is consistent with both the LBCCG and Seqwater aim of reducing threats and risks to water quality posed by environmental weeds in the Obi Obi Creek riparian zone, and associated activities are considered a prudent investment to support.

ii. BACKGROUND

The property 'Cedar Park' has recently changed hands with the new owner intending to improve the properties grazing capacity while being sympathetic to environmental and particularly land degradation issues. LBCCG have previously implemented a project on the property when owned by RK Thorne (managed by Debbie Thorne and Colin Eastmure – see project 1213-009 Upper Alcorn Creek Riparian Fencing), fencing Alcorn Creek and formalising waterway crossings.

The new owner, Garry Crick has immediately commenced weed management, boundary and internal fencing activities, particularly the recognised landslip prone eastern paddocks of the property (immediately upslope from the Cavanagh property). Intervention from LBCCG resulted in areas that were storing water on the landslip, including a dam were removed in an attempt to improve stability of the area. It was intended a new dam, further upslope, but still within the landslip envelope was to be constructed. LBCCG suggested instead that a better option would be to extend the properties existing off stream watering system to include the eastern paddocks thereby improving landslip stability and improving property management.

The current project plan is a result of these negotiations.

Furthermore the extensive weed management being undertaken by the landholder will provide the opportunity to see areas of landslip and enable targeted management (primarily revegetation) in 2015-16 under the Seqwater Landslide Remediation program.

iii. LANDSLIPS

Landslides (landslips) are common on the cleared slopes of the Maleny plateaux – particularly on the flanks that have formed by the deep cutting of watercourses and the edges of the lava (basalt) flows. The basalts are volcanic lavas that were poured out during the Tertiary period about 25 million years ago. They were originally much more extensive, but have been reduced in area by the gradual erosion of streams. Basalt forms a sensitive geological formation which is in a delicate balance under natural conditions. Clearing of the original forest has dramatically altered the balance resulting in the failure of the slopes (Willmott 1983).

Basalt is a rock which breaks down readily to deep fertile soils. On the Maleny plateaux these soils have combined with high rainfall to allow the growth of dense rainforest. In the early decades of this century, the fertile soils were cleared for dairying and intensive grazing. Unfortunately, the small size of the properties necessitated the clearing of even the steepest slopes with very little of the original forest remaining (Willmott 1983).

The basalt occurs as numerous individual lava flows that are roughly horizontal. While the thick, harder flows resist erosion and form scarps and cliff lines, the softer or more fractured lavas, or bands of sediments, form gently sloping benches or shelves on the flanks and valleys of the plateaux (Willmott 1983).

Following erosion of the edges of the plateaux over long periods of time, large volumes of rock and soil debris (colluvium) derived from disintegration of the scarps have accumulated as benches and extensive aprons. Red Ferrosol soils are common on the plateaux surfaces, and dark grey to black, clayey prairie soils; chocolate soils and black earths are usual on their benched flanks. Such dark soils are typical of areas mantled by colluvium. Many of these contain large quantities of swelling clay minerals (montmorillonite) which cause the soils to crack on drying and to swell on wetting. The swelling is accompanied by a marked decrease in strength. The presence of sodium cations in some of these clays tends to accentuate the loss of strength that accompanies the wetting (Willmott 1983).

The low permeability of this subsoil is evidently an important factor in promoting mass movement, causing water to flow laterally within the upper portions of the mantle and lubricate a slip surface. This, as is indicated by the sliding and flowing that occurs on the terraces with their low gradients, is evidently the chief reason for the greater incidence of landslides on the shallower, dark soil of the sides of the plateau than on the deep red soils at the top (Ellison & Coaldrake 1954).

Most of the landslides occur on slopes and benches on the flanks of the plateaux and ranges, and few occur on the actual flat surfaces of the plateaux.

The Crick property in the Bridge Creek catchment has relatively poor soils and steep slopes, and consequently suffers from extensive land slips that are clearly visible from Bridge Creek Road. Baroon Pocket Dam is a short distance downstream so any sediment (and associated nutrients, pathogens and pesticides) generated by excessive slippage will be delivered to the storage.

Bridge Creek (2,413 hectares) is characterised by its steep slopes that lack stabilising vegetation. The soils of the catchment are predominantly black clays lacking the ability to absorb nutrients and rainfall, resulting in minimal filtering of run-off. Although there are significant areas of natural vegetation and most of the waterways have good riparian vegetation, the sub-catchment contributes high volumes of sediments, nutrients and potentially pathogens to Baroon Pocket Dam.

1.0 WHAT



Figure 1: The Crick property on the left with the very unstable Cavanagh property on the right. The shaded area is the focus of this project – weed management, improved livestock management and preparation for the 2015-16 Seqwater Landslide Remediation program.

The project will control weeds, install fencing to improve grazing management (landholder funded) and extend the existing off stream watering system to include the properties eastern paddocks thereby eliminating the need for dams on an extremely unstable landslip. This will assist with stability but also provide the necessary steps to commence targeted revegetation of the slip zone in 2015-16.

The project aims to complete four components:

4. Complete weed management over ten hectares;
5. Install off stream watering system to provide livestock water (two points);
6. Install fencing to improve grazing management; *and*
4. Decommission one farm dam and drain several areas of water storage on the unstable hill-slope.

2.0 WHERE

Garry Crick grazing property
196 Maleny-Kenilworth Road, Witta

Property is approximately 104 hectares – currently comprising the following:

- 40 ha of improved pasture;
- 46 ha of degraded improved pasture;
- 17.4 ha of vegetation; *and*
- 0.6 ha dwellings and sheds;

Included in the above figures are approximately 12 ha of remnant vegetation (RE 12.8.3 & RE 12.12.15) and approximately 20 ha of highly unstable landslip area.

Alcorn Creek (major tributary of Bridge Creek) passes through the middle of the property with a total length of approximately 1,100 metres.

3.0 WHY

Lake Baroon Catchment Care Group is focussed on improving raw water quality in the Lake Baroon catchment and by definition achieves this by working with private landholders in the catchment. Supporting landholders to improve land management, which provides multiple outcomes; water quality and broader environmental benefits while providing essential productivity gains. Catchment activities not only benefit the raw water flowing into one of south east Queensland's most important water storages (hence Seqwater's significant support) but also provides broad environmental outcomes.

Seqwater have a clear core business of providing high quality water to the population of the Sunshine Coast Council and to the greater south east Queensland via the Northern Pipeline Interconnector. The project will support the 2015-16 Seqwater Project "*Baroon Pocket Dam – Landslide Remediation Program*" through the provision of access to revegetation sites and the improvement of drainage on the Cork property which will contribute to the stabilisation of land slip prone areas.

The implementation of the planned activities will reduce threats to catchment water quality:

- Remove heavy infestation of lantana and other environmental and pasture weeds enabling identification of the areas most prone to slippage;
- provide access for Seqwater programs;
- improve stability of land slip areas by improving upper-slope drainage;
- improve livestock management on the Crick property;
- provide alternative watering points for livestock enabling removal of a destabilising farm dam;
- build land manager capacity and improve land manager engagement; *and*
- establish demonstration site.

Removing or managing water sources (dams) in land slip prone areas significantly improves stabilisation in these areas. By allowing springs and seasonal soaks to drain freely reduces pore water pressure and lubrication, improving the chances of establishing appropriate vegetation which provides longer term stabilisation.

Revegetating landslips to provide long term stability is unlikely to be successful if effective drainage works are not implemented first.

LBCCG has completed (or underway) several nearby projects, including immediately to the east on the Cavanagh property (2013-15 Seqwater landslide Remediation program, Cavanagh - 2013-14 Seqwater Landslide Support Program) and in 2015-16 have planned to implement a project on the Nathan property immediately downstream on Alcorn Creek (Western Alcorn Creek - Nathan).

More than 95% of raw water samples in the period 1994-2005 taken at McCarthy Road exceeded ANZECC guideline levels.

The project's objectives and outcomes are consistent with:

- 2014-14 Priority Strategy for Funding Provided by Seqwater (LBCCG 2014)
- Lake Baroon Catchment Implementation Plan (AquaGen/LBCCG 2007)
- Lake Baroon Catchment Management Strategy (AquaGen/LBCCG 2004)
- Seqwater Natural Assets Management Plan – Lake Baroon Catchment (Seqwater 2012)
- Sanitary Survey of Baroon Pocket Catchment Report (Seqwater 2014)
- Catchment and In-Storage Risk Assessment for Water Quality – Baroon Pocket Dam (Seqwater 2009)
- Sunshine Coast Council Waterways and Coastal Management Strategy 2011-2012 (SCC 2011)

- Mary River and Tributaries Rehabilitation Plan (Mary River Catchment Coordinating Committee 2001)

4.0 HOW

4.1 WEED MANAGEMENT

The clearing of a very large infestation of lantana and other environmental and agricultural weeds will enable the identification of landslip prone areas including the presence of springs, soaks and waterlogged areas. These areas can then be targeted for drainage, and revegetation in 2015-16. Lantana is shallow rooted and provides little stability on landslips while discouraging the establishment of deep rooted species (both native and exotic) which are more useful long term. Additionally lantana degrades pasture areas and reduces carrying capacity of grazing areas (that are stable). Lush grass cover assists with stabilisation by establishing a thick, binding root mass, slows overland flow and utilises nutrients before reaching watercourses and ultimately being delivered to Baroon Pocket Dam.

4.2 FENCING



Fencing is required to enable effective and controlled grazing of the landslip area. The management of the area, particularly following the weed control will be critical to reestablishing pasture and maintaining a thick coverage and providing as much stability to the site pre-vegetation as possible.

Fencing will consist of standard cattle fencing; timber split posts at four metre intervals, timber strainer posts and steel gates, and four strands of barb wire.

Figure 2: Standard cattle fencing to be erected.

4.3 OFF STREAM WATERING



With the removal of all water sources on the landslip alternative livestock water is required. The existing property off stream watering system can be extended to reach the eastern paddocks (landslip zone). This will require a 5,000 gallon (23,000 litre) tank, piping and two concrete troughs. This will enable the splitting of the eastern paddock into two which will improve pasture management, grazing and landslip management, revegetation and further works.

Figure 3: LBCCG provides concrete troughs which helps ensure they are not moved from site.

5.0 WHEN

Weed management has commenced in late April, taking advantage of the excavator on site to install boundary fencing and the weather conditions.

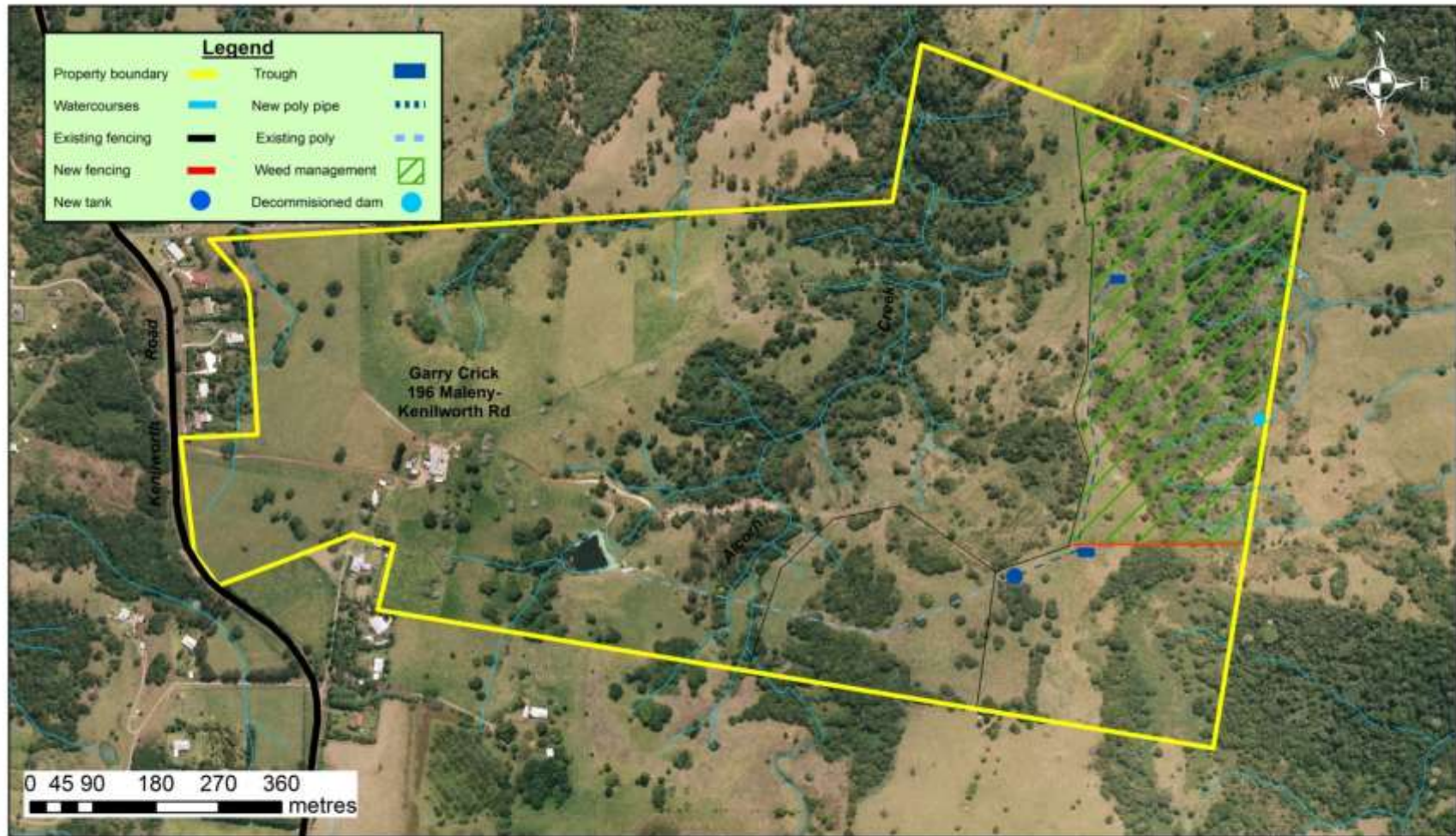
1415-022 Alcorn Creek Off Stream Watering (Crick)

Ideally off stream watering will be installed immediately following the fencing however weather conditions and access will dictate installation. It is expected that all 2014-15 planned works will be completed by June 30, 2015.

6.0 BUDGET

LBCCG has a policy of keeping Project Budgets confidential as individual project costings vary and can give misleading information. Detailed Budgets can be supplied on request. Please contact the LBCCG Project Manager on info@lbccg.org.au for further information.

7.0 PROJECT MAP



Alcorn Creek Off Stream Watering (Crick)

This plan has been generated using data supplied by The State of Queensland (Department of Natural Resources and Water), Maroochy Shire Council, Caloundra City Council and Lake Baroon Catchment Care Group. Digital Cadastre Database (DCDB) © The State of Queensland Department of Natural Resources and Water (2006). Maroochy Shire Council, Caloundra City Council, and Department of Natural Resources and Water (NRW), does not warrant the correctness of this plan or any information thereon. The Council's and NRW accepts no liability or responsibility in respect of the plan and any information or inaccuracies thereon. Any persons relying on this plan shall do so at their risk. Data shown in Map Grid of Australia coordinates (Universal Transverse Mercator, Zone 56). This map must not be reproduced in any form whole or part without the express written consent of the Lake Baroon Catchment Care Group.



8.0 REFERENCES

Dunstan, M 2007, *Lake Baroon Catchment Implementation Plan*, AquaGen Water & Renewable Energy, Palmwoods.

Ellison, L & Coaldrake, J.E. 1954, *Soil mantle movement in relation to forest clearing in south-eastern Queensland*, Ecology Volume 35, Ecological Society of America,

Murton, S. & Keys, S. 2012, *Seqwater Natural Asset Management Plan – Lake Baroon*, Sinclair Knight Merz, Brisbane

Traill, C.B. 2007, *State of the Lake Baroon Catchment, Volume 2: Appendices*, AquaGen Water and Renewable Energy, Palmwoods.

Willmott, W, 2007, *Rocks and Landscapes of the Sunshine Coast Second Edition*, Geological Society of Australia, Brisbane.