LAKE
BAROON
CATCHMENT
CARE
GROUP

seqwater
WATER FOR LIFE

Projects 2010-11

Bridge Creek Rehabilitation (McLauchlan) Year 2

Project No. 1011-004

(0910-004)

This Project proposal has been prepared by:

Mark Amos

Catchment Coordinator
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

PROJECT APPROVALS

Date	Description	Result
9/12/2009	Project Proposal completed	n/a
10/12/2010	Project presented to LBCCG Committee	Approved (Minutes 33.4.2.2)
9/12/2009	Project Proposal forwarded to Seqwater for approval (email)	Approved by Brad Heck (Land Management Coordinator - Seqwater) on 17/12/2009
	Draft Project Proposal (2nd Year)	
	Project Proposal completed	
	Project presented to LBCCG Committee	
	Project Proposal forwarded to Seqwater for approval (email)	

This 2nd Year Project Proposal should be read in conjunction with Bridge Creek Rehabilitation (McLauchlan) [LBCCG Project no. 0910-004] (see Attachment 1).

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

Cover photo: *Revegetation on McLauchlan property as viewed from Tesch Road, Witta – June 2010.*

TABLE OF CONTENTS

LAKE BAROON CATCHMENT CARE GROUP INC.
1. Project Details

PROJECT TITLE: **Bridge Creek Rehabilitation Project (McLauchlan)**

PROJECT NUMBER: **1011-004** **DATE:** **November 2010**

PROJECT SUMMARY:

The proposed project will reduce sediment and nutrient run-off from eroding hill-slopes, rehabilitate areas of erosion and revegetate significant waterways in the Bridge Creek catchment. Farm productivity will be enhanced by reducing nutrient, sediment and chemical export through a range of activities implemented on the property bordering Lake Baroon.

APPLICANT/LANDHOLDER DETAILS

First Name/s	Rob & Janice
Surname	McLauchlan
Postal Address	[redacted]
Phone Numbers	
E-mail	

PROJECT / SITE LOCATION

Property Name	n/a		
Property Address	Wells Rd, Maleny		
RP Numbers	RP208215	SP118115	
Lot Number	3	5	6
Property Size (ha)	40 hectares		
Existing Land-use	Beef cattle		
Stock Carried	70		
Sub-Catchment	Bridge Creek		
Management Unit	BR3		
M.U. Priority (LBCCG IP)	**Low**	**M.U. Priority** (Pollution)	**High**

PROJECT PARTNERS/STAKEHOLDERS & ROLES

Lake Baroon Catchment Care Group	Project administration & reporting, monitoring & evaluation
Federal Government	Community Action Grants Funding
Rob & Janice McLauchlan	Landowner

PROJECT DETAILS

Project Start Date	2009
Project Completion Date	2014
Fencing Required	720 metres
Plant Numbers/Area	5,000/25,000 metres^2
Project Maintenance	LBCCG/Contractor, landowner
Provision of Labour	Contractors; landowner
Provision of Funding	LBCCG, Australian Government

2. PROJECT RATIONALE, PURPOSE & OBJECTIVES

An estimated 80% of sediment and 35% of nitrogen in the waterways in South East Queensland come from non-urban diffuse loads. Reduction of these loads clearly represents a major target for action if significant improvements in water quality are to continue to be achieved in South East Queensland.

Modern agricultural activities have been identified as a major source of diffuse pollutants into waterways (Polyakov et al, 2005). Land management practices, such as stocking rates, grazing pressures, land clearing and the application of fertilisers have significant impacts on pasture and land condition. These practices can result in erosion processes, decreased infiltration of soils, and excess nutrient and sediment run-off, all of which impact on local water quality.

Diffuse pollutants are:

- Aggregated within a catchment; but delivered from sources dispersed throughout the catchment;
- Random in nature with weather playing a critical role in the process of pollutant delivery;
- Difficult to monitor on a continuous basis for a reasonable cost (Qureshi and Harrison, 2002).

Despite these barriers, evidence suggests there is an opportunity to reduce the contribution of non-urban diffuse source pollutants to prevent further water quality degradation throughout south east Queensland. Providing incentives for landholders to change management practices is one strategy to improve water quality [3].

Sediment generation identified from private agricultural land is considered to derive from 3 key sources of erosion:

- Hill-slope erosion is the wearing away of soil particles, chiefly by rain and water flows over the land instead of in channels. Although hill-slope erosion may occur on soil surfaces that are covered with vegetation, it is more prevalent on bare soil (SEQHWP, 2007)
- Gully erosion is the removal of soil along drainage lines by surface water run-off. It occurs when run-off concentrates and flows at a velocity sufficient to detach and transport soil particles, eroding channels (a concentrated flow path for water leaving a field or watershed) into a hill-slope (Ziebell and Richards, 1999)
- Stream bank erosion is the detachment of soil particles by concentrated flow paths occurring along stream bank channels. Stream bank erosion is especially prevalent where riparian vegetation is degraded (SEQHWP, 2007)

These three sources of erosion deliver a high level of sediments and nutrients to the waterways of south east Queensland. The velocity and volume of water delivery to major channel erosion sites, poor soil structure and land use disturbances are all causes of channel erosion throughout south east Queensland. The channel origin of the sediment means that attention needs to be directed to stream and gully stability, and the prevention of hill-slope erosion.

A survey examining barriers to the adoption of best land-use management practices by farmers concluded that economic barriers pose the biggest constraint (Slack-Smith, 2005). Investment in south east Queensland catchment management has historically been quite sporadic and not well targeted, especially in rural catchments (Faulkner, 2008). Cost effective investment, targeted at the most important non-urban diffuse pollutant sources throughout south east Queensland, is required to efficiently achieve a large reduction of sediment and nutrient loads with a limited budget (Olley et al., 2006).

(taken from: Department of Environment and Resource Management, *Development of a water quality metric for south east Queensland*, 2010)

3. DESCRIPTION OF WORKS

Project Overview

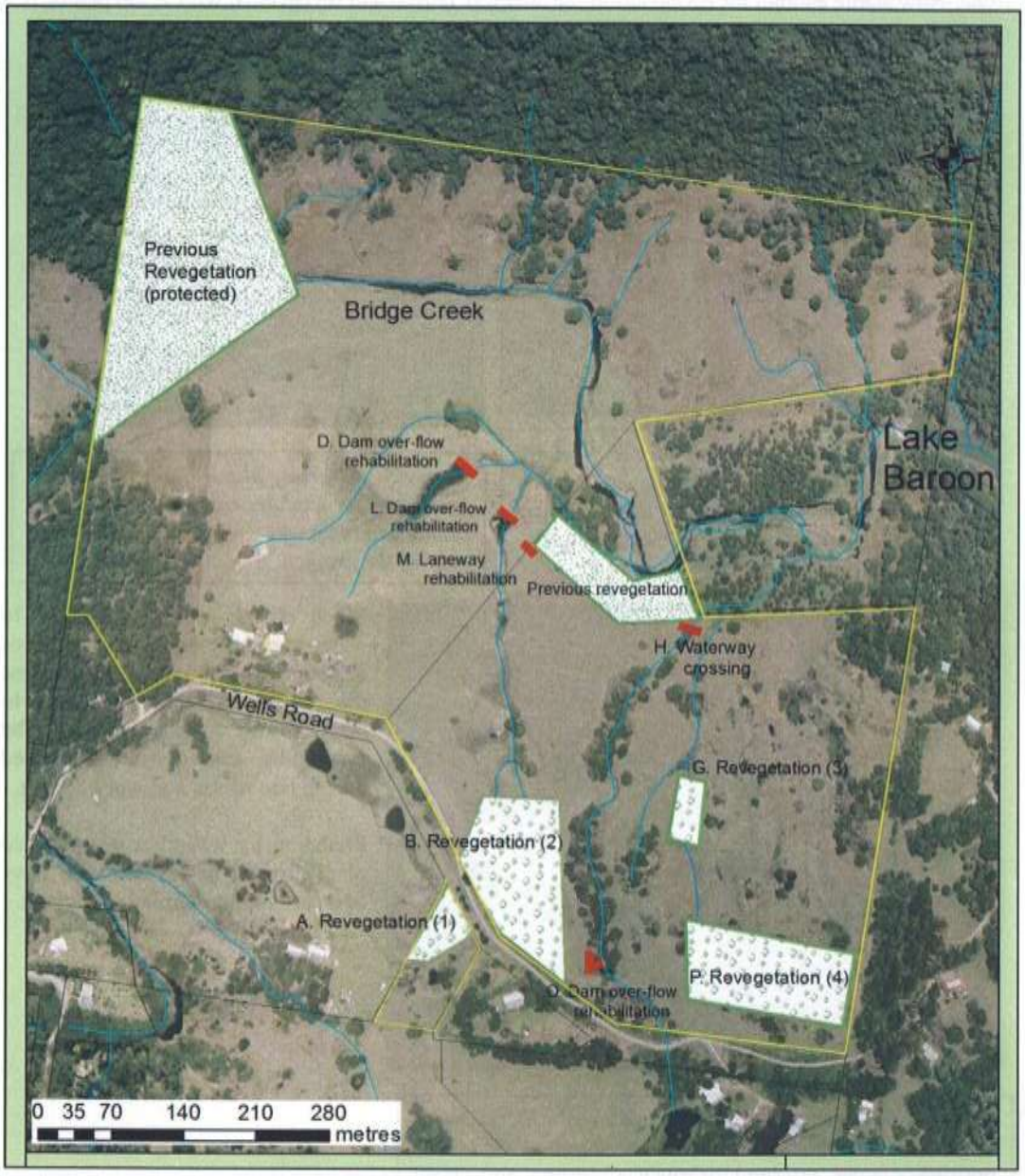

Figure 1: Map of proposed on-ground works.

3.1. Site B: Fencing and Revegetation.

This area has in the past been subjected to land slips exacerbated by a spring situated on Well's Road. Now stable enough for revegetation the area was fenced and revegetated with 2,500 plants as per the Project plan.

Figure 2: The main waterway on the property and Revegetation Area 1. Fencing to exclude livestock will run either side of the waterway and be revegetated with appropriate species. Note the sedges growing in the waterway.

Figure 3: Waterway planted and permanent fencing underway. Approximately one third of the waterway was revegetated in the first year of the project.

Figure 4: Revegetation of the site has been difficult due to large areas suffering from waterlogging. However through careful selection of species, results have been encouraging with less than 10% plant losses in the first 6 months.

Much of the area is subjected to water-logging and the species selection reflects this. Nevertheless the plantings are expected to perform well – particularly with the favourable conditions experienced during late winter and early Spring.

Predation by wallabies has affected plant growth, however guards have been installed to minimise damage.

3.2. Site P: Fencing and Revegetation.

This part of the project received funding from the 2009 Caring for Country: Community Action Grants program.

The area was fenced, management of lantana and devil's fig completed and revegetated with 1,300 tree species. All plants were guarded; however 300 of these are on loan from Barung Landcare. It is envisaged the 1,000 purchased guards will be removed after 12 months and be used on future revegetation projects (the guards are expected to have a useable life of approximately 3 years).

Weed management was a combination of a posi-track mulcher and the manual cutting and painting method performed by Barung Landcare. The mulcher was an efficient and effective method of removing lantana etc., although the steep slopes of the area could not be fully accessed.

Some of the materials, including several dead Acacia's were burnt on site which has contributed to the natural regeneration of the site. With good vegetation nearby the site is expected to undergo significant natural regeneration.

Figure 5: The site prior to works.

Figure 6: Fencing, weed management and revegetation completed in October 2010.

Figure 7: Posi-track mulcher clearing lantana and devil's fig.

Figure 8: Fencing of the site.

3.3. Site O: Dam over-flow rehabilitation.

The dam over-flow has had large woody debris placed in the gully which should improve stability and ensure the dam wall does not fail. Initially large (300mm) rock was suggested to be used however cost and availability was an issue.

Figure 9: Site prior to rehabilitation.

Figure 10: Large woody debris was placed in the eroding gully for stability.

Road-base was placed on the dam bank to further improve stability – the bank is used as an access point (crossing) for the western side of the waterway.

Figure 11: Road-base placed on dam bank.

3.4. Sites D & L: Dam over-flow rehabilitation.

Two existing crossings were rehabilitated with road-base to provide long-term stabilisation.

Figure 12: Crossing prior to rehabilitation.

Figure 13: Road-base placed on the crossings provides a hardened surface for livestock to safely cross without placing the dam wall at risk of failure.

3.5. Site M: Laneway rehabilitation.

Laneway and gateway has been rehabilitated with hardening with road-base to eliminate pugging and sediment run-off in high rainfall events.

Figure 14: Gateway prior to rehabilitation.

Figure 15: Hardening of gateway and laneway completed.

3.6. Site H: Waterway crossing.

Access to Waterway Crossing H has been restricted due to the unseasonal wet late winter and spring.

Crossing will be constructed in the second year of the project.

Figure 16: Proposed crossing site has been inaccessible due to the wet conditions experienced in the 2010 winter and spring.

3.7. Site A: Revegetation.

Figure 17: Land slip in September 2009. Temporary fencing and pasture seeding.

The land-slip on the McLauchlan (and Bull) property has been rehabilitated according to a geotechnical assessment by Paul Fraser of Civil Assurance.

This report recommended a three stage rehabilitation program:

1. Sub-surface drainage;
2. Surface profiling;
3. Revegetation.

'Wick' drains were installed consisting of coarse gravel wrapped in geo-fabric and placed in a herringbone pattern. The small dam at the head of the slip was filled with similar drainage gravel. The drain emerges at the dam downstream on David Bull's property.

Figure 18: Site was profiled following drainage installation to ensure a free-draining surface.

Figure 19: Site following revegetation.

The entire slip area was profiled to ensure a free-draining surface by Range Earthmoving, followed by a heavy covering of pasture grass seed.

Finally the slip was area was permanently fenced and revegetated with species suited to land slip sites that were tolerant of widely varying soil moisture conditions; were fast growing and hardy.

The trees were planted by Green Jobs Corps with approximately 1,200 plants used. Funding for the purchase of the trees was funded by Sunshine Coast Council.

The site will provide an important demonstration of land-slip management on the Maleny plateau.

3.8. Additional Works.

Figure 20: The additional crossing.

An additional waterway crossing was installed by the landholder immediately below Revegetation Site B. This was to improve access to the revegetation site and improve drainage.

This additional work was paid for by the landholder.

4. 2010-11 PROJECT (Year 2)

Project Variation.

4.1. Site G: Revegetation.

It is proposed to revegetate a new Project Site (Q) in place of the originally proposed Site G. This is required as access to Site G is very difficult due to steep slopes and frequent waterlogging. Additionally the landholder has expressed interest in the new site which will revegetate a gully improving linkages and connectivity with revegetation completed in 2009-10, and pro0vide an improved filter and buffer to Well's Road run-off..

Revegetation of this site will be simpler as there is far less waterlogging and there are several existing native trees established on site. Access to the site is also easier.

It is anticipated costs will be similar to the previously proposed Site G.

Figure 21: Proposed project variation – new Site (Q) to replace Site G.

Figure 22: Proposed new revegetation Site Q.

4.2. Site B: Revegetation Maintenance.

Maintenance of this site will continue as per the original Project Plan. Maintenance will be conducted by Barung Landcare Contracting.

Figure 23: Barung Landcare performing maintenance spray of Site B (2,500 plants).

5. PROJECT ACTION REPORT

Legend: Completed as per Plan | Completed since last Report | Planned | Overdue

	Action	Responsibility	Start Date	Completion Date	Measurable Output	Completed (output if different from Plan)
Project Proposal		LBCCG Coordinator	Sep 09	Dec 09	Project Plan	
Project presented to LBCCG Committee for approval.		LBCCG Coordinator Seqwater rep.	Nov 09	Dec 09	-	
Pre-works monitoring.		LBCCG Coordinator	Nov 09	Dec 09	-	
WORKS IMPLEMENTATION	Site B: Fencing.	Contractor	Dec 09	Mar 10	120 m fencing	
	Revegetation	Contractor	Dec 09	Mar 10	2,500 plants	
	Site D: Dam overflow rehab.	Landholder	Dec 09	Mar 10	1 crossing rehab.	
					25 m hardening	
	Site G: Fencing	Contractor	Dec 10	Mar 11	250 m fencing	
	Revegetation	Contractor	Dec 10	Mar 11	1,000 plants	
	Site H: Waterway cross.	Landholder	Dec 09	Mar 10	1 new crossing	
	Site L: Dam overflow rehab.	Landholder	Dec 09	Mar 10	1 crossing rehab.	
					25 m hardening	
	Site M: Gateway rehab. & harden.	Landholder	Dec 09	Mar 10	25 m hardening	
	Site O: Dam over-flow rehab.	Landholder	Dec 09	Mar 10	1 crossing rehab.	
					25 m hardening	
	Site P: Fencing*	Contractor	Dec 09	Mar 10	350 m fencing	
	Revegetation*	Contractor	Dec 09	Mar 10	1,000 plants	
	Revegetation maintenance	Contractor/landholder	Mar 10	Jun 14	>90% survival	'10 '11 '12 '13 '14
Quarterly progress reports.		LBCCG Coordinator	Nov 09	Jun 14	20 Progress Reports	1 5 9 13 17 2 6 10 14 18 3 7 11 15 19 4 8 12 16 20
Post-works monitoring.		LBCCG Coord.	Mar 10	Mar 14	-	'10 '11 '12 '13 '14
Media Releases.		LBCCG Coord.	Apr 10	May 11	2 Media Releases	
Project evaluation report prepared and presented for approval of 2nd year funding.		LBCCG Coordinator	June 10	Aug 10	First Year Progress Report	
Project evaluation report prepared and presented for approval of 3rd year funding.		LBCCG Coordinator	June 11	Aug 11	First Year Progress Report	
On maintenance (works completed, inspected & compliance with Plan.		LBCCG Coordinator	Jun 12	Jul 12	On Maintenance Report	
Project completed.		LBCCG Comm.	May 14	Jun 14	Final Report	

Project Budget & Funding Sources (as at November 25, 2010)

Funding Source	Total Funding	Expenditure	Balance
Seqwater ($26,733.00)	**$46,508.00**	**$46,282.00**	**$226.00**

6. PROJECT EVALUATION

The project has performed reasonably well with most components of the project completed on schedule. Wet conditions during late winter and spring hindered access to the sites and necessitated the erection of temporary electric fencing which was an additional project cost. Access to the CAG site for mulching was also hindered and this part of the project was slightly behind schedule.

A geo-technical report was paid for by LBCCG to ensure any remediation activities performed by the landholders followed 'best management practice'. Similarly LBCCG organised the revegetation of this site to ensure correct species selection and placement.

The difficult access issues meant that the fencing of the revegetation areas was completed after revegetation activities. This resulted in the purchase and erection of temporary electric fencing.

Permanent fencing costs were higher than anticipated with the inclusion of extra gates required for access.

Planting was completed by Barung Landcare with survival rates well within the acceptable loss rate of 10%. Predation by wallabies however did necessitate the erection of guards on Site B, and the purchase of the 'Think Pink' guards for Site P (Community Action Grant project).

Revegetation costs for Site B came in under budget while costs for Site P exceeded budget due to an extra 300 plants being required.

Crossings and laneway hardening was carried out by the landholder who paid for all the road base in exchange for assistance with the revegetation of the land slip site (A).

7. WHAT HAVE WE LEARNED

The project has performed relatively well and although some areas of the project were slightly over budget, overall the project has met expectations.

Revegetation species selection for the various conditions encountered on the project (waterlogging, land-slip, and cracking clays) proved challenging and as yet cannot be accurately assessed, although indications are that selection was effective.

Landholder support and assistance has been exceptional and the project has proven to be an excellent example of landholder engagement in the lake Baroon catchment.

8. RECOMENDATIONS

With the success of the first year of the project, the second year of the project should be funded as per the original Project plan; excepting the proposed project variation described above on page 14.

The second year of the project proposes fencing and revegetation of Site Q; continued maintenance of Site B to ensure successful establishment of the revegetation; and replanting of both Site B and Site P.

10. PROJECT ACTION PLAN (2nd Year)

Action		Responsibility	Start Date	Completion Date	Measurable Output
Project Proposal (2nd Year)		LBCCG Coordinator	Oct 10	Nov 10	Project Plan
Project presented to LBCCG Committee for approval (includes Seqwater rep).		LBCCG Coordinator & Committee	Nov 10	Dec 10	-
Mid project monitoring		LBCCG Coordinator	Nov 10	Jun 11	-
WORKS IMPLEMENTATION	Revegetation maintenance (Site B)	Contractor	Jul 10	Jun 11	>90% survival
	Fencing (Site G)	Contractor	Jan 11	Mar 11	250 metres 1 gate
	Revegetation (Site G)	Contractor	Mar 11	May 11	1,000 plants
	Revegetation maintenance (Site P)	Contractor	Jul 10	Jun 11	>90% survival
	Field Day	LBCCG Coordinator	Dec 10	May 11	Field Day
Quarterly progress reports.		LBCCG Coordinator	Mar 10	Sept 14	16 Progress Reports
Post-works monitoring		LBCCG Coordinator	Jul 10	Sept 14	-
Project evaluation & progress report prepared and presented for approval of 3rd year funding.		LBCCG Coordinator	Jun 11	Jun 11	Second Year Progress Report
Project evaluation & progress report prepared and presented for approval of 4th year funding.		LBCCG Coordinator	Jun 12	Jun 12	Third Year Progress Report
On maintenance (on-ground works completed & inspected for compliance with Project Plan – Report.		LBCCG Coordinator & Committee	Jun 13	Jul 13	On Maintenance Report
Project completed/signed off.		LBCCG Committee	Sept 14	Sept 14	Final report

11. BIBLIOGRAPHY

Department of Environment and Resource Management, *Development of a water quality metric for south east Queensland*, 2010

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

Olley, J, Wilkinson, S, Caitcheon, G & Read, A 2006, *Protecting Moreton Bay: How can we reduce sediment and nutrient loads by 50%?*, 9th International River Symposium, Brisbane.

Polyakov, V, Fares, A & Ryder, MH 2005, *'Precision riparian buffers for the control of nonpoint source pollutant loading into surface water: a review'*, Environmental Reviews, Vol. 13, pp. 129-44.

Qureshi, ME & Harrison, S 2002, *'Economic instruments and regulatory approaches in implementing riparian revegetation options: observations of the Queensland system'*, Australian Journal of Environmental Management, Vol. 9, pp. 89-98.

Slack-Smith, E 2005, Diffuse Source Best Management practices: Review of Efficacy and Costs, report for Moreton Bay Waterways and Catchment Partnerships, WBM Oceanics, Brisbane.

South East Queensland Healthy Waterways Partnership 2007, *South East Queensland Healthy Waterways Strategy 2007-2012*, South East Queensland Healthy Waterways, Brisbane.

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

Ziebell, D & Richards, PL 199, *Gully Erosion in South Gippsland*, Landcare Note SC0039, State of Victoria, Department of Natural Resources and Environment.