Bridge Creek Rehabilitation Project

Lake Baroon Catchment Care Group

2009-10

A cooperative project between Lake Baroon Catchment Care Group, and the landowners: Rob & Janice McLauchlan.

Lake Baroon Catchment Care Group

Prepared by Mark Amos
Catchment Coordinator
LBCCG

Project No. 0910-004

PROJECT APPROVALS

Date	Description	Result
9/12/2009	Project Proposal completed	n/a
10/12/2009	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.

LAKE BAROON CATCHMENT CARE GROUP INC.
Project Proposal

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

PROJECT NUMBER: **0910-004** **DATE:** **December 2009**

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	[redacted]
E-mail	[redacted]

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

PROJECT LOCATION

The Bridge Creek sub-catchment is the second largest in the Lake Baroon catchment (behind the Obi Obi Creek catchment) consisting of 52 kilometres of waterways and covering an area of 2,134 hectares. The sub catchment has a moderate covering of vegetation (43%), although much of this is significantly disturbed and degraded by environmental weeds.

Bridge Creek has been divided into six management units that reflect property boundaries, physiography, vegetation, land use, point and diffuse source impacts, and administrative convenience.

Figure 1: Bridge Creek near the River School on Bridge Creek Road. The waterways generally have good riparian vegetation, with good bed diversity and bank stability. The creek however is threatened by sediment loads entering the waterway through erosion in the catchment.
Lake Baroon, the main potable water supply for the Sunshine Coast is less than 500 metres downstream from

The proposed project is located within Management Unit BR3 which borders Lake Baroon; the property is the nearest to the Dam and shares significant fence lines to Seqwater managed lands. The MU is 518 ha in size and has 14 km of significant waterways. The dominant land use in the MU is beef production. Riparian vegetation is present alongside 40% of the waterway lengths, a significant proportion of which has been landholder revegetation.

The relatively steep nature of the land, moderate instability (63% of land unstable) and lack of natural cover in some areas of the catchment means that there is high erosion potential, and minimal filtering of run-off, therefore inputs of nutrients are significant (70% of samples exceeding guideline levels) [(1)].

The Lake Baroon Catchment Implementation Plan (2007) rates BR3 a LOW priority for rehabilitation works. However, when assessing the Management Unit using a modified version of the Prioritisation Process, which prioritises MU's on pollution input levels and land instability parameters, BR3 rates as a HIGH priority (fourth highest of all MU's in the Baroon catchment).

The McLauchlan property has historically been used for grazing (dairy, with beef production in the last two decades), although the owners have carried less livestock than the property could realistically support resulting in good property management.

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

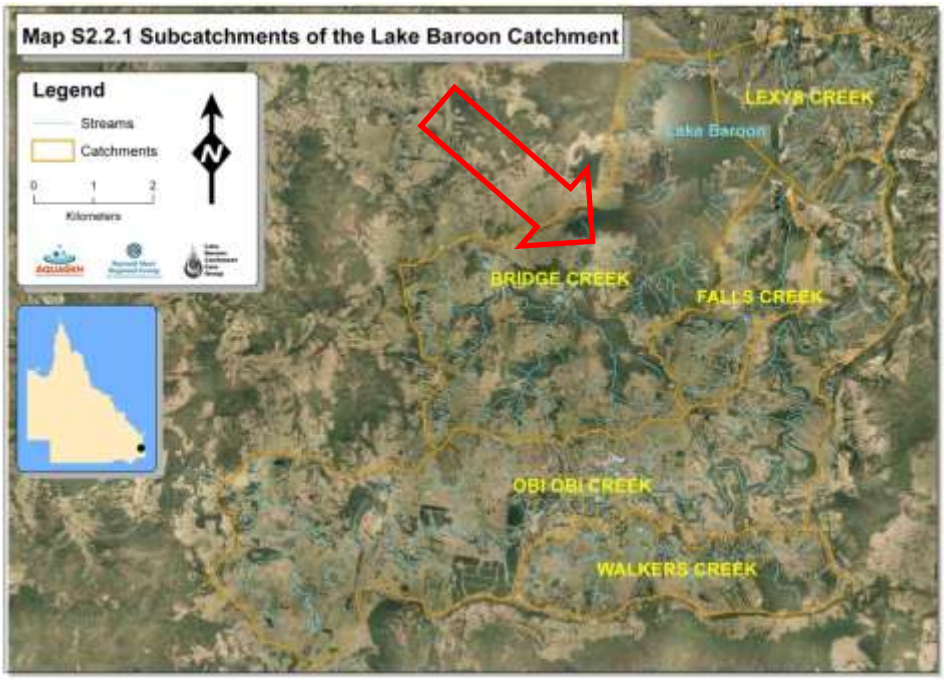

Figure 2: Bridge Creek forms the western sub-catchment of Lake Baroon.
The McLauchlan property is situated on Bridge Creek immediately before it enters Lake Baroon.

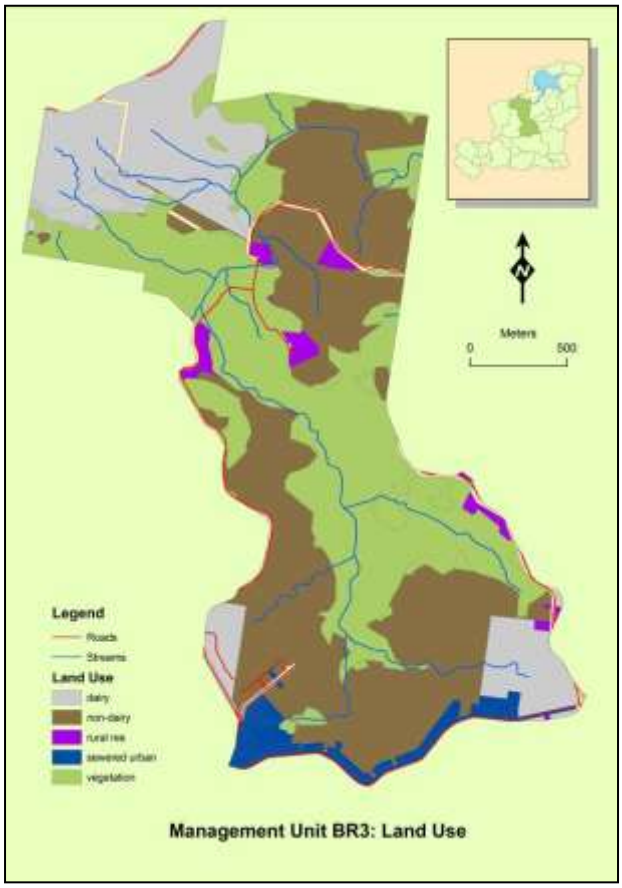

Figure 3: The McLauchlan property is shown as the brown shading at the top of the map. Beef production is the dominant land use in the Management Unit with a significant proportion of the catchment covered with vegetation.

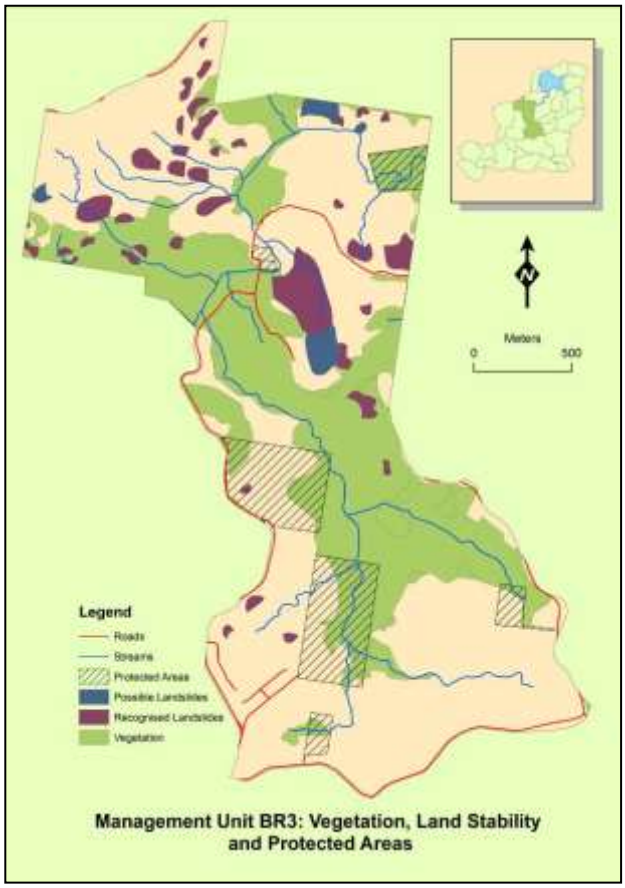

Figure 4: This map shows BR3's instability and likelihood of suffering mass movement (land slides & slips).The proposed project site has suffered from movement in the past but good property management has limited these events.

PROJECT BACKGROUND

The McLauchlan's have been active in 'landcare' activities over the years with major revegetation activities with Barung Landcare and partners. The "Corridors of Green" project fenced 220 metres of lower Bridge Creek and revegetated 3.5 hectares of waterway and steep, eroding hill-slope (see Attachment 2).

Figure 5: "The Corridors of Green" project on the property, coordinated by Barung Landcare, fenced 220 metres of Bridge Creek and revegetated 3.5 hectares of waterway and steep hill-slope.

Figures 6 & 7: The COG project in 2009

The Bridge Creek catchment is recognised as being relatively unstable and prone to mass movement; and although the heavy rainfall in early to mid 2009 resulted in some minor movement; generally this particular property is sufficiently stable for revegetation. The geology of the property (and most of the Bridge Creek catchment) however, is dotted with numerous springs that continually contribute to waterlogged areas, which tend to be frequented by livestock resulting in over-grazing and 'pugging' of the soils, and consequently significant sediment and nutrient run-off during heavy rainfall events.

The proximity of the property to Lake Baroon effectively means that any run-off from the property enters the storage with minimal filtering of sediments, nutrients or pollutants. An opportunity to remove livestock and establish large areas of vegetation would be beneficial to improving the quality of run-off entering Lake Baroon.

Figure 8: Bridge Creek where it enters Lake Baroon immediately downstream of the McLauchlan property. Note the large amounts of sediment in the bed of the creek; sediment 'drops' out as the flow dissipates at this point where it enters the Dam.

Figure 9: Much of the sediment that reaches Lake Baroon originates from springs on the hill-slopes of the catchment – particularly from the McLauchlan property.
The constant moisture provided by the springs tends to grow more and 'fresher' pasture on these sites, resulting in heavier grazing pressure which contributes to a higher concentration of nutrients and greater erosion which is washed into Bridge Creek during heavy rainfall events.

PROJECT PURPOSE & OBJECTIVES

In 2008-09 Rob McLauchlan completed a Property Management Planning program with Lake Baroon Catchment Care Group. The main outcome of the PMP program was the potential to improve water quality in Bridge Creek and its tributaries (and ultimately Lake Baroon) by identifying and completing on-ground works that would also improve the productivity and sustainability of the farm business.

The main issue identified by the McLauchlan's was the management difficulties associated with the numerous springs and associated water-logging. Erosion from the steeper areas of the property deposits sediment onto less steep areas and with groundwater springs contributing moisture, results in the formation of water-logged zones. Furthermore during heavy rainfall events loosened sediment, caused by livestock overgrazing, runs off and enters Bridge Creek and ultimately Lake Baroon (see Figure 8).

The proposed project will minimise sediment and nutrient run-off from the property by fencing and revegetating springs, rehabilitating high livestock traffic areas (dam over-flows and a laneway) and enhance the filtering and buffering ability of the properties' waterways. Furthermore farm productivity will be improved by reducing nutrient, sediment and chemical export.

Three springs will be fenced and revegetated (one site is subject to funding applied for under the Caring for Country Community Action Grants). These areas are on relatively gentle slopes that are overgrazed and as a result pasture growth is limited, contributing to increased erosion and deterioration of topsoil, further affecting growth.

The hardening of waterway crossings, and moving of a crossing to a more stable and suitable location will reduce the amount of sediment (and attached nutrients) washing into the waterways during rainfall events.

Priorities identified by the McLauchlan's in their Property Management Plan (see Figure 8).

Priority	Description	Rehabilitation Methods & Works
A	Hill-slope instability caused by failure of small spring fed dam.	Remove dam, improve drainage & profile. Revegetation.
B & F	Previous land slip & spring overgrazed by livestock resulting in puggy/eroding area.	Minor drainage works. Fencing & revegetation.
C	Eroding bend on Bridge Creek.	Install rock rip rap or alternatively tree stumps (on site). Revegetate with suitable species.
D & L	Dam over-flow.	Road base and compaction..
E	Waterlogged drainage line across paddock.	Monitor.
G	Spring fed waterlogged waterway.	Fencing & revegetation.
H	Waterway crossing.	Install pipe & harden with road base. Move gateway.
I	Bridge Creek waterway crossing.	Monitor – not a priority.
J & K	Flood fence.	Design & install effective flood fences.
M	Muddy gateway adjacent to Bridge Creek.	Road base and compaction..
N	Muddy gateway adjacent to Bridge Creek.	Monitor – not a priority.
O	Dam bank over-flow eroding.	Install pipe, road base, place tree stumps or rock into gully head.
P	Waterlogged spring area.	Fencing & revegetation.

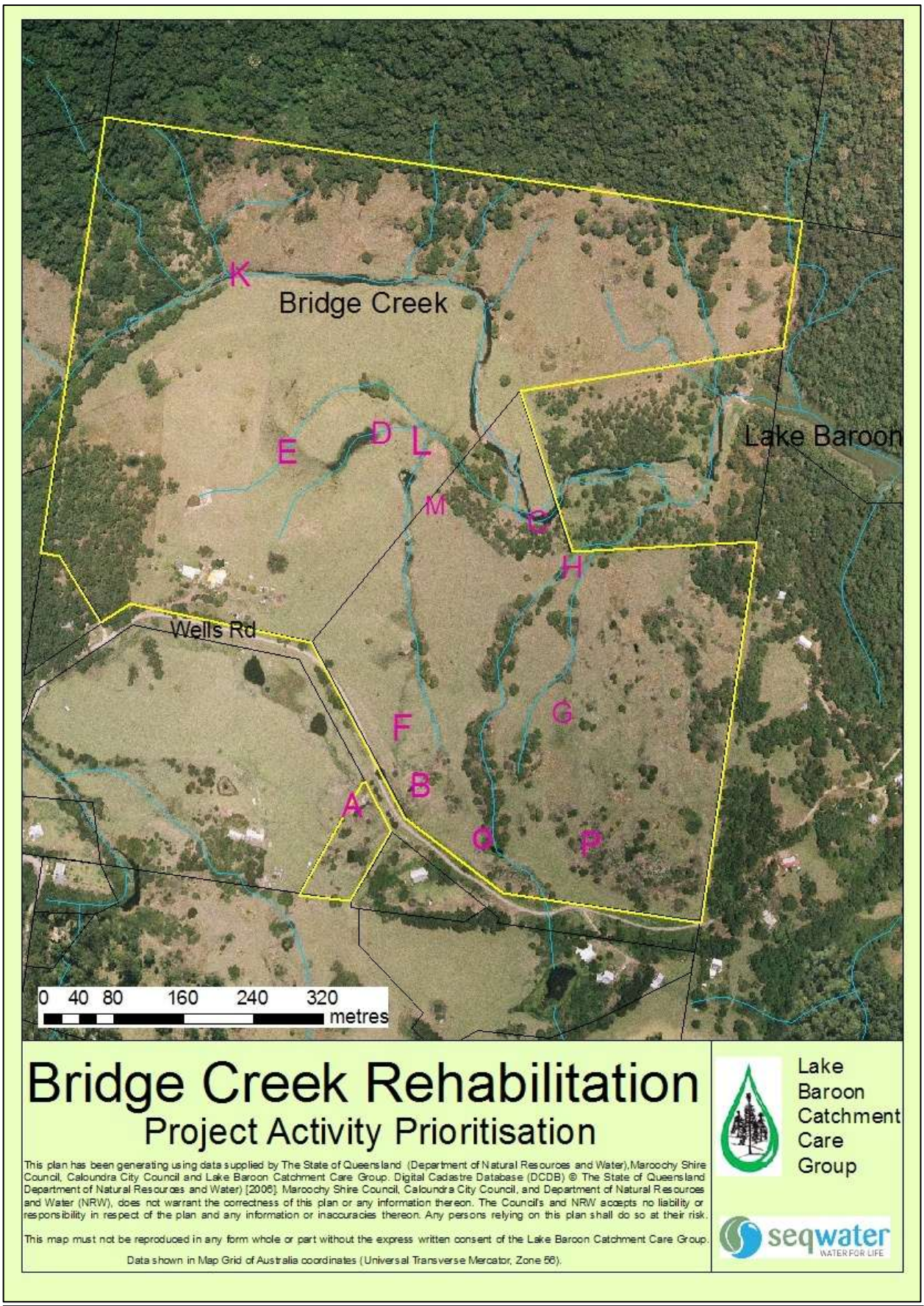

Figure 10: The proposed project site in relation to Lake Baroon) - the Sunshine Coast's largest and most important source of potable water.

PROJECT OUTCOMES

1. **Water Quality Improvements**
   The primary aim of the project is to improve the water quality of Bridge Creek by targeting a permanent waterway in the upper catchment. By reducing erosion and the associated sediment and nutrient inputs into the properties waterways, the quality of water in the Bridge Creek catchment will be improved. Ultimately this improves the quality of water entering Lake Baroon which leads to a lowering in cost of drinking water production costs, as well as improving the recreational and amenity value of Bridge Creek and the lake.

2. **Securing and improving wetland habitats.**
   The project will remove stock from year-round spring-fed wet areas that will provide valuable habitat to amphibian species (frogs) and other animals that inhabit the zone between aquatic and terrestrial areas. These areas will act as small wetlands and perform a filtering function, removing sediment and nutrients before flows reach Bridge Creek.

3. **Development of habitat clusters and corridors.**
   The project will establish clusters of native vegetation and expand the vegetation in the local area with only narrow open areas in between. This will provide opportunities for wildlife to travel across the property to neighbouring remnants and vegetation as well as providing habitat. Species selection will be consistent with the Regional Ecosystems of the immediate area and will also include rare and threatened flora species of these RE's so that the site will also assist in the long term preservation of species.

4. **Community Education**
   The project will demonstrate waterway rehabilitation along a significant, continuous reach of waterway and improve awareness of catchments, water quality and sustainable farming. The landowners have a good understanding of the catchment, livestock management and the environmental, and water quality issues unique to Maleny. The property is currently used as a research site by the University of the Sunshine Coast for the study of macro-invertebrates and riparian zones. The works will further enhance the properties demonstration values, and improve understanding and technical capacity of the agricultural extension community.

5. **Improvements in farm productivity**
   Farm productivity will be enhanced by improving the manageability of the property, while contributing to agricultural sustainability by reducing nutrient loss, soil loss through erosion and chemical export from run-off. The owners have shown excellent property management in the past and the property can be used for Field Days demonstrating the links between good environmental management and improved farm manageability.

6. **Whole farm approach to property planning.**
   The property has been assessed through the Property Management Planning program which evaluated the property from both an environmental perspective and a productive agriculture perspective. Innovative techniques are being employed to continue the evolution of best practice management and in-depth monitoring and evaluation is expected to inform and influence future planning and project implementation.

DESCRIPTION OF WORKS

The following on-ground works were identified that meet the objectives of the project:

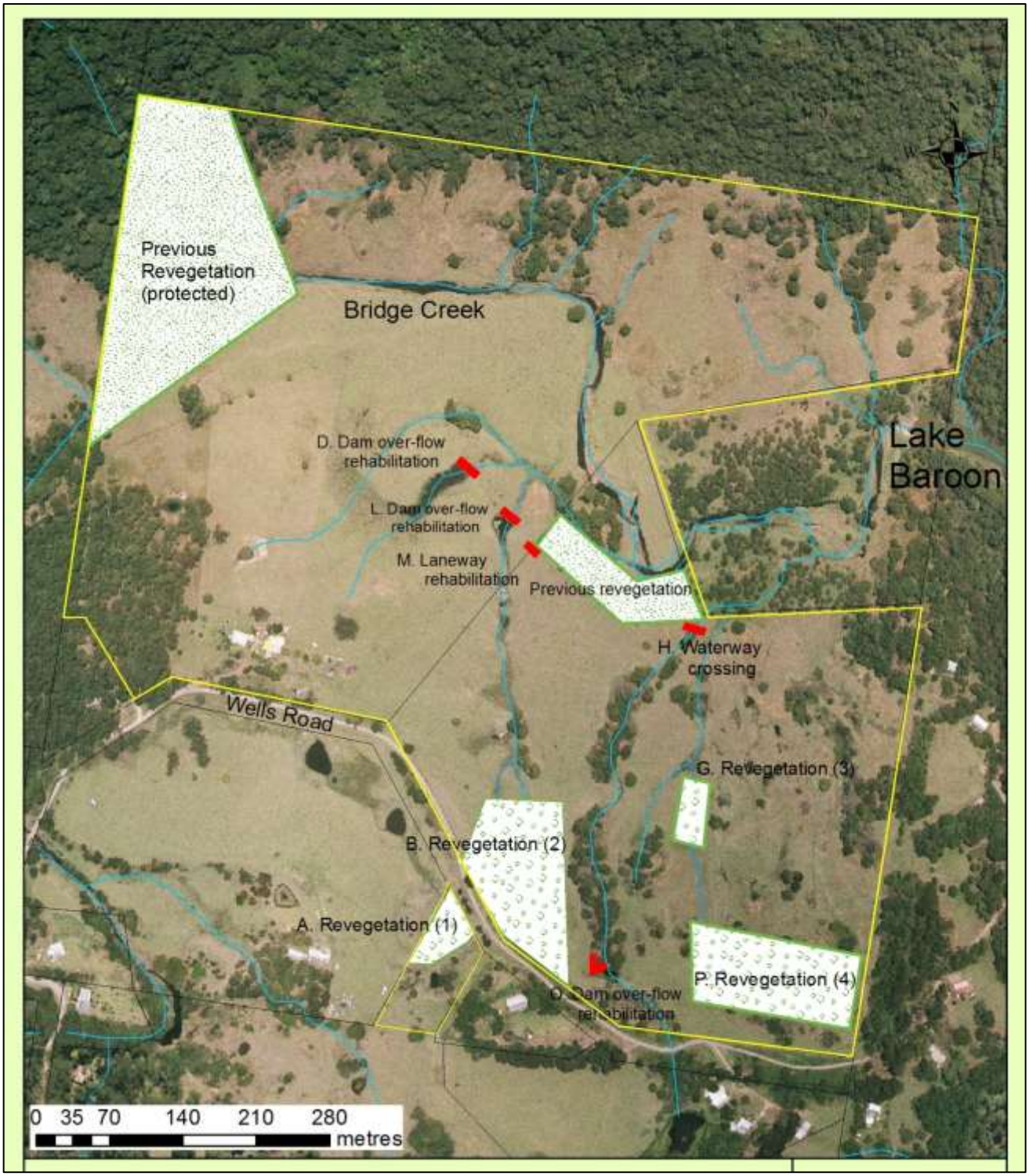

Figure 11: Proposed on-ground works and previous revegetation sites.

Revegetation Area 1 (B).

This area has in the past been subjected to land slips exacerbated by a spring situated on Well's Road. The area is now relatively stable, however unrestricted livestock access and constant moisture results in 'pugging' and overgrazing which leads to erosion.

Figure 12: Erosion in the past has resulted in flows from a spring on Well's Road following a new path. Minor earthworks, fencing and re-vegetation will stabilise the area and provide a large (1 hectare) vegetation 'cluster'.
Note the lumps and mounds of sediment eroded from higher up-slope.

With minor earthworks; forming a low diversion bank to redirect surface water flows back to the original waterway, and revegetation, the site will be stabilised reducing soil loss and nutrient inputs into Bridge Creek.

The site is approximately one hectare in area and will provide a sizeable vegetation 'cluster'.
Despite livestock frequenting this area, a scattering of native vegetation persists, including Acacias, Lomandra, Sedge and Juncus species, which will be protected and would be expected to proliferate once livestock have been removed.

Revegetation species selection will be consistent with the adjacent Regional Ecosystems, with the objective of establishing a canopy cover as quickly as possible to minimise long term maintenance and provide rapid soil stabilisation. Plant species (including rare and endangered) of the identified Regional Ecosystems will be utilised to provide diversity, and secure the long term survival of uncommon species.

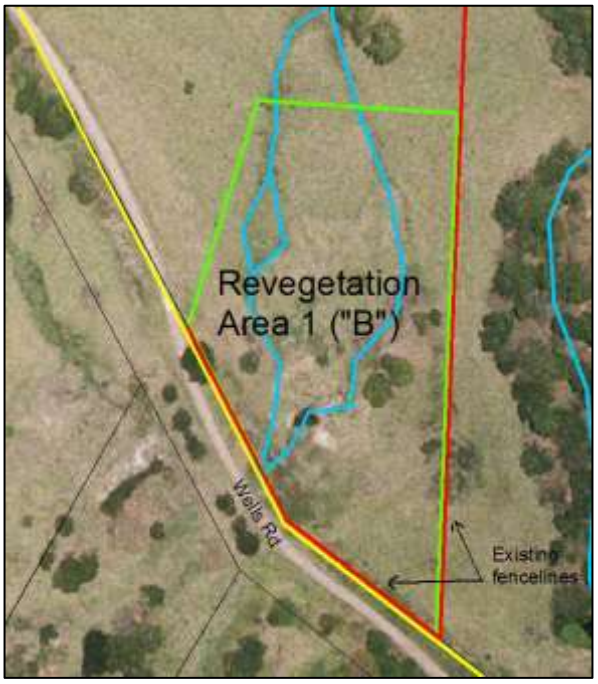

Figure 13: Revegetation Area 1.

Revegetation Area 2 (G).

This area is similar to that of Revegetation Area 1. A spring ensures this area remains waterlogged throughout the year, with heavy grazing pressure, resulting in 'pugging' and continual erosion. Sediments deposited in this area from erosion further up-slope will be stabilised
Fencing and revegetation of the site will remove livestock, and stabilise sediments deposited in this area from erosion further up-slope.

Figure 14: The waterway, although ephemeral, is constantly waterlogged and attracts heavy grazing pressure from livestock.
Note the humps and mounds which is material deposited by erosion further up the hill-slope – particularly the area in the background (Revegetation Area 3).

The site is approximately half a hectare in area and would provide a sizeable vegetation 'cluster'. Despite livestock frequenting this area, a scattering of native vegetation Sedge and Juncus species persist, which will be protected and expected to proliferate once livestock have been removed.

Revegetation species selection will be consistent with the adjacent Regional Ecosystems, with the objective of establishing a canopy cover as quickly as possible to minimise long term maintenance and provide rapid soil stabilisation. Plant species (including rare and endangered) of the identified Regional Ecosystems will be utilised to provide diversity, and secure the long term survival of uncommon species.

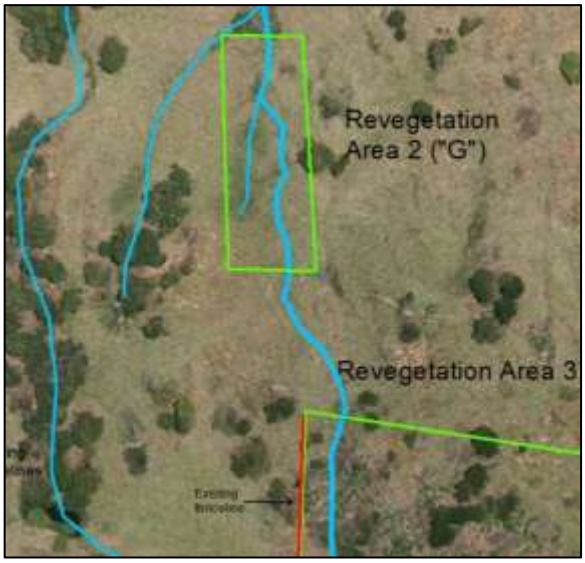

Figure 15: Revegetation Area 2.
The site is approximately half a hectare and will require 250 metres of fencing.
There is a scattering of native Sedge and Juncus species which would be expected to spread once livestock is removed from the site.
Revegetation will consist of 1,000 plants selected for their ability to withstand water-logging.

Revegetation Area 3 (P).

This area has been identified as having a high likelihood of suffering from mass movement (land slips and land slides) exacerbated by a freshwater spring maintaining ground pore-water pressure on the hill-slope. Consequently the landowner has maintained any vegetation on the slope possible; native blady grass (Imperata cylindrical), Blackwood wattles (Acacia melanoxylon); as well as retaining camphor laurel and lantana. The current vegetation provides fair stability and the site is now relatively stable and unlikely to suffer mass movement. The site however has unrestricted livestock access and due to the constant moisture, suffers from 'pugging' and continual erosion.

Figure 16: The relatively steep slope has been identified as having a high likelihood of suffering from land slips.
The landowner has retained all vegetation possible to maintain stability, but would prefer to replace weedy species with native vegetation.
Note the green spring in the centre of the photo.

The landowner manages weed species on the rest of the property exceptionally well and would prefer to have native vegetation providing hill slope stability rather than lantana which spreads from the site onto other parts of the property and neighbouring properties.

Figure 17: The hill-slope has stabilised with good growth of blady grass and the weedy lantana. Low impact removal of the lantana will minimise soil disturbance and combined with exclusion fencing will allow natural regeneration and recruitment to occur.
The site will be enhancement planted in the second year to ensure biodiversity and full slope coverage is achieved in the longer term.

Fencing of the site to exclude livestock, and weed management of lantana will promote natural regeneration of native species which will contribute to the stabilisation of the hill-slope. The blady grass will be encouraged as it provides an exceptional buffer to run-off and stabilises loose soils with extensive root systems. (An exception to the general rule; the landowner encourages blady grass on the property and improves its palatability to livestock by regularly slashing to promote fresh growth.)

Once natural regeneration rates are determined, the site will be enhancement planted to ensure species diversity (based on the Regional Ecosystem of the site) and adequate coverage is achieved in the longer term.

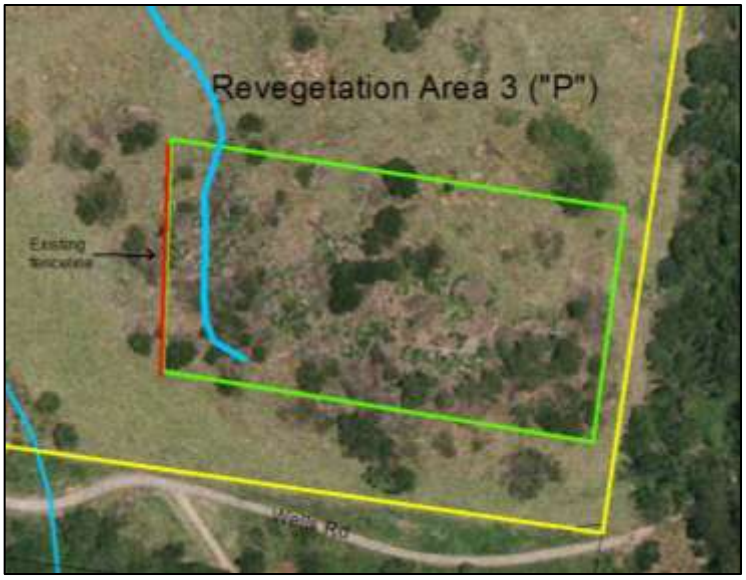

Figure 18: Revegetation Area 3.
The site is approximately 1 hectare, but only requires fencing on 3 sides (350m).
Note the 'fair' covering of Acacia's, blady grass and lantana. Natural regeneration would be expected to occur once livestock (and lantana) are removed.
Enhancement revegetation will ensure diversity and adequate coverage results.

Note: This part of the project is subject to a funding application to 2009 Community Action Grants (see Attachment 3).

Dam over-flow rehabilitation (O).

A small spring-fed dam functioning as a wetland and providing useful habitat to aquatic species has a steep overflow which is likely to fail without a 'formal' over-flow being installed – including the placement of suitable rock in the gully immediately downstream of the dam.

Large woody debris (LWD) was originally sourced by the landholder to be placed in the over-flow and downstream gully to provide stabilisation, however this material would be better utilised at "C", (see page 20). Large manufactured rock (300mm diameter) would provide superior stabilisation at this site.

A crossing will be constructed with a 200mm diameter pipe, a load of road base to stabilise, and large rock placed in the over-flow to halt head-ward erosion.

Figure 20: The over-flow to the dam falls away steeply to the gully below.
Head-ward erosion is migrating up the slope putting the dam bank at risk.
Suitable manufactured rock will form a hard surface for the over-flowing water from the dam to run over minimising scour.
Rushes, sedges and pasture grass will further stabilise the over-flow over time.

Dam over-flow rehabilitation (D & L).

Two existing dam over-flows/waterway crossings on the property suffer from livestock damage.
These crossings require a load of road base and compaction (by excavator) to stabilise, thereby reducing erosion and sedimentation of the waterway.

Figure 21 & 22: The dam over-flows/crossings require rehabilitation to ensure the dam wall does not fail and erosion is minimised.

Laneway rehabilitation (M).

A laneway adjacent to Bridge Creek is eroding from excessive livestock traffic resulting in sediment and nutrient run-off in heavy rainfall events.
A load of road base and compaction will harden the laneway minimising erosion.

Figure 23: Laneway adjacent to Bridge Creek. A previous revegetation project by Barung Landcare (see Attachment 2) is immediately to the right – a planting on the banks of Bridge Creek.

Waterway crossing (H).

Sediment eroded off hill-slopes (see Revegetation Area 3 [P]) and gullies upstream is deposited in a gateway that accesses the north eastern paddocks of the property. This area is often waterlogged and is frequented by livestock leading to overgrazing and the formation of ruts and channels. The gateway is severely eroded.

The gateway is situated on the boundary fence with Seqwater. **By moving the gate back up the fence-line to a more stable position, livestock tracking through the gate will be stopped.**
The construction of a new waterway crossing opposite the gate will enable access to the north eastern paddocks of the property.

Figure 24: An old waterway crossing on the boundary of Seqwater property. Sediment caused by erosion further up-slope is deposited here creating a boggy waterlogged area. Even during the driest part of the year, livestock cause severe 'pugging' and surface water flows cut channels through the gateway resulting in significant erosion.

The crossing will be constructed using a 300mm diameter pipe, a load of road base to harden and stabilise, and property-sourced rock to protect the pipe opening and outlet.

Note that this particular waterway is ephemeral and a piped crossing will not impact on the movement of aquatic species.

Figure 25: Site for new crossing. A gate will be moved from the left of the picture to the fence in the background to provide access to the north eastern paddocks of the property.
A waterway crossing is required to minimise erosion and provide access to the north eastern paddocks on the property.

FUTURE ACTIVITIES

Revegetation Area 4 (A).

The heavy rainfall in early to mid 2009 reactivated an old landslip on Rob McLauchlan's residential property. A small dam constructed at the head of the gully increased ground pore-water pressure and resulted in a slip that caused the failure of the dam bank. A debris slide flowed downstream into the neighbour's property (David Bull's).

A geotechnical assessment recommended three stabilisation alternatives:

1. Revegetation of entire area in its current form with no additional rehabilitation works (relies on vegetation to [a] extract moisture from the soil leading to lower ground pore-water pressure; and [b] reinforce the soil through extensive root systems increasing shear strength and reducing susceptibility to erosion);
2. Surface profiling and re-vegetation to remove surface voids and create a uniform, free-draining surface, followed by revegetation as described in (1); and
3. Sub-surface drainage, surface profiling and revegetation would install trench drains through the landslip area, and profiling and revegetation as described in (2) and (1).

All options require the removal of the dam which in isolation should considerably improve stability.

Figure 26: The site to be revegetated is in the background (where the small excavator sits). Note the debris flow (green area in gully) that has entered David Bull's property (LBCCG provided electric fencing and seeding around the area).

Currently the landowner is attempting to source an earthmoving contractor that can remediate the site. **Revegetation of the site can be commenced once engineering works are completed.**

Bank erosion management on Bridge Creek (C).

Immediately before Bridge Creek enters Seqwater owned property, the waterway turns at ninety degrees, resulting in significant bank erosion on the outside of the bend. This erosion is affecting revegetation established under a previous Barung Landcare program (see Attachment 2) and will eventually impact on revegetation on Seqwater land.

Ideally this bend could be reshaped and armoured with large manufactured rock (400mm minus). The site however is difficult to access by large trucks capable of delivering rock. **An alternative method of stabilisation could be by using approximately 30 large tree stumps and trunks salvaged off site (stored on the property).** These could be placed with an excavator (with assistance from Dale Watson – MRCCC) and backfilled with soil so that appropriate vegetation could be planted to provide long term stability.

Figure 27: The bend on Bridge Creek before it enters Lake Baroon. Sediment from this erosion is transported to the storage and previous re-vegetation is threatened by continuing erosion.

Figure 28: The large woody debris that could be used to rehabilitate the eroding bend on Bridge Creek.
This will provide the added benefit of aquatic habitat as this reach of Bridge Creek contains a deep, permanent hole (fish were observed in the hole when visited).

Flood fence (K).

Bridge Creek is a significant waterway that carries large volumes of flow in high rainfall events. Traditional flood fencing is time consuming and potentially expensive to repair, and difficult to access during the wetter part of the year.

Where Bridge Creek enters the grazing area of the property, flood fencing is regularly swept away even during minor flood events resulting in lengthy periods where livestock access a previous revegetation project. Where Bridge Creek leaves the property and enters Seqwater property a similar situation occurs. Removing stock from these areas is a significant management issue for the owner.

The design and installation of flood fencing that is permanent and only requires minimal maintenance would prove not only effective in keeping stock from entering sensitive areas, but also provide improved property management.

Figure 29: Flood fence on Bridge Creek.
The fence is regularly washed away and is difficult to maintain and repair.
A suitable low maintenance replacement would serve as a demonstration/test site.

The erection of a suitable flood fence would involve the placement of strainer posts above the high water mark of the waterway, stringing a 10mm cable between the strainer posts and hanging appropriate lengths of chain or steel rods vertically off the cable. The flood fence is electrified using a simple solar powered energiser to discourage livestock from pushing through the chains or bars. The assembly can move, without catching debris in high flows and fall back into position when flows subside.

Such a fence would provide an excellent demonstration of dealing with waterways and livestock issues in the catchment.

KEY PERFORMANCE INDICATORS

Key Performance Indicators (KPIs) for this project are in line with those listed in the Lake Baroon Catchment Care Group Ten Year Financial Plan (and thus are linked to the Lake Baroon Catchment Implementation Plan (LBCIP).

Links to Lake Baroon Catchment Implementation Plan Actions

LBCIP Link	LBCIP Link Description	Proposed Outcomes (Burnett Mary Regional Group Targets)	Aquagen Operational Plan
OG1	Develop on-ground works for water quality improvement and aquatic biodiversity maintenance & improvement	Land management factors directly responsible for riparian zone instability and locations for feasible rehabilitation with both water quality and biodiversity outcomes are identified. Remedial works targeting priority reaches as identified in Rivercare Plans to prevent degradation or enhance condition	4.1 Catchment Projects (i) Number trees planted (ii) Survival goal (iii) Metres waterway fenced (iv) Stock restricted access to waterway
OG2	Support and develop on ground works for habitat recovery.	The status and condition of identified priority EVR and iconic species are improved and there is no net decline in status for all EVR taxa by 2015	
OG3	Locate high value areas within catchment and target for protection and remediation	All locations of high value are protected by Local Government planning initiatives by 2010.	
CM1	Develop a program whereby all landholders involved in on-ground activities initiate PMP's as part of application process.	The status and condition of High and Moderate Value TB sites identified in 2005 are maintained or improved by Land Management by 2015.	10.2 Public Benefit (i) Develop a comprehensive project plan (ii) Develop a property management plan for project site
CM2	Property Management Planning toolkit	Soil productivity, health and structure are maintained at 2004 levels (or better) within the cultivated lands and exports of nutrients, sediment and agrochemicals in runoff is within EV/WQO targets by 2015.	
CM3	Weeds toolkit	Weeds and pest animals of significance to productivity and biodiversity values are controlled in cleared agricultural land (including grazing and cultivated areas) and do not spread into remnant vegetation areas by 2015.	
CM4	Adoption of BMP for point and concentrated diffuse pollution	Best practice guidelines for point and concentrated diffuse sources of nutrients, sediments and agrochemicals and associated land development are identified by 2006 and priority pilot projects implemented in 2007.	
CM6	Community involvement	At least 50% of NRM stakeholders in the region feel that their ownership and trust in the NRM planning process has increased by 2015.	6.3 Press Releases & Advertisements (i) Media releases (ii) Field Days (iii) Signs erected
CM7	Stakeholder Survey		
CM8	Transition in NRM practice	At least five pathways for transition in NRM practice are implemented in the region (e.g. landholders change from riparian zone grazing to protection of riparian areas) by 2015.	
CM12	Training and skilling stakeholders in NRM	Participation rates in NRM related training have increased by 30% by 2015.	
MR1	Water quality hotspots	Water Quality? hot spots? are identified; mitigation programs are developed and commence by 2007.	5.1 Catchment Water Analysis (i) Regular analysis of ecological integrity of site.
MR5	Identification of point and concentrated diffuse pollution	Both concentrated diffuse and point sources loads are reduced by 50% (or are consistent with the EV/WQO program targets) throughout region by 2020 and region-wide standards and BMP are widely used in ERA license reviews.	

PROJECT BUDGET/FUNDING APPLICATION

FINANCIAL YEAR LBCCG FUNDING 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 (07) 5494 3775 for further information.

PROJECT ACTION PLAN

Action	Responsibility	Start Date	Completion Date
Project Proposal	LBCCG (Coordinator)/landholder	Sep 09	Dec 09
Project presented to LBCCG Committee for approval (includes Seqwater rep.) Site visit for Project Approvals Committee (if required).	LBCCG Coordinator	Nov 09	Dec 09
Pre-works monitoring (including photo points, Index of Stream Condition & macro-invertebrates.	LBCCG (Coordinator)	Nov 09	Dec 09
Fencing of revegetation areas.	Contractor/landholder	Dec 09	Mar 10
Quarterly progress report.	LBCCG (Coordinator)	Mar 10	Mar 10
Site preparation and revegetation using appropriate species (first stage).	Contractor/landholder	Mar 10	May 10
Media Release to promote project and objectives of LBCCG (includes due reference to Seqwater).	LBCCG (Coordinator)	Apr 10	May 10
Post-works monitoring (first stage).	LBCCG (Coordinator)	Nov 09	Dec 09
Project evaluation & progress report prepared and presented to LBCCG Committee (includes Seqwater rep.) for approval of 2nd year funding.	LBCCG (Coordinator)	June 10	July 10
Quarterly progress report.	LBCCG (Coordinator)	Sep 10	Sep 10
Quarterly progress report.	LBCCG (Coordinator)	Dec 10	Dec 10
Site preparation and revegetation using appropriate species (second stage).	Contractor/landholder	Mar 11	May 11
Quarterly progress report.	LBCCG (Coordinator)	Mar 11	Mar 11
Media Release to promote project and objectives of LBCCG (includes due reference to Seqwater).	LBCCG (Coordinator)	Apr 11	May 11
Project evaluation & progress report prepared and presented to LBCCG Committee (includes Seqwater rep.) for approval of 3rd year funding.	LBCCG (Coordinator)	Jun 11	Jul 11
Quarterly progress report.	LBCCG (Coordinator)	Sep 11	Sep 11
Post-works monitoring (second stage).	LBCCG (Coordinator)	Nov 11	Dec 11
Quarterly progress report.	LBCCG (Coordinator)	Sep 10	Sep 10
On maintenance (on-ground works completed & inspected for compliance with Project Plan.	LBCCG (Coordinator)	Jun 12	Jul 12
Project completed/signed off.	LBCCG (Coordinator/Committee)	May 14	Jun 14

MONITORING & EVALUATION

Monitoring and evaluation strategies are essential components of any environmental rehabilitation project. Evaluation is the best way to improve our knowledge about what works, what doesn't and how we can best direct our rehabilitation efforts. Monitoring strategies are key components of the overall evaluation process that allows you and others to learn from the project and assess whether rehabilitation aims have been met.

Photo point monitoring will provide valuable evidence of works completion, a record of vegetation growth, and provide an important assessment tool to evaluate the project.

Furthermore, monitoring results and information will be used to:

1. Raise awareness and encourage further works with priority landholders (primary producers and large landholders in the Lake Baroon catchment).

2. Promote cooperative projects between Lake Baroon Catchment Care Group, Seqwater, Sunshine Coast Regional Council and other Natural Resource Management organisations.

3. Critically examine techniques and methods used throughout the project to continually improve the service to landholders conducting on-ground works in the catchment and improve best practice management.

4. Develop cost-effective strategies and techniques to perform on-ground activities.

5. Continue to develop monitoring and evaluation program that meets the requirements of funding bodies, but also provides the relevant information and feedback to the LBCCG and Seqwater to improve project delivery.

PROJECT REPORTING

Reporting on the progress of the project is an essential component of delivering successful on-ground outcomes. Therefore the following reporting schedule will be implemented to ensure all stakeholders are informed in a comprehensive and timely way.

Report	Recipients of Report	When
Progress Reports (presentation & brief summary).	LBCCG	Monthly
Progress Reports (written report).	LBCCG Seqwater Stakeholders	Quarterly
On Maintenance Report	LBCCG Seqwater Stakeholders	On-ground activities completed (excluding re-planting & maintenance).
Final Report (includes evaluation & further recommendations for project)	LBCCG Seqwater Stakeholders	Completion of project