

The Waikato Regional Plan has allowed for grandparenting of water being taken by farmers prior to 2008 for dairy shed wash down and milk cooling systems. Many farmers must apply for resource consent before 1 January 2015 to use the grandparenting clause. Anyone taking surface water (with a few exclusions) will need to have an approved Riparian Vegetation Management Plan as part of their resource consent application.

This template will guide you in the preparation of a Riparian Management Plan for your farm. Once completed, the template will need to accompany your farm dairy shed water take consent application form that needs to be submitted.



HOW TO COMPLETE YOUR RIPARIAN VEGETATION MANAGEMENT PLAN

The first four pages contain instructions, tips and hints on how to provide all the information required for your application. Pages 5-8 are the template for a Riparian Vegetation Management Plan. Complete the template on the pages provided or add additional pages if you need more room. A list of further resources, such as websites, planting guides and plant species suitable for your area can be found on the Waikato Regional Council website.

Regional Plan Rules regarding grandparented surface water take and streams require farmers to:

1. fence the stream from which water is taken but not any upstream or downstream tributaries, within three years of obtaining consent, with a minimum set back of 3 m from the top of the stream bank;
2. progressively plant the setback area over the period of the consent with predominantly native species (80% or more) at a minimum density of 2,500 stems per hectare; and
3. maintain the fence and planting for the duration of the consent (up to 15 years).

The Riparian Vegetation Management Plan needs to address who, where, what, how and when you will conduct these activities along the entire stream length upon the property from which water is taken.

Note: If it is impractical to fence and plant the stream from which you take water, Regional Council staff will work with you to identify an alternative tributary within the catchment for you to fence and plant. If your stream is already fenced and has vegetation, please contact Regional Council staff to discuss whether it will be sufficient to meet consent requirements.

YOUR CONTACT DETAILS

This is the 'who'. Please provide contact details of the person completing the application.

DESCRIPTION OF PROPERTY

This is the 'where'. Please provide details of the property owner, occupier, area and valuation number.

There is a box for you to draw a farm map or you can attach an aerial photograph or image (such as a Google image or cadastral map from your local council). Whatever option you choose, include and label the following details:

- outline of the property boundary, named road, north arrow
- date of aerial image (if used), map scale, location of stream take
- stream margins to be fenced and planted.

WORK PLAN

This is the 'what', 'when' and 'how' the Riparian Vegetation Management Plan work will be undertaken.

Fencing, planting and maintenance are the main activities that need to occur.

Planting and maintenance activities will include site preparation; selection and ordering of plants; planting; follow up weed control (releasing) and replacement of any plants that die.

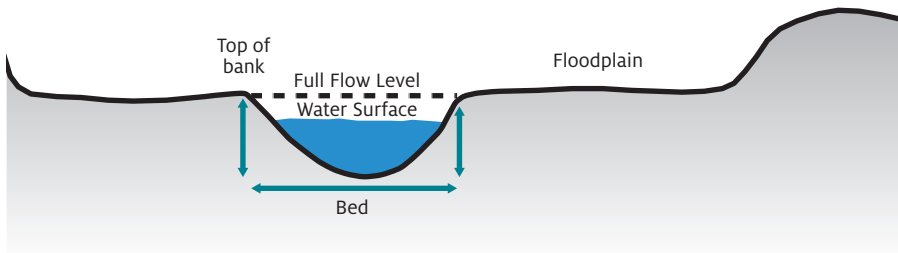
Pest control is optional, but recommended. Reducing the density of animal pests, especially possums, rabbits and hares prior to planting will improve plant survival.

Below is an example of an annual work plan:

Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
New fencing*			✓	✓	✓							
Select plants for next year									✓	✓	✓	
Order plants for next year									✓	✓	✓	
Prepare site		✓	✓	✓	✓							
Collect plants						✓	✓	✓	✓			
Planting						✓	✓	✓	✓			
Release weeds**	✓	✓		✓	✓					✓	✓	
Fence repairs#	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Replace dead plants#						✓	✓	✓	✓			
Pest control ⁺	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

- * Years 1 – 3 only
- ** Releasing involves removing those weeds immediately around the base of plants. Releasing can be reduced to twice per year if spacing between plants is 1.5 m or less and plantings are not threatened from weed competition
- # Check fencing and planting done in previous years' and repair or replace where required
- + Optional.

1. FENCING



Your nominated stream needs to be fenced within three years of obtaining consent.

Fences need to be set back 3 m or more from the top of the bank. Water levels at the annual fullest flow determine where the top of the bank is (refer to Figure 1).

Calculate the length of fence required on the left bank and right bank of the stream. Add these figures together to get the total length of fencing required.

All fencing should generally be permanent and must be completed within three years of obtaining consent. You can fence an equal amount each year or portion the work according to work load and available resources.

Tips and hints

Undertake fencing once the first rains have come through so the ground is softer.

Ensure there is a sufficient gap between your fence line and planting area so stock can't graze your plants or pull them out.

Electric fences will short out if vegetation touches them

Keep fences well maintained to exclude stock - years of work can be destroyed in minutes.

It may be beneficial to have a wider set back:

- where there is boggy, unstable or flood prone ground; this may also reduce stock losses.
- rather than follow twists and turns of the stream; this will to reduce the cost and the length of fence required.

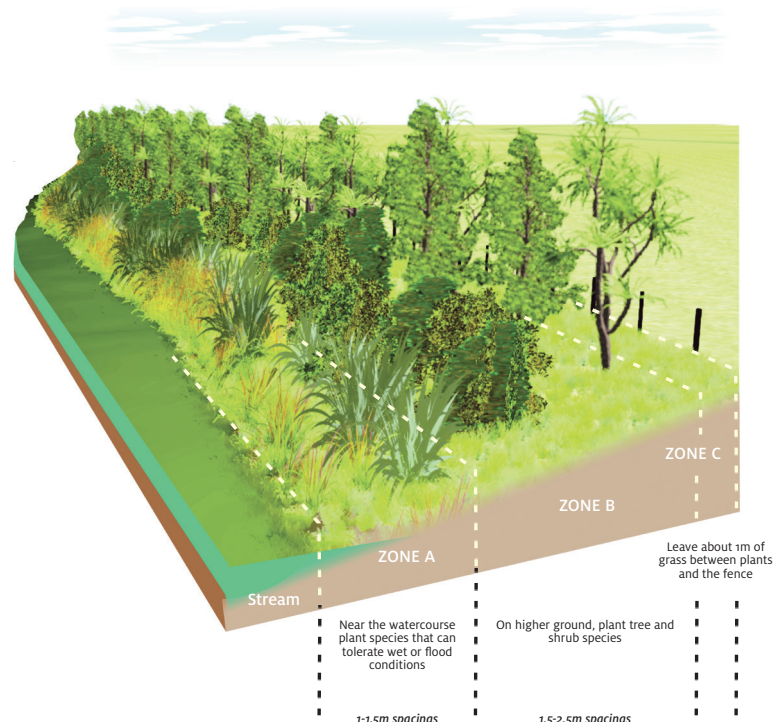
2. PLANTING PLAN

Draw the stream cross section and identify planting zones A, B and C (refer Figure 2):

- Zone A: low growing plants that tolerate wet soils or occasional flooding.
- Zone B: trees and shrubs in damp or dry soils, not usually flooded.
- Zone C: pasture strip between fence and trees / shrubs.

Determine the area of each planting zone by multiplying the length of the stream (following its curves) by the width of set back to be planted. Measure both the stream length and width of the setback in metres.

Select plants suitable for each planting zone. The minimum plant density is 2,500 stems per hectare, although planting density of 4,500 to 10,000 stems per hectare is known to increase plant survival rates and reduce maintenance costs.

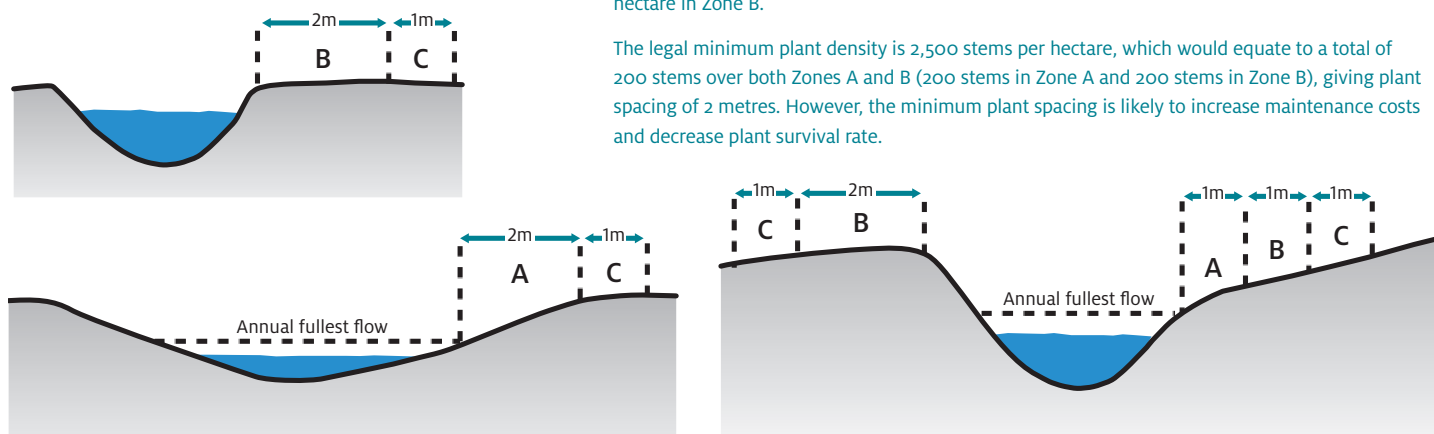


Example of area to be planted and number of plants required:

	Zone A	Zone B	Zone C
Length of stream (m)*	800 m	800 m	800 m
Width to be planted (m)	1 m	1 m	1 m
Area (length x width, m ²)	800 m ²	800 m ²	800 m ²
Plant spacing	1 m	1.5 m	Grass strip
Number of plants = area ÷ plant spacing then ÷ plant spacing (again)	800 m ² ÷ 1 m = 800 then 800 m ² ÷ 1 m = 800	800 m ² ÷ 1.5 m = 533 then 533 m ² ÷ 1.5 m = 356	Grass strip
Number of plants	800	356	Grass strip

* Measure the course of the stream following its bends, not in a straight line.

Example stream profiles



In this example the plant density is 10,000 stems per hectare in Zone A and 4,444 stems per hectare in Zone B.

The legal minimum plant density is 2,500 stems per hectare, which would equate to a total of 200 stems over both Zones A and B (200 stems in Zone A and 200 stems in Zone B), giving plant spacing of 2 metres. However, the minimum plant spacing is likely to increase maintenance costs and decrease plant survival rate.

The following riparian plants are common in the Waikato Region, are frost tolerant, wind tolerant, and are suitable colonisers (grow in exposed sites):

Zone A: low growing, flexible plants that will bend and follow water flow during a flood.

- Rautahi *Carex geminata*
- Rautahi *Carex lessoniana*
- Sward forming sedge *Carex subdola*
- Pukio *Carex virgata*

The first three species are sward forming sedges so plant groups of each species together.

Zone B: trees and shrubs that will grow tall enough to provide shade cover for the stream. Small streams (<3 m) need shrubs and short trees; larger streams (>3 m) need trees.

- Toetoe 1.5 m *Austroderia fulvida* (was *Cortaderia fulvida*)
- Harakeke / flax 2 m *Phormium tenax*
- Ti kouka / cabbage tree 3 m *Cordyline australis*
- Manuka 4 m *Leptospermum scoparium*
- Mahoe / whiteywood 7 m *Melicytus ramiflorus*
- Houhere / lacebark 8 m *Hoheria sexstylosa*
- Broadleaf 10 m *Griselinia littoralis*

Other suitable plant species may be found in the Waikato Regional Council local area planting guide series.

Zone C: grass maintenance strip 1 m wide.

Tips and hints

Plant selection:

- Ecosourced plants have higher survival rates because they are adapted to local conditions.
- Plants of PB2 or PB3 size are better able to compete with weeds and have a higher survival rate.
- Plant taller shrubs and trees on northern stream banks to intercept the sun and provide shade for the stream.
- Plant canopy cover provides shade, lowers the stream temperature and improves the habitat for aquatic invertebrates and fish.

Smaller plant spacings mean a closed canopy will be created quicker. Benefits are:

- reduced light levels will slow or prevent weed growth
- reduced weeds means less time and money spent on maintenance
- a microclimate is created which retains soil moisture and reduces drought damage
- creates stream bank stability and reduces erosion

3. FENCING AND PLANTING SCHEDULE

So far you have determined your fence line, the area to be planted, the species and the number of plants for each zone. The next step is to determine the length of stream you will fence and new area you will prepare and plant each year.

Remember that all fencing needs to be completed within the first 3 years of obtaining consent, so you may have fewer resources available for planting at this time.

Maintenance is a key activity to ensure the survival and success of riparian plantings. As you complete the fencing and planting schedule, keep in mind maintenance requirements for previously planted areas and how this will impact your available resources. Section 4 below contains detailed information regarding time and costs associated with planting activities.

4. APPENDIX 'ANNUAL WORK PLAN'

To help plan your annual activities, use the worksheet attached as an appendix. Each year, use this sheet to plan pre-ordering plants for the next year, maintenance activities, preparation and planting of new areas and any pest control measures.

You may be required to submit a copy of this appendix annually to Waikato Regional Council as a condition of a consent. If this is required, this will be clearly indicated to you when a consent is granted.

Tips and hints

Begin site preparation, weed control and planting upstream and progressively move downstream. This will prevent weed fragments carried by the stream reinvading your site.

Cluster plantings in triangles to create a more natural look. Avoid planting in rows.

Remember to remove the plastic planter bag before you put the plant in the ground.

Be realistic about how many plants can be planted in any one year.

Maintenance is time consuming. It's important to schedule it in or you will lose your riparian investment.

Weeds:

- Weed control methods include hand weeding, grubbing, slashing, mulching and spraying.
- Blackberry, gorse and broom are the biggest scrub weed issues. Herbicides can be sprayed, or cut and paint stems. Alternatively, you can grub these weeds out.
- Willow can block stream channels, smother native plants and prevent natural regeneration. Control methods include drill and inject, or cut and paint with herbicide. Beware of cutting live crack willow: any twigs or branches that break off will form new trees.
- Don't forget, tall rank grass can smother young plants
- Weed control is most effective when the plants are short.
- Weed control reduces competition with plants for light, moisture, space and nutrients.

Planting includes the following activities:

- selection and ordering of plants;
- site preparation;
- planting; and
- replacement of any dead plants.

Some or all of the planting activities will occur each year.

- **Maintenance** includes fence repairs and release of weeds. Maintenance occurs throughout the year. Planting maintenance is most intensive within the first three years. Make sure you allow plenty of time and resources to do the job. Good maintenance will ensure the survival and healthy growth of your plants.
- **Select plants** - For each planting zone select the plant species and number of plants required. Identify a nursery or supplier where you can order or buy the quantity and species required.
- **Site preparation** - Prepare your site by controlling weeds such as blackberry, gorse, privet, honeysuckle, broom and Spanish heath at least 6 weeks in advance. Mark each planting spot with a circular area cleared using a spade or herbicide.
- **Planting** – collect plants from supplier and lay the plants out on site. Plant the plants.
- **Releasing** – control weed growth regularly around new plants, especially for the first 3 years.
- **Replace** any dead plants from previous year's work.

Herbicides:

- Avoid herbicides entering waterways. If you are spraying near water, use herbicide registered for use around waterways (e.g. water registered formulations of glyphosate).
- Use the right herbicide for the right weed. Refer to the NZ Novachem Agrichemical Manual and details on control methods for each weed species can be found on Auckland Council webpage (http://www.arc.govt.nz/environment/biosecurity/search-for-plants/regional-plants_home.cfm).
- Always follow manufacturer's directions and label instructions.
- Plants can easily be killed by spray drift. Avoid killing your plants by using a shield on the spray nozzle to prevent spray drift onto your native plants or use a wick wiper or similar selective applicator.
- Apply herbicides in light or no winds to avoid spray drift.
- Is it better for you and your staff or paid contractors to do planting and releasing work?
- Allow 2.5 – 3 minutes per plant to lay the plants out, dig the hole, debag, plant and fill in soil.
- On this basis you can get 20-24 plants in the ground per hour.
- A contractor takes about 2 minutes per plant, or 30 plants per hour at a cost of \$36/hr + GST
- A contractor charges about 25 cents per plant for releasing (plus travel & GST).

RIPARIAN VEGETATION MANAGEMENT PLAN

Your contact details

Name: _____

Postal address: _____

Telephone: _____ Mobile: _____

Date of application: _____ Email: _____

Property description

Property name (if applicable): _____

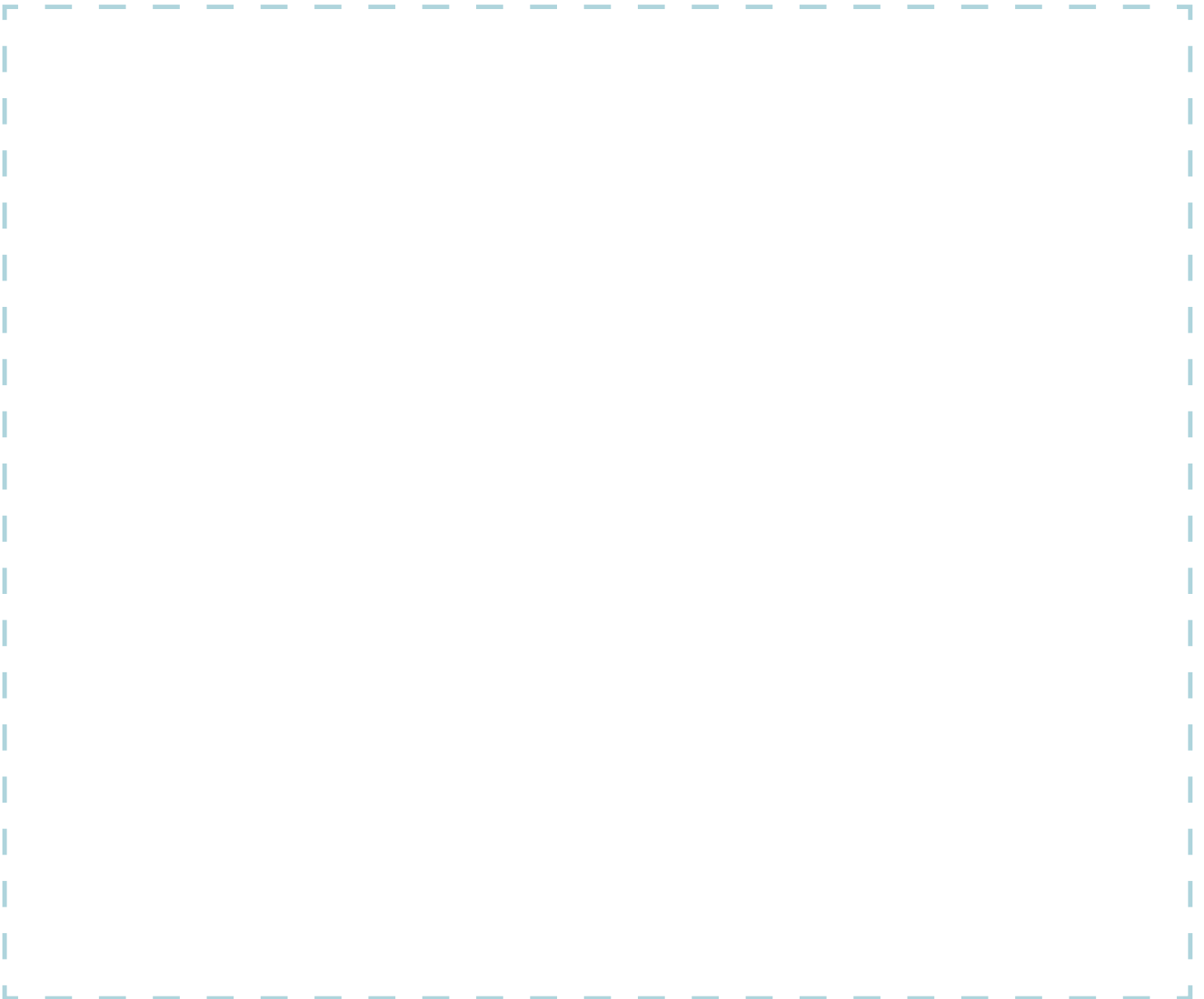
Registered owner(s): _____

Occupier (if different from above): _____

Property address: _____

Name of Waterway to be fenced/planted (if known) _____

Insert farm map here or attach a labelled aerial image



WORK PLAN

1. Fencing

Length of stream to be fenced on:

Left hand side of river: _____ (m)

+ right hand side of river: _____ (m)

= total length of stream to be fenced: _____ (m)

	Year 1* (m)	Year 2* (m)	Year 3* (m)	Total fence length (m)
Length of stream to fence (left & right hand sides)				

*Mark on farm map which section is done in what year

Type of fence to be erected: _____

Fencing to be completed by: farm staff fencing contractor other (specify): _____

2. Planting Plan

Draw the stream cross section and identify Planting Zones A, B and C (refer to stream profiles on page 3):

Area to be planted and number of plants required

(check your stream profile to see if it has both Zone A and Zone B, or just one of these zones):

	Zone A	Zone B	Zone C
Length of stream (m)*			
Width to be planted (m)			1 m
Area (length x width) (m ²)			
Plant spacing**			
Number of plants = Area ÷ plant spacing then ÷ plant spacing (again)			
Number of plants			Grass strip

* Measure the course of the stream following its bends, not in a straight line

** Best practice for Zone A is 1 m spacing which equates to 10,000 plants per hectare. Where larger trees and shrubs are used, best practice for Zone B is 1.5 m spacing which equates to 4,444 plants per hectare. The legal minimum plant density required is 2,500 stems per hectare (2 m spacing). However, the minimum plant spacing is likely to increase maintenance costs and decrease plant survival rate.

3. Planting and maintenance (annual activities)

Total Length of Stream Fencing (left and right) _____ m [From 1]

Total number of plants required _____ plants [From 2]

Zone A Species of Plants selected _____

Zone B Species of Plants selected _____

Anticipated schedule of fencing and planting:

Year	Length of Fencing	Location of planting (area or length). Show on your farm map	Number of plants required (use the table in section 2 for each yearly section to work this out)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

Use this schedule to identify the length of stream you will plant each year. You can bracket years together to indicate that planting will occur at the best opportunity within that period, taking into account climate, financial considerations and farm operations.

APPENDIX 1 – Annual Work Programme

The following template can be copied and used to plan each year's work programme. It does not need to be submitted with your Riparian Vegetation Management Plan, but should be submitted to Waikato Regional Council on a yearly basis to indicate the upcoming work programme and detailing any changes to the anticipated schedule of fencing and planting.

Activity	Details				Timeframe
Fencing	Length of fence (m):				
	Zone A:		Zone B:		
Number of dead plants					
Replacement plants selected*	Species	Number	Species	Number	
	1		1		
	2		2		
	3		3		
	Total replacement plants		Total replacement plants		
New area to be planted (ha)	Zone A:		Zone B:		
Number of dead plants					
Plants selected*	Species	Number	Species	Number	
	1		1		
	2		2		
	3		3		
Order plants**	Nursery or plant supplier:				
Collect plants	Nursery or plant supplier:				
Planting work	Planting work done by:				
	Zone A:		Zone B:		
Weed control for site preparation	Weed species	Method	Weed species	Method	
	1		1		
	2		2		
	3		3		
	4		4		
	5		5		
Planting	Time (hours)	Cost	Time (hours)	Cost	
Weed control releasing – event 1	Weed species	Method	Weed species	Method	
	1		1		
	2		2		
	3		3		
Weed control releasing – event 2	Weed species	Method	Weed species	Method	
	1		1		
	2		2		
Weed control releasing – event 3	Weed species	Method	Weed species	Method	
	1		1		
	2		2		

* Select recommended species or add other desired plants (remember 80% or more of plantings need to be native species).

** It may take up to a year for ordered plants to be ready for pick up - contact your nursery or plant supplier to discuss your specific situation.