

A review of Lower Waikato River RIPARIAN RESTORATION SITES and priorities for future work and monitoring



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CONTENTS

•••••	•••••		•••••
FOR	EWORD		3
VC	DLUN	/IE 1	5
1.	INTF	ODUCTION	6
2.	MET	HODS	7
3.	HIST	ORICAL CONTEXT	8
•••••	3.1	Geomorphology and hydrology	8
•••••	3.2	Historic riparian vegetation	9
•••••	3.3	Historic human impacts	10
4.	CUR	RENT STATE OF THE RIVER ENVIRONMENT	11
•••••	4.1	Hydrology	11
•••••	4.2	Riparian vegetation	
•••••	4.3	Land use effects on the river landscape and ecology	15
5	EVAI	UATION OF EXISTING RIPARIAN RESTORATION PROJECTS	16
	51	Evaluation methods	16
•••••	5.2	Findings	16
•••••	5.3	Conclusions	24
6.	SILE	SELECTION AND PRIORITISATION	26
•••••	0.1	Selection and prioritisation methods	20
•••••	0.2	Riparian restoration objectives for the lower vvalkato River	20
•••••	0.3	Restoration criteria and site prioritisation process	21
7.	ASSE	SSMENT OF POTENTIAL RIPARIAN RESTORATION SITES	32
8.	RIPA	RIAN RESTORATION INDICATORS	35
	8.1	Restoration limitations and risks	35
	8.2	Restoration targets - suitable reference sites or restoration endpoints	35
	8.3	Selection of monitoring sites	37
	8.4	Restoration indicators	37
9.	CON	CLUSIONS	39
ACK	NOWLE	DGMENTS	40
REF	ERENCES	3	41
APP	ENDICES		
1.	Mea	n monthly river levels at six monitoring stations located on lower Waikato River 2003-2013	42
2.	Cons	ultation meeting participants	45
	-		

VOLUME 2

RIPARIAN RESTORATION SITE ASSESSMENTS	49 - 184



Foreword

Waikato RiverCare has, since 1999, with the generous support of many local Waikato people and businesses, worked on habitat restoration projects along the 120 kilometres of Waikato riverbank from Hamilton to the river mouth at Port Waikato.

Waikato RiverCare is a recognised leader in riparian restoration projects to improve the native habitat and biodiversity on the banks of the Waikato River.

With a significant new funding stream for environmental projects on the Waikato River arriving in the form of the Waikato River Authority, Waikato RiverCare identified the need for a riparian restoration road map to help coordinate activities.

A result of a comprehensive consultation and scientific research process undertaken by Wildland Consultants, Waikato RiverCare has produced two documents:

- A user friendly how-to guide for anyone wanting to undertake riparian restoration
- An assessment of the suitability of various sites along the lower Waikato River for habitat restoration.

Using a robust site selection and prioritisation method, 44 sites have been identified and assessed. Volume 1 of this report outlines the research process, background and criteria for assessment and Volume 2 details the priority sites. The report should be read and used in conjunction with Waikato RiverCare's how-to guide for riparian restoration best practice on the lower Waikato River, to maximise project success in this challenging environment.

Most of the priority sites identified are on public land, however some private land has been included if a landowner has expressed interest or the site was nominated by other parties during consultation meetings/hui.

The assessment process includes non-negotiable bottom line criteria and objective criteria, which take into account a variety of goals including biodiversity, water quality, visual enhancement, community engagement, cultural and spiritual outcomes and public access. Management criteria are also used in the assessment, including pre-project checks, site access, cost effectiveness and sustainability. The concept of Mahitahi, working together, is also taken account in the assessment.

This document provides an excellent resource for identifying new project locations and a guideline for riparian restoration on the lower Waikato River. Anyone wanting to undertake a restoration project is encouraged to follow the guidelines provided to plan their project. Land administrators

47

and owners must always be consulted and an agreement made before any work is undertaken at an identified site.

Waikato RiverCare can provide technical input and offers a comprehensive riparian restoration project development and delivery service.

The Waikato RiverCare Executive Committee would like to take this opportunity to acknowledge the support and assistance received over the last 15 years from our communities and industry leaders in sustaining and driving the valuable restoration work which has already been completed on the lower Waikato River. The Committee is excited about the potential this report provides, and looks forward to empowering and guiding communities wanting to make a difference to the health, wellbeing and mauri of this great river.

Ben Wolf Chairman, Waikato RiverCare March 2014

Volume 1

A review of Riparian Restoration Sites along the lower Waikato River and priorities for future restoration work and monitoring

Wildland Consultants Report No 3143

A review of lower Waikato River riparian restoration sites





1. INTRODUCTION

The purpose of this review is to provide guidance on the prioritising and monitoring of sites on the banks of the lower Waikato River, for Waikato RiverCare or other parties undertaking riparian restoration activities. It was commissioned by Waikato RiverCare (RiverCare), which has been undertaking riparian restoration on the banks of the lower Waikato River since 1999, with the aim of establishing selfsustaining indigenous plant-based communities.

The lower Waikato River, as referred to in this report, is the section of the Waikato River from the northern boundary of Hamilton City (Kirikiriroa) to Port Waikato (Te Puuaha O Waikato).

6

Riparian restoration is defined in this report to mean restoration activities undertaken on land immediately adjacent to the Waikato River and includes stock exclusion, weed control, and indigenous revegetation.

This report contains information on the historical context and current condition of the lower Waikato River, a review of ten lower Waikato River riparian restoration projects, a method for prioritising sites for riparian restoration, descriptions of 44 potential riparian restoration sites, and indicators for monitoring the progress and relative success of riparian restoration projects.

Detailed guidelines on how to implement riparian restoration projects were also commissioned by Waikato RiverCare as part of this project, and are provided in a separate document available from Waikato RiverCare.

Consultation

Information was gained from reviewing relevant literature and consultation with iwi, hapu, and marae along the river, as well as community groups, statutory bodies and interested groups and individuals.

Nine consultation meetings/hui were held between May and July 2013, including a public meeting at the Huntly Community Hall. A number of individuals with a good knowledge of the lower Waikato River were also interviewed.

At consultation meetings/hui, participants shared their knowledge of the river, objectives for riparian restoration, potential criteria for the selection and prioritising of sites for riparian restoration, and any 'tips' they could provide on undertaking riparian restoration along the lower Waikato River.

Ben Wolf, Waikato District Counci

2. METHODS

Field Evaluations

Between June and August 2013, ten riparian restoration sites - five to eleven years old - were surveyed to assess their current ecological condition. Site conditions, vegetation composition and cover abundance, closest natural area, and adjacent land uses were recorded at each site. Site management plans and interviews with site managers were used to determine ages of plantings, site conditions prior to restoration implementation, and maintenance activities.



3. HISTORICAL CONTEXT

3.1 Geomorphology & hydrology

The Waikato River begins at Lake Taupo, which draws its water from the Tongariro River. Historically, the river channel has had a number of courses besides the current alignment of the Waikato River, including the Mangakino Stream and a previous major course through the Hinuera Valley towards the Hauraki Gulf (Collier et al. 2010). These changes and the resulting landscapes they have created have been driven by the volcanic geology of the central North Island from before the formation of the current Lake Taupo 26,500 years ago.

In the cold climate of the last glaciation, post-eruption erosion

8

the braided river channels of the Waikato River, depositing it in the Hamilton and Hauraki basins and damming tributary streams creating many small lakes. Warming climate brought more vegetation cover, reduced erosion, higher sea levels, and a single river channel. The channel changed course several times, creating levees between which peat bogs formed over time. Higher sea levels transformed the lower reaches of the river into an estuary where deposition of erosion debris accumulated over time.

and floods brought debris down

Eventually, due to upstream debris reduction and erosion of its own bed, the river channel stabilised further, abandoning the Hinuera course. The Taupo eruption in 230 AD temporarily reversed this process by briefly damming the lake outlet and then depositing large amounts of debris in the subsequent flood, again damming tributaries to form lakes, eroding to form terraces, levees and peat bogs in the lower valley (Collier et al. 2010).

Natural hydrological processes below the Taupiri Gorge involved interactions between the river's wide channel and the wide flat floodplain with its backwater channels, shallow riverine lakes and peat wetlands, to moderate the impacts of floods and droughts and to create substantial kahikatea swamp forests and bogs (peatland vegetation) with significant wildlife habitat values. The river estuary also created significant wetland habitats for birds and fish.

3.2 Historic riparian vegetation

At the end of the last glacial period, about 14000 BP, the Waikato was treeless, with only grasses, herbs and shrubs present. A warming climate brought about forest establishment from 11000 BP. In totara-matai-kowhai forest that occurred on low terraces and levees, totara, matai, kowhai and kanuka would have been dominant with less abundant kahikatea, rimu, tawa, hinau (Elaeocarpus dentatus), rewarewa (Knightia excelsa), lacebark (Hoheria sextylosa) and ribbonwood. Divaricating shrubs were also significant in the understorey and would have included turepo, Coprosma rhamnoides, and C. rigida. Wheki (Dicksonia squarrosa), ponga, ground ferns (e.g. Blechnum spp., Polystichum richardii), grasses (e.g. Oplismenus imbecillis) and kiekie would also have occurred in the understorey (Clarkson et al. 2007).

Lower river margins and wetlands along the Waikato River were dominated by a mosaic of kahikatea swamp forest, manuka scrub and low forest, ti kouka-coprosma swamp, sedge swamp, raupo swamp and totara-matai-kowhai forest on the lower ridges and levees (Collier et al. 2010; Clarkson et al. 2002; Champion 1997).

Swamp forests would have been dominated by kahikatea (Dacrycarpus dacrydioides) with rarer matai (Prumnopitys taxifolia), rimu (Dacrydium cupressinum), pukatea (Laurelia novae-zelandiae), titoki (Alectryon excelsus), swamp maire (Syzygium maire), tawa (Beilschmiedia tawa), pokaka (Elaeocarpus hookerianus), and occasional ti kouka (cabbage tree, Cordyline australis).

In the understorey, the prominent species would have comprised ponga (Cyathea dealbata), mapou (Myrsine australis), hangehange (Geniostoma ligustrifolium), pate (Schefflera digitata), mahoe (Melicytus ramiflorus), kanono (Coprosma grandifolia), kiekie (Freycinetia banksii), supplejack (Ripogonum scandens), and a range of small-leaved divaricating shrubs, e.g. turepo (Streblus heterophyllus), poataniwha (Melicope simplex), small leaved mahoe (Melicytus micranthus), Coprosma areolata and Coprosma rotundifolia.

Dominant ground cover species would have included bush rice grass (Microlaena avenacea), kakaha (Astelia fragrans) mauri (Astelia grandis) and the ferns irirangi (Hymenophyllum demissum), Diplazium australe, panako (Blechnum filiforme), mokimoki (Microsorum scandens), hen and chicken fern (Asplenium bulbiferum), and button fern (Pellaea rotundifolia) (Clarkson et al. 2002; Clarkson et al. 2007).

Wetland vegetation on the margins of riparian forests would have included harakeke (flax / *Phormium* tenax), manuka (Leptospermum scoparium), sedges (e.g. Carex spp., Cyperus ustulatus), ribbonwood (Plagianthus regius), pokaka, and ti kouka along with lianes including kohia (Passiflora tetrandra), kaihua (Parsonsia spp.), and Fuchsia perscandens (Clarkson et al. 2007; Champion 1997).

In the swamps and river margins 'where the current is not too swift' and at the base of banks and 'in the adjacent marshes' riparian aquatic plants included raupo (Typha orientalis), kuawa (Schoenoplectus tabernaemontanii), and kukuraho (Bolboschoenus fluviatilis) (Kirk 1871). Other riparian plants and plants of the backswamps close to the river included rautahi (Carex geminata), Carex secta, Carex virgata, upoko tangata (Cyperus ustulatus), karamu (Coprosma robusta), swamp coprosma (Coprosma propinqua), manuka, ti kouka, and harakeke.

Warm, wet conditions promoted peat development in waterlogged depressions in the northern Waikato, forming ecologically unique peat bogs dominated by *Empodisma robustum* and *Sporodanthus ferrugineus*. The expansion of peat dammed and increased the depths of the lakes in the lower Waikato River catchment.

3.3 Historic human impacts

Humans have lived in the lower Waikato River catchment since about 1200 AD, modifying the river and landscape substantially. Māori used the river as an important transport route using waka and as a source of food, including tuna (eels), other fish, and plants. 1

They cleared large areas along river banks for settlements and cultivation of crops and also burnt some forested areas. Raupo was an important material for houses and harakeke for clothing and rope (Champion 1997).

After the arrival of Europeans in the 1840s and 1850s the Waikato River remained the main access route inland for traders and missionaries. After the land wars, 4,869 sq. km of Māori land was confiscated and European settlement took hold with clearing, drainage of the plains, and related development. From the 1880s, dairy farming was the main agricultural activity in the Waipa and Waikato areas. Hamilton was established in 1864 and other small towns grew up to service the farming industry. Over the last one hundred years there have been major changes within the Waikato catchment. Hill country was developed for farming, small towns and industries grew and hydro-electric dams were built along the Waikato River .2

In the lower catchment, peat swamps and lakes have been drained (the first drainage board was set up in 1895), sand has been mined in the lower reaches of the river, and flood control works now regulate river flow and protect about 47% of the floodplain (Mullholland 2010).

Exotic trees and plant species have been introduced, and many of these have become weeds. Crack willow (Salix fragilis) was introduced to the river floodplains to protect the river banks following settlement and clearance of the Waikato floodplains for farming (Thompson and Reeves 1994). Alder (Alnus glutinosa) was introduced as fuel wood for steamboats and has established widely downstream of the Karapiro Dam. A range of other introduced species are either garden or farm escapes including, most notably, tradescantia (Tradescantia fluminensis), ginger (Hedychium gardnerianum), yellow flag iris (Iris pseudacorus), pampas (Cortaderia selloana), woolly nightshade (Solanum mauritianum), honeysuckle (Lonicera *japonica*), and reed sweet grass (Glyceria maxima). Accidental introductions include alligator weed (Alternanthera philoxeroides) and Californian bulrush (Schoenoplectus californicus).

Mammals, birds, and fish have

also been introduced. Pest species

present along the lower Waikato

River include possums (Trichosurus

vulpecula), hedgehogs (Erinaceus

europaeus), ferrets (Mustela furo),

stoats (M. erminea), weasels (M.

nivalis), ship rats (Rattus rattus),

(Felis cattus). Koi carp (Cyprinus

wetland system.

Norway rats (R. norvegicus) and cats

carpio) are abundant in the river and

Natalie Douglas, CravePhotography.co.nz



4. CURRENT STATE OF THE RIVER ENVIRONMENT

4.1 Hydrology

Effects of Soils

In the lower catchment, alluvial plains are characterised by a mixture of free-draining allophanic levee soils, slower draining gleyed swale soils, organic raised-bog soils with mixed recent soils, gley soils, and pumice alluvium soils on the floodplain terraces beside the river. Non-alluvial lowland soils are deep, moisture-retentive, tephraderived clays and loams, which are moderately-drained and are generally good for agriculture or horticulture.

Soils in the upper catchment allow rapid rain infiltration, and produce a subdued flood response due to the large groundwater stores, which moderate and sustain stream and river flows. In contrast, older soils within the lower catchment, including the Waipa catchment, which makes a significant contribution to the lower Waikato River, have lower infiltration rates, and support low levels of groundwater storage, and this means that the river is much more responsive to rainfall, and subject to large flood peaks and very low flows.

The effect of the Waipa River on the Lower Waikato is marked, and it contributes up to two-thirds of the total river flow during flood events.

Site
Lake Taupo outflow
Hamilton
Ngaruawahia below
Waipa River

Effects of Hydro Dams on Flow Regimes

Major flooding in the Lower Waikato is generally due to heavy rainfall in the Waipa catchment. Typical flood flows can be up to three times the median flow rates (Table 1), or more. Extended wet periods before a flood, can create higher flows, and floods of longer duration.

Hydro-system infrastructure on the Waikato River includes eight dams, nine power stations, and control gates on the Lake Taupo outlet. Diversion of Whanganui tributaries into the Tongariro catchment initially added an additional 30 m3/s to the outflows from Taupo, but this has since been halved, due largely to a decline in average annual rainfall since the early 1980s. Originally, resident time of water in the river was in the order of 5-6 days from Taupo to the Waikato mouth, but the dams have extended this to 16-40 days.

Since 2001, the daily minimum flow from Karapiro, the most northern and downstream dam, has been

1. From www.waikatoriver.org.nz.about-the-waikato-river/history

10

Table 1: Median flows of the Waikato River

	Median Daily	Median Daily		
	Summer Flows	Winter Flows		
V	130 m3/s	180 m3/s		
	210 m3/s	300 m3/s		
v the	250 m3/s	400 m3/s		

varied to provide greater generation flexibility. Operating ranges of the lakes have been increased, and a modified minimum flow regime introduced, which theoretically reflects former natural river flow patterns, and enables outflows from the dam to be dropped below 148 m3/s. This has had the effect of increasing the range of maximum and minimum flow rates ("ramping") in the lower Waikato River. The net effect of ramping since 2001 has been to increase typical daily flow fluctuations from 40 m3/s to 70 m3/s.

Net effects of hydro dams and their storage and controlled release of water include lower flood peaks, less acute low flows during droughts, and marginally higher average flows. Dampening of peak flood flows and increased mid-range flow duration has reduced sediment transport, but this has been offset by additional flows from the Tongariro diversion, resulting in a net increase of 13% in bed material transport at Ngaruawahia.

River Levels

River levels are affected by channel morphology, flood control structures, and flow regimes (see table 1), and vary considerably along the course of the river, from week-to-week, month-to-month, and year-to-year. This is well illustrated by analysis of mean monthly river levels at six locations between Ngaruawahia and Port Waikato, where levels are automatically monitored. Graphs of mean monthly river levels recorded from 2003 to early to mid-2013 for each of these locations are provided in Appendix 1. High river levels can be experienced at any time of year, e.g. in 2004, significantly higher levels than normal were sustained for a two month period during February-March, and the same occurred in January 2012. However, highest sustained river levels are generally experienced during the months of July to October, as shown during the 10 year period from 2003 to 2012. For five of the 10 years, highest sustained levels were in August; in three of the 10 years it was in October; one year it was in July, and one year it was in September.

Over the course of a year, river levels can range from a minimum to a maximum of less than one metre towards the mouth of the river when tidal fluctuation is taken out of the equation - to close to 4.5 m at Ngaruawahia. Table 2 shows the maximum, minimum, and mean ranges over which river levels have varied during the nine years from 2004 to 2012, inclusive, at the six sites monitored.



Table 2:

Annual ranges of river levels during the nine years from 2004 to 2012, inclusive, at the six sites monitored on the lower Waikato River.

Site	Maximum	Minimum	Mean Range
	Range (m)	Range (m)	(m)
Ngaruawahia Cableway	4.38	2.78	3.56
Huntly Power Station	3.73	2.44	3.09
Rangiriri Bridge	3.50	2.26	2.87
Mercer Bridge	3.93	2.61	3.14
Tuakau Bridge	2.97	1.83	2.36
Hoods Landing	1.23	0.71	0.98



4.2 Riparian vegetation

The current state of riparian vegetation varies considerably along the lower Waikato River, reflecting adjacent land use and cover (Figure 1). Between Hamilton and Ngaruawahia riparian vegetation is a mixture of pasture and exotic forest dominated by crack willow and alder with very little undergrowth. In non-agricultural areas there is often a subcanopy with ferns (Cyathea and Dicksonia spp.), mahoe (Melicytus ramiflorus), pate (Schefflera digitata), Chinese privet (Ligustrum sinense), honeysuckle (Lonicera japonica), Muehlenbeckia australis, and ground covers of ferns, karamu, ti kouka, Carex secta, Carex virgata, kuawa (Bolboschoenus fluviatilis), and the invasive tradescantia.

Floodplains downstream of Ngaruawahia are now largely pasture, often with unrestricted stock access to the edge of the water. Crack willow is dominant along the river margins, with weeping willow also common. Since the collapse of crack willow forest due to sawfly from the early 2000s, alder has become more abundant, and dominant, in some areas, and is actively invading typical former kahikatea forest habitat.

Between Huntly and Mercer, river islands and riverine wetlands become more common. These are largely dominated by exotic species such as crack willow, alder, and grey willow - and include some of the largest infestations of yellow flag iris present in the lower Waikato River (Wildland Consultants 2011).

River islands without a history of grazing often contain indigenous vegetation. Common indigenous species include ti kouka, harakeke, and kahikatea (Champion and Clayton 2010). Remnant indigenous vegetation in riverine wetlands is often dominated by ti kouka, harakeke, raupo, and a mixture of sedges and rushes. Rautahi (Carex geminata) and Carex subdola often form extensive swards, the former in backswamps and the latter on betterdrained sites or in pasture.

Kahikatea forest remnants occur on both river banks between Huntly and Mercer, however many are grazed and have a paucity of associated species, and are hydrologically separated from the river by stopbanks. The most extensive kahikatea remnant occurs within the Punga Punga Wetland, near Pukekawa, which also contains extensive raupo and *Cyperus* ustulatus wetlands (Wildland Consultants 1999).



The largest and most extensive

remnants of indigenous riparian

forest and riverine wetland occur

downstream of Mercer, to the

Waikato River mouth. Riparian

forest is dominated by kanuka

with broadleaved species. The best

remnant of riparian forest is River

comprises rimu-tawa-taraire forest

(Wildland Consultants 1999). Kowhai

extensively on both sides of the river

and on large river and deltaic islands

downstream of Mercer and have,

collectively, been assessed as being

internationally significant (Cromarty

and Scott 1995) but, paradoxically, are

the least known areas ecologically

on the entire Waikato River system

(Clive Howard-Williams et al. 2010).

Crack willow and alder are dominant

in many of these wetlands but there

forest remnants and large harakeke

are also many kahikatea swamp

flaxlands.

Road Bush, near Tuakau, which

Tidal riverine wetlands occur

is common on bluffs.

Natalie Douglas, CravePhotography.co.nz

4.3 Land use effects on the river landscape and ecology

Land use changes have wrought major impacts on natural river processes and the vegetation and habitats of the Waikato catchment.

Early vegetation clearance increased erosion in the catchment and increased sediment loads within the river and erosion along the river banks. However, recent hillslope planting, land retirement for soil conservation, riparian planting under the scope of 'Project Watershed', and fencing of river banks have reduced some of the erosion and sedimentation issues arising from agricultural land use.

Alders planted for fuel, and willows planted for erosion control, have also altered the natural hydrology of the river, with consequences for its ecology.

Ongoing bank erosion between Karapiro and Ngaruawahia is linked to flood scour, bank steepness, and physical characteristics of the bank material. Downriver of Ngaruawahia, the river has undergone an overall reduction in width consistent with a degrading bed, with no widespread evidence of increased bank erosion. Erosion is, however, still an issue locally, and is frequently evident where the river changes course.

Sand mining in the lower reaches has altered sediment balances, resulting in lower flood levels, and has had a negative effect on wetland drainage. For example, the Whangamarino Wetland, which drains into the Waikato River at Meremere, required a weir to be installed to restore minimum water levels that had been falling steadily due to sand abstraction from the lower Waikato River.

Waikato RiverCare 2014

Land drainage and flood control works in the lower Waikato River catchment have modified the interaction of the river with its associated wetlands and lakes. The net effect of stopbanks is that floods are not able to dissipate as freely across the floodplains as previously, and accordingly, are of longer duration.

Introduced pest animals have had impacts on indigenous vegetation by browsing and seed predation, and on the processes of plant reproduction and distribution of seeds by predation on indigenous birds. Some pest animals and birds assist the spread of weeds and some directly affect the river banks (e.g. rat excavations). Pest fish have also adversely affected indigenous fish species, indigenous aquatic vegetation, and the stability of river banks.



Plate 1: Large hydrological fluctuations make it difficult for indigenous plants to survive in the normal winter flood zone¹. At this Huntly site only one large ti kouka has survived in the flood zone, which regularly receives debris and sediment.

14

One of the major impacts of hydrological changes on riparian restoration programmes is the increased duration of floods, which severely affects vegetation intolerant of prolonged inundation. Conversely, prolonged low river levels can deprive wetland vegetation of water and have adverse consequences, particularly during summer when evapotranspiration is at its greatest. High energy flood flows exert considerable pressure on plantings, particularly during early establishment phases, and large debris such as branches or tree trunks transported by the river can cause significant damage to these and other important infrastructure, such as fences (Plate 1).

Changes to key drivers of riparian ecology of the magnitudes described have tipped the ecological balance beyond a threshold from which restoration to pre-human riparian vegetation can be achieved easily.

1. The 'normal winter flood zone' or simply 'flood zone' referred to throughout this report is defined in relation to duration of inundation and the upper and lower limits of normal winter floods. For the purpose of this report, the boundary between the 'normal winter flood zone' and the 'upper flood zone' is defined as the ground elevation relative to Moturiki Datum that is reached or exceeded by river levels approximately 20 days/annum, as averaged over the past ten years. Prior to restoration, this zone is generally characterised either by the presence of crack willow (sometimes associated with reed sweet grass, yellow flag iris and Tradescantia) or in the absence crack willow, by reed sweet grass, harakeke, Persicaria spp., and beggars ticks (Bidens frondosa). The upper or near upper limit of these species marks the transition to the 'upper flood zone'.



5. EVALUATION OF EXISTING RIPARIAN RESTORATION PROJECTS

5.1 Evaluation methods

Riparian restoration along the lower Waikato River is a relatively recent phenomenon. Various groups and individuals have undertaken riparian planting along the lower Waikato River, but this has often been for aesthetic purposes rather than to create sustainable indigenous vegetation. RiverCare has the longest history of carrying out extensive riparian restoration aimed at creating self-sustaining indigenous plant communities. Ten of their riparian restoration projects that were initiated five or more years ago were evaluated to identify any significant issues or opportunities for improvement.

The ten sites are located between Tuakau and Ngaruawahia and are evenly split between the true right and true left banks (Figure 2). An initial field survey was undertaken to describe key features at each site, site conditions prior to restoration, and the restoration treatment of each site, so far as these could be ascertained from the sites and existing records. A summary of descriptive characteristics is provided in Table 3.

Each site was also assessed for its current condition - as at August 2013 - using a range of criteria (see Table 4). Sites were scored 1-10 for overall naturalness; the degree of selfsustainability was assessed, and the species originally planted and those surviving were recorded.

None of the projects had undertaken consistent pest animal control, so evaluation of the effectiveness of pest control was not possible.

5.2 Findings

Restoration Process

Site characteristics and management are summarised in Table 3, for each of the sites evaluated. Sites varied in age from five to 11 years since the final planting, except for an older part of the Taupiri A site. All sites were dominated by weeds prior to implementation of riparian restoration, with urban sites containing the highest numbers and greatest covers of weed species. Most sites received at least one year of weed control prior to planting. Prior to restoration, the most significant weeds at all sites were bindweed (Calystegia silvatica), crack willow, common alder (Alnus glutinosa), Tradescantia, yellow flag iris, and kikuyu (Pennisetum clandestinum).

Planting stock grades used were PB3 and PB5, with tubed stock used for some grasses or rapidly-growing species. Spacings were generally c.1 m. Spacings of up to 3 m observed at some sites may have been the result of plant mortality. The earliest sites planted tended to have a smaller range of planted species than sites planted at later dates. At most sites, additional plants were added over the establishment period, to fill gaps left by plant mortality. Species planted in the normal winter flood zone (see footnote on Page 15) had very high mortality (Plate 1). There was also some direct loss of plants due to erosion at three sites. The frequency of weed maintenance was generally similar for five of the six sites with a known maintenance history. The exception was the Hakarimata A site, where the effects of no weed maintenance were assessed.



A review of lower Waikato River riparian restoration sites

Table 3: Site characteristics and management of ten riparian restoration projects reviewed along the lower Waikato River.

Site	Hakarimata A	Horahora	Meremere	Rangiriri A	Huntly A	Ngaruawahia A	Ngaruawahia B	Tuakau	Gedye	Taupiri A
Dimensions	12 m × 400 m	140 m × 400 m	8 m × 1,150 m	5 m × 750 m	20 m × 580 m	22 m × 350 m	17 m × 150 m	5 m × 285 m	18 m × 50 m	15 m × 650 m
Topographic features	Terrace, bank, levee	Stopbank, river terrace, backswamp, levee	Backswamp, stopbank,channel, backswamp,levee	Stopbank, river terrace, bank	Stopbank, terrace, bank	Terrace, bank, low terrace	Steep high bank, low terrace	River terrace, steep river bank	River terrace, backswamp, levee	Steep bank, low terrace
Nearest road	Adjacent to top of bank	2 km	20-100 m	25 m	At south and north ends	20 m	15-17 m	40-50 m	700 m	adjacent to top of bank
Nearest natural area	500 m (hill forest)	1.5 km (wetland)	200 m (swamp forest; scrub)	1 km (hill scrub and fern)	3 km (hill forest)	1500 m (hill forest)	2 km (hill forest)	100 m (forest; scrub and fern)	40 m (swamp forest)	50 m (scrub and fern)
Adjacent land use	Road reserve	Farming	Farming, walkway	Farming	School, walkway	Urban park	Urban park	Park, carpark	Farming	Carpark, state highway
Stock excluded 1					\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark
Dominated by exotic weeds prior to restoration	\checkmark	V	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	V	\checkmark
Significant	Crack willow,	Crack willow,	Crack willow,	Crack willow,	Crack willow, common	Crack willow,	Crack willow, common	Silver wattle,	Crack willow, woolly	Crack willow, common
weeds at outset	pampas, bindweed, tradescantia	common alder, yellow flag iris, bindweed	common alder, pampas, kikuyu, yellow flag iris, bindweed	common alder, yellow flag iris, bindweed	alder, yellow flag iris, reed sweet grass, bindweed, pampas, Chinese privet, kikuyu, elephant ear, tradescantia	common alder, bindweed, Indian shot, elephant ear, tradescantia	alder, bindweed, arum, bears breeches, gorse, rice paper plant, kikuyu, tradescantia	bindweed, kikuyu, common alder	nightshade, flag iris, pampas, bindweed, tradescantia	alder, kikuyu, pampas, bindweed, Chinese privet, onion weed, yellow flag iris, Japanese honeysuckle, tradescantia
Start of project	c. 1998	c. 2001	c. 2001	c.2003	c.2003	c.2003	c.2004	c. 2005	c. 2005	c.2007 ²
Final year of planting	c.2004	c.2002	c.2003	c.2004	2006	c.2006	c.2007	c.2005	c.2006	2008
Length of weed control following initial planting	None ³	3-4 years	3-4 years	3-4 years	3-4 years	3-4 years	3-4 years	3-4 years	3-4 years	3-4 years
Maintenance frequency	None	Unknown	Unknown	Unknown	Spraying 2-3 times per year + releases and gap planting	Spraying 2-3 times per year + releases and gap planting	Spraying 2-3 times per year + releases and gap planting	Unknown	Spraying 2-3 times per year + releases	Spraying 2-3 times per year + releases

1. There was evidence at the Meremere and Rangiriri sites of stock access or inadequate controls to prevent stock intrusion.

2. The Taupiri A site had an older area of planting - about 20 years or older - established at the downstream end of the site.

3. At the Hakarimata A site, weed control was done before, but not after, planting.

Table 4: Current condition of ten riparian restoration projects reviewed along the lower Waikato River.

C :4.	TT-leasing of A	Hanahana	Manana	Dom of mini A	TT	 Neemakie A	Naamaanahia D	Trealess	Calma	To up in i A
Site	Hakarimata A	Horanora	Meremere	Rangiriri A	Huntiy A	 Ngaruawania A	Ngaruawania B	luakau	Geaye	laupiri A
Width of riparian	12 m	140 m	8 m	5 m	20 m	22 m	17 m	5 m	18 m	15 m
margin										
Dominant planted	karamu, ti kouka,	ti kouka,	harakeke, ti kouka,	karamu, ti kouka,	kohuhu, houhere,	karamu, ti kouka,	karamu, ti kouka,	kanuka,	Ti kouka,	karamu, mahoe ti kouka, houhere
species	pate, mahoe	karamu,	manuka, kahikatea	manuka	karamu harakeke,	manuka, harakeke	manuka, harakeke,	ti kouka,	ribbonwood,	
		harakeke			mahoe, manuka,	houhere, kanuka	houhere, kanuka	harakeke	karamu, harakeke,	
					ribbonwood	(on banks)	(on banks)		(kahikatea healthy)	
Canopy height	6-8 m	4-5 m	4-6 m	4-5 m	4-6 m	4-6 m	4-6 m	3-4 m	4-6 m	3-4 m (4-8 m older planting)
(planted species										
only)										
Percentage of	c 50%	<10%	<10%	<5%	c 50%	c 20%	<10%	<5%	<10%	c 75% in areas planted prior to
canopy with po										restoration by RiverCare
										restoration by inversare
gaps Indiana	N/ahaa maanan	Custhessen	Cananan	Kanamu (ana nlant)	Kanamu lumana	Kanamu ti haulu	Ti havila	Nama	None	Comence wetwite the home we have
Indigenous	Manoe, mapou,	Cyatnea spp.,	Carex sp.	Karamu (one plant)	Karamu, kanono,	Karamu, ti kouka,	11 KOUKA	None	None	<i>Cyperus ustulatus</i> , karamu, manoe,
regeneration/self	karamu, ti kouka	karamu,ti			mahoe, ti kouka,	Coprosma				ti kouka, mapou, kawakawa, kowhai,
introduction		kouka			karo, kohuhu,	xcunninghamii				terns (Pteris, Blechnum, Lastreopsis,
					tarata, kawakawa					Cyathea) Carex sp., Hoheria
					ribbonwood, houpara,					populnea (abundant); Muehlenbeckia
					ferns (Pteris sp.,					australis
					Cyathea sp. and					
					others)					
Exotic weed	Ginger, pampas,	Common alder,	Common alder,	Inkweed, yellow flag	Chinese privet,	Exotic Carex spp.,	Verbena sp.,	Common alder,	Yellow flag iris,	Pampas, honeysuckle, ginger, onion
regeneration	Chinese privet.	vellow flag	pampas, kikuvu,	iris	pampas, loguat, black	Euonymus sp.	Chinese privet.	kikuvu	reed sweet grass.	weed, black nightshade, inkweed
	tradescantia	iris boxelder	wild turnin		nightshade inkweed	tradescantia	woolly nightshade		tradescantia	······································
	honoveucklo	crooping joppy	bindwood rood		crooping joppy	li uucocumu.	tradoscantia			
	Ioneysuckie,	bindwood	billaweed, leed		read awast gross		liadescantia			
	Jerusalem cherry	Dindweed	sweet grass,		reed sweet grass,					
			tradescantia		tradescantia					
Exotic weed cover	Ground 75%	Ground >50%	Ground 50-100%	Ground c.80%	Ground 20-80%	Ground c.50%	Ground 60%	Ground <10%	Ground c.80%	Ground 80% Canopy <40%
abundance	Canopy <20%	Canopy <20%	Canopy <30%	Canopy <20%	Canopy <20%	Canopy <10%	Canopy <10%	Canopy <10%	Canopy <10%	
Significant weeds	Crack willow,	Common alder,	Common alder,	Black nightshade,	Crack willow, yellow	Black nightshade,	Crack willow,	Common	Yellow flag iris,	Yellow flag iris, ginger, kikuyu, black
	pampas, Japanese	yellow flag	Japanese walnut,	inkweed, wild turnip,	flag iris, woolly	exotic Carex spp.,	bindweed, woolly	alder, kikuyu,	tradescantia	nightshade, crack willow, pampas,
	honeysuckle,	iris, pampas,	pampas, woolly	arum, tradescantia	nightshade, wild	tradescantia	nightshade,	climbing dock		bindweed, box elder (Acer negundo)
	tradescantia	bindweed	nightshade,		turnip, inkweed,		tradescantia			Chinese privet, woolly nightshade,
			kikuyu, yellow		bindweed, pampas,					German ivy, nasturtium, inkweed,
			flag iris, bindweed,		kikuyu, arum,					onion weed, Himalayan honeysuckle,
			reed sweet grass.		onion weed, fennel.					Japanese honevsuckle, reed sweet
			tradescantia		reed sweet grass.					grass tradescantia
					tradescantia					g,
Other issues	Maintonanco	Poor species	Voruparrow	Poor species range	Flood wulnerable	Flood wylporable	Flood vulnorable	Poor spacias	Flood yulporable	Edge offect (loss of plants) human
Other issues	ivialitienance,	roor species		anosion steel access	human disturbance	human diaturbanca	human diaturbanaa	rongo site too	riood vuillerable,	disturbance (rubbish and access)
		range, nood	planting area, poor	erosion, stock access,				range, site too	erosion	disturbance (rubbish and access)
	(weed vulnerable)	vulnerable,	species range,	site too narrow and	(rubbish, lawn waste,	(rubbish, lawn	(rubbish,	narrow		
		stock access,	flood vulnerable,	intensifies edge	vandalism), edge	waste, vandalism),	vandalism), edge			
		edge effect	stock access, edge	effect (losses due to	effect (losses due	edge effects (weed	effects (weed			
		(weed	effect (losses due	exposure of planting)	to willow shade and	vulnerable)	vulnerable)			
		vulnerable)	to exposure of		floods)					
			planting)							, iller
Naturalness	3	2	1	1	4	2	2	2	2	2 (upstream part)
(maximum score	Sec. 212									
10)										5 (downstream part)
Is the site	No	No	No	No	Partial self-	No	No	No	No	Partial self-regeneration
currently self-					regeneration					
sustaining?					<i>J </i>					

Various local site issues had a bearing on the relative effectiveness of individual restoration projects:

- Part of the Taupiri A site had been planted previously with a mixture of indigenous species, about 20 years or more prior to this project.
- Ground compaction at Taupiri A.
- Human access and rubbish at Taupiri A, Huntly, Ngaruawahia, and Meremere.
- Erosion at Gedye, Huntly, and Rangiriri.

Current Condition of Sites

The current condition of the riparian restoration sites evaluated is summarised in Table 4. Overall, the condition of all restoration sites was poor.

Most sites had a low level of 'naturalness' and no sites currently meet the RiverCare goal of selfsustainability. However two sites contained areas that were considered to be self-sustaining: Taupiri A, particularly the older section, and Huntly A.

Older and well-maintained sites had the greatest percentage of canopy closure and the oldest sites had the tallest canopy. These sites also tended to have 'bushy' plants - such as kawakawa (Macropiper excelsum), koromiko (Hebe stricta), and harakeke - on their edges, that was providing shelter to the interior (Plate 3).

Generally, across all restoration sites, there was a reduced range of species surviving compared to the range of species planted. Lists of the species planted most commonly at the restoration sites and the most common surviving species are provided in Table 5. Table 5: Species most commonly planted and surviving at ten restoration sites reviewed along the lower Waikato River.

Species Most Commonly Planted	Species Most Commonly Surviving
Ti kouka	Ti kouka*
Karamu	Karamu*
Harakeke	Harakeke*
Manuka	Manuka*
Lacebark	Lacebark*
Kanuka	Kanuka*
Mahoe	Mahoe*
Ribbonwood	Ribbonwood
Koromiko	Koromiko
Mapou	Mapou
Kahikatea	Kahikatea
Totara	Totara
Kowhai	
Coprosma propinqua	
Kanono	

* Most common canopy species at riparian restoration sites.

Regeneration and self-introduction of indigenous species was best at older sites and sites at which frequent and intensive maintenance had occurred (e.g. Huntly A, see Plate 2). At sites where natural regeneration was occurring, recruitment was denser where several plants of the same species were close together. The species most commonly observed regenerating in plantings were, in descending order of frequency:

- Ti kouka and karamu;
- Mahoe, mapou, kawakawa,
 Cyathea spp., Pteris spp., Carex spp., and Cyperus ustulatus;
- Ribbonwood, houhere (Hoheria sextylosa), kowhai, karo (Pittosporum crassifolium), kohuhu (Pittosporum tenuifolium), tarata (Pittosporum eugenioides), Coprosma × cunninghamii, Blechnum spp., and Lastreopsis sp.

Self-introduced species were mostly sedges (e.g. Carex secta, C. virgata, C. geminata, and Cyperus ustulatus) and ferns (wheki, mamaku - Cyathea medullaris, kiokio - Blechnum novae-zelandiae, Pteris tremula, Blechnum filiforme, and Lastreopsis hispida).

The greatest barrier to the creation of self-sustaining indigenous plantings appears to be the ongoing establishment and spread of weeds. The Tuakau and Huntly sites were relatively free of weeds, but weed cover at ground level at all other sites was >50%. The weeds observed most



Plate 2: Natural regeneration occurring beneath riparian planting at the 'Huntly A' riparian restoration site.



Plate 3: Landward edge of the 'Huntly A' riparian restoration site comprises 'bushy' and clump-forming plants (e.g. harakeke) that provide shelter for the interior of the site.

Waikato RiverCare 2014

commonly regenerating included (in descending order of occurrence and relative abundance at sites):

- Tradescantia;
- Pampas;
- Yellow flag iris, common alder, inkweed (*Phytolacca octandra*), Chinese privet, reed sweetgrass;
- Bindweed, creeping jenny (Lysimachia nummularia), and black nightshade (Solanum nigrum).
- Locally significant weeds were ginger: Himalayan honeysuckle (Leycesteria formosa), Japanese honeysuckle (Lonicera japonica), German ivy (Delairea odorata), Rubus sp., woolly nightshade, onion weed (Allium triquetrum), nasturtium (Tropaeolum majus), and Persicaria spp.

5.3 Conclusions

Critical Factors

The most critical factors affecting implementation of riparian restoration along the Lower Waikato are:

- Weed recruitment (establishment and over-topping of plants);
- Inadequate site preparation, which contributes to weed problems;
- Inadequate planting maintenance, which allows weed establishment and proliferation, with subsequent loss of plants;
- Direct losses of plants due to floods (especially within the normal winter flood zone - see footnote on Page 15 and drought;
- Time since planting.

Weed recruitment is affected by major weed sources within recruitment distance of the sites, the presence of difficult-to-control weeds, ongoing disturbance of the sites by stock, people, and floods, and strong edge effects due to the narrowness of the sites. The early stages of plantings are open and are therefore more susceptible to weed infestation.

Assessment of management history has revealed that good site preparation and maintenance are critically important to achieve sustainable and more natural sites, and that it is essential to identify critical points at which site intervention is needed to keep a site on target. The most recently restored sites were generally better prepared than sites restored earlier, because RiverCare has developed and implemented better techniques over time. The Huntly and Hakarimata A sites both had good site preparation, but are at opposite ends of the maintenance spectrum. Huntly is a relatively young restoration project, but good maintenance resulted in few weed problems, even after five years. Hakarimata A is the oldest site, but a low level of maintenance after planting has resulted in low levels of regeneration, naturalness, and sustainability. It should be noted,

however, that while the Huntly site is currently in good condition, it lacks forest canopy species which are necessary for the site to become fully sustainable.

Loss of plants in the normal winter flood zone is affected by flood duration, flood flows, damage by flood-borne debris, shade provided by the crack willow canopy (losses were greater under willow canopy), and sizes and ages of plantings (small, recently planted stock are more vulnerable).

Loss of plants above the normal winter flood zone is affected by edge effects (e.g. increased exposure to the elements, stock damage, weed competition, and human disturbance) and the sizes of planting stock. Edge effects are a feature of narrow restoration plantings, but can be exacerbated by using a limited range of plant species which reduces the resilience of the plantings to variations in environmental conditions and weeds.

Where deciduous willows are present, extreme seasonal fluctuations occur in the amount of light reaching the understorey. This increases vulnerability to weeds along the river-side of the plantings. Also, riparian forest species especially kahikatea and ribbonwood - that require high light conditions for growth, struggle when planted under willows. There are some species, however, that have better shade tolerance (e.g. pukatea).

Time is also a critical factor in the success of restoration activities. At Taupiri, the older part of the site, which is likely to have had minimal preparation before planting, is now beginning to regenerate.

Improved Approaches and Techniques

To improve plant survival and the resilience of restoration sites, the following approaches and techniques are suggested:

- Avoid planting below average winter river levels until planting trials have established what will establish and grow successfully in this particularly challenging environment;
- Ensure that restoration sites are >10 m in width or, where this isn't an option, plant site margins with 'bushy' indigenous plants that will provide shelter for the interior;
- Select sites where invasion by weeds is likely to be slower, e.g. sites upstream of weed control programmes, sites without dense weed populations within 1 km, or sites that are currently weedfree;
- Ensure that a high degree of rigour is utilised in site preparation;
- Ensure that a high degree of rigour is utilised in plant selection, and carefully match plant species and their respective tolerances and preferences to the habitats present at each site;
- Provide timely and comprehensive ongoing monitoring for each site;

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- Ensure that a high degree of rigour is applied in terms of weed control, as maintenance of plantings in the establishment period is critical;
- Provide high quality, long-term maintenance of restoration sites, including weed control, infill planting, and removal of any garden waste;
- Ensure that all grazing and browsing domestic stock are excluded permanently by good fencing and that fences are located at least 1.5-2 m from the nearest plantings. Consideration should be given to whether gates should be incorporated into fences.
- Consider the use of fencing for new urban sites and erection of signage, to reduce human disturbance during the establishment phase and discourage the dumping of garden waste;



24

Consider trimming or the creation of canopy gaps on the landward sides of crack willow stands where planting is undertaken, to reduce shading, which will improve the survival of normal winter flood zone planting and allow better development of a 'closed edge';

• Set up trials to investigate the following:

- Evaluate whether larger/ taller specimens of kahikatea, pukatea, ribbonwood, and other species will establish under willow canopy gaps and/or in the normal winter flood zone; and
- Determine whether later planting results in better survival rates (i.e. in November, when the frequency of major flood flows is declining).



6. SITE SELECTION & PRIORITISATION

6.1 Selection and prioritisation methods

A method for selecting and prioritising sites for riparian restoration along the lower Waikato Riv er was developed based on consultation undertaken as part of this project. Consultation meetings were held between June and August 2013 with a range of stakeholders, including Waikato RiverCare, iwi, council staff, and the general public. Participants at the consultation meetings/hui for this project are listed in Appendix 2.

Consultation involved identification of objectives for riparian restoration and development of potential criteria for selection and prioritising of sites for riparian restoration.

Other important considerations in development of a method for site selection and prioritisation included ensuring that:

- The method was simple to use;
- The method could be applied using desktop information;
- Current knowledge about success factors was incorporated; and
- Management criteria were incorporated.

6.2 Riparian restoration objectives for the Lower Waikato River

Consultation participants identified a range of objectives for riparian restoration along the Lower Waikato River, as summarised in Table 6.

Participants also contributed ideas about how to select restoration sites using criteria that were not always directly related to riparian management objectives and outcomes:

- Select cost-effective sites, i.e. few weeds, not close to weed sources (coordinate with weed control programmes), and already fenced;
- Ensure that sites are wide enough to be self-sustaining (e.g. >10-15 m wide);
- Find a balance between the restoration of 'easy' sites and those that are much harder to restore, but have much greater ecological values;
- Only restore sites where domestic stock have been excluded;

- Select sites that are safe for people to work at;
- Keep out of the normal winter flood zone, as it is too difficult to establish sustainable plantings and fences are destroyed by flood events;
- Riparian plantings should not interfere with flood scheme assets (e.g. stopbanks and pumping stations); and
- 'Mahitahi' work together where possible. Many people are undertaking projects near the river, providing lots of opportunities for synergies.



6.3 Restoration criteria and site prioritisation process

Three types of criteria for the selection and prioritising of restoration sites were identified following an analysis of consultation outcomes and the evaluation of riparian restoration projects:

- Bottom line criteria: These criteria are conditions that each site must meet to be suitable for not meet one of these criteria then no further assessment would occur.
- **Objective criteria:** These criteria relate to riparian restoration objectives identified through consultation. A site must meet at least one objectivesite.
- Management criteria: These criteria cover management considerations and help to identify sites that are likely to be the easiest and most costeffective to manage.

A review of lower Waikato River riparian restoration sites

riparian restoration. If a site does

related criterion to be considered as a potential riparian restoration

The criteria and how they should be assessed are set out in Table 7. This approach can be used to determine the highest priority sites for restoration - based on the scores for all criteria - but can also be used to identify the best sites for meeting different objectives. For example, to determine the highest priority sites for biodiversity management, only the biodiversity objective scores would be added to the management criteria scores.

Each criterion addresses a separate issue. For example both 'community engagement' and 'visual enhancement' criteria refer to recreation, but only in relation to each criterion being addressed. The comments section of the Table 7 indicates the approach to be adopted or factors to consider in scoring each of the criteria.

Table 6: Summary of riparian restoration objectives for the Lower Waikato River identified by participants at consultation meetings/hui undertaken in June-August 2013.

Theme	Objectives	Comment
Biodiversity / ecological values	 Protect existing ecological values. Create habitat that encourages wildlife. Extend existing riparian plantings. Use local seed sources to eventually create more seed sources for local riparian plants. Establish a range of plant species that mimics pre-European indigenous habitats. Connect the river to other indigenous habitats. Reduce the risk of weed establishment. Reduce dominance of weed species along the river. 	Species specifically mentioned for protection and enhancement included; kowhai, kahikatea, watercress, harakeke, ti kouka, inanga (whitebait), kaeo (freshwater mussels), porohe (smelt), tuna (eels), and ducks.
Cultural, historical	 Enhance and restore significant cultural and historic sites. Incorporate commemorative features or interpretive panels into riparian plantings at significant and historic sites. Nga tikanga mahinga kai (support traditional food sources). 	Significant sites that were specifically mentioned during consultation included historical landing sites, Awaroa River portage to Manukau Harbour, and Maioro. Many of these objectives were about trying to reconnect people with the heritage of specific sites and to strengthen relationships with the awa.
Community engagement	 Involve local communities. Support the work of other parties undertaking restoration. Provide opportunities for learning. Provide employment opportunities for local people. 	Many consultation participants also voiced the need to locate riparian restoration projects close to marae, schools, urban communities, and other places where people congregate.
Water quality Aesthetics and amenity	 Purify water where possible before it enters the river. Focus on confluences with other waterways. Incorporate stormwater treatment where possible. Kia pai te ahua o te awa (improve the look 	
	and feel of the river). • Enhance areas that are highly visible to the public.	
Access	• Enhance and maintain public access.	The Te Araroa walkway and the Te Awa cycleway were both mentioned as access routes along the river that would benefit from riparian restoration.
Erosion	• If necessary, initially stabilise sites prone to erosion with exotics, but aim to replace over time with indigenous species.	

BOTTOM LINE CRITERIA		Comme
The site is at least 10 m wide on	Y/N	This is co
average.		sustainin
The site can be safely accessed.	Y/N	This inclu
		plan, steep
The majority of the site is above the	Y/N	See Section
normal winter flood zone.		normal w
		from aeria
		used as ar
Stock are/will be permanently	Y/N	
excluded from the site.		
The site has a willing landowner.	Y/N	Landown
		Conserva
		administe
The site will be maintained for at least	Y/N	The minin
five years.		plant com



Table 7: Site selection and prioritisation criteria for potential restoration projects along the lower Waikato River.

nt

nsidered to be the minimum width needed to create selfg indigenous plant communities.

Ides consideration of the need for a traffic management pness of terrain, and other health and safety issues.

on 2.3 (footnote to Plate 1) for how to determine the

inter flood zone on the ground. When identifying sites al imagery, the landward extent of crack willow can be n indicator of the normal winter flood zone.

er permission is required for Department of tion, Waikato Regional Council, or District Councilered land, and private land.

mum time needed to create self-sustaining indigenous nmunities.

OBJECTIVE CRITERIA	Set	Comment
-	Score	

Biodiversity

Adjoins or contains an area with >25% indigenous vegetation.	2	
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3	
Presence of rare plant community or species.	3	Planting should be designed to safeguard rare species and communities.
Provides shade or habitat for aquatic life.	3	Plantings would need to reach over water to meet this criterion.
Contains two or more habitat types.	3	Habitat types include river bank, river terrace, tributary streams, and riverine wetland (sometimes referred to as backswamps).

Water Quality

length.	then overland flow is unlikely.
Contains wetland or seepage that receives 3 nutrient enriched water.	Aerial imagery can be used to determine the presence of wetlands or seepages.

Visual Enhancement

Visible from roads or heavily used public	3	The riparian planting would be easily seen by the public.
areas.		
Current or potential popular recreational site.	3	Provided planting does not compromise existing direct river
		access.

Community Engagement

Within an urban area accessible to the public.	3	Planting project should promote community engagement.	
Close to a marae or school.	3	Planting project should promote community engagement.	
Close to other hubs of community activity.	2	Other hubs of community activity could include occasionally used recreation areas or sites specific to a particular recreation sector such as picnic areas, fishing sites, and waterskiing areas provided planting does not compromise existing direct river access.	

Cultural and Spiritual

-		
Adjoins or includes a cultural and/or spiritual	3	Provided planting does not compromise cultural/spiritual
site identified by manawhenua.		values or Waahi tapu.
Adjoins or includes historical sites.	3	Provided planting does not compromise heritage values.
Riparian restoration could add value to	3	
traditional food, spiritual or cultural uses.		

Public Access

Adjoins or within an area with formal public 3		Provided planting does not compromise existing access.	
access.			
Adjoins or within informal public access	2	Provided planting does not compromise the existing defined	
routes (Te Araroa, unformed road, or others).		access routes.	

MANAGEMENT CRITERIA

Pre-Project Checks

Site requires no resource consent prior to	3	Con
beginning project or has consent already		rem
		trigg
Site has no legal issues to be resolved for	3	Con
project to proceed		any
		impi

Site Access

Can only by accessed by foot; >5 minute walk.	0	
Easy foot access; <5 minute walk.	1	
Indirect vehicle access (e.g. gated).	1	Part
		nori
Direct vehicle access. 2	2	

Cost-Effectiveness/Sustainability

Preparation and maintenance costs >\$20,000/	0	Exte
Preparation and maintenance costs \$10,000- 20.000/ha.	1	Exte
Preparation and maintenance costs \$5,000- 10,000/ha.	2	Gra oth 10,0
Preparation and maintenance costs <\$5,000/ ha.	3	Site to b
Very likely key weed species will dominate within five years of initial planting.	0	Hea diff gen
Moderately likely key weed species will dominate within five years of initial planting.	1	Mo a fe the pro
Unlikely that key weed species will dominate within five years of initial planting.	3	Site ups not leve
Average planting width 10-20 m.	1	Exc Sec
Average planting width 20-30 m.	2	Exc
Average planting width >30 m.	3	Exc
Landowner agreed to undertake maintenance after five years.	3	
Unlikely to be affected by erosion.	2	

Mahitahi - Working Together

Waikato RiverCare 2014

Complements non-riparian restoration work	2	
of other groups.		
Complements riparian restoration work of	3	
other groups.		
Volunteer interest likely.	3	

A review of lower Waikato River riparian restoration sites

nsult with Regional Council: all significant vegetation noval, earth movement and heavy vehicle use are likely to ger consent requirements.

nsider permission to cross intervening private land, licences for watertake, etc, and any existing consents binging on use of the river bank.

ticularly access across farmland where permission would mally have to be obtained from a private landowner.

ensive weed tree species and dense understorey weeds are ly to incur costs >\$20,000/ha.

ensive weed tree species, but limited understorey weeds, likely to incur costs between \$10,000-20,000/ha.

azed areas or areas with no weed tree species, but a range of er weed species, are likely to incur costs between \$5,000-D00/ha.

mostly clear of difficult weeds. (These sites are also likely e grazed prior to restoration)

avily weed-infested sites where there are a range of icult-to-control weeds in the site or the vicinity and erally downstream of Regional Council weed control areas.

derately or heavily weed-infested sites where there are w difficult-to-control weeds in the site or the vicinity, but site is only moderately vulnerable to Regional Council gramme weeds (e.g. most of site is above flag iris level).

is free of difficult-to-control weeds and is generally tream of a Regional Council weed control programme or is susceptible to such weeds (e.g. whole site is above flag iris el).

lude normal winter flood zone (definition in this report tion 2.3 - footnote to Plate 1).

lude normal winter flood zone.

lude normal winter flood zone.



7. ASSESSMENT OF POTENTIAL **RIPARIAN RESTORATION SITES**

Over 50 potential riparian restoration Table 8: sites were assessed using the site selection and prioritisation method set out in the section above. These sites included specific sites nominated by stakeholders during consultation and sites that were identified as being likely to meet restoration objectives. Most sites occurred on public land however some private land was included if a landowner had expressed interest or the site had been nominated by other parties during consultation meetings/hui.

Forty-four sites were identified as being potentially suitable as riparian restoration sites (Figure 3). The extent of the sites and prioritisation assessments are set out in Volume 2. These assessments should be considered to be preliminary, because none of the sites were assessed on-site. A site survey should be undertaken to confirm the preliminary assessments. The highest ranking sites, based on all objectives, are listed in Table 8 and are shown in Figure 3.

32

Highest ranking sites for riparian restoration along the lower Waikato River. The maximum achievable total score is 68, and scores assigned range from 27 to 39.

Site	Objective	Management	Total Score
	Criteria Score	Criteria Score	
33: Mercer Recreation A	26	13	39
40: Batkin Reserve	20	19	39
37: Alder Road	17	13	30
12: Waahi A	12	15	27
41: Tuakau Jetty A	17	10	27

Potential riparian restoration sites are spread along the lower Waikato River from Horotiu to Elbow Road, between Aka Aka and Tuakau. There were no riparian restoration sites identified on the last 15 km of river before the sea. Several potential sites were investigated during a boat trip in this area, but it was found that they were all constrained by the close proximity of the stopbank to the river.

The highest ranking sites are located near Mercer and the Tuakau Bridge:

Site 33 - Mercer Recreation A: includes land administered by the Department of Conservation and managed by Waikato District Council. It is a large site (180 m × 100 m) comprising river terrace with some backswamps. It contains remnants of kahikatea swamp forest, but there are a number of problematic weed species present, e.g. yellow flag iris and alder.

• Site 40, at Batkin Reserve near Tuakau: moderately large (525 m × 25 m) and includes river bank and river terrace habitat types. Much of the site is currently mown grass, which will make site preparation for riparian planting fairly straightforward.

Site 37 is located off Alder Road, immediately upstream of the Tuakau Bridge: a moderately large site (560 m × 100 m) with good visibility and public access, with indigenous forest sited nearby.



A review of lower Waikato River riparian restoration sites

Waikato RiverCare 2014



- Site 12: is immediately north of Parry Road in Huntly and planning is underway by the Waahi Whanui Trust to restore this site. It is highly visible with good public access and there are opportunities to restore mahinga kai.
- Site 41: comprises two separate blocks near the Tuakau jetty, and is highly visible.

The highest ranking sites in relation to individual restoration objectives are listed in Table 9.

Table 9: Highest ranking potential riparian restoration sites¹ for each riparian restoration objective, listed in descending order, along the lower Waikato River.

Biodiversity	Water Quality	Visual Enhancement	Community	Cultural and	Public
			Engagement	Spiritual	Access
40	14	40	40	12	40
33	13	37	43	1,33	37
17	6, 8, 34, 38	33	12	20	33
35		12	37		1
25,26		41	15,19		19,36

1. 01-Fonterra, Te Rapa; 06-Hakarimata F; 08-Riverside Way, Ngaruawahia; 12-Waahi A, Huntly; 13 Ohinewai A; 14-Ohinewai B; 15-Te Ohaaki A, Huntly; 17-Te Ohaaki C, Huntly; 19-Maurea Marae, Rangiriri; 20-Te Onetea Confluence, Rangiriri; 25-Punga punga wetland A, Pukekawa; 26-Punga punga wetland B, Pukekawa; 33-Mercer Recreation A; 34-Bluff Rd, Pokeno; 35-Buchseeder site, Pukekawa; 36 Murray Rd, Tuakau; 37- Alder Road, Tuakau; 38-Tuakau Bridge A; 40-Batkin Reserve, Tuakau; 43 Gary McGuire, Tuakau

Ben Wolf. Waikato District Counci



8. RIPARIAN RESTORATION **INDICATORS**

Riparian restoration projects generally aim to restore site attributes such as biodiversity, water quality, hydrology, physical habitat, and connectivity to a more natural state and condition. However, many projects do not begin with a clear statement of their goals and this hampers their ability to determine success.

Successful riparian restoration (c.f. Palmer et al. 2005) is likely to be indicated by the following:

- Enhancement of the ecological condition of the riparian zone;
- A greater degree of riparian zone self-sustainability after restoration:
- Reduced or zero net damage to the river banks as a result of the restoration process;
- Careful project documentation and monitoring, resulting in improved restoration practice; and
- Progress towards an identified ecological endpoint, or a target ecological state, used to guide the restoration.

A good monitoring programme (c.f. Parkyn et al. 2010) should include:

- Identification of the restoration goals at the project outset;
- Identification of the constraints or the limitations to restoration;
- Identification of the reference endpoint(s);
- Selection of the monitoring site locations;

Waikato RiverCare 2014

- Identification of the monitoring time scales, including prerestoration baselines;
- Choosing indicators to match restoration goals.

The above approaches have been adopted in the following sections, apart from the project goals which have already been identified by Waikato RiverCare through the recent consultation process.

8.1 Restoration limitations and risks

It is critical to identify the range of long-term limitations and shorter-term risks that jeopardise the restoration process, and the management actions required to improve the chances of success.

Condition of the river floodplain as a whole can limit the rehabilitation of local habitat. For example, alteration of natural flow regimes and the effects of long duration flooding may mean that establishment of vegetation within the normal winter flood zone will be slow, or impossible, to achieve. There may be dispersal barriers for specific plants reaching the restored area, such as large distances to the nearest patches of indigenous vegetation, which will affect biodiversity goals and ecosystem functioning, such as natural regeneration. The extent of the river bank and type of habitat restoration required can also be a constraint. In general, the greater the scale of restoration, the better chance there is of achieving ecological goals.

Sites <1 km long and <20 m wide may constrain restoration success. However, larger sites may also be constrained by funding limitations. Other factors which may affect a restoration project include stock or human access damaging plants and allowing weed infestations to establish.

Table 10 identifies limitations and risks likely to affect riparian restoration along the lower Waikato River. This table identifies which of the objectives that have been set and can realistically be met, even at sites identified as being suitable for restoration.

8.2 Restoration targets - suitable reference sites or restoration endpoints

A key component of being able to judge whether the ecological success has been achieved is having an "endpoint" that determines when the restoration is complete. Natural systems are dynamic and subject to gradual or abrupt changes depending on a range of conditions created by environmental conditions and events. This "dynamic equilibrium" also relates to the functioning of natural riparian ecosystems. The endpoint for a riparian restoration site would normally be the ecological state and condition of a nearby reference site that has a similar size, geology, soils, topography, and range of habitats to the restoration site, but which is relatively unmodified, with its ecological processes intact.

Limitation or Risk	Potentially Unachievable	Achievable Goals	Possible Means to Improve
	Goals		- Chances of Success
Restoration provides	Iwi cultural objectives	Natural habitat. Terrestrial	Trials for river edge species
minimal intercept of runoff	related to: aquatic	biodiversity. Some	(see below) may help.
and shading of river habitat	biodiversity, water quality,	ecosystem functioning.	
to improve water quality or	river health and fisheries.	Aesthetic value.	
in-stream habitat.			
Highly modified river and	Natural habitat and	Some ecosystem functions,	Investigate use of evergreen
floodplain and hydrology.	terrestrial diversity (below	terrestrial plant diversity	exotic and indigenous species
	the flood zone).	(above the flood zone).	that might replace willows to
		Aesthetic Value. Habitat for	enable better establishment
		tolerant species.	of typical indigenous species.
Excess sediment and flood	Natural habitat. Aquatic	Some terrestrial	Limit planting zone to above
debris in the flood zone	biodiversity. Ecosystem	biodiversity short term.	flood level; trial species and
and long flood durations	functioning. Iwi cultural		size of stock for this zone.
damage plants.	objectives related to the		
	above.		
River erosion makes	Natural habitat and	Some ecosystem functions,	Trial shade tolerant species
retention/planting of	terrestrial diversity (along	terrestrial plant diversity	and indigenous species for
willows unavoidable.	the river margin).	(above the river edge).	bank stability; trial trimming
		Aesthetic value. Habitat for	of willow canopy on landward
		tolerant species.	side.
Extensive unrestored	Natural habitat. Terrestrial	Some terrestrial	Work with Regional Council
stream length upstream	biodiversity. Ecosystem	biodiversity short term.	weed control programmes or
of restoration site, with	functioning. Iwi cultural		carry out buffer weed control
extensive weed presence.	objectives related to the		upstream of restoration site.
	above.		
Indigenous habitat (natural	Natural habitat. Terrestrial	Some terrestrial	Enrich planting after
source of seed) is often	ecosystem functioning	biodiversity short term.	establishment period with
not within a reasonable	may be limited. Iwi cultural		successional species for long
distance of prospective	objectives related to the		term seed supply.
sites.	above.		Prohibitation and a local station
Stopbanks and roads	lerrestrial ecosystem	Aesthetic value. Habitat for	Establish good edge planting
sometimes limit the width	functioning may be	tolerant species.	with dense shrub species.
available for planting.	Matural habitat Tarrastrial	Torrostrial bio divorsity	Investigate (review funding
Limited resources to		ab art tarm	distribution over the project
	may be limited		life to enable periodic
years.	may be minted.		menitoring and release
			maintenance
Possible stock access	Natural habitat Terrestrial	If stock excluded: Natural	Insist on stock-proof fences
1 0001010 0100K access.	biodiversity Terrestrial	habitat Terrestrial	moist on stock proof fences.
	ecosystem functioning	hiodiversity Terrestrial	
	may be limited	ecosystem functioning may	
	indy be infinited.	be limited.	
Possible direct human	Natural habitat. Terrestrial	If human disturbance is	Possibly fence sites to
impacts.	biodiversity. Terrestrial	controlled: Natural habitat.	discourage access or rubbish
	ecosystem functioning	Terrestrial ecosystem.	dumping.
	may be limited.	Terrestrial biodiversity.	

Where there is no suitable unmodified reference site available, a target set of parameters needs to be identified that reflect the climate, geology, soils, hydrology, and topography, and potential species, communities, and habitats at restoration sites.

Reference habitats suggested for sites along the lower Waikato River include the vegetation types described in Section 3.2 above:

- Kahikatea swamp forest; ٠
- Totara-matai-kowhai forest;
- Harakeke and ti kouka swamp;
- Manuka swamp;
- Sedge swamp; and
- Raupo swamp.

8.3 Selection of monitoring sites

The locations of monitoring sites can either be random or based on best judgement. Random site selection may provide an unbiased estimate of conditions within the area being restored, but an informed judgement approach would help to ensure that the locations are representative of the site as a whole, and that restored sites more closely match reference sites or desired stages or endpoints.

Two or three monitoring locations per restoration site should be adequate to capture variation across the site, unless there is a high level of habitat variability.

GPS coordinates should be recorded for each monitoring site and relevant landmarks noted, to assist with relocation.



Natalie Douglas, CravePhotography.co.nz

8.4 Restoration indicators

Based on the Waikato RiverCare goals and the range of currently available data, a range of suitable indicators, matched to these goals, is set out in Table 11. The relative success of ecological restoration goals is defined as movement towards a reference state or restoration endpoint. Success of societal goals, such as enhancement of aesthetics or the cultural values of planted areas is defined as establishment of a more diverse canopy of indigenous species. Each goal has several indicators and each of the indicators applies to more than one goal, with some crossover between ecological and societal goals. The indicators below may need to be fine-tuned, depending on:

- Key problems identified at the range of sites proposed;
- Changes to the management regime; and
- The need to monitor any undesirable outcomes identified from restoration sites.

A reasonably wide range of indicators may require more work to set up, but will yield more important information later in the restoration process. This is particularly important if trial sites are set up to explore better ways of achieving the restoration outcomes sought.

Indicators should be assessed using a range of methods, such as photopoints, walk-though assessments, permanent plots, and possibly microclimate monitoring.

Table 11:Riparian restoration indicators, measurement methods, and monitoring time scales for riparianrestoration projects along the lower Waikato River.

Goal codes: EF = Ecosystem Functioning, NH = Natural Habitat, TB = Terrestrial Biodiversity, A = Aesthetics, C = Cultural and Spiritual.

Indicator	Goals Addressed	Measurement Method	Suggested Minimum Monitoring
			Time Scale
Survival of plantings	NH, TB, A, C	Photopoints ¹ , quick plots ² transects, marked plants.	Photopoints annually first five years then at five-yearly intervals. Quick plots, transects at project outset and then at 2-3 yearly intervals.
Canopy height	EF, A	Recce plots ³	At project outset and then at 3-5 yearly intervals.
Canopy closure	EF, A	Canopy cover assessments ¹ , Recce plots ³	At project outset and then at 3-5 yearly intervals.
Relative dominance of different planted species (structural diversity)	EF, NH, TB	Recce plots ³	At project outset and then at 3-5 yearly intervals.
Total indigenous/exotic species cover	EF, A, C	Recce plots ³ , assessment of overall cover ¹	At project outset and then at 3-5 yearly intervals.
Indigenous plant species diversity	EF, NH, TB, C	Recce plots ³	At project outset and then at 3-5 yearly intervals.
Litter abundance	EF, NH	Recce plots ³	At project outset and then at 3-5 yearly intervals.
Indigenous vs. exotic weed regeneration/ recruitment	EF, TB	Recce plots ³	At project outset and then at 3-5 yearly intervals.
Microclimate	EF, NH	Air temperature and relative humidity data loggers ¹	
Bird species abundance	EF, NH, TB, A	Slow walk transects ²	Annually first five years then at five- yearly intervals.
Invertebrate species abundance	EF, NH, TB	Pit fall traps ²	Annually first five years then at five- yearly intervals.

1 Methods described in Parkyn et al. (2010).

2 Methods described in Handford (2000).

38

3 Methods described in Hurst and Allen (2007).

It is important that indicators are measured over an appropriate timescale. Monitoring¹ should be undertaken before the project begins (to obtain a baseline), during the project (to assess works status), and after the project (to evaluate project success). Guidance for monitoring work status is provided in 'Riparian restoration guidelines in the Lower Waikato River' (Wildland Consultants 2013).

1 Note that this should not be confused with operational monitoring, which needs to be undertaken relatively frequently to assess the need for maintenance of plantings, for example.



9. CONCLUSIONS

Due to its highly modified, present day hydrological regime, and its weediness, the riparian zone of the Waikato River is a very challenging environment in which to re-establish a representative suite of indigenous plant communities. Most riparian restoration projects undertaken to date have achieved only limited success with establishment of self-sustaining indigenous riparian plantings. Much greater success is possible, however, although this will require more robust site selection, better planning, and more rigorous application of restoration techniques suited to this environment, as being undertaken more recently by Waikato RiverCare.

Evaluation of existing restoration sites indicated that the critical factors affecting riparian restoration were weed establishment, inadequate site preparation, inadequate maintenance of plantings, direct loss of plants due to floods and drought, and time since restoration works began.

Consultation with stakeholders identified a range of key restoration objectives for the lower Waikato River, within the themes of biodiversity, culture, history, community engagement, water quality, aesthetics and amenity, access, and erosion.

A review of lower Waikato River riparian restoration sites

This report provides guidance on the prioritising and monitoring of riparian restoration sites, to improve restoration project success. Site selection for riparian restoration depends on restoration objectives. Criteria for the selection and prioritisation of restoration sites were developed and applied to 50 potential restoration sites. Forty-four sites met the selection criteria, with the five highest ranking sites being 33: Mercer Recreation A, 40: Batkin Reserve, 37: Alder Road, 12: Waahi A, and 41: Tuakau Jetty A.

Monitoring of restoration sites and works before, during, and after restoration implementation is critical. Monitoring is required to identify issues as they arise, to measure restoration success, and to guide future projects. A range of appropriate indicators and measurement methods has been developed for each of these.

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REFERENCES

Champion P. 1997: An Overview of the Lower Waikato/Hauraki Plains Wetlands and Issues Relating to their management. *NIWA Consultancy Report DOC8026*. Prepared for Department of Conservation. 62pp.

Champion P. and Clayton J. 2010: Riparian vegetation. In Collier K., Hamilton D., Vant W., Howard-Williams C. (Eds) The Waters of the Waikato. Ecology of New Zealand's Longest River. Environment Waikato and CBER, Hamilton. P268.

Clarkson B.D., Clarkson B.R., and Downs T.M. 2007: Indigenous vegetation types of Hamilton Ecological District. *CBER Contract Report 58. 16 pp.*

Clarkson B., Merrett M., and Downs T. 2002: Botany of the Waikato. Waikato Botanical Society. 136 pp.

Collier K., Watene-Rawiri E., and McCraw J. 2010: Geography and history. In Collier K., Hamilton D., Vant W., Howard-Williams C. (Eds) The Waters of the Waikato. Ecology of New Zealand's Longest River. Environment Waikato and CBER, Hamilton. Pp 1-12.

Cromarty P. and Scott D.A. (Eds) 1995: A directory of wetlands in New Zealand. Department of Conservation, Wellington.

Handford P. 2000: Indigenous Forest Monitoring: a guide for forest owners and managers. Forme Consulting Group Ltd, Wellington. 184 pp. Howard-Williams C., Vant W.N., Collier K.J., and Hamilton D.P. 2010: The River: past present and future. In Collier K., Hamilton D., Vant W., Howard-Williams C. (Eds) The Waters of the Waikato. Ecology of New Zealand's Longest River. Environment Waikato and CBER, Hamilton. Pp 283-292.

Hurst J.M. and Allen R.B. 2007: The Recce method for describing New Zealand vegetation: field protocols. Landcare Research, Lincoln, Canterbury.

Mulholland M. 2010: History of the Lower Waikato Flood Protection Scheme. In Collier K., Hamilton D., Vant W., Howard-Williams C. (Eds) The Waters of the Waikato. Ecology of New Zealand's Longest River. Environment Waikato and CBER, Hamilton. P 16.

Palmer M.A., Bernhardt E.S., Allan, J.D., Lake P.S., Alexander G., Brooks S., Carr J., Clayton S., Dahm C.N., Follastad J., Shah D.L., Galat S.G., Loss P., Goodwin D.D., Hart B., Hassett R., Jenkinson G.M., Kondolf R., Lave J.L., Meyer T.K., O'Donnell L., and Sudduth E. 2005: Standards for ecologically successful river restoration. *Journal of Applied Ecology 42: 208-217.*

Parkyn S., Collier K., Clapcott J., David B., Davies-Colley R., Matheson F., Quinn J., Shaw W., and Storey R. 2010: The restoration indicator toolkit: Indicators for monitoring the ecological success of stream restoration. National Institute of Water and Atmospheric Research Ltd, Hamilton, New Zealand. 134 pp.

Waikato RiverCare 2014

Thompson K. and Reeves P. 1994: History and ecology of willows in New Zealand. In West C. (Ed) Wild willows in New Zealand. Department of Conservation, Hamilton. Pp 3-22.

Wildland Consultants 1999: Key ecological sites for pest control in private tenure in Waikato Region -Waikato District and part of Franklin District. *Wildland Consultants Ltd Contract Report No. 236.* Prepared for Environment Waikato.

Wildland Consultants 2010: Biodiversity enhancement opportunities for Environment Waikato land in the Lower Waikato Zone (Volume 2). *Wildland Consultants Ltd Contract Report No. 2368.* Prepared for Environment Waikato.

Wildland Consultants 2011: Current extent and potential distribution of yellow flag iris in part of the lower Waikato River Catchment. *Wildland Consultants Ltd Contract Report No.2714.* Prepared for Department of Conservation and Waikato Regional Council. 27 pp.

Wildland Consultants 2013: Implementation guidelines for riparian restoration projects along the Lower Waikato River. *Wildland Consultants Ltd Contract Report No. 3143a*. Prepared for Waikato RiverCare.

APPENDIX 1 MEAN MONTHLY RIVER LEVELS AT SIX MONITORING STATIONS LOCATED ON LOWER WAIKATO RIVER 2003-2013









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A review of lower Waikato River riparian restoration sites





APPENDIX 2

CONSULTATION MEETING PARTICIPANTS

Date	Location/Organisation	Partici
4 June 2013	Waahi Whaanui	John Te
		from N
28 June 2013	Huakina Development Trust,	Rangi N
	Ngati Te Ata and Tamaoho	Te Ata)
		(Tamac
8 July 2013	DOC, Te Rapa	Lucy R
12 July 2013	Greenspace, Hamilton	Waikat
		Region
		Bala Til
14 July 2013	Public meeting, Huntly	Julane
		Grahar
		Muir, B
23 July 2013	Comments by email	Wayne
24 July 2013	Nga Muka, Hopuhopu	Various
		Whaan
31 July 2013	Ngati Wairere	Wirem
2 August 2013	Taupiri Marae	Boxer C
6 August 2013	Boat trip	Gary M
		Ruther
		RiverC

pants (besides Wildland facilitators)

Maru, Aareka Hopkins, Dale from Matahuru, Norm Hill ga Maramara and various kuia from Hukanui a Muri.

Mahuta (Huakina Development Trust), Karl Flavell (Ngati , Lucy Rutherford (Tamaoho) and Dennis Kirkwood oho).

oberts, Shannon Patterson, Eric Pene, Chris Annandale.

to District Council: Ben Wolf, Giles Boundy; Waikato al Council: Louisa Alix, Michael Duffy, Leanne Thomson, kkisetty, Catherine Beard, Judy van Rossem.

Sutton, Barbara Harrison, Philip Mabin, John Brown, n Mackie, Robert Fisher, Stella Wilson, Kim Jobson, Stu Bruce MacKay, Tangaroa Whitiora.

Bennett (Waikato RiverCare member).

s Nga Muka representatives, John Te Maru (Waahi nui).

u Puke.

George.

IcGuire (Envirofert), Karl Flavell (Ngati Te Ata), Lucie ford (Ngati Tamaoho), Kevin Hutchinson (Waikato are).

Volume 2

A review of Riparian Restoration Sites along the lower Waikato River and priorities for future restoration work and monitoring

Wildland Consultants Report No 3143







QUICK FIND INDEX

Site	01	49
Site	02	53
Site	03	56
Site	04	59
Site	05	62
Site	06	65
Site	07	68
Site	08	71
Sito	09	74
Sito	10	77
Site	11	21
Site	11	00
Site	12	03
Sile	13	00
Site	14	07
Site	15	92
Site	16	95
Site	17	98
Site	18	10
Site	19	10
Site	20	10
Site	21	11
Site	22	114
Site	23	11
Site	24	12
Site	25	12
Site	26	12
Site	27	12
Site	28	13
Site	29	13
Site	30	13
Site	31	14
Site	32	14
Site	33	14
Site	34	15
Site	35	15
Site	36	15
Site	37	16
Site	38	16
Site	39	16
Site	40 Jul	16
Site	41	17
Site	12	17
Cite	12	17
Site	43	1/
Site	44	18



A review of lower Waikato River riparian restoration sites



SITE DESCRIPTION	
Site Name:	Fonterra
Site Location:	Left Bank behind Fon
Grid Reference:	37°42′48.69″S; 175°13′
Access:	From the main factor
Ownership:	Fonterra
Approximate Site Dimensions:	A:397 × 15 m; B:134 × 5
Approximate Site Area:	A: 0.5 ha; B: 0.9 ha
Boundaries/Adjacent Landowners:	A is entirely Fonterra
Current Vegetation Cover:	A: Willows, alders an
Specific Habitat Types Present:	River terraces
Comments:	Two possible sites - n

BOTTOMLINES	
The site is at least 10 m wide on average.	Y/N
The site can be safely accessed without a traffic	Y/N
management plan.	
The majority of the site is above the normal winter flood	Y/N
zone.	
Stock are/will be permanently excluded from the site.	Y/N
Willing landowner.	Y/N
Will be maintained for at least five years.	Y/N
	Set S
OBJECTIVE CRITERIA	
Biodiversity	
Adjoins or contains an area with >25% indigenous	2
vegetation.	
Adjoins or is within 500 m of an area with >75%	3
indigenous vegetation.	
Presence of rare plant community or species.	3
Provides shade or habitat for aquatic life.	3
Contains two or more habitat types.	3
Water Quality	
Intercepts overland flows over >50% of its length.	2
Contains wetland or seepage that receives nutrient	3
enriched water.	
Visual Enhancement	
Visible from roads or heavily used public areas.	3
Current or potential popular recreational site.	3
Community Engagement	
Within an urban area accessible to the public.	3
Close to a marae or school.	3
Close to other hubs of community activity.	2
Cultural and Spiritual	
Adjoins or includes a cultural and/or spiritual site	3
identified by manawhenua.	

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nterra factory

′5.47″E

ry access road through the carpark

55 m

a owned; Part of site B is non-Fonterra ownership nd some native planting; B: willows alders and scrub

eed a site check to determine which is more appropriate

		COMMENTS
	Y	Looks to be but it is unclear whether there is a suitable planting area due to previous works and there are two possible areas which have been outlined but need a site check.
	Y	
	Y	
	Y	
	Y	
	Y	
ore	Score	COMMENTS
	2	
	2	
		S. 1117/4
	3	

Adjoins or Includes instruction could advise to traditional food, spiritual or cultural uses. 3 Image: Construction could advise to traditional food, spiritual or cultural uses. Adjoins or within an area with formal public access 3 Image: Construction Could advise to traditional food, spiritual or cultural uses. Adjoins or within informal public access routes (Te 2 2 Adjoins or within informal public access routes (Te 2 2 Advise or others: Image: Construction Could advise to the could advise to the could construct adv		6	<u> </u>	
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TOTAL SCORE	Volunteer interest likely.	3	3	Fonterra has been very helpful in the past with installation of Pou on the site and has a strong environmental brand. A project like this will fit well with their ethos.
TOTAL SCORE 25				
	TOTAL SCORE		25	



SITE DESCRIPTION	
Site Name:	North of Ngaruawahia Golf Course
Site Location:	LB nth of Ngaruawahia Golf Course
Grid Reference:	37°40′50.28″S; 175°10′12.07″E
Access:	From Croall Crescent Ngaruawahia or the Ngaruawahia golf club, paper roads off SH1
Ownership:	WDC (Esplanade)
Approximate Site Dimensions:	820 × 15 m
Approximate Site Area:	1.5 ha
Boundaries/Adjacent Landowners:	WDC esplanades at both ends and private land adjacent
Current Vegetation Cover:	Mainly crack willow and alder
Specific Habitat Types Present:	River terraces
Comments:	

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management	Y/N	Y	
plan.			
The majority of the site is above the normal winter flood zone.	Y/N	Y	
Stock are/will be permanently excluded from the site.	Y/N	Y	Will need to be surveyed and fenced
			(trotting track may encroach onto
	37/NI		VVDC esplanade).
VVIIIing landowner.	I/N	Y Y	
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity	1.		
Adjoins or contains an area with >25% indigenous vegetation.	2		
Adjoins or is within 500 m of an area with >75% indigenous	3		
vegetation.	-	<u> </u>	
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3		
Contains two or more habitat types.	3		
Water Quality			
Intercepts overland flows over >50% of its length.	2		
Contains wetland or seepage that receives nutrient enriched	3		
water.			
Visual Enhancement			
Visible from roads or heavily used public areas.	3	3	
Current or potential popular recreational site.	3		
Community Engagement			
Within an urban area accessible to the public.	3		
Close to a marae or school.	3		
Close to other hubs of community activity.	2		
Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by	3		
manawhenua.			

Adjoins or includes historical sites. Riparian restoration could add value to traditional food, spiritual or cultural uses. Public Access Adjoins or within an area with formal public access. Adjoins or within informal public access routes (Te Araroa, unformed road or others). MANAGEMENT CRITERIA Pre-Project Checks Site requires no resource consent prior to beginning project or has consent already. Site has no legal issues to be resolved for project to proceed. Site Access Can only by accessed by foot; >5 minute walk. Easy foot access; <5 minute walk. Indirect vehicle access (e.g. gated). Direct vehicle access. Cost Effectiveness/Sustainability Preparation and maintenance costs >\$20,000/ha. Preparation and maintenance costs \$10,000-20,000/ha. Preparation and maintenance costs \$5,000-10,000/ha. Preparation and maintenance costs <\$5,000/ha. Very likely key weed species will dominate within five years of initial planting. Moderately likely key weed species will dominate within five years of initial planting. Unlikely that key weed species will dominate within five years of initial planting. Riparian width 10-20 m. Riparian width 20-30 m. Riparian width >30 m. Landowner agreed to undertake maintenance after five years. Unlikely to be affected by erosion. Mahitahi - Working Together Complements non-riparian restoration work of other groups. Complements riparian restoration work of other groups. Volunteer interest likely. TOTAL SCORE



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2		Site is designated as a river stability policy area (steep or unstable banks).
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SITE DESCRIPTION	Γ
Site Name:	Γ
Site Location:	
Grid Reference:	
Access:	
Ownership:	$\left[\cdot \right]$
Approximate Site Dimensions:	
Approximate Site Area:	
Boundaries/Adjacent Landowners:	
Current Vegetation Cover:	
Specific Habitat Types Present:	
Comments:	Γ

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	Y	
The majority of the site is above the normal winter flood zone.	Y/N	Y	
Stock are/will be permanently excluded from the site.	Y/N	Y	Survey of boundaries necessary prior to fencing - see comment regarding landowner.
Willing landowner.	Y/N	?	There are some individual riparian rights holders - private land - perhaps negotiate with landowners to plant riverside.
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2		
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3		
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3		
Contains two or more habitat types.	3		
Water Quality			
Intercepts overland flows over >50% of its length.	2	2	
Contains wetland or seepage that receives nutrient enriched water.	3		
Visual Enhancement			
Visible from roads or heavily used public areas.	3		
Current or potential popular recreational site.	3		
Community Engagement			A well of these
Within an urban area accessible to the public.	3		State Sheet
Close to a marae or school.	3	3	
Close to other hubs of community activity.	2		
Cultural and Spiritual			

Driver Road A

RB, Driver Road to Turangawaewae, c.2 km

37°40′38.09″S; 175° 9′55.52″E

From Driver Road, off River Road Ngaruawahia

WDC (Esplanade)

1,055 × 17 m

1.75 ha

WDC esplanades and private land adjacent

Mainly crack willow and alder

River terraces

Adjoins or includes a cultural and/or spiritual site	3		
A dising an includes historical sites	2		
Adjoins of includes historical sites.	3		
Riparian restoration could add value to traditional	3		
Public Access			
Adjoins or within an area with formal public access.	3		
Adjoins or within informal public access routes (Te	2	2	
Araroa, uniormed road or others).			
MANAGEMENT CRITERIA			
Pre-Project Checks			
Site requires no resource consent prior to beginning	3	3	
project or has consent already.			
Site has no legal issues to be resolved for project to	3	3	
proceed.			
Site Access			
Can only by accessed by foot; >5 minute walk.	0		
Easy foot access; <5 minute walk.	1		
Indirect vehicle access (e.g. gated).	1		
Direct vehicle access.	2	?	Need to negotiate site access through various
			adjoining landowners. There may be some
			access at either end and down paper roads.
Cost Effectiveness/Sustainability			
Preparation and maintenance costs >\$20,000/ha.	0		
Preparation and maintenance costs \$10,000-20,000/	1	1	
ha.			
Preparation and maintenance costs \$5,000-10,000/ha.	2		
Preparation and maintenance costs <\$5,000/ha.	3		
Very likely key weed species will dominate within five	0		
years of initial planting.			
Moderately likely key weed species will dominate	1	1	
within five years of initial planting.			
Unlikely that key weed species will dominate within	3		
five years of initial planting.			
Riparian width 10-20 m.	1	1	
Riparian width 20-30 m.	2		
Riparian width >30 m.	3		
Landowner agreed to undertake maintenance after	3		
five years.			
Unlikely to be affected by erosion.	2	2	
Mahitahi - Working Together			
Complements non-riparian restoration work of other	2		
groups.			
Complements riparian restoration work of other	3		
groups.			
Volunteer interest likely.	3	3	
TOTAL SCORE		21	



SITE DESCRIPTION	
Site Name:	Driver Road B
Site Location:	RB, Driver Road to Turangawaewae, c.2 km
Grid Reference:	37°40′15.40″S; 175° 9′27.34″E
Access:	From Turangawaewae and paper roads off River Road, Ngaruawahia
Ownership:	WDC (Esplanade)
Approximate Site Dimensions:	20 m × 1,045 m
Approximate Site Area:	2.2 ha
Boundaries/Adjacent Landowners:	WDC esplanades and private land adjacent
Current Vegetation Cover:	Mainly crack willow and alder
Specific Habitat Types Present:	River terraces
Comments:	

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	Y	
The majority of the site is above the normal winter flood zone.	Y/N	Y	
Stock are/will be permanently excluded from the site.	Y/N	Y	Survey may be necessary prior to fencing - see comment regarding landowner.
Willing landowner.	Y/N	?	There may be some individual riparian rights holders - private land.
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2		
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3		
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3		
Contains two or more habitat types.	3		
Water Quality			
Intercepts overland flows over >50% of its length.	2	2	
Contains wetland or seepage that receives nutrient enriched water.	3		
Visual Enhancement			
Visible from roads or heavily used public areas.	3		
Current or potential popular recreational site.	3		
Community Engagement			
Within an urban area accessible to the public.	3		
Close to a marae or school.	3	3	
Close to other hubs of community activity.	2		
Cultural and Spiritual			

Adjoins or includes a cultural and/or spiritual site identified by manawhenua.	3
Adjoins or includes historical sites.	3
Riparian restoration could add value to traditional food,	3
spiritual or cultural uses.	
Public Access	Ì
Adjoins or within an area with formal public access.	3
Adjoins or within informal public access routes (Te	2
Araroa, unformed road or others).	
MANAGEMENT CRITERIA	
Pre-Project Checks	
Site requires no resource consent prior to beginning	3
project or has consent already.	
Site has no legal issues to be resolved for project to	3
proceed.	<u> </u>
Site Access	<u> </u>
Can only by accessed by foot; >5 minute walk.	0
Easy foot access; <5 minute walk.	1
Indirect vehicle access (e.g. gated).	1
Direct vehicle access.	2
Cost Effectiveness/Sustainability	
Preparation and maintenance costs >\$20,000/ha.	
Preparation and maintenance costs \$10,000-20,000/ha.	
Preparation and maintenance costs \$5,000-10,000/na.	
Preparation and maintenance costs <\$5,000/ha.	3
years of initial planting.	
Moderately likely key weed species will dominate within	1
five years of initial planting.	
Unlikely that key weed species will dominate within five years of initial planting.	3
Riparian width 10-20 m.	1
Riparian width 20-30 m.	2
Riparian width >30 m.	3
Landowner agreed to undertake maintenance after five	3
years.	
Unlikely to be affected by erosion.	2
Mahitahi - Working Together	
Complements non-riparian restoration work of other groups.	2
Complements riparian restoration work of other groups.	3
Volunteer interest likelv.	3
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TOTAL SCORE	

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SITE DESCRIPTION	Γ
Site Name:	Ŀ
Site Location:	
Grid Reference:	
Access:	
Ownership:	
Approximate Site Dimensions:	[
Approximate Site Area:	1
Boundaries/Adjacent Landowners:	
Current Vegetation Cover:	
Specific Habitat Types Present:	1
Comments:	

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	Y	
The majority of the site is above the normal winter flood zone.	Y/N	Y	
Stock are/will be permanently excluded from the site.	Y/N	Y	Need to clearly ID boundaries.
Willing landowner.	Y/N	Y	
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2		
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3		
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3		
Contains two or more habitat types.	3		
Water Quality			
Intercepts overland flows over >50% of its length.	2		
Contains wetland or seepage that receives nutrient enriched water.	3		
Visual Enhancement			
Visible from roads or heavily used public areas.	3		
Current or potential popular recreational site.	3		
Community Engagement			
Within an urban area accessible to the public.	3	3	
Close to a marae or school.	3	3	
Close to other hubs of community activity.	2		
Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by manawhenua.	3		
Adjoins or includes historical sites.	3	1	
Riparian restoration could add value to traditional food, spiritual or cultural uses.	3		
Public Access			
Adjoins or within an area with formal public access.	3	h ar	

Waikato RiverCare 2014

Thomas St NGA

LB Thomas street/North St, NGA

From Thomas or North Streets

WDC (Esplanade)

560 × 25 m

1.75 ha

WDC esplanades and private land adjacent

Mainly crack willow and alder

River terraces

Esplanade boundaries may need to be checked

Adjoins or within informal public access routes (Te Araroa, unformed road or others).	2	2	
MANAGEMENT CRITERIA			
Pre-Project Checks			
Site requires no resource consent prior to beginning project or has consent already.	3	3	
Site has no legal issues to be resolved for project to proceed.	3	3	
Site Access			
Can only by accessed by foot; >5 minute walk.	0		
Easy foot access; <5 minute walk.	1		
Indirect vehicle access (e.g. gated).	1		
Direct vehicle access.	2	2	
Cost Effectiveness/Sustainability			
Preparation and maintenance costs >\$20,000/ha.	0	0	
Preparation and maintenance costs \$10,000-20,000/ha.	1		
Preparation and maintenance costs \$5,000-10,000/ha.	2		
Preparation and maintenance costs <\$5,000/ha.	3		
Very likely key weed species will dominate within five years of initial planting.	0	0	
Moderately likely key weed species will dominate within five years of initial planting.	1		
Unlikely that key weed species will dominate within five years of initial planting.	3		
Riparian width 10-20 m.	1	1	
Riparian width 20-30 m.	2		
Riparian width >30 m.	3		
Landowner agreed to undertake maintenance after five years.	3		
Unlikely to be affected by erosion.	2	2	
Mahitahi - Working Together			
Complements non-riparian restoration work of other groups.	2		
Complements riparian restoration work of other groups.	3	3	
Volunteer interest likely.	3		
TOTAL SCORE		22	



SITE DESCRIPTION	
Site Name:	Hakarimata F
Site Location:	LB, about 1.8 km downstream of Waipa Bridge, Ngaruawahia
Grid Reference:	37°38′46.02″S;175° 8′53.13″E
Access:	From Hakarimata road
Ownership:	LINZ?
Approximate Site Dimensions:	655 × 45 m
Approximate Site Area:	2.65 ha
Boundaries/Adjacent Landowners:	WDC esplanades at both ends and private land adjacent
Current Vegetation Cover:	Mainly crack willow and alder
Specific Habitat Types Present:	River terraces and back swamps
Comments:	

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	Y	
The majority of the site is above the normal winter flood zone.	Y/N	Y	
Stock are/will be permanently excluded from the site.	Y/N	Y	May need to be surveyed and refenced/closed to stock.
Willing landowner.	Y/N	Y	Adjoining landowner has cleared willow off esplanade area.
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2		
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3	3	
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3		
Contains two or more habitat types.	3	3	
Water Quality			
Intercepts overland flows over >50% of its length.	2	2	
Contains wetland or seepage that receives nutrient enriched water.	3		
Visual Enhancement			
Visible from roads or heavily used public areas.	3	3	
Current or potential popular recreational site.	3		
Community Engagement			
Within an urban area accessible to the public.	3		
Close to a marae or school.	3		
Close to other hubs of community activity.	2		
Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by manawhenua.	3		
Adjoins or includes historical sites.	3		
Riparian restoration could add value to traditional food, spiritual or cultural uses.	3		

Public Access Adjoins or within an area with formal public access. Adjoins or within informal public access routes (Te Araroa, unformed road or others). MANAGEMENT CRITERIA Pre-Project Checks Site requires no resource consent prior to beginning project or h consent already. Site has no legal issues to be resolved for project to proceed. Site Access Can only by accessed by foot; >5 minute walk. Easy foot access; <5 minute walk. Indirect vehicle access (e.g. gated). Direct vehicle access. Cost Effectiveness/Sustainability Preparation and maintenance costs >\$20,000/ha. Preparation and maintenance costs \$10,000-20,000/ha. Preparation and maintenance costs \$5,000-10,000/ha. Preparation and maintenance costs <\$5,000/ha. Very likely key weed species will dominate within five years of initial planting. Moderately likely key weed species will dominate within five year of initial planting. Unlikely that key weed species will dominate within five years of initial planting. Riparian width 10-20 m. Riparian width 20-30 m. Riparian width >30 m. Landowner agreed to undertake maintenance after five years. Unlikely to be affected by erosion. Mahitahi - Working Together Complements non-riparian restoration work of other groups. Complements riparian restoration work of other groups. Volunteer interest likely.

TOTAL SCORE

Waikato RiverCare 2014

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	3	3	
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	2	2	
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	1	1	
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ars	1	1	
f	3		
	1		
	2	2	
	3		
	3		
	2	2	
	2		
	3		
	3		
		27	



SITE DESCRIPTION					
Site Name: Hakarim		nata G			
Site Location:	LB, abou	ıt 4.3km dov	vnstream	n of Waipa Bridge, Ngaruawahia	
Grid Reference:	37°37′55	5.46″S; 175°10	0.00″E		
Access:	From H	akarimata r	oad		
Ownership:	LINZ?				
Approximate Site Dimensions:	940 × 20) m			
Approximate Site Area:	1.95 ha	3			
Boundaries/Adjacent Landowners:	Riverbe the side	ed and esplanade adjoin at the ends and private land to e			
Current Vegetation Cover:	Crack w	villow, popla	r and ald	er with pasture	
Specific Habitat Types Present:	River te	rraces			
Comments:	Ì				
	•				
BOTTOMLINES				COMMENTS	
The site is at least 10 m wide on average.		Y/N	Y		
The site can be safely accessed without a traffic management p	olan.	Y/N	Y		
The majority of the site is above the normal winter flood zone.		Y/N	Y		
Stock are/will be permanently excluded from the site.		Y/N	Y		
Willing landowner.		Y/N	Y?	May need to be boundary surveyed and refenced.	
Will be maintained for at least five years.		Y/N	Y	Upstream half - need to ID landowner (LINZ, DOC or WDC?).	
		Set Score	Score	COMMENTS	
OBJECTIVE CRITERIA					
Biodiversity					
Adjoins or contains an area with >25% indigenous vegetation.		2			
Adjoins or is within 500 m of an area with >75% indigenous veg	jetation.	3	3		
Presence of rare plant community or species.		3			
Provides shade or habitat for aquatic life.		3	1		
Contains two or more habitat types.		3			
Water Quality			1		
Intercepts overland flows over >50% of its length.		2			
Contains wetland or seepage that receives nutrient enriched w	vater.	3			
Visual Enhancement					
Visible from roads or heavily used public areas.			3		
Current or potential popular recreational site.					
Community Engagement			1		
Within an urban area accessible to the public.			1		
Close to a marae or school.		3	i –		
Close to other hubs of community activity.					
Cultural and Spiritual					
Adioins or includes a cultural and/or spiritual site identified by					
manawhenua.				the start and the	
Adjoins or includes historical sites.					

Riparian restoration could add value to traditional food, spiritual or cultural uses.	3	
Public Access		
Adjoins or within an area with formal public access.	3	
Adjoins or within informal public access routes (Te Araroa, unformed road or others).	2	
Site requires no resource consent prior to beginning project or has consent already.	3	3
Site has no legal issues to be resolved for project to proceed.	3	3
Site Access		
Can only by accessed by foot; >5 minute walk.	0	
Easy foot access; <5 minute walk.	1	1
Indirect vehicle access (e.g. gated).	1	1
Direct vehicle access.	2	2
Cost Effectiveness/Sustainability		
Preparation and maintenance costs >\$20,000/ha.	0	
Preparation and maintenance costs \$10,000-20,000/ha.	1	1
Preparation and maintenance costs \$5,000-10,000/ha.	2	
Preparation and maintenance costs <\$5,000/ha.	3	
Very likely key weed species will dominate within five years of initial planting.	0	
Moderately likely key weed species will dominate within five years of initial planting.	1	1
Unlikely that key weed species will dominate within five years of initial planting.	3	
Riparian width 10-20 m.	1	1
Riparian width 20-30 m.	2	
Riparian width >30 m.	3	
Landowner agreed to undertake maintenance after five years.	3	
Unlikely to be affected by erosion.	2	
Mahitahi - Working Together		
Complements non-riparian restoration work of other groups.	2	
Complements riparian restoration work of other groups.	3	
Volunteer interest likely.	3	
TOTAL SCORE		19

70



A review of lower Waikato River riparian restoration sites
SITE DESCRIPTION	
Site Name:	Riverside Way
Site Location:	LB, at end of Riverside Way (subdivision) on Hakarimata road
Grid Reference:	37°37′26.16″ S; 175°10′51.41″ E
Access:	From Riverside Way off Hakarimata Road, Ngaruawahia
Ownership:	WDC Espl
Approximate Site Dimensions:	1,200 × 40 m
Approximate Site Area:	4.6 ha
Boundaries/Adjacent Landowners:	Private to both ends and landward side
Current Vegetation Cover:	Crack willow, poplar and pasture
Specific Habitat Types Present:	River terraces (maybe some back swamp)
Comments:	

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	Y	
The majority of the site is above the normal winter flood zone.	Y/N	Y	
Stock are/will be permanently excluded from the site.	Y/N	Y	Needs fencing and removal of existing private fences.
Willing landowner.	Y/N	Y	
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2		
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3		
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3	3	
Contains two or more habitat types.	3	?	
Water Quality			
Intercepts overland flows over >50% of its length.	2	2	
Contains wetland or seepage that receives nutrient enriched water.	3		
Visual Enhancement			
Visible from roads or heavily used public areas.	3	3	
Current or potential popular recreational site.	3		
Community Engagement			
Within an urban area accessible to the public.	3		
Close to a marae or school.	3		
Close to other hubs of community activity.	2		
Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by manawhenua.	3		
Adjoins or includes historical sites.	3		
Riparian restoration could add value to traditional food, spiritual or cultural uses.	3		
Public Access			

3	3
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Waikato RiverCare 2014



73



SITE DESCRIPTION	Γ
Site Name:]
Site Location:	
Grid Reference:	:
Access:	1
Ownership:	
Approximate Site Dimensions:	
Approximate Site Area:	
Boundaries/Adjacent Landowners:]
Current Vegetation Cover:	0
Specific Habitat Types Present:]]
Comments:	

BOTTOMLINES	
The site is at least 10 m wide on average.	Y/N
The site can be safely accessed without a traffic management plan.	Y/N
The majority of the site is above the normal winter flood zone.	Y/N
Stock are/will be permanently excluded from the site.	Y/N
Willing landowner.	Y/N
Will be maintained for at least five years.	Y/N
	Set Scor
OBJECTIVE CRITERIA	
Biodiversity	
Adjoins or contains an area with >25% indigenous vegetation.	2
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3
Presence of rare plant community or species.	3
Provides shade or habitat for aquatic life.	3
Contains two or more habitat types.	3
Water Quality	
Intercepts overland flows over >50% of its length.	2
Contains wetland or seepage that receives nutrient enriched water.	3
Visual Enhancement	
Visible from roads or heavily used public areas.	3
Current or potential popular recreational site.	3
Community Engagement	
Within an urban area accessible to the public.	3
Close to a marae or school.	3

Waikato RiverCare 2014

Mangawara

RB, Confluence of the Mangawara, SH1

37°36′35.35″S; 175°11′4.45″E

From SH1 at Taupiri by the Mangawara Bridge

LINZ?/ SH1

380 × 50 m

2.15 ha

Public land and highway adjacent

Crack willow

Low terrace/back swamp with levees

		COMMENTS
	Y	
	?	
	N	No planting possible at top end of banks (traffic visibility). The only real option here is planting within the flood zone under willow canopy - perhaps use as an experimental site for large specimens of <i>Dacrycarpus dacrydioides</i> (kahikatea trees) under canopy gaps in the willow.
	Y	
	Y?	
	Y	
e	Score	COMMENTS
	?	
		No. H I I date
	3	
	3	1.6 km from Taupiri Marae.

Close to other hubs of community activity.	2		
Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by manawhenua.	3		
Adjoins or includes historical sites.	3		
Riparian restoration could add value to traditional	3	1	
food, spiritual or cultural uses.			
Public Access			
Adjoins or within an area with formal public access.	3		
Adjoins or within informal public access routes (Te Araroa, unformed road or others).	2		
		1	
MANAGEMENT CRITERIA			
Pre-Project Checks			
Site requires no resource consent prior to beginning project or has consent already.	3	3	
Site has no legal issues to be resolved for project to	3	3	
Site Access			
Cap only by accounted by fact: >E minute walk			
Call only by accessed by loot, >5 initiate walk.	1	1	
Lasy loot access, <5 illillute walk.	1		
Direct vehicle access (e.g. gated).	2	2	
Direct vehicle access.	2	2	
Property and maintenance sector \$20,000/ha			
Preparation and maintenance costs >\$20,000/na.	1		
ha.			
Preparation and maintenance costs \$5,000-10,000/ ha.	2		
Preparation and maintenance costs <\$5,000/ha.	3		
Very likely key weed species will dominate within five years of initial planting.	0		
Moderately likely key weed species will dominate within five years of initial planting.	1	1	
Unlikely that key weed species will dominate within five years of initial planting.	3		
Riparian width 10-20 m.	1	1	
Riparian width 20-30 m.	2	2	
Riparian width >30 m.	3		
Landowner agreed to undertake maintenance after five years.	3		
Unlikely to be affected by erosion.	2		
Mahitahi - Working Together			
Complements non-riparian restoration work of other	2		
groups.			
Complements riparian restoration work of other	3		
groups.			
Volunteer interest likely.	3		
TOTAL SCORE		18	



SITE DESCRIPTION	
Site Name:	Hakarimata H
Site Location:	LB, Hakarimata Road about 1.5 m upstream of Stevensons
	Quarry
Grid Reference:	37°36′12.16″S; 175°10′3.61″E
Access:	Off Hakarimata road
Ownership:	WDC Esplanade/LINZ
Approximate Site Dimensions:	1,425 × 30 m
Approximate Site Area:	5.45 ha
Boundaries/Adjacent Landowners:	Riverbed both ends and private to the landward side
Current Vegetation Cover:	Crack willow, common alder and scrub (privet?)
Specific Habitat Types Present:	River terraces (maybe some back swamp)
Comments:	

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	Y	
The majority of the site is above the normal winter flood zone.	Y/N	Y	
Stock are/will be permanently excluded from the site.	Y/N	Y	
Willing landowner.	Y/N	Y	
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2		
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3	3	
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3		
Contains two or more habitat types.	3	?	
Water Quality			
Intercepts overland flows over >50% of its length.	2		
Contains wetland or seepage that receives nutrient enriched water.	3		
Visual Enhancement			
Visible from roads or heavily used public areas.	3	3	
Current or potential popular recreational site.	3		
Community Engagement			
Within an urban area accessible to the public.	3		
Close to a marae or school.	3		
Close to other hubs of community activity.	2		
Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by manawhenua.	3		
Adjoins or includes historical sites.	3		
Riparian restoration could add value to traditional food, spiritual or cultural uses.	3		
Public Access			
Adjoins or within an area with formal public access.	3		
Adjoins or within informal public access routes (Te Araroa, unformed road or others).	2	2	

MANAGEMENT CRITERIA			
Pre-Project Checks			
Site requires no resource consent prior to beginning project or has consent already.	3	3	
Site has no legal issues to be resolved for project to proceed.	3	3	
Site Access			
Can only by accessed by foot; >5 minute walk.	0		
Easy foot access; <5 minute walk.	1	1	
Indirect vehicle access (e.g. gated).	1	1	
Direct vehicle access.	2	2	
Cost Effectiveness/Sustainability			
Preparation and maintenance costs >\$20,000/ha.	0	0	
Preparation and maintenance costs \$10,000-20,000/ha.	1		
Preparation and maintenance costs \$5,000-10,000/ha.	2		
Preparation and maintenance costs <\$5,000/ha.	3		
Very likely key weed species will dominate within five years of initial planting.	0		
Moderately likely key weed species will dominate within five years of initial planting.	1	1	
Unlikely that key weed species will dominate within five years of initial planting.	3		
Riparian width 10-20 m.	1		
Riparian width 20-30 m.	2	2	
Riparian width >30 m.	3		
Landowner agreed to undertake maintenance after five years.	3		
Unlikely to be affected by erosion.	2	2	
Mahitahi - Working Together			
Complements non-riparian restoration work of other groups.	2		
Complements riparian restoration work of other groups.	3		
Volunteer interest likely.	3		
TOTAL SCORE		23	

79



SITE DESCRIPTION	
Site Name:	
Site Location:	
Grid Reference:	
Access:	
Ownership:	
Approximate Site Dimensions:	
Approximate Site Area:	
Boundaries/Adjacent Landowners:	
Current Vegetation Cover:	
Specific Habitat Types Present:	
Comments:	

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	Y	
The majority of the site is above the normal winter flood zone.	Y/N	Y	
Stock are/will be permanently excluded from the site.	Y/N	Y	
Willing landowner.	Y/N	Y	
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2		
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3	3	
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3		
Contains two or more habitat types.	3		
Water Quality			
Intercepts overland flows over >50% of its length.	2	2	
Contains wetland or seepage that receives nutrient enriched water.	3		
Visual Enhancement			
Visible from roads or heavily used public areas.	3	3	
Current or potential popular recreational site.	3		
Community Engagement			
Within an urban area accessible to the public.	3		
Close to a marae or school.	3	3	3.9 km from Taupiri marae.
Close to other hubs of community activity.	2		
Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by manawhenua.	3		And Market
Adjoins or includes historical sites.	3		
Riparian restoration could add value to traditional food, spiritual or cultural uses.	3		
Public Access		11/	

Waikato RiverCare 2014

Kaiwhenua

RB, about 2.5km downstream of the Mangawara bridge on SH1

37°35′40.00″S; 175° 9′29.75″E

From SH1 at Taupiri by the Mangawara bridge

WDC Esplanade

1,130 × 35 m

3.55 ha

Private land both ends and private to the landward side

Crack willow, common alder, pines? and pasture

River terrace

Adjoins or within an area with formal public access.	3		
Adjoins or within informal public access routes (Te Araroa, unformed road or others).	2		
MANAGEMENT CRITERIA			
Pre-Project Checks			
Site requires no resource consent prior to beginning project or has consent already.	3	3	
Site has no legal issues to be resolved for project to proceed.	3	3	
Site Access			
Can only by accessed by foot; >5 minute walk.	0		
Easy foot access; <5 minute walk.	1		
Indirect vehicle access (e.g. gated).	1	1	
Direct vehicle access.	2	2	
Cost Effectiveness/Sustainability			
Preparation and maintenance costs >\$20,000/ha.	0		
Preparation and maintenance costs \$10,000-20,000/ha.	1	1	
Preparation and maintenance costs \$5,000-10,000/ha.	2		
Preparation and maintenance costs <\$5,000/ha.	3		
Very likely key weed species will dominate within five years of initial planting.	0		
Moderately likely key weed species will dominate within five years of initial planting.	1	1	
Unlikely that key weed species will dominate within five years of initial planting.	3		
Riparian width 10-20 m.	1		
Riparian width 20-30 m.	2	2	
Riparian width >30 m.	3		
Landowner agreed to undertake maintenance after five years.	3		
Unlikely to be affected by erosion.	2	2	
Mahitahi - Working Together			
Complements non-riparian restoration work of other groups.	2		
Complements riparian restoration work of other groups.	3		
Volunteer interest likely.	3		
TOTAL SCORE		26	

82



A review of lower Waikato River riparian restoration sites

SITE DESCRIPTION	
Site Name:	Waahi A
Site Location:	LB Huntly, about 1km downstream of main Huntly bridge
Grid Reference:	37°33′16.51″S; 175° 9′21.55″E
Access:	From Waahi Marae, Parry Street (off Harris Street), Huntly
Ownership:	DOC/LINZ/ Waahi Marae
Approximate Site Dimensions:	960 × 175 m
Approximate Site Area:	14.3 ha
Boundaries/Adjacent Landowners:	Private land both ends and private to the landward side
Current Vegetation Cover:	Crack willow with extensive flag iris where the willow has been cleared
Specific Habitat Types Present:	Low terrace/back swamp with levees
Comments:	

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	Y	
The majority of the site is above the normal winter flood zone.	Y/N	N	
Stock are/will be permanently excluded from the site.	Y/N	Y	
Willing landowner.	Y/N	Y	
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2		
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3		
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3		
Contains two or more habitat types.	3	3	
Water Quality			
Intercepts overland flows over >50% of its length.	2		
Contains wetland or seepage that receives nutrient enriched water.	3		
Visual Enhancement			
Visible from roads or heavily used public areas.	3	3	
Current or potential popular recreational site.	3		
Community Engagement			
Within an urban area accessible to the public.	3		
Close to a marae or school.	3	3	
Close to other hubs of community activity.	2		
Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by manawhenua.	3		
Adjoins or includes historical sites.	3		
Riparian restoration could add value to traditional food, spiritual or cultural uses.	3	3	
Public Access			

Adjoins or within informal public access routes (Te Araroa, unfor road or others). MANAGEMENT CRITERIA Pre-Project Checks Site requires no resource consent prior to beginning project or h consent already. Site has no legal issues to be resolved for project to proceed. Site Access Can only by accessed by foot; >5 minute walk. Easy foot access; <5 minute walk. Indirect vehicle access (e.g. gated). Direct vehicle access. Cost Effectiveness/Sustainability Preparation and maintenance costs >\$20,000/ha. Preparation and maintenance costs \$10,000-20,000/ha. Preparation and maintenance costs \$5,000-10,000/ha. Preparation and maintenance costs <\$5,000/ha. Very likely key weed species will dominate within five years of in planting. Moderately likely key weed species will dominate within five year initial planting. Unlikely that key weed species will dominate within five years of planting. Riparian width 10-20 m. Riparian width 20-30 m. Riparian width >30 m. Landowner agreed to undertake maintenance after five years. Unlikely to be affected by erosion. Mahitahi - Working Together Complements non-riparian restoration work of other groups. Complements riparian restoration work of other groups. Volunteer interest likely.

Adjoins or within an area with formal public access.

TOTAL SCORE

3		
2		
3	0	
3	3	
0		
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SITE DESCRIPTION	Γ
Site Name:	6
Site Location:	1
Grid Reference:	
Access:	0
Ownership:]]
Approximate Site Dimensions:	•
Approximate Site Area:	[
Boundaries/Adjacent Landowners:]]
Current Vegetation Cover:	(
Specific Habitat Types Present:]]
Comments:	

BOTTOMLINES
The site is at least 10 m wide on average.
The site can be safely accessed without a traffic management pl
The majority of the site is above the normal winter flood zone.
Stock are/will be permanently excluded from the site.
Willing landowner.
Will be maintained for at least five years.
OBJECTIVE CRITERIA
Biodiversity
Adjoins or contains an area with >25% indigenous vegetation.
Adjoins or is within 500 m of an area with >75% indigenous
vegetation.
Presence of rare plant community or species.
Provides shade or habitat for aquatic life.
Contains two or more habitat types.
Water Quality
Intercepts overland flows over >50% of its length.
Contains wetland or seepage that receives nutrient enriched
water.
Visual Enhancement
Visible from roads or heavily used public areas.
Current or potential popular recreational site.
Community Engagement
Within an urban area accessible to the public.
Close to a marae or school.
Close to other hubs of community activity.
Cultural and Spiritual
Adjoins or includes a cultural and/or spiritual site identified by
manawhenua.
Adjoins or includes historical sites.
Riparian restoration could add value to traditional food, spiritua cultural uses.
Public Access
Adjoins or within an area with formal public access.

Waikato RiverCare 2014

Ohinewai A

RB north of Huntly and Sth of Ohinewai, SH1

37°30′58.12″S; 175° 9′50.26″E

Off SH1

DOC?/LINZ

910 × 150 m

11.35 ha

Riverbed adjacent both ends and private landward side

Crack willow, alder, flag Iris, cabbage trees

Low terrace/back swamp with levees

			COMMENTS
	Y/N	Y	
an.	Y/N	?	
	Y/N	Y?	
	Y/N	Y	
	Y/N	Y?	Need to ID landowner (LINZ, DOC ?)
	Y/N	Y	
	Set Score	Score	COMMENTS
	2		
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	2		
	3	3	Back swamps.
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lor	3		
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Adjoins or within informal public access routes (Te Araroa, unformed road or others).	2	
	ļ	
MANAGEMENT CRITERIA		
Pre-Project Checks		
Site requires no resource consent prior to beginning project or has consent already.	3	3
Site has no legal issues to be resolved for project to proceed.	3	3
Site Access		
Can only by accessed by foot; >5 minute walk.	0	
Easy foot access; <5 minute walk.	1	1
Indirect vehicle access (e.g. gated).	1	1
Direct vehicle access.	2	2
Cost Effectiveness/Sustainability		
Preparation and maintenance costs >\$20,000/ha.	0	0
Preparation and maintenance costs \$10,000-20,000/ha.	1	
Preparation and maintenance costs \$5,000-10,000/ha.	2	
Preparation and maintenance costs <\$5,000/ha.	3	
Very likely key weed species will dominate within five years of initial planting.	0	0
Moderately likely key weed species will dominate within five years of initial planting.	1	
Unlikely that key weed species will dominate within five years of initial planting.	3	
Riparian width 10-20 m.	1	
Riparian width 20-30 m.	2	
Riparian width >30 m.	3	3
Landowner agreed to undertake maintenance after five years.	3	
Unlikely to be affected by erosion.	2	
Mahitahi - Working Together		
Complements non-riparian restoration work of other groups.	2	
Complements riparian restoration work of other groups.	3	
Volunteer interest likely.	3	3
TOTAL SCORE		25



A review of lower Waikato River riparian restoration sites

SITE DESCRIPTION	
Site Name:	Ohinewai B
Site Location:	RB north of Huntly and Sth of Ohinewai, SH1
Grid Reference:	37°30′46.83″S; 175° 9′55.81″E
Access:	Off SH1
Ownership:	DOC?/LINZ
Approximate Site Dimensions:	375 × 80 m
Approximate Site Area:	3.25 ha
Boundaries/Adjacent Landowners:	Riverbed adjacent both ends and private landward side
Current Vegetation Cover:	Crack willow, alder, flag Iris, cabbage trees
Specific Habitat Types Present:	Low terrace/back swamp with levees
Comments:	

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	?	
The majority of the site is above the normal winter flood zone.	Y/N	Y?	
Stock are/will be permanently excluded from the site.	Y/N	Y	
Willing landowner.	Y/N	Y?	Need to ID landowner (LINZ, DOC ?)
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2		
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3		
Presence of rare plant community or species.	3	1	
Provides shade or habitat for aquatic life.	3	1	
Contains two or more habitat types.	3	3	
Water Quality			
Intercepts overland flows over >50% of its length.	2		
Contains wetland or seepage that receives nutrient enriched water.	3	3	Back swamps.
Visual Enhancement			
Visible from roads or heavily used public areas.	3	3	
Current or potential popular recreational site.	3		
Community Engagement			
Within an urban area accessible to the public.	3		
Close to a marae or school.	3		
Close to other hubs of community activity.	2		
Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by manawhenua.	3		
Adjoins or includes historical sites.	3		

Riparian restoration could add value to traditional food, spiritual or cultural uses.	3	
Public Access		
Adjoins or within an area with formal public access.	3	
Adjoins or within informal public access routes (Te Araroa, unformed road or others).	2	
MANAGEMENT CRITERIA		
Pre-Project Checks	1	
Site requires no resource consent prior to beginning project or has consent already.	3	3
Site has no legal issues to be resolved for project to proceed.	3	3
Site Access		
Can only by accessed by foot; >5 minute walk.	0	
Easy foot access; <5 minute walk.	1	1
Indirect vehicle access (e.g. gated).	1	1
Direct vehicle access.	2	2
Cost Effectiveness/Sustainability		
Preparation and maintenance costs >\$20,000/ha.	0	0
Preparation and maintenance costs \$10,000-20,000/ha.	1	
Preparation and maintenance costs \$5,000-10,000/ha.	2	
Preparation and maintenance costs <\$5,000/ha.	3	
Very likely key weed species will dominate within five years of initial planting.	0	0
Moderately likely key weed species will dominate within five years of initial planting.	1	
Unlikely that key weed species will dominate within five years of initial planting.	3	
Riparian width 10-20 m.	1	
Riparian width 20-30 m.	2	
Riparian width >30 m.	3	3
Landowner agreed to undertake maintenance after five years.	3	
Unlikely to be affected by erosion.	2	
Mahitahi - Working Together		
Complements non-riparian restoration work of other groups.	2	
Complements riparian restoration work of other groups.	3	
Volunteer interest likely.	3	3
TOTAL SCORE		25



SITE DESCRIPTION	Γ
Site Name:	Γ
Site Location:	Γ
	ľ
Grid Reference:	
Access:	
Ownership:	ŀ
Approximate Site Dimensions:	
Approximate Site Area:	
Boundaries/Adjacent Landowners:	
Current Vegetation Cover:	
Specific Habitat Types Present:	
Comments:	

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	Y	
The majority of the site is above the normal winter flood zone.	Y/N	Y	
Stock are/will be permanently excluded from the site.	Y/N	Y	
Willing landowner.	Y/N	Y	
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2		
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3		
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3		
Contains two or more habitat types.	3		
Water Quality			
Intercepts overland flows over >50% of its length.	2		
Contains wetland or seepage that receives nutrient enriched water.	3		
Visual Enhancement			
Visible from roads or heavily used public areas.	3	3	
Current or potential popular recreational site.	3		
Community Engagement			
Within an urban area accessible to the public.	3		
Close to a marae or school.	3	3	4 km from Te Ohaaki Marae.
Close to other hubs of community activity.	2		
Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by manawhenua.	3		
Adjoins or includes historical sites.	3		
Riparian restoration could add value to traditional food, spiritual or cultural uses.	3		
Public Access			

Te Ohaaki A

LB, Te Ohaaki Road nth of Golfcourse: Area between stop bank (but 10 m away) and flood zone.

37°29'21.19"S; 175° 8'55.44"E

Off Te Ohaaki Road

WRC?

675 × 35 m

2.1 ha

Golf course land upstream, esplanade downstream , private landward side

Currently mostly in pasture with small patches of hawthorn. River terrace

Adjoins or within an area with formal public access	3		
Adjoins of within an area with formal public access.	3		
Adjoins or within informal public access routes (le Araroa, unformed	2	3	
Site requires no resource consent prior to beginning project or has consent already.	3	3	
Site has no legal issues to be resolved for project to proceed.	3	3	
Site Access			
Can only by accessed by foot; >5 minute walk.	0		
Easy foot access; <5 minute walk.	1	1	
Indirect vehicle access (e.g. gated).	1	1	
Direct vehicle access.	2	2	
Cost Effectiveness/Sustainability			
Preparation and maintenance costs >\$20,000/ha.	0		
Preparation and maintenance costs \$10,000-20,000/ha.	1		
Preparation and maintenance costs \$5,000-10,000/ha.	2	2	
Preparation and maintenance costs <\$5,000/ha.	3		
Very likely key weed species will dominate within five years of initial planting.	0		
Moderately likely key weed species will dominate within five years of initial planting.	1		
Unlikely that key weed species will dominate within five years of initial planting.	3	3	
Riparian width 10-20 m.	1	1	
Riparian width 20-30 m.	2		
Riparian width >30 m.	3		
Landowner agreed to undertake maintenance after five years.	3	?	
Unlikely to be affected by erosion.	2	2	
Mahitahi - Working Together			
Complements non-riparian restoration work of other groups.	2		
Complements riparian restoration work of other groups.	3		
Volunteer interest likely.	3		
TOTAL SCORE		26	



A review of lower Waikato River riparian restoration sites

94

SITE DESCRIPTION	
Site Name:	Te Ohaaki B
Site Location:	LB, Te Ohaaki Road north of Golf Course: Area between stopbank (but 10 m away) and flood zone
Grid Reference:	37°28′47.99″S; 175° 8′46.88″E
Access:	Off Te Ohaaki Road
Ownership:	WRC?
Approximate Site Dimensions:	1,075 × 25 m
Approximate Site Area:	4.0 ha
Boundaries/Adjacent Landowners:	Esplanade adjacent upstream and private downstream and landward side
Current Vegetation Cover:	Currently mostly in pasture with small patches of hawthorn.
Specific Habitat Types Present:	Low terrace/back swamp with levees
Comments:	

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	Y	
The majority of the site is above the normal winter flood zone.	Y/N	Y	
Stock are/will be permanently excluded from the site.	Y/N	Y	
Willing landowner.	Y/N	Y	
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2		
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3		
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3		
Contains two or more habitat types.	3	3	
Water Quality			
Intercepts overland flows over >50% of its length.	2		
Contains wetland or seepage that receives nutrient enriched water.	3		
Visual Enhancement			
Visible from roads or heavily used public areas.	3	3	
Current or potential popular recreational site.	3		
Community Engagement			
Within an urban area accessible to the public.	3		
Close to a marae or school.	3		
Close to other hubs of community activity.	2		
Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by manawhenua.	3		
Adjoins or includes historical sites.	3		
Riparian restoration could add value to traditional food, spiritual or cultural uses.	3		
Public Access			

Adjoins or within an area with formal public access.	3		
Adjoins or within informal public access routes (Te Araroa, unformed road or others).	2	2	
MANAGEMENT CRITERIA			
Pre-Project Checks			
Site requires no resource consent prior to beginning project or has consent already.	3	3	
Site has no legal issues to be resolved for project to proceed.	3	3	
Site Access			
Can only by accessed by foot; >5 minute walk.	0		
Easy foot access; <5 minute walk.	1	1	
Indirect vehicle access (e.g. gated).	1	1	
Direct vehicle access.	2	2	
Cost Effectiveness/Sustainability			
Preparation and maintenance costs >\$20,000/ha.	0		
Preparation and maintenance costs \$10,000-20,000/ha.	1		
Preparation and maintenance costs \$5,000-10,000/ha.	2	2	
Preparation and maintenance costs <\$5,000/ha.	3		
Very likely key weed species will dominate within five years of initial planting.	0		
Moderately likely key weed species will dominate within five years of initial planting.	1		
Unlikely that key weed species will dominate within five years of initial planting.	3	3	
Riparian width 10-20 m.	1	1	
Riparian width 20-30 m.	2		
Riparian width >30 m.	3		
Landowner agreed to undertake maintenance after five years.	3	?	
Unlikely to be affected by erosion.	2	2	
Mahitahi - Working Together			
Complements non-riparian restoration work of other groups.	2		
Complements riparian restoration work of other groups.	3		
Volunteer interest likely.	3		
TOTAL SCORE		26	





SITE DESCRIPTION	Γ
Site Name:	ŀ
Site Location:	ľ
Grid Reference:	ŀ
Access:	ŀ
Ownership:	ļ
Approximate Site Dimensions:	ŀ
Boundaries/Adjacent Landowners:	Ļ
Current Vegetation Cover:	ļ
Specific Habitat Types Present:	ļ
Comments:	L
BOTTOMLINES	
The site is at least 10 m wide on average.	
The site can be safely accessed without a traffic management p)
The majority of the site is above the normal winter flood zone.	
Stock are/will be permanently excluded from the site.	
Willing landowner.	
Will be maintained for at least five years.	
OBJECTIVE CRITERIA	
Biodiversity	
Adjoins or contains an area with >25% indigenous vegetation.	
Adjoins or is within 500 m of an area with >75% indigenous veg	je
Presence of rare plant community or species.	
Provides shade or habitat for aquatic life.	
Contains two or more habitat types.	
Water Quality	-
Intercepts overland flows over >50% of its length.	
Contains wetland or seepage that receives nutrient enriched w	18
Visual Enhancement	
Visible from roads or heavily used public areas.	
Current or potential popular recreational site.	-
Community Engagement	
Within an urban area accessible to the public.	
Close to a marae or school.	
Close to other hubs of community activity.	
Cultural and Spiritual	
Adjoins or includes a cultural and/or spiritual site identified by	,
	1

Adjoins or includes historical sites.

Riparian restoration could add value to traditional food, spiritual cultural uses.

Waikato RiverCare 2014

Te Ohaaki C

LB, Te Ohaaki Road: Area between stopbank and an old island now attached to the mainland. WRC land. Currently grazed. Need to enquire about fencing.

37°27′49.91″S;175° 8′51.09″E

Off Te Ohaaki Road

WRC?

870 × 90 m

11.8 ha

Riverbed adjacent both ends and private landward side $% \left({{{\mathbf{x}}_{i}}} \right)$

Pasture, crack willow, alder

Low terrace/back swamp with levees

			COMMENTS
	Y/N	Y	
an.	Y/N	Y	
	Y/N	Y	
	Y/N	Y	Need to be negotiated with
			adjacent landowners.
	Y/N	Y	
	Y/N	Y	
	Set Score	Score	COMMENTS
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tation.	3		
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ter.	3		
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or	3		

Public Access			
Adjoins or within an area with formal public access.	3		
Adjoins or within informal public access routes (Te Araroa, unformed road or others).	2	2	
MANAGEMENT CRITERIA			
Pre-Project Checks			
Site requires no resource consent prior to beginning project or has consent already.	3	3	
Site has no legal issues to be resolved for project to proceed.	3	3	
Site Access			
Can only by accessed by foot; >5 minute walk.	0		
Easy foot access; <5 minute walk.	1	1	
Indirect vehicle access (e.g. gated).	1	1	
Direct vehicle access.	2	2	
Cost Effectiveness/Sustainability			
Preparation and maintenance costs >\$20,000/ha.	0	İ	
Preparation and maintenance costs \$10,000-20,000/ha.	1	1	
Preparation and maintenance costs \$5,000-10,000/ha.	2		
Preparation and maintenance costs <\$5,000/ha.	3	İ	
Very likely key weed species will dominate within five years of initial	0	0	
Moderately likely key weed species will dominate within five years of initial planting.	1		
Unlikely that key weed species will dominate within five years of initial planting.	3		
Riparian width 10-20 m.	1		
Riparian width 20-30 m.	2		
Riparian width >30 m.	3	3	
Landowner agreed to undertake maintenance after five years.	3	?	
Unlikely to be affected by erosion.	2	2	
Mahitahi - Working Together			
Complements non-riparian restoration work of other groups.	2		
Complements riparian restoration work of other groups.	3		
Volunteer interest likely.	3		
TOTAL SCORE		26	



A review of lower Waikato River riparian restoration sites

SITE DESCRIPTION	
Site Name:	Te Ohaaki D
Site Location:	LB, Te Ohaaki Road: Area between stopbank and an old island now attached to the mainland. WRC land. Currently grazed. Need to enquire about fencing.
Grid Reference:	37°27′19.08″S; 175° 8′40.59″E
Access:	Off Te Ohaaki Road
Ownership:	WRC?
Approximate Site Dimensions:	930 × 125 m
Approximate Site Area:	10.27 ha
Boundaries/Adjacent Landowners:	Riverbed adjacent both ends and private landward side
Current Vegetation Cover:	Pasture, crack willow, alder
Specific Habitat Types Present:	Low terrace/back swamp with levees
Comments:	

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	Y	
The majority of the site is above the normal winter flood zone.	Y/N	Y	
Stock are/will be permanently excluded from the site.	Y/N	Y	Need to be negotiated with adjacent landowners.
Willing landowner.	Y/N	Y	
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2		
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3		
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3	3	
Contains two or more habitat types.	3	3	
Water Quality			
Intercepts overland flows over >50% of its length.	2		
Contains wetland or seepage that receives nutrient enriched water.	3		
Visual Enhancement			
Visible from roads or heavily used public areas.	3		
Current or potential popular recreational site.	3		
Community Engagement			
Within an urban area accessible to the public.	3		
Close to a marae or school.	3		
Close to other hubs of community activity.	2		
Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by manawhenua.	3		
Adjoins or includes historical sites.	3		

Riparian restoration could add value to traditional food, spiritual or cultural uses.	3		
Public Access			
Adjoins or within an area with formal public access.	3		
Adjoins or within informal public access routes (Te Araroa, unformed	2	2	
road or others).			
MANAGEMENT CRITERIA			
Pre-Project Checks			
Site requires no resource consent prior to beginning project or has consent already.	3	3	
Site has no legal issues to be resolved for project to proceed.	3	3	
Site Access			
Can only by accessed by foot; >5 minute walk.	0		
Easy foot access; <5 minute walk.	1	1	
Indirect vehicle access (e.g. gated).	1	1	
Direct vehicle access.	2	2	
Cost Effectiveness/Sustainability			
Preparation and maintenance costs >\$20,000/ha.	0		
Preparation and maintenance costs \$10,000-20,000/ha.	1	1	
Preparation and maintenance costs \$5,000-10,000/ha.	2		
Preparation and maintenance costs <\$5,000/ha.	3		
Very likely key weed species will dominate within five years of initial planting.	0	0	
Moderately likely key weed species will dominate within five years of initial planting.	1		
Unlikely that key weed species will dominate within five years of initial planting.	3		
Riparian width 10-20 m.	1		
Riparian width 20-30 m.	2		
Riparian width >30 m.	3	3	
Landowner agreed to undertake maintenance after five years.	3	?	
Unlikely to be affected by erosion.	2	2	
Mahitahi - Working Together			
Complements non-riparian restoration work of other groups.	2		
Complements riparian restoration work of other groups.	3		
Volunteer interest likely.	3		
TOTAL SCORE		27	





Waikato RiverCare 2014



Location and proposed area for riparian restoration at Site 19b



105

SITE DESCRIPTION	
Site Name:	Maurea Marae
Site Location:	LB, Behind Maurea Marae, off Te Ohaaki Road
Grid Reference:	37°26′26.15″S; 175° 8′21.20″E
Access:	Off Te Ohaaki Road, via Maurea Marae
Ownership:	WRC?
Approximate Site Dimensions:	640 × 40 m
Approximate Site Area:	2.35 ha (2 parts: 1.0 ha and 2.35 ha)
Boundaries/Adjacent Landowners:	Riverbed adjacent both ends and private landward side
Current Vegetation Cover:	Mainly pasture
Specific Habitat Types Present:	Low terrace (maybe some back swamp?)
Comments:	Two sites slightly separated

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	Y	
The majority of the site is above the normal winter flood zone.	Y/N	Y	
Stock are/will be permanently excluded from the site.	Y/N	Y	Need to be negotiated with adjacent landowners.
Willing landowner.	Y/N	Y	
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2		
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3		
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3	3	
Contains two or more habitat types.	3	3	
Water Quality			
Intercepts overland flows over >50% of its length.	2		
Contains wetland or seepage that receives nutrient enriched water.	3		
Visual Enhancement			
Visible from roads or heavily used public areas.	3		
Current or potential popular recreational site.	3		
Community Engagement			
Within an urban area accessible to the public.	3		
Close to a marae or school.	3	3	
Close to other hubs of community activity.	2		
Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by manawhenua.	3		
Adjoins or includes historical sites.	3		
Riparian restoration could add value to traditional food, spiritual or cultural uses.	3		
Public Access			

Adjoins or within an area with formal public access. Adjoins or within informal public access routes (Te Araroa, unfor road or others). MANAGEMENT CRITERIA Pre-Project Checks Site requires no resource consent prior to beginning project or h consent already. Site has no legal issues to be resolved for project to proceed. Site Access

Site Access Can only by accessed by foot; >5 minute walk. Easy foot access; <5 minute walk. Indirect vehicle access (e.g. gated). Direct vehicle access. Cost Effectiveness/Sustainability Preparation and maintenance costs >\$20,000/ha. Preparation and maintenance costs \$10,000-20,000/ha. Preparation and maintenance costs \$5,000-10,000/ha. Preparation and maintenance costs <\$5,000/ha. Very likely key weed species will dominate within five years of in planting. Moderately likely key weed species will dominate within five year initial planting. Unlikely that key weed species will dominate within five years of initial planting. Riparian width 10-20 m. Riparian width 20-30 m. Riparian width >30 m. Landowner agreed to undertake maintenance after five years. Unlikely to be affected by erosion. Mahitahi - Working Together Complements non-riparian restoration work of other groups. Complements riparian restoration work of other groups. Volunteer interest likely.

TOTAL SCORE



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	3	3	
		28	





SITE DESCRIPTION	Γ
Site Name:	Τ
Site Location:	Ι
Grid Reference:	Ι
Access:	Γ
Ownership:	Τ
Approximate Site Dimensions:	Τ
Approximate Site Area:	Ι
Boundaries/Adjacent Landowners:	Τ
Current Vegetation Cover:	Γ
Specific Habitat Types Present:	Γ
Comments:	Γ

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	?	Need to find out whether the site can be safely accessed.
The majority of the site is above the normal winter flood zone.	Y/N	Y	
Stock are/will be permanently excluded from the site.	Y/N	?	Need to find out.
Willing landowner.	Y/N	Y	
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2		
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3		
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3		
Contains two or more habitat types.	3	?	
Water Quality			
Intercepts overland flows over >50% of its length.	2	?	
Contains wetland or seepage that receives nutrient enriched water.	3		
Visual Enhancement			
Visible from roads or heavily used public areas.	3	3	
Current or potential popular recreational site.	3		
Community Engagement			
Within an urban area accessible to the public.	3		
Close to a marae or school.	3		
Close to other hubs of community activity.	2		
Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by manawhenua.	3	3	*
Adjoins or includes historical sites.	3		
Riparian restoration could add value to traditional food, spiritual or cultural uses.	3		
Public Access			
Adjoins or within an area with formal public access.	3	10	

A review of lower Waikato River riparian restoration sites

Te Onetea Confluence

RB, Te Onetea Confluence, Rangiriri, SH1

37°26′2.56″S; 175° 8′24.10″E

Off SH1 DOC/iwi

630 × 25 m

1.95 ha

Riverbed adjacent both ends and SH1 landward side

Mainly pasture/ flag iris?

Low terrace (maybe some back swamp?)

Adjoins or within informal public access routes (Te Araroa, unformed road or others).	2		
MANAGEMENT CRITERIA			
Pre-Project Checks			
Site requires no resource consent prior to beginning project or has consent already.	3	3	
Site has no legal issues to be resolved for project to proceed.	3	3	
Site Access			
Can only by accessed by foot; >5 minute walk.	0		
Easy foot access; <5 minute walk.	1	?	
Indirect vehicle access (e.g. gated).	1		
Direct vehicle access.	2	?	
Cost Effectiveness/Sustainability			
Preparation and maintenance costs >\$20,000/ha.	0		
Preparation and maintenance costs \$10,000-20,000/ha.	1		
Preparation and maintenance costs \$5,000-10,000/ha.	2	2	
Preparation and maintenance costs <\$5,000/ha.	3		
Very likely key weed species will dominate within five years of initial planting.	0	0	
Moderately likely key weed species will dominate within five years of initial planting.	1		
Unlikely that key weed species will dominate within five years of initial planting.	3		
Riparian width 10-20 m.	1	1	
Riparian width 20-30 m.	2		
Riparian width >30 m.	3		
Landowner agreed to undertake maintenance after five years.	3		
Unlikely to be affected by erosion.	2	2	
Mahitahi - Working Together			
Complements non-riparian restoration work of other groups.	2	?	Bolbschoenus project.
Complements riparian restoration work of other groups.	3	?	
Volunteer interest likely.	3		
TOTAL SCORE		17	



A review of lower Waikato River riparian restoration sites

SITE DESCRIPTION	
Site Name:	Whangape Confluence A
Site Location:	LB, Whangape Stream confluence , abt 4.25km downstream of Rangiriri
Grid Reference:	37°25′48.76″S; 175° 4′45.04″E
Access:	Off Whangape stopbank from Glen Murray Road or off Horahora stopbank, Horahora Road
Ownership:	Private
Approximate Site Dimensions:	910 × 50 m
Approximate Site Area:	3.95 ha
Boundaries/Adjacent Landowners:	Private
Current Vegetation Cover:	Crack willow, alder and flag iris with pasuyre
Specific Habitat Types Present:	Low terrace/back swamp with levees
Comments:	

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	Y	
The majority of the site is above the normal winter flood zone.	Y/N	Y	Need to negotiate with landowner.
Stock are/will be permanently excluded from the site.	Y/N	¥?	Need to be negotiated with private landowners.
Willing landowner.	Y/N	Y?	Need to be negotiated with private landowners.
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2		
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3	3	
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3		
Contains two or more habitat types.	3	3	
Water Quality			
Intercepts overland flows over >50% of its length.	2	?	
Contains wetland or seepage that receives nutrient enriched water.	3		
Visual Enhancement			
Visible from roads or heavily used public areas.	3		
Current or potential popular recreational site.	3		
Community Engagement			
Within an urban area accessible to the public.	3		
Close to a marae or school.	3	3	2.5km from Horahora Marae.
Close to other hubs of community activity.	2		
Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by manawhenua.	3		
Adjoins or includes historical sites.	3		

Riparian restoration could add value to traditional food, spiritual or cultural uses.	3		
Public Access			
Adjoins or within an area with formal public access.	3		
Adjoins or within informal public access routes (Te Araroa, unformed road or others).	2		
Pre-Project Checks			
Site requires no resource consent prior to beginning project or has consent already.	3	3	
Site has no legal issues to be resolved for project to proceed.	3	3	
Site Access			
Can only by accessed by foot; >5 minute walk.	0		
Easy foot access; <5 minute walk.	1		
Indirect vehicle access (e.g. gated).	1	1	
Direct vehicle access.	2	?	
Cost Effectiveness/Sustainability			
Preparation and maintenance costs >\$20,000/ha.	0		
Preparation and maintenance costs \$10,000-20,000/ha.	1	1	
Preparation and maintenance costs \$5,000-10,000/ha.	2		
Preparation and maintenance costs <\$5,000/ha.	3		
Very likely key weed species will dominate within five years of initial planting.	0	0	
Moderately likely key weed species will dominate within five years of initial planting.	1		
Unlikely that key weed species will dominate within five years of initial planting.	3		
Riparian width 10-20 m.	1	1	
Riparian width 20-30 m.	2		
Riparian width >30 m.	3		
Landowner agreed to undertake maintenance after five years.	3		
Unlikely to be affected by erosion.	2	2	
Mahitahi - Working Together			
Complements non-riparian restoration work of other groups.	2		
Complements riparian restoration work of other groups.	3		
Volunteer interest likely.	3		
TOTAL SCORE		20	





	_
SITE DESCRIPTION	Γ
Site Name:	ŀ
Site Location:	
Grid Reference:	;
Access:	1
Ownership:	ŀ
Approximate Site Dimensions:	
Approximate Site Area:	1
Boundaries/Adjacent Landowners:	
Current Vegetation Cover:	•
Specific Habitat Types Present:] [
Comments:	
BOTTOMLINES	

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	N	
The majority of the site is above the normal winter flood zone.	Y/N	N?	
Stock are/will be permanently excluded from the site.	Y/N	Y	Need to be negotiated with adjacent landowners.
Willing landowner.	Y/N	Y	
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2	2	
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3		
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3		
Contains two or more habitat types.	3	?	
Water Quality			
Intercepts overland flows over >50% of its length.	2		
Contains wetland or seepage that receives nutrient enriched water.	3		
Visual Enhancement			
Visible from roads or heavily used public areas.	3	3	
Current or potential popular recreational site.	3		
Community Engagement			
Within an urban area accessible to the public.	3		
Close to a marae or school.	3		
Close to other hubs of community activity.	2		
Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by manawhenua.	3		
Adjoins or includes historical sites.	3		
Riparian restoration could add value to traditional food, spiritual or cultural uses.	3		
Public Access			

A review of lower Waikato River riparian restoration sites

Whangape Confluence B

LB, Downstream of Whangape Confluence

37°25′33.29″S; 175° 4′35.66″E

Off Churchill Road across private land

WRC?

890 × 35 m

3.45 ha

Private land upstream, paper road and riverbed downstream and WRC landward side

Crack willow, scrub, alder and pasture

Low terrace (maybe some back swamp?)

Adjoins or within an area with formal public access.	3		
Adjoins or within informal public access routes (Te Araroa, unformed road or others).	2		
MANAGEMENT CRITERIA			
Pre-Project Checks			
Site requires no resource consent prior to beginning project or has consent already.	3	3	
Site has no legal issues to be resolved for project to proceed.	3	3	
Site Access			
Can only by accessed by foot; >5 minute walk.	0		
Easy foot access; <5 minute walk.	1	1	
Indirect vehicle access (e.g. gated).	1	1	
Direct vehicle access.	2	2	
Cost Effectiveness/Sustainability			
Preparation and maintenance costs >\$20,000/ha.	0		
Preparation and maintenance costs \$10,000-20,000/ha.	1	1	
Preparation and maintenance costs \$5,000-10,000/ha.	2		
Preparation and maintenance costs <\$5,000/ha.	3		
Very likely key weed species will dominate within five years of initial planting.	0	0	
Moderately likely key weed species will dominate within five years of initial planting.	1		
Unlikely that key weed species will dominate within five years of initial planting.	3		
Riparian width 10-20 m.	1		
Riparian width 20-30 m.	2		
Riparian width >30 m.	3		
Landowner agreed to undertake maintenance after five years.	3		
Unlikely to be affected by erosion.	2		
Mahitahi - Working Together			
Complements non-riparian restoration work of other groups.	2		
Complements riparian restoration work of other groups.	3		
Volunteer interest likely.	3		
TOTAL SCORE		16	



SITE DESCRIPTION	
Site Name:	Opuatia Confluence A
Site Location:	LB, Upstream of Opuatia Stream Confluence
Grid Reference:	37°25′6.08″S; 175° 4′19.00″E
Access:	Off Churchill Road across private land
Ownership:	WRC?
Approximate Site Dimensions:	985 × 30 m
Approximate Site Area:	3.5ha
Boundaries/Adjacent Landowners:	WRC land from road to river
Current Vegetation Cover:	Crack willow, scrub, alder and pasture
Specific Habitat Types Present:	Low terrace (maybe some back swamp?)
Comments:	

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	N	
The majority of the site is above the normal winter flood zone.	Y/N	N?	
Stock are/will be permanently excluded from the site.	Y/N	Y	Need to be negotiated with adjacent landowners.
Willing landowner.	Y/N	Y	
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2	2	
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3		
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3		
Contains two or more habitat types.	3	?	
Water Quality			
Intercepts overland flows over >50% of its length.	2		
Contains wetland or seepage that receives nutrient enriched water.	3		
Visual Enhancement			
Visible from roads or heavily used public areas.	3	3	
Current or potential popular recreational site.	3		
Community Engagement			
Within an urban area accessible to the public.	3		
Close to a marae or school.	3		
Close to other hubs of community activity.	2		
Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by manawhenua.	3		
Adjoins or includes historical sites.	3		
Riparian restoration could add value to traditional food, spiritual or cultural uses.	3		
Public Access			

Adjoins or within an area with formal public access.	3		
Adjoins or within informal public access routes (Te Araroa, unformed coad or others).	2		
MANAGEMENT CRITERIA			
Pre-Project Checks			
Site requires no resource consent prior to beginning project or has consent already.	3	3	
Site has no legal issues to be resolved for project to proceed.	3	3	
Site Access			
Can only by accessed by foot; >5 minute walk.	0		
Easy foot access; <5 minute walk.	1	1	
indirect vehicle access (e.g. gated).	1	1	
Direct vehicle access.	2	2	
Cost Effectiveness/Sustainability			
Preparation and maintenance costs >\$20,000/ha.	0		
Preparation and maintenance costs \$10,000-20,000/ha.	1	1	
Preparation and maintenance costs \$5,000-10,000/ha.	2		
Preparation and maintenance costs <\$5,000/ha.	3		
Very likely key weed species will dominate within five years of initial planting.	0	0	
Moderately likely key weed species will dominate within five years of nitial planting.	1		
Unlikely that key weed species will dominate within five years of initial planting.	3		
Riparian width 10-20 m.	1		
Riparian width 20-30 m.	2		
Riparian width >30 m.	3		
Landowner agreed to undertake maintenance after five years.	3		
Unlikely to be affected by erosion.	2		
Mahitahi - Working Together			
Complements non-riparian restoration work of other groups.	2		
Complements riparian restoration work of other groups.	3		
Volunteer interest likely.	3		
TOTAL SCORE		16	





SITE DESCRIPTION	
Site Name:	Opuatia Confluence B
Site Location:	LB, Opuatia Stream Co
Grid Reference:	37°24′45.81″S; 175° 3′45
Access:	Off Churchill Road
Ownership:	WRC?
Approximate Site Dimensions:	1,015 × 50 m
Approximate Site Area:	5.55 ha
Boundaries/Adjacent Landowners:	WRC land from road t
Current Vegetation Cover:	Crack willow, scrub, al
Specific Habitat Types Present:	Low terrace/back swar
Comments:	

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	N	
The majority of the site is above the normal winter flood zone.	Y/N	N?	
Stock are/will be permanently excluded from the site.	Y/N	Y	Need to be negotiated with adjacent landowners.
Willing landowner.	Y/N	Y	
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2	2	
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3		
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3		
Contains two or more habitat types.	3	?	Back swamps?
Water Quality			
Intercepts overland flows over >50% of its length.	2		
Contains wetland or seepage that receives nutrient enriched water.	3	3	
Visual Enhancement			
Visible from roads or heavily used public areas.	3	3	
Current or potential popular recreational site.	3		
Community Engagement			
Within an urban area accessible to the public.	3		
Close to a marae or school.	3		
Close to other hubs of community activity.	2		
Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by	3		
manawhenua.		k	
Adjoins or includes historical sites.	3	1	
Riparian restoration could add value to traditional food, spiritual or cultural uses.	3	3	
Public Access			
Adjoins or within an area with formal public access.	3		

A review of lower Waikato River riparian restoration sites

onfluence

5.76″E

to river

lder and pasture

mp with levees

Adjoins or within informal public access routes (Te Araroa, unformed road or others).	2		
	1		
MANAGEMENT CRITERIA			
Pre-Project Checks			
Site requires no resource consent prior to beginning project or has consent already.	3	3	
Site has no legal issues to be resolved for project to proceed.	3	3	
Site Access			
Can only by accessed by foot; >5 minute walk.	0		
Easy foot access; <5 minute walk.	1		
Indirect vehicle access (e.g. gated).	1	1	
Direct vehicle access.	2	2	Across farmland.
Cost Effectiveness/Sustainability			
Preparation and maintenance costs >\$20,000/ha.	0	0	
Preparation and maintenance costs \$10,000-20,000/ha.	1		
Preparation and maintenance costs \$5,000-10,000/ha.	2		
Preparation and maintenance costs <\$5,000/ha.	3		
Very likely key weed species will dominate within five years of initial planting.	0	0	
Moderately likely key weed species will dominate within five years of initial planting.	1		
Unlikely that key weed species will dominate within five years of initial planting.	3		
Riparian width 10-20 m.	1		
Riparian width 20-30 m.	2		
Riparian width >30 m.	3		
Landowner agreed to undertake maintenance after five years.	3		
Unlikely to be affected by erosion.	2		
Mahitahi - Working Together			
Complements non-riparian restoration work of other groups.	2		
Complements riparian restoration work of other groups.	3		
Volunteer interest likely.	3		
TOTAL SCORE		17	



A review of lower Waikato River riparian restoration sites

SITE DESCRIPTION	
Site Name:	Punga Punga Wetland A
Site Location:	LB, Punga Punga wetland confluence: c.2km length;
Grid Reference:	37°21′9.25″S; 175° 1′57.37″E
Access:	Off Punga Punga Road or Geraghty Road, Pukekawa
Ownership:	Private?
Approximate Site Dimensions:	1,430 × 70 m
Approximate Site Area:	11.85 ha
Boundaries/Adjacent Landowners:	Private landward
Current Vegetation Cover:	Kahikatea remnants with crack willow, alder and pasture
Specific Habitat Types Present:	Terrace with some wetlands
Comments:	Ownership is unclear - there appears to be some esplanade type of reserve along part of the site

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	Y	
The majority of the site is above the normal winter flood zone.	Y/N	Y	Need to negotiate with landowner.
Stock are/will be permanently excluded from the site.	Y/N	?	Need to be negotiated with private landowners.
Willing landowner.	Y/N	?	
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2	2	
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3	3	
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3		
Contains two or more habitat types.	3	3	
Water Quality			
Intercepts overland flows over >50% of its length.	2		
Contains wetland or seepage that receives nutrient enriched water.	3	?	
Visual Enhancement			
Visible from roads or heavily used public areas.	3	3	
Current or potential popular recreational site.	3		
Community Engagement			
Within an urban area accessible to the public.	3		
Close to a marae or school.	3		
Close to other hubs of community activity.	2		
Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by manawhenua.	3		
Adjoins or includes historical sites.	3		
Riparian restoration could add value to traditional food, spiritual or cultural uses.	3		

Public Access			
Adjoins or within an area with formal public access.	3		
Adjoins or within informal public access routes (Te Araroa, unformed road or others).	2		
MANAGEMENT CRITERIA			
Pre-Project Checks			
Site requires no resource consent prior to beginning project or has consent already.	3	3	
Site has no legal issues to be resolved for project to proceed.	3	3	
Site Access			
Can only by accessed by foot; >5 minute walk.	0		
Easy foot access; <5 minute walk.	1		
Indirect vehicle access (e.g. gated).	1	1	
Direct vehicle access.	2	?	
Cost Effectiveness/Sustainability			
Preparation and maintenance costs >\$20,000/ha.	0		
Preparation and maintenance costs \$10,000-20,000/ha.	1	1	
Preparation and maintenance costs \$5,000-10,000/ha.	2		
Preparation and maintenance costs <\$5,000/ha.	3		
Very likely key weed species will dominate within five years of initial planting.	0	0	
Moderately likely key weed species will dominate within five years of initial planting.	1		
Unlikely that key weed species will dominate within five years of initial planting.	3		
Riparian width 10-20 m.	1	1	
Riparian width 20-30 m.	2		
Riparian width >30 m.	3		
Landowner agreed to undertake maintenance after five years.	3		
Unlikely to be affected by erosion.	2	2	
Mahitahi - Working Together			
Complements non-riparian restoration work of other groups.	2		
Complements riparian restoration work of other groups.	3		
Volunteer interest likely.	3		
TOTAL SCORE		22	



SITE DESCRIPTION	
Site Name:	
Site Location:	1
Grid Reference:	;
Access:	0
Ownership:	
Approximate Site Dimensions:	1
Approximate Site Area:	4
Boundaries/Adjacent Landowners:	
Current Vegetation Cover:]]
Specific Habitat Types Present:	•
Comments:	0
	1.4

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	Y	
The majority of the site is above the normal winter flood zone.	Y/N	Y	Need to negotiate with landowner.
Stock are/will be permanently excluded from the site.	Y/N	?	Need to be negotiated with adjacent landowners.
Willing landowner.	Y/N	?	
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2	2	
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3	3	
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3		
Contains two or more habitat types.	3	3	
Water Quality			
Intercepts overland flows over >50% of its length.	2		
Contains wetland or seepage that receives nutrient enriched water.	3	?	Depends on where the site selected is.
Visual Enhancement			
Visible from roads or heavily used public areas.	3	3	
Current or potential popular recreational site.	3		
Community Engagement			
Within an urban area accessible to the public.	3		
Close to a marae or school.	3		
Close to other hubs of community activity.	2		
Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by manawhenua.	3		Soft and and and and and and and and and and
Adjoins or includes historical sites.	3		
Riparian restoration could add value to traditional food, spiritual or cultural uses.	3		

A review of lower Waikato River riparian restoration sites

Punga Punga Wetland B

LB, Punga Punga wetland confluence: c.2km length

37°20'40.09"S; 175° 1'48.92"E

Off Punga Punga Road or Geraghty Road, Pukekawa Private?

905 × 50 m

4.05 ha

Private landward

Kahikatea remnants with crack willow, alder and pasture

Ownership is unclear - there appears to be some esplanade type of reserve along part of the site

Public Access			
Adjoins or within an area with formal public access.	3	Ì	
Adjoins or within informal public access routes (Te Araroa, unformed road or others).	2		
MANAGEMENT CRITERIA			
Pre-Project Checks		1	
Site requires no resource consent prior to beginning project or has consent already.	3	3	
Site has no legal issues to be resolved for project to proceed.	3	3	
Site Access			
Can only by accessed by foot; >5 minute walk.	0		
Easy foot access; <5 minute walk.	1		
Indirect vehicle access (e.g. gated).	1	1	
Direct vehicle access.	2	?	Farm tracks to the site; negotiate with landowner.
Cost Effectiveness/Sustainability			
Preparation and maintenance costs >\$20,000/ha.	0		
Preparation and maintenance costs \$10,000-20,000/ha.	1	1	
Preparation and maintenance costs \$5,000-10,000/ha.	2		
Preparation and maintenance costs <\$5,000/ha.	3		
Very likely key weed species will dominate within five years of initial planting.	0	0	
Moderately likely key weed species will dominate within five years of initial planting.	1		
Unlikely that key weed species will dominate within five years of initial planting.	3		
Riparian width 10-20 m.	1	1	
Riparian width 20-30 m.	2		
Riparian width >30 m.	3		
Landowner agreed to undertake maintenance after five years.	3		
Unlikely to be affected by erosion.	2	2	
Mahitahi - Working Together			
Complements non-riparian restoration work of other groups.	2		
Complements riparian restoration work of other groups.	3		
Volunteer interest likely.	3		
TOTAL SCORE		22	



A review of lower Waikato River riparian restoration sites



SITE DESCRIPTION	Γ
Site Name:	Γ
Site Location:	Γ
Grid Reference:	
Access:]
Ownership:	
Approximate Site Dimensions:	
Approximate Site Area:	
Boundaries/Adjacent Landowners:	
Current Vegetation Cover:	
Specific Habitat Types Present:	
Comments:	
	Γ

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	Y	
The majority of the site is above the normal winter flood zone.	Y/N	Y	
Stock are/will be permanently excluded from the site.	Y/N	Y	Need to be negotiated with adjacent landowners.
Willing landowner.	Y/N	Y	Recommended by Louisa Alix, WRC.
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2		
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3		
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3		
Contains two or more habitat types.	3		
Water Quality			
Intercepts overland flows over >50% of its length.	2		
Contains wetland or seepage that receives nutrient enriched water.	3		
Visual Enhancement			
Visible from roads or heavily used public areas.	3		
Current or potential popular recreational site.	3		
Community Engagement			
Within an urban area accessible to the public.	3		
Close to a marae or school.	3		August 11/14
Close to other hubs of community activity.	2		
Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by manawhenua.	3		

A review of lower Waikato River riparian restoration sites

Hampton Downs A

RB, Meremere Dragway to Hampton Downs Road: 1km downstream from end of Hampton Downs Road

37°21′21.38″S; 175° 2′26.69″E

Access from Hampton Downs Road

DOC/iwi

830 × 20 m

2.6 ha (2 parts: 1.3 ha, 1.3 ha)

Esplanade reserve and paper road both ends

 ${\it Crack\,willow, conservation\,willow\,hybrids, poplar, alder,}$

pasture

River terrace

Two sites slightly separated

Adjoins or includes historical sites.	3		
Riparian restoration could add value to traditional food, spiritual or cultural uses.	3		
Public Access			
Adjoins or within an area with formal public access.	3	Ì	
Adjoins or within informal public access routes (Te Araroa, unformed road or others).	2	2	
MANAGEMENT CRITERIA			
Pre-Project Checks			
Site requires no resource consent prior to beginning project or has consent already.	3	3	
Site has no legal issues to be resolved for project to proceed.	3	3	
Site Access			
Can only by accessed by foot; >5 minute walk.	0		
Easy foot access; <5 minute walk.	1	1	
Indirect vehicle access (e.g. gated).	1	1	
Direct vehicle access.	2	2	
Cost Effectiveness/Sustainability			
Preparation and maintenance costs >\$20,000/ha.	0		
Preparation and maintenance costs \$10,000-20,000/ha.	1		
Preparation and maintenance costs \$5,000-10,000/ha.	2		
Preparation and maintenance costs <\$5,000/ha.	3	3	
Very likely key weed species will dominate within five years of initial planting.	0	0	
Moderately likely key weed species will dominate within five years of initial planting.	1		
Unlikely that key weed species will dominate within five years of initial planting.	3		
Riparian width 10-20 m.	1	1	
Riparian width 20-30 m.	2		
Riparian width >30 m.	3		
Landowner agreed to undertake maintenance after five years.	3		
Unlikely to be affected by erosion.	2	2	
Mahitahi - Working Together			
Complements non-riparian restoration work of other groups.	2		
Complements riparian restoration work of other groups.	3		
Volunteer interest likely.	3		
TOTAL SCORE		18	



Waikato RiverCare 2014

A review of lower Waikato River riparian restoration sites

132



SITE DESCRIPTION	
Site Name:	Hampton Downs B
Site Location:	RB, Meremere Dragway to Hampton Downs Road: 1km downstream from end of Hampton Downs Road
Grid Reference:	37°20′52.67″S; 175° 2′5.58″E
Access:	Access from Hampton Downs Road
Ownership:	WRC?
Approximate Site Dimensions:	1,000 × 20 m
Approximate Site Area:	3.7 ha
Boundaries/Adjacent Landowners:	Esplanade reserve and paper road both ends
Current Vegetation Cover:	Crack willow, conservation willow hybrids, pasture
Specific Habitat Types Present:	River terrace
Comments:	

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	Y	
The majority of the site is above the normal winter flood zone.	Y/N	Y	
Stock are/will be permanently excluded from the site.	Y/N	Y	Need to be negotiated with adjacent landowners.
Willing landowner.	Y/N	Y	
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2		
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3	3	
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3		
Contains two or more habitat types.	3		
Water Quality			
Intercepts overland flows over >50% of its length.	2		
Contains wetland or seepage that receives nutrient enriched water.	3		
Visual Enhancement			
Visible from roads or heavily used public areas.	3		
Current or potential popular recreational site.	3		
Community Engagement			
Within an urban area accessible to the public.	3		
Close to a marae or school.	3		
Close to other hubs of community activity.	2		
Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by manawhenua.	3		
Adjoins or includes historical sites.	3		
Riparian restoration could add value to traditional food, spiritual or cultural uses.	3		
Public Access			

Adjoins or within informal public access routes (Te Araroa, unfor road or others). MANAGEMENT CRITERIA Pre-Project Checks Site requires no resource consent prior to beginning project or h consent already. Site has no legal issues to be resolved for project to proceed. Site Access Can only by accessed by foot; >5 minute walk. Easy foot access; <5 minute walk. Indirect vehicle access (e.g. gated). Direct vehicle access. Cost Effectiveness/Sustainability Preparation and maintenance costs >\$20,000/ha. Preparation and maintenance costs \$10,000-20,000/ha. Preparation and maintenance costs \$5,000-10,000/ha. Preparation and maintenance costs <\$5,000/ha. Very likely key weed species will dominate within five years of in planting. Moderately likely key weed species will dominate within five year initial planting. Unlikely that key weed species will dominate within five years of planting. Riparian width 10-20 m. Riparian width 20-30 m. Riparian width >30 m. Landowner agreed to undertake maintenance after five years. Unlikely to be affected by erosion. Mahitahi - Working Together Complements non-riparian restoration work of other groups. Complements riparian restoration work of other groups. Volunteer interest likely.

Adjoins or within an area with formal public access.

TOTAL SCORE



	3		
rmed	2	2	
ias	3	3	
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	0		
	1	1	
	1	1	
	2	2	
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nitial	0	0	
ars of	1		
finitial	3		
	1	1	
	2		
	3		
	3		
	2	2	
	2		
	3		
	3		
		21	



SITE DESCRIPTION	
Site Name:	1
Site Location:	1
Grid Reference:	
Access:	
Ownership:	1
Approximate Site Dimensions:	(
Approximate Site Area:	!
Boundaries/Adjacent Landowners:	1
Current Vegetation Cover:	(
Specific Habitat Types Present:	1
Comments:	
BOTTOMLINES	
The site is at least 10 m wide on average.	
The site can be safely accessed without a traffic management p	1
The majority of the site is above the normal winter flood zone.	
Stock are/will be permanently excluded from the site.	
Willing landowner.	-
Will be maintained for at least five years.	
OBJECTIVE CRITERIA	
Biodiversity	
Adjoins or contains an area with >25% indigenous vegetation.	
Adjoins or is within 500 m of an area with >75% indigenous veg	e
Presence of rare plant community or species.	
Provides shade or habitat for aquatic life.	
Contains two or more babitat types	

Provides shade or habitat for aquatic life.
Contains two or more habitat types.
Water Quality
Intercepts overland flows over >50% of its length.
Contains wetland or seepage that receives nutrient enriched wat
Visual Enhancement
Visible from roads or heavily used public areas.
Current or potential popular recreational site.
Community Engagement
Within an urban area accessible to the public.
Close to a marae or school.
Close to other hubs of community activity.
Cultural and Spiritual
Adjoins or includes a cultural and/or spiritual site identified by manawhenua.
Adjoins or includes historical sites.

Riparian restoration could add value to traditional food, spiritual cultural uses.

Dragway A

RB, Meremere Dragway

37°20'21.90"S; 175° 2'20.17"E

Access from Dragway Road

WRC?

950 × 35 m

5.05 ha

Esplanade reserve and paper road both ends

Crack willow, conservation willow hybrids, poplar, alder,

pasture

Low terrace (maybe some back swamp?)

			COMMENTS
	Y/N	Y	
an.	Y/N	Y	
	Y/N	Y	
	Y/N	Y	Need to be negotiated with adjacent landowners.
	Y/N	Y	
	Y/N	Y	
	Set Score	Score	COMMENTS
	2		
tation.	3	3	
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	3	?	
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ter.	3		
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or	3		And we want

Public Access			
Adjoins or within an area with formal public access.	3	1	
Adjoins or within informal public access routes (Te Araroa, unformed road or others).	2	2	
MANAGEMENT CRITERIA			
Pre-Project Checks			
Site requires no resource consent prior to beginning project or has consent already.	3	3	
Site has no legal issues to be resolved for project to proceed.	3	3	
Site Access			
Can only by accessed by foot; >5 minute walk.	0		
Easy foot access; <5 minute walk.	1	1	
Indirect vehicle access (e.g. gated).	1	1	
Direct vehicle access.	2	2	
Cost Effectiveness/Sustainability			
Preparation and maintenance costs >\$20,000/ha.	0		
Preparation and maintenance costs \$10,000-20,000/ha.	1		
Preparation and maintenance costs \$5,000-10,000/ha.	2		
Preparation and maintenance costs <\$5,000/ha.	3	3	
Very likely key weed species will dominate within five years of initial planting.	0	0	
Moderately likely key weed species will dominate within five years of initial planting.	1		
Unlikely that key weed species will dominate within five years of initial planting.	3		
Riparian width 10-20 m.	1	1	
Riparian width 20-30 m.	2		
Riparian width >30 m.	3		
Landowner agreed to undertake maintenance after five years.	3		
Unlikely to be affected by erosion.	2	2	
Mahitahi - Working Together			
Complements non-riparian restoration work of other groups.	2		
Complements riparian restoration work of other groups.	3		
Volunteer interest likely.	3		
TOTAL SCORE		21	



SITE DESCRIPTION	
Site Name:	Dragway B
Site Location:	RB, Meremere Dragway
Grid Reference:	37°20′7.15″S; 175° 3′2.38″E
Access:	Access from Dragway Road
Ownership:	DOC/iwi
Approximate Site Dimensions:	1,160 m × 20 m
Approximate Site Area:	3.85 ha
Boundaries/Adjacent Landowners:	Esplanade reserve and paper road both ends
Current Vegetation Cover:	Crack willow, conservation willow hybrids, poplar, alder,
	pasture
Specific Habitat Types Present:	River terrace
Comments:	

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	Y	
The majority of the site is above the normal winter flood zone.	Y/N	Y	
Stock are/will be permanently excluded from the site.	Y/N	Y	Need to be negotiated with adjacent landowners.
Willing landowner.	Y/N	Y	
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2		
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3	3	
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3		
Contains two or more habitat types.	3		
Water Quality			
Intercepts overland flows over >50% of its length.	2		
Contains wetland or seepage that receives nutrient enriched water.	3		
Visual Enhancement			
Visible from roads or heavily used public areas.	3		
Current or potential popular recreational site.	3		
Community Engagement			
Within an urban area accessible to the public.	3		
Close to a marae or school.	3		
Close to other hubs of community activity.	2		
Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by manawhenua.	3		
Adjoins or includes historical sites.	3		
Riparian restoration could add value to traditional food, spiritual or cultural uses.	3		
Public Access			

Adjoins or within an area with formal public access.	3		
Adjoins or within informal public access routes (Te Araroa, unformed road or others).	2	2	
MANAGEMENT CRITERIA			
Pre-Project Checks			
Site requires no resource consent prior to beginning project or has consent already.	3	3	
Site has no legal issues to be resolved for project to proceed.	3	3	
Site Access			
Can only by accessed by foot; >5 minute walk.	0		
Easy foot access; <5 minute walk.	1	1	
Indirect vehicle access (e.g. gated).	1	1	
Direct vehicle access.	2	2	
Cost Effectiveness/Sustainability			
Preparation and maintenance costs >\$20,000/ha.	0		
Preparation and maintenance costs \$10,000-20,000/ha.	1		
Preparation and maintenance costs \$5,000-10,000/ha.	2		
Preparation and maintenance costs <\$5,000/ha.	3	3	
Very likely key weed species will dominate within five years of initial planting.	0	0	
Moderately likely key weed species will dominate within five years of initial planting.	1		
Unlikely that key weed species will dominate within five years of initial planting.	3		
Riparian width 10-20 m	1	1	
Riparian width 20-30 m	2		
Riparian width >30 m	3		
Landowner agreed to undertake maintenance after five years.	3		
Unlikely to be affected by erosion.	2	?	
Mahitahi - Working Together			
Complements non-riparian restoration work of other groups.	2		
Complements riparian restoration work of other groups.	3		
Volunteer interest likely.	3		
TOTAL SCORE		19	



SITE DESCRIPTION	
Site Name:	Dragway C
Site Location:	RB, Merem
Grid Reference:	37°19′36.96
Access:	Access from
Ownership:	DOC/iwi
Approximate Site Dimensions:	1,350 × 40 r
Approximate Site Area:	4.8 ha
Boundaries/Adjacent Landowners:	Esplanade
Current Vegetation Cover:	Crack willo
Specific Habitat Types Present:	River terra
Comments:	

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	Y	
The majority of the site is above the normal winter flood zone.	Y/N	Y	
Stock are/will be permanently excluded from the site.	Y/N	Y	Need to be negotiated with adjacent landowners.
Willing landowner.	Y/N	Y	
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2	2	
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3	3	
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3		
Contains two or more habitat types.	3		
Water Quality			
Intercepts overland flows over >50% of its length.	2		
Contains wetland or seepage that receives nutrient enriched water.	3		
Visual Enhancement			
Visible from roads or heavily used public areas.	3	3	
Current or potential popular recreational site.	3		
Community Engagement			
Within an urban area accessible to the public.	3		
Close to a marae or school.	3		
Close to other hubs of community activity.	2		
Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by	3		
manawhenua.			
Adjoins or includes historical sites.	3		
Riparian restoration could add value to traditional food, spiritual or cultural uses.	3		
Public Access		N.	
Adjoins or within an area with formal public access.	3	d an	

Waikato RiverCare 2014

nere Dragway to Meremere site

″S; 175° 3′37.56″E

n Dragway Road

reserve and paper road both ends

ow, alder, pasture

ce
Adjoins or within informal public access routes (Te Araroa, unformed road or others).	2	2	
MANAGEMENT CRITERIA	-	-	
Pre-Project Checks			
Site requires no resource consent prior to beginning project or has consent already.	3	3	
Site has no legal issues to be resolved for project to proceed.	3	3	
Site Access			
Can only by accessed by foot; >5 minute walk.	0	?	
Easy foot access; <5 minute walk.	1		
Indirect vehicle access (e.g. gated).	1	?	
Direct vehicle access.	2	?	
Cost Effectiveness/Sustainability			
Preparation and maintenance costs >\$20,000/ha.	0		
Preparation and maintenance costs \$10,000-20,000/ha.	1		
Preparation and maintenance costs \$5,000-10,000/ha.	2	2	
Preparation and maintenance costs <\$5,000/ha.	3		
Very likely key weed species will dominate within five years of initial planting.	0	0	
Moderately likely key weed species will dominate within five years of initial planting.	1		
Unlikely that key weed species will dominate within five years of initial planting.	3		
Riparian width 10-20 m.	1		
Riparian width 20-30 m.	2		
Riparian width >30 m.	3	3	
Landowner agreed to undertake maintenance after five years.	3		
Unlikely to be affected by erosion.	2	2	
Mahitahi - Working Together			
Complements non-riparian restoration work of other groups.	2		
Complements riparian restoration work of other groups.	3		
Volunteer interest likely.	3		
TOTAL SCORE		23	



SITE DESCRIPTION	
Site Name:	Whangamarino Confluence
Site Location:	RB,c.700 m upstream of Whangamarino Confluence
Grid Reference:	37°17′49.32″S; 175° 3′33.41″E
Access:	Off SH1
Ownership:	NZTA
Approximate Site Dimensions:	710 × 30 m
Approximate Site Area:	2.75 ha
Boundaries/Adjacent Landowners:	Paper road and riverbed both ends
Current Vegetation Cover:	Native shrubs with pampas, and scrub weeds, mown grass
Specific Habitat Types Present:	River terrace
Comments:	

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	?	
The majority of the site is above the normal winter flood zone.	Y/N	Y	
Stock are/will be permanently excluded from the site.	Y/N	Y	
Willing landowner.	Y/N	Y?	NZTA.
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2		
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3	3	
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3		
Contains two or more habitat types.	3		
Water Quality			
Intercepts overland flows over >50% of its length.	2		
Contains wetland or seepage that receives nutrient enriched water.	3		
Visual Enhancement			
Visible from roads or heavily used public areas.	3	3	
Current or potential popular recreational site.	3		
Community Engagement			
Within an urban area accessible to the public.	3		
Close to a marae or school.	3		
Close to other hubs of community activity.	2		
Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by manawhenua.	3		
Adjoins or includes historical sites.	3		
Riparian restoration could add value to traditional food, spiritual or cultural uses.	3		
Public Access			
Adjoins or within an area with formal public access.	3		

Adjoins or within informal public access routes (Te Araroa, unfor road or others). MANAGEMENT CRITERIA Pre-Project Checks Site requires no resource consent prior to beginning project or h consent already. Site has no legal issues to be resolved for project to proceed.

Can only by accessed by foot; >5 minute walk.

Easy foot access; <5 minute walk. Indirect vehicle access (e.g. gated).

Direct vehicle access.

Cost Effectiveness/Sustainability Preparation and maintenance costs >\$20,000/ha. Preparation and maintenance costs \$10,000-20,000/ha. Preparation and maintenance costs \$5,000-10,000/ha. Preparation and maintenance costs <\$5,000/ha. Very likely key weed species will dominate within five years of in planting. Moderately likely key weed species will dominate within five year initial planting. Unlikely that key weed species will dominate within five years of planting. Riparian width 10-20 m. Riparian width 20-30 m. Riparian width >30 m. Landowner agreed to undertake maintenance after five years. Unlikely to be affected by erosion. Mahitahi - Working Together Complements non-riparian restoration work of other groups. Complements riparian restoration work of other groups. Volunteer interest likely.

TOTAL SCORE

Site Access



rmed	2	2	
	1	1	
ias	3	3	
	3	3	
		1	
	0		
	1	1	
	1	1	
	2	2	
	0		
	1	1	Previously planted and needs weed control of pampas mainly.
	2		
	3	1	
nitial	0		
ars of	1	1	
finitial	3		
	1		
	2	2	
	3		
	3	?	
	2		
	2		
	3		
	3		
		21	



	-
SITE DESCRIPTION	Γ
Site Name:	
Site Location:	
Grid Reference:	
Access:	
Ownership:	
Approximate Site Dimensions:	
Approximate Site Area:	
Boundaries/Adjacent Landowners:	
Current Vegetation Cover:	
Specific Habitat Types Present:	
Comments:	

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	Y	
The majority of the site is above the normal winter flood zone.	Y/N	?	
Stock are/will be permanently excluded from the site.	Y/N	Y	Human 'stock' the problem: fence area to be planted , to exclude recreational users and possible vandalism
Willing landowner.	Y/N	Y	Owned by DOC and administered by WDC
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2	2	
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3	3	
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3	3	
Contains two or more habitat types.	3	3	River terrace, wetland.
Water Quality			
Intercepts overland flows over >50% of its length.	2		
Contains wetland or seepage that receives nutrient enriched water.	3		
Visual Enhancement			
Visible from roads or heavily used public areas.	3	3	
Current or potential popular recreational site.	3	3	
Community Engagement			
Within an urban area accessible to the public.	3		
Close to a marae or school.	3	3	
Close to other hubs of community activity.	2		
Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by manawhenua.	3	3	A A A A A A A A A A A A A A A A A A A

Waikato RiverCare 2014

Mercer Recreation A

RB, Mercer Recreation downstream of Mercer Village

37°16′18.38″S; 175° 2′9.78″E

Off Kimikimi Road, Mercer

 $\operatorname{DOC}/\operatorname{WDC}\operatorname{admin}$

1,080 × 100 m

10.55 ha

Site is within public reserve and has some riverbed bordering it

Scattered kahikatea, Crack willow, alder, pasture, yellow flag iris

Terrace with some wetlands

Adjoins or includes historical sites.3IRiparian restoration could add value to traditional food, spiritual or cultural uses.33Public AccessIIAdjoins or within an area with formal public access, could33Adjoins or within informal public access, routes (Te Araroa, unformed road or others).33Image: Constrained Constraine			-	
Riparian restoration could add value to traditional food, spiritual or cultural uses.399Public AccessIIIAdjoins or within an area with formal public access.33IAdjoins or within informal public access routes (Te Araroa, unformed road or others).1IIMANAGEMENT CRITERIAIIIIPre-Project ChacksIIIISite requires no resource consent prior to beginning project or has consent already.33ISite has no legal issues to be resolved for project to proceed.33ISite has no legal issues to be resolved for project to proceed.3IICan only by accessed by foot, >5 minute walk.IIIIndirect vehicle access (e.g. gated).IIIIIndirect vehicle access (e.g. gated).IIIIPreparation and maintenance costs \$20,000/ha.IIIIPreparation and maintenance costs \$20,000/ha.IIIIPreparation and maintenance costs \$20,000/ha.IIIIPreparation and maintenance costs \$5,000-lo,000/ha.IIIIPreparation and maintenance costs \$5,000-lo,000/ha.IIIIPreparation and maintenance costs \$5,000-lo,000/ha.IIIIPreparation and maintenance costs \$5,000-lo,000/ha.IIIIPreparation and maintenance costs \$5,000-lo,000/ha.	Adjoins or includes historical sites.	3		
cultural uses.Image: Cultural uses.Image: Cultural uses.Image: Cultural uses.Public Access333Adjoins or within an area with formal public access routes (Te Araroa, unformed road or others).33Adjoins or within informal public access routes (Te Araroa, unformed road or others).11MANAGEMENT CRITERIA111Pre-Project Checks331Site requires no resource consent prior to beginning project or has consent already.331Site has no legal issues to be resolved for project to proceed.331Site Access1111Can only by accessed by foot; >5 minute walk.0111Indirect vehicle access (e.g. gated).1111Direct vehicle access (e.g. gated).1111Preparation and maintenance costs \$20,000/ha.1111Preparation and maintenance costs \$20,000/ha.2111Preparation and maintenance costs \$20,000/ha.1111Preparation and maintenance costs \$5,000-10,000/ha.2111Preparation and maintenance costs \$5,000-10,000/ha.1111Preparation and maintenance costs \$5,000-10,000/ha.3111Preparation and maintenance costs \$5,000-10,000/ha.1111Preparation and maintenance costs \$10,000-ha.1111Prepar	Riparian restoration could add value to traditional food, spiritual or	3		
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Unlikely to be affected by erosion.2Image: marget state	Landowner agreed to undertake maintenance after five years.	3	3	
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TOTAL SCORE 45	Volunteer interest likely.	3	3	There may be an opportunity to initiate working with local iwi who have a claim on the land.
TOTAL SCORE 45				
	TOTAL SCORE		45	



150

SITE DESCRIPTION	
Site Name:	Bluff Road
Site Location:	RB, paper road between Bluff Road and paper road opposite north end of Te Toki Island
Grid Reference:	37°17′3.22″S; 175° 0′55.28″E
Access:	Off Bluff Road, Pokeno
Ownership:	WDC
Approximate Site Dimensions:	890 × 20 m
Approximate Site Area:	2.5 ha
Boundaries/Adjacent Landowners:	Paper road either end, private land landward
Current Vegetation Cover:	Poplar?, conservation willow pasture
Specific Habitat Types Present:	River terrace
Comments:	

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	For most of site - need to check boundaries/fences.
The site can be safely accessed without a traffic management plan.	Y/N	Y	
The majority of the site is above the normal winter flood zone.	Y/N	Y	
Stock are/will be permanently excluded from the site.	Y/N	Y	Need to assess where fence is and width of planting.
Willing landowner.	Y/N	Y?	WDC wants this, paper road.
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2		
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3	3	
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3	?	
Contains two or more habitat types.	3		
Water Quality			
Intercepts overland flows over >50% of its length.	2	2	
Contains wetland or seepage that receives nutrient enriched water.	3		
Visual Enhancement			
Visible from roads or heavily used public areas.	3		
Current or potential popular recreational site.	3		
Community Engagement			
Within an urban area accessible to the public.	3		
Close to a marae or school.	3		
Close to other hubs of community activity.	2		
Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by manawhenua.	3		
Adjoins or includes historical sites.	3		
Riparian restoration could add value to traditional food, spiritual or cultural uses.	3		

Public Access Adjoins or within an area with formal public access. Adjoins or within informal public access routes (Te Araroa, unfor road or others). MANAGEMENT CRITERIA Pre-Project Checks Site requires no resource consent prior to beginning project or l consent already. Site has no legal issues to be resolved for project to proceed. Site Access Can only by accessed by foot; >5 minute walk. Easy foot access; <5 minute walk. Indirect vehicle access (e.g. gated). Direct vehicle access. Cost Effectiveness/Sustainability Preparation and maintenance costs >\$20,000/ha. Preparation and maintenance costs \$10,000-20,000/ha. Preparation and maintenance costs \$5,000-10,000/ha. Preparation and maintenance costs <\$5,000/ha. Very likely key weed species will dominate within five years of in planting. Moderately likely key weed species will dominate within five year initial planting. Unlikely that key weed species will dominate within five years of planting. Riparian width 10-20 m. Riparian width 20-30 m. Riparian width >30 m. Landowner agreed to undertake maintenance after five years. Unlikely to be affected by erosion. Mahitahi - Working Together Complements non-riparian restoration work of other groups. Complements riparian restoration work of other groups. Volunteer interest likely.

TOTAL SCORE



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SITE DESCRIPTION	
Site Name:	
Site Location:	
Grid Reference:	
Access:	
Ownership:	
Approximate Site Dimensions:	
Approximate Site Area:	
Boundaries/Adjacent Landowners:	
Current Vegetation Cover:	
Specific Habitat Types Present:	
Comments:	

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	Y	
The majority of the site is above the normal winter flood zone.	Y/N	Y	
Stock are/will be permanently excluded from the site.	Y/N	Y?	Seems to be fenced - need to negotiate with landholder.
Willing landowner.	Y/N	Y?	Need to negotiate with landholder - DOC suggestion.
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2	2	
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3	3	
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3	3	
Contains two or more habitat types.	3	3	
Water Quality			
Intercepts overland flows over >50% of its length.	2	2	
Contains wetland or seepage that receives nutrient enriched water.	3		
Visual Enhancement			
Visible from roads or heavily used public areas.	3		
Current or potential popular recreational site.	3		
Community Engagement			
Within an urban area accessible to the public.	3		
Close to a marae or school.	3		and the part of the second s
Close to other hubs of community activity.	2		
Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by manawhenua.	3		MAN MAN
Adjoins or includes historical sites.	3	1 11	

Waikato RiverCare 2014

A review of lower Waikato River riparian restoration sites

Buchseeder Site

LB, about 1 km upstream from Smeeds Quarry Road Buchseeder Site

37°17′3.57″S; 174°59′48.08″E

Off Smeeds Quarry Road across private farmland

WDC/LINZ?

595 × 100 m; 640 × 30 m

8.9 ha

Either end riverbed and 'esplanade', private landward side

Crack willow, wetland herbs, pasture and scrub (maybe some poplar)

River terrace, back swamps and riparian margins for stream

A leg of the proposed area follows the stream for whitebait spawning habitat creation

Riparian restoration could add value to traditional food, spiritual or	3		
Public Access			<u> </u>
Adjoins or within an area with formal public access	3		
Adjoins or within informal public access routes (Te Araroa, unformed road or others).	2		
Pre-Project Checks	2	2	
consent already.	3	3	
Site has no legal issues to be resolved for project to proceed.	3	3	
Site Access			
Can only by accessed by foot; >5 minute walk.	0		
Easy foot access; <5 minute walk.	1		
Indirect vehicle access (e.g. gated).	1	1	
Direct vehicle access.	2	?	
Cost Effectiveness/Sustainability			
Preparation and maintenance costs >\$20,000/ha.	0		
Preparation and maintenance costs \$10,000-20,000/ha.	1	1	
Preparation and maintenance costs \$5,000-10,000/ha.	2		
Preparation and maintenance costs <\$5,000/ha.	3		
Very likely key weed species will dominate within five years of initial planting.	0	0	
Moderately likely key weed species will dominate within five years of initial planting.	1		
Unlikely that key weed species will dominate within five years of initial planting.	3		
Riparian width 10-20 m.	1		
Riparian width 20-30 m.	2		
Riparian width >30 m.	3	3	
Landowner agreed to undertake maintenance after five years.	3		
Unlikely to be affected by erosion.	2	2	
Mahitahi - Working Together			
Complements non-riparian restoration work of other groups.	2		
Complements riparian restoration work of other groups.	3		
Volunteer interest likely.	3		
TOTAL SCORE		26	



SITE DESCRIPTION	
Site Name:	Murray Road, Tuakau
Site Location:	Alternative to 23: at Junction of Murray Road and SH22 Doc owned, but other side of road from the river edge
Grid Reference:	37°18′15.28″S; 174°57′8.75″E
Access:	Off Murray Road
Ownership:	DOC/iwi
Approximate Site Dimensions:	310 × 155 m
Approximate Site Area:	5.45 ha
Boundaries/Adjacent Landowners:	Surrounded by private land and roads
Current Vegetation Cover:	With Dacrycarpus dacrydioides remnant; scrub and pasture
Specific Habitat Types Present:	River terrace (podocarp forest), some wetland
Comments:	

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	Y	
The majority of the site is above the normal winter flood zone.	Y/N	Y	
Stock are/will be permanently excluded from the site.	Y/N	Y	There is some problem with adjoining landowner encroachment by grazing.
Willing landowner.	Y/N	Y?	Auckland DOC office would need to be consulted.
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2	2	
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3	3	
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3		
Contains two or more habitat types.	3	3	
Water Quality			
Intercepts overland flows over >50% of its length.	2		
Contains wetland or seepage that receives nutrient enriched water.	3		
Visual Enhancement			
Visible from roads or heavily used public areas.	3	3	
Current or potential popular recreational site.	3		
Community Engagement			
Within an urban area accessible to the public.	3		
Close to a marae or school.	3		
Close to other hubs of community activity.	2		
Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by manawhenua.	3		
Adjoins or includes historical sites.	3		
Riparian restoration could add value to traditional food, spiritual or cultural uses.	3		

Public Access Adjoins or within an area with formal public access. Adjoins or within informal public access routes (Te Araroa, unfor road or others). MANAGEMENT CRITERIA Pre-Project Checks Site requires no resource consent prior to beginning project or h consent already. Site has no legal issues to be resolved for project to proceed. Site Access Can only by accessed by foot; >5 minute walk. Easy foot access; <5 minute walk. Indirect vehicle access (e.g. gated). Direct vehicle access. Cost Effectiveness/Sustainability Preparation and maintenance costs >\$20,000/ha. Preparation and maintenance costs \$10,000-20,000/ha. Preparation and maintenance costs \$5,000-10,000/ha. Preparation and maintenance costs <\$5,000/ha. Very likely key weed species will dominate within five years of in planting. Moderately likely key weed species will dominate within five year initial planting. Unlikely that key weed species will dominate within five years of planting. Riparian width 10-20 m. Riparian width 20-30 m. Riparian width >30 m. Landowner agreed to undertake maintenance after five years. Unlikely to be affected by erosion. Mahitahi - Working Together Complements non-riparian restoration work of other groups. Complements riparian restoration work of other groups. Volunteer interest likely.

TOTAL SCORE

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SITE DESCRIPTION	Γ
Site Name:	Ŀ
Site Location:	
Grid Reference:	I
Access:	
Ownership:	Ŀ
Approximate Site Dimensions:	
Approximate Site Area:	
Boundaries/Adjacent Landowners:	T
Current Vegetation Cover:	
Specific Habitat Types Present:	
Comments:	Γ

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	Y	
The majority of the site is above the normal winter flood zone.	Y/N	Y	
Stock are/will be permanently excluded from the site.	Y/N	Y	Human 'stock' the problem: fence area used by Scouts and for public access and improve visibility for users by some tree removal; allowing rest of site to be planted with bikes etc excluded.
Willing landowner.	Y/N	Y	
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2		
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3	3	
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3		
Contains two or more habitat types.	3	3	
Water Quality			
Intercepts overland flows over >50% of its length.	2		
Contains wetland or seepage that receives nutrient enriched water.	3		
Visual Enhancement			
Visible from roads or heavily used public areas.	3	3	
Current or potential popular recreational site.	3	3	
Community Engagement			
Within an urban area accessible to the public.	3		
Close to a marae or school.	3	d	
Close to other hubs of community activity.	2	2	
Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by manawhenua.	3		

A review of lower Waikato River riparian restoration sites

Alder Road

RB from Tuakau Bridge upstream along Alder Road 500 m 37°17'58.56"\$; 174°56'54.60"E

Off Alder Road and Batkin Reserve access, Tuakau

WDC/LINZ

560 × 100 m

5.3 ha

Riverbed and paper road both ends, road way landward side Scrub, crack willow, alder

Low river terrace/ levee (very sandy)

Adjoins or includes historical sites.	3		
Riparian restoration could add value to traditional food, spiritual or cultural uses.	3		
Public Access			
Adjoins or within an area with formal public access.	3	3	
Adjoins or within informal public access routes (Te Araroa, unformed road or others).	2		
MANAGEMENT CRITERIA			
Pre-Project Checks		1	
Site requires no resource consent prior to beginning project or has consent already.	3	3	
Site has no legal issues to be resolved for project to proceed.	3	3	
Site Access			
Can only by accessed by foot; >5 minute walk.	0		
Easy foot access; <5 minute walk.	1	1	
Indirect vehicle access (e.g. gated).	1	1	
Direct vehicle access.	2	2	
Cost Effectiveness/Sustainability			
Preparation and maintenance costs >\$20,000/ha.	0		
Preparation and maintenance costs \$10,000-20,000/ha.	1	1	
Preparation and maintenance costs \$5,000-10,000/ha.	2		
Preparation and maintenance costs <\$5,000/ha.	3		
Very likely key weed species will dominate within five years of initial planting.	0	0	
Moderately likely key weed species will dominate within five years of initial planting.	1		
Unlikely that key weed species will dominate within five years of initial planting.	3		
Riparian width 10-20 m.	1		
Riparian width 20-30 m.	2		
Riparian width >30 m.	3	3	
Landowner agreed to undertake maintenance after five years.	3		
Unlikely to be affected by erosion.	2	2	
Mahitahi - Working Together			
Complements non-riparian restoration work of other groups.	2		
Complements riparian restoration work of other groups.	3	3	
Volunteer interest likely.	3		
TOTAL SCORE		36	



SITE DESCRIPTION	
Site Name:	Tuakau Bridge A
Site Location:	SH22: LB from Tuakau Bridge to 300 m upstream of bridge
Grid Reference:	37°17′59.63″S; 174°56′42.39″E
Access:	From SH 22
Ownership:	DOC/LINZ
Approximate Site Dimensions:	425 × 25 m
Approximate Site Area:	1.35 ha
Boundaries/Adjacent Landowners:	River bed upstream, road/bridge downstream, road landward side
Current Vegetation Cover:	Crack willow, alder and native species
Specific Habitat Types Present:	Riverbank and terrace
Comments:	

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	Y?	There is a small parking area beside bridge.
The majority of the site is above the normal winter flood zone.	Y/N	Y	
Stock are/will be permanently excluded from the site.	Y/N	Y	
Willing landowner.	Y/N	Y? (WDC?)	
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2	2	
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3	3	
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3		
Contains two or more habitat types.	3	?	
Water Quality			
Intercepts overland flows over >50% of its length.	2	2	
Contains wetland or seepage that receives nutrient enriched water.	3		
Visual Enhancement			
Visible from roads or heavily used public areas.	3	3	
Current or potential popular recreational site.	3		
Community Engagement			
Within an urban area accessible to the public.	3		
Close to a marae or school.	3		
Close to other hubs of community activity.	2		
Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by manawhenua.	3		
Adjoins or includes historical sites.	3		
Riparian restoration could add value to traditional food, spiritual or cultural uses.	3		

Public Access			
Adjoins or within an area with formal public access.	3		
Adjoins or within informal public access routes (Te Araroa, unformed road or others).	2	2	
MANAGEMENT CRITERIA			
Pre-Project Checks			
Site requires no resource consent prior to beginning project or has consent already.	3	3	
Site has no legal issues to be resolved for project to proceed.	3	3	
Site Access			
Can only by accessed by foot; >5 minute walk.	0		
Easy foot access; <5 minute walk.	1	1	
Indirect vehicle access (e.g. gated).	1	1	
Direct vehicle access.	2	2	
Cost Effectiveness/Sustainability			
Preparation and maintenance costs >\$20,000/ha.	0		
Preparation and maintenance costs \$10,000-20,000/ha.	1	1	
Preparation and maintenance costs \$5,000-10,000/ha.	2		
Preparation and maintenance costs <\$5,000/ha.	3		
Very likely key weed species will dominate within five years of initial planting.	0		
Moderately likely key weed species will dominate within five years of initial planting.	1	1	
Unlikely that key weed species will dominate within five years of initial planting.	3		
Riparian width 10-20 m.	1	1	
Riparian width 20-30 m.	2		
Riparian width >30 m.	3		
Landowner agreed to undertake maintenance after five years.	3		
Unlikely to be affected by erosion.	2		
Mahitahi - Working Together			
Complements non-riparian restoration work of other groups.	2		
Complements riparian restoration work of other groups.	3	3	
Volunteer interest likely.	3		
TOTAL SCORE		28	



SITE DESCRIPTION	Γ
Site Name:	ľ
Site Location:	
Grid Reference:	1
Access:	
Ownership:	
Approximate Site Dimensions:	
Approximate Site Area:	ŀ
Boundaries/Adjacent Landowners:	
Current Vegetation Cover:	
Specific Habitat Types Present:	
Comments:	

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	?	Need to find out whether the site can be safely accessed.
The majority of the site is above the normal winter flood zone.	Y/N	Y	
Stock are/will be permanently excluded from the site.	Y/N	Y	
Willing landowner.	Y/N	Y (WDC?)	
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2		
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3	3	
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3		
Contains two or more habitat types.	3	?	
Water Quality			
Intercepts overland flows over >50% of its length.	2		
Contains wetland or seepage that receives nutrient enriched water.	3		
Visual Enhancement			
Visible from roads or heavily used public areas.	3	3	
Current or potential popular recreational site.	3		
Community Engagement			
Within an urban area accessible to the public.	3		
Close to a marae or school.	3		
Close to other hubs of community activity.	2		
Cultural and Spiritual			Virl ////
Adjoins or includes a cultural and/or spiritual site identified by manawhenua.	3		
Adjoins or includes historical sites.	3		
Riparian restoration could add value to traditional food, spiritual or cultural uses.	3		

Tuakau Bridge B

LB from Tuakau Bridge downstream 400 m

37°17′45.32″S; 174°56′34.69″E

From Tuakau-Port Waikato Road

LINZ

510 × 15 m

1.3 ha

Road/bridge upstream, river bed downstream, road landward side

Crack willow and native species

Riverbank and terrace

Public Access			
Adjoins or within an area with formal public access.	3	İ	
Adjoins or within informal public access routes (Te Araroa, unformed road or others).	2		
MANAGEMENT CRITERIA			
Pre-Project Checks			
Site requires no resource consent prior to beginning project or has consent already.	3	3	
Site has no legal issues to be resolved for project to proceed.	3	3	
Site Access			
Can only by accessed by foot; >5 minute walk.	0		
Easy foot access; <5 minute walk.	1	1	
Indirect vehicle access (e.g. gated).	1		
Direct vehicle access.	2	2	
Cost Effectiveness/Sustainability			
Preparation and maintenance costs >\$20,000/ha.	0		
Preparation and maintenance costs \$10,000-20,000/ha.	1	1	
Preparation and maintenance costs \$5,000-10,000/ha.	2		
Preparation and maintenance costs <\$5,000/ha.	3		
Very likely key weed species will dominate within five years of initial planting.	0		
Moderately likely key weed species will dominate within five years of initial planting.	1	1	
Unlikely that key weed species will dominate within five years of initial planting.	3		
Riparian width 10-20 m.	1	1	
Riparian width 20-30 m.	2		
Riparian width >30 m.	3		
Landowner agreed to undertake maintenance after five years.	3		
Unlikely to be affected by erosion.	2	2	
Mahitahi - Working Together			
Complements non-riparian restoration work of other groups.	2		
Complements riparian restoration work of other groups.	3		
Volunteer interest likely.	3		
TOTAL SCORE		20	



SITE DESCRIPTION	
Site Name:	Batkin Reserve, Tuakau
Site Location:	Batkin Reserve about 500 m north of boat ramp near Tuakau Bridge
Grid Reference:	37°17′33.46″S; 174°56′40.24″E
Access:	Off River Road (SH22), Tuakau
Ownership:	WDC
Approximate Site Dimensions:	525 × 25 m
Approximate Site Area:	1.6 ha
Boundaries/Adjacent Landowners:	Site is within the Batkin Reserve
Current Vegetation Cover:	Acacia dealbata, common alder, kikuyu and mown grass
Specific Habitat Types Present:	Riverbank and terrace
Comments:	

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	May need to negotiate planting width with WDC/ users.
The site can be safely accessed without a traffic management plan.	Y/N	Y	
The majority of the site is above the normal winter flood zone.	Y/N	Y	
Stock are/will be permanently excluded from the site.	Y/N	Y	
Willing landowner.	Y/N	Y	
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2		
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3	3	
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3	3	
Contains two or more habitat types.	3	3	Riverbank and terrace.
Water Quality			
Intercepts overland flows over >50% of its length.	2		
Contains wetland or seepage that receives nutrient enriched water.	3		
Visual Enhancement			
Visible from roads or heavily used public areas.	3	3	
Current or potential popular recreational site.	3	3	
Community Engagement			
Within an urban area accessible to the public.	3		
Close to a marae or school.	3		
Close to other hubs of community activity.	2	2	
Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by manawhenua.	3		
Adjoins or includes historical sites.	3	?	
Riparian restoration could add value to traditional food, spiritual or cultural uses.	3		

Public Access			
Adjoins or within an area with formal public access.	3	3	
Adjoins or within informal public access routes (Te Araroa, unformed road or others).	2		
MANAGEMENT CRITERIA			
Pre-Project Checks			
Site requires no resource consent prior to beginning project or has consent already.	3	3	
Site has no legal issues to be resolved for project to proceed.	3	3	
Site Access			
Can only by accessed by foot; >5 minute walk.	0		
Easy foot access; <5 minute walk.	1	1	
Indirect vehicle access (e.g. gated).	1	1	
Direct vehicle access.	2	2	
Cost Effectiveness/Sustainability			
Preparation and maintenance costs >\$20,000/ha.	0		
Preparation and maintenance costs \$10,000-20,000/ha.	1		
Preparation and maintenance costs \$5,000-10,000/ha.	2	2	
Preparation and maintenance costs <\$5,000/ha.	3		
Very likely key weed species will dominate within five years of initial planting.	0		
Moderately likely key weed species will dominate within five years of initial planting.	1	1	
Unlikely that key weed species will dominate within five years of initial planting.	3		
Riparian width 10-20 m.	1	1	
Riparian width 20-30 m.	2		
Riparian width >30 m.	3		
Landowner agreed to undertake maintenance after five years.	3	3	
Unlikely to be affected by erosion.	2	2	
Mahitahi - Working Together			
Complements non-riparian restoration work of other groups.	2		
Complements riparian restoration work of other groups.	3	3	
Volunteer interest likely.	3	3	
TOTAL SCORE		45	

171





SITE DESCRIPTION	
Site Name:	Tuakau Jetty A
Site Location:	c.550 m including jetty and picnic area; downstream from corner Lapwood Road and SH 22 near Tuakau
Grid Reference:	37°17′5.48″S; 174°56′7.71″E
Access:	Off corner Lapwood Road and River Road (SH22)
Ownership:	WDC?
Approximate Site Dimensions:	551 × 35 m
Approximate Site Area:	2.4 ha (2 parts: 0.1 ha, 2.3 ha)
Boundaries/Adjacent Landowners:	Road upstream and riverbed/esplanade downstream, landward side is private industrial site
Current Vegetation Cover:	The jetty area is mown grass, the downstream part has cover of crack willow, alder, herbaceous weeds and unidentified exotic species along the boundary of the industrial land
Specific Habitat Types Present:	River Terrace, there may be some wetland on the downstream part of the site
Comments:	Industrial site may have riparian rights and has some water extraction assets on the bank

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	Y	
The majority of the site is above the normal winter flood zone.	Y/N	Y	
Stock are/will be permanently excluded from the site.	Y/N	Y	
Willing landowner.	Y/N	Y	The Waikato District Council has documentation stating that contaminants may be located on part of this parcel. Waikato RiverCare recommends persons interested in undertaking a project at this location contact the Waikato District Council before undertaking any restoration activities at this site. For area downstream of jetty it is unclear who the owner is or if adjacent owner has license for water take.
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2		
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3	3	
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3	3	
Contains two or more habitat types.	3	?	
Water Quality			

Intercepts overland flows over >50% of its length.
Contains wetland or seepage that receives nutrient enriched
Visual Enhancement
Visible from roads or heavily used public areas.
Current or potential popular recreational site.
Community Engagement
Within an urban area accessible to the public.
Close to a marae or school.
Close to other hubs of community activity.
Cultural and Spiritual
Adjoins or includes a cultural and/or spiritual site identified b
manawhenua.
Adjoins or includes historical sites.
Riparian restoration could add value to traditional food, spirit cultural uses.
Public Access
Adjoins or within an area with formal public access.
Adjoins or within informal public access routes (Te Araroa,
unformed road or others).
MANAGEMENT CRITERIA
Pre-Project Checks
Site requires no resource consent prior to beginning project of
consent already.
Site has no legal issues to be resolved for project to proceed.
Site Access
Can only by accessed by foot; >5 minute walk.
Easy foot access; <5 minute walk.
Indirect vehicle access (e.g. gated).
Direct vehicle access.
Cost Effectiveness/Sustainability
Preparation and maintenance costs >\$20,000/ha.
Preparation and maintenance costs \$10,000-20,000/ha.
Preparation and maintenance costs \$5,000-10,000/ha.
Preparation and maintenance costs <\$5,000/ha.
Very likely key weed species will dominate within five years of initial planting.
Moderately likely key weed species will dominate within five
of initial planting.
Unlikely that key weed species will dominate within five year
Discrimenting.
Riparian Width 10-20 m.
Riparian Width 20-30 m.
kiparian width >30 m.
Landowner agreed to undertake maintenance after five years
Unlikely to be attected by erosion.
Mahitahi - Working Together
Complements non-riparian restoration work of other groups.
Complements riparian restoration work of other groups.
Volunteer interest likely.
TOTAL SCORE

A review of lower Waikato River riparian restoration sites Waikato RiverCare 2014

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	2	2	Downstream of jetty - negotiate with
			adjacent landowner for access.
	0	0	Part around the jetty itself is well
			cleared already.
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	0	0	For part downstream of jetty proper.
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SITE DESCRIPTION	
Site Name:	1
Site Location:	3
Grid Reference:	3
Access:	1
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Ownership:	7
Approximate Site Dimensions:	3
Approximate Site Area:	(
Boundaries/Adjacent Landowners:	1
	ç
Current Vegetation Cover:	(
	f
Specific Habitat Types Present:	I
Comments:	

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	Y	
The majority of the site is above the normal winter flood zone.	Y/N	Y	
Stock are/will be permanently excluded from the site.	Y/N	?	Fence may need to be negotiated as landowner has assets associated with water take from the river.
Willing landowner.	Y/N	?	Unclear who landowner is may be WRC/WDC.
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2		
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3	3	
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3	3	
Contains two or more habitat types.	3		
Water Quality			
Intercepts overland flows over >50% of its length.	2		
Contains wetland or seepage that receives nutrient enriched water.	3		
Visual Enhancement			
Visible from roads or heavily used public areas.	3		
Current or potential popular recreational site.	3	10	
Community Engagement		4	
Within an urban area accessible to the public.	3		
Close to a marae or school.	3		
Close to other hubs of community activity.	2		

A review of lower Waikato River riparian restoration sites

Tuakau Jetty B

360 m upstream of Gary McGuire property

37°16′56.71″S; 174°55′45.55″E

By foot from Lapwood Road, or else through private land adjacent to the site (from Geraghtys Road or River Road SH22, Tuakau) - permission needed

WRC?

355 × 20 m

0.85 ha

Both ends are 'riverbed'(WRC?), landward is private market garden

Crack willow (and alder?), and rough grass and weeds (in fenced off river bank area) mown or grazed grass

River terrace

Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by	3	1	
manawhenua.			
Adjoins or includes historical sites.	3		
Riparian restoration could add value to traditional food, spiritual or	3		
cultural uses.			
Public Access			
Adjoins or within an area with formal public access.	3		
Adjoins or within informal public access routes (Te Araroa, unformed	2		
road or others).			
MANAGEMENT CRITERIA			
Pre-Project Checks			
Site requires no resource consent prior to beginning project or has consent already.	3	3	
Site has no legal issues to be resolved for project to proceed.	3	3	
Site Access			
Can only by accessed by foot; >5 minute walk.	0		
Easy foot access; <5 minute walk.	1	1	
Indirect vehicle access (e.g. gated).	1	1	
Direct vehicle access.	2	2	
Cost Effectiveness/Sustainability	1	1	
Preparation and maintenance costs >\$20,000/ha.	0	İ	
Preparation and maintenance costs \$10,000-20,000/ha.	1	1	
Preparation and maintenance costs \$5,000-10,000/ha.	2	2	There may be a fencing cost.
Preparation and maintenance costs <\$5,000/ha.	3		
Very likely key weed species will dominate within five years of initial	0	0	
planting.			
Moderately likely key weed species will dominate within five years of initial planting.	1		
Unlikely that key weed species will dominate within five years of initial	3		
planting.			
Riparian width 10-20 m.	1	1	
Riparian width 20-30 m.	2		
Riparian width >30 m.	3		
Landowner agreed to undertake maintenance after five years.	3		
Unlikely to be affected by erosion.	2		
Mahitahi - Working Together			
Complements non-riparian restoration work of other groups.	2		
Complements riparian restoration work of other groups.	3		
Volunteer interest likely.	3		
TOTAL SCORE		21	



SITE DESCRIPTION	
Site Name:	Gary McGuire
Site Location:	Gary McGuire property (Envirofert)
Grid Reference:	37°16′50.56″S; 174°55′32.94″E
Access:	Through private land adjacent to the site (from Geraghtys Road , Tuakau)
Ownership:	WRC?
Approximate Site Dimensions:	470 × 20 m
Approximate Site Area:	1.3 ha
Boundaries/Adjacent Landowners:	Both ends are 'riverbed' (WRC?), landward is private
Current Vegetation Cover:	Crack willow conservation willow hybrids (or poplar?) with mown grass, rough grass and weeds
Specific Habitat Types Present:	River terrace
Comments:	

BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	Y	
The majority of the site is above the normal winter flood zone.	Y/N	Y	
Stock are/will be permanently excluded from the site.	Y/N	Y	
Willing landowner.	Y/N	Y	
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2		
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3		
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3		
Contains two or more habitat types.	3		
Water Quality			
Intercepts overland flows over >50% of its length.	2		
Contains wetland or seepage that receives nutrient enriched water.	3		
Visual Enhancement			
Visible from roads or heavily used public areas.	3		
Current or potential popular recreational site.	3		
Community Engagement			
Within an urban area accessible to the public.	3		
Close to a marae or school.	3	3	
Close to other hubs of community activity.	2		
Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by manawhenua.	3		
Adjoins or includes historical sites.	3		
Riparian restoration could add value to traditional food, spiritual or cultural uses.	3		
Public Access			

Adjoins or within an area with formal public access.	3		
Adjoins or within informal public access routes (Te Araroa, unformed road or others).	2		
MANAGEMENT CRITERIA			
Pre-Project Checks			
Site requires no resource consent prior to beginning project or has consent already.	3	3	
Site has no legal issues to be resolved for project to proceed.	3	3	
Site Access			
Can only by accessed by foot; >5 minute walk.	0		
Easy foot access; <5 minute walk.	1	1	
Indirect vehicle access (e.g. gated).	1	1	
Direct vehicle access.	2	2	
Cost Effectiveness/Sustainability			
Preparation and maintenance costs >\$20,000/ha.	0		
Preparation and maintenance costs \$10,000-20,000/ha.	1		
Preparation and maintenance costs \$5,000-10,000/ha.	2	2	
Preparation and maintenance costs <\$5,000/ha.	3		
Very likely key weed species will dominate within five years of initial planting.	0	0	
Moderately likely key weed species will dominate within five years of initial planting.	1		
Unlikely that key weed species will dominate within five years of initial planting.	3		
Riparian width 10-20 m.	1	1	
Riparian width 20-30 m.	2		
Riparian width >30 m.	3		
Landowner agreed to undertake maintenance after five years.	3	3	
Unlikely to be affected by erosion.	2	2	
Mahitahi - Working Together			
Complements non-riparian restoration work of other groups.	2		
Complements riparian restoration work of other groups.	3		
Volunteer interest likely.	3	3	
TOTAL SCORE		24	



SITE DESCRIPTION	
Site Name:	E
Site Location:	E
Grid Reference:	3
Access:	F
Ownership:	V
Approximate Site Dimensions:	4
Approximate Site Area:	2.
Boundaries/Adjacent Landowners:	U
	la
Current Vegetation Cover:	C
Specific Habitat Types Present:	R
Comments:	Т
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BOTTOMLINES			COMMENTS
The site is at least 10 m wide on average.	Y/N	Y	
The site can be safely accessed without a traffic management plan.	Y/N	Y	
The majority of the site is above the normal winter flood zone.	Y/N	Y	
Stock are/will be permanently excluded from the site.	Y/N	Y	
Willing landowner.	Y/N	Y?	
Will be maintained for at least five years.	Y/N	Y	
	Set Score	Score	COMMENTS
OBJECTIVE CRITERIA			
Biodiversity			
Adjoins or contains an area with >25% indigenous vegetation.	2	?	
Adjoins or is within 500 m of an area with >75% indigenous vegetation.	3	3	
Presence of rare plant community or species.	3		
Provides shade or habitat for aquatic life.	3		
Contains two or more habitat types.	3	?	
Water Quality			
Intercepts overland flows over >50% of its length.	2		
Contains wetland or seepage that receives nutrient enriched water.	3		
Visual Enhancement			
Visible from roads or heavily used public areas.	3		
Current or potential popular recreational site.	3	3	
Community Engagement			
Within an urban area accessible to the public.	3		
Close to a marae or school.	3		North 1 Mart
Close to other hubs of community activity.	2	2	
Cultural and Spiritual			
Adjoins or includes a cultural and/or spiritual site identified by	3		
manawhenua.			
Adjoins or includes historical sites.	3		

Waikato RiverCare 2014

Elbow Road A

Elbow Road/ upstream of Winstone quarry site

37°16′34.34″S; 174°50′42.91″E

From water ski club access off Elbow Road, Puni, Pukekohe NDC

470 × 35 m

.1 ha

Jpstream private, downstream ski club on WDC land, andward side is also part of WDC reserve.

Crack willow, alder and likely remnants of kahikatea forest

River terrace (and wetland?)

The Waikato District Council has documentation stating that contaminants may be located on part of this parcel. Waikato RiverCare recommends persons interested in undertaking a project at this location contact the Waikato District Council before undertaking any restoration activities at this site.

Riparian restoration could add value to traditional food, spiritual or cultural uses.	3		
Public Access			
Adjoins or within an area with formal public access.	3	3	
Adjoins or within informal public access routes (Te Araroa, unformed road or others).	2		
MANAGEMENT CRITERIA			
Pre-Project Checks			
Site requires no resource consent prior to beginning project or has consent already.	3	3	
Site has no legal issues to be resolved for project to proceed.	3	3	
Site Access			
Can only by accessed by foot; >5 minute walk.	0		
Easy foot access; <5 minute walk.	1	1	
Indirect vehicle access (e.g. gated).	1	1	
Direct vehicle access.	2	2	
Cost Effectiveness/Sustainability			
Preparation and maintenance costs >\$20,000/ha.	0	0	
Preparation and maintenance costs \$10,000-20,000/ha.	1		
Preparation and maintenance costs \$5,000-10,000/ha.	2		
Preparation and maintenance costs <\$5,000/ha.	3		
Very likely key weed species will dominate within five years of initial planting.	0		
Moderately likely key weed species will dominate within five years of initial planting.	1	1	
Unlikely that key weed species will dominate within five years of initial planting.	3		
Riparian width 10-20 m.	1		
Riparian width 20-30 m.	2	2	
Riparian width >30 m.	3		
Landowner agreed to undertake maintenance after five years.	3	3	
Unlikely to be affected by erosion.	2		
Mahitahi - Working Together			
Complements non-riparian restoration work of other groups.	2		
Complements riparian restoration work of other groups.	3		
Volunteer interest likely.	3		
TOTAL SCORE		27	

All photos: Waikato RiverCare unless otherwise credited.





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