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The presentation can be downloaded from the WET website

Waihora Ellesmere Catchment Riparian Restoration Programme

Restoration projects often have multiple inputs from a range of organisations. Some of the projects that highlighted in the presentation have had involvement from up to 5 organisations, as well as individuals, in their development and maintenance.

In 2007 WET hosted the first "Living Lake Symposium" which identified numerous values and drivers associated with Te Waihora/lake Ellesmere and its catchment:

- It is Canterbury's biggest lake at the bottom of a 256,000 ha catchment
- It has over 40 tributaries
- Its major tributaries are high in nitrogen, phosphorus, faecal coliforms & suspended solids
- The Lake is highly eutrophic

A universally agreed action was riparian planting with native species. Funding was sought by WET to carry out a programme of riparian restoration in priority catchment around the Lake. Details of that programme are also on the WET website.

The work can be broadly divided into "talking" and "doing". The experience and knowledge of others was drawn on, landowners were engaged with, and riparian plans prepared. Community groups were organised and educated in restoration practices and put to work planting seedlings. On the "doing" side, in excess of 20 sites were planted out over two years and 50,000 seedlings were installed. Where possible we first used public land with good visibility and access.

WET engaged four different contractors and allowed them to employ their own specific restoration techniques. From this WET was able to identify the components that make up the best restoration system and produced the Lessons Learned publication (available from the WET website).

Riparian restoration is carried out to develop buffers of beneficial vegetation and plant communities along waterways. The proper function of these installations can only work when we get high seedling survival rates and growth. Dead seedlings can't contribute to the designed function of the installation and will compromise the effective performance of the buffer. However, it is normal practice for organisations and individuals to highlight how many seedlings they have planted as a means of identifying the scope and scale of their works.

The costs of the seedlings and the cheapness of their planting are often highlighted. However, very seldom is the survival and performance of the planting quantified. From the results achieved during WET's Riparian Restoration Programme it is apparent that different contractors employ very different practices and that these practices result in different outcomes and associated costs.

Operator	*Costs per seedling*	*Total Cost*	*Survival after 1yr*	*Survival %*	*Cost per live plant*
Contractor A	1000 @ $6.00 each	$6,000	160	16%	$37.50 per live plant
Contractor B	1000 @ $6.50 each	$6,500	680	68%	$9.55 per live plant
Contractor C	1000 @ $7.50 each	$7,500	950	95%	$7.89 per live plant

The true cost of restoration should perhaps be analysed on the basis of the cost per surviving seedling that will grow on and contribute to the installation, and not on how cheaply the work can be carried out. This would also suggest that additional costs incurred to improve survival and performance, eg fertiliser tablets and combiguards, should be considered and weighed against the true cost of mortality.

One example of a thriving riparian plant community can be seen at Boggy Creek after 1 year.

A case study of one site over 18months shows a typical riparian installation sequence - the Old Tai Tapu Road (OTTR) Streamcare group 2010 riparian restoration project on the Halswell River.

First willows were poisoned and then removed. Banks were rebattered to a more sustainable angle. 2460 seedlings were installed. A community planting day attracted 60 people who planted for a day and the balance of the plants were installed by contractors. 600 metres of stream bank was worked on.

The week after the planting the river flooded and engulfed the plants. And it flooded a further 5 times over the next year. The drainage network functioned well. The species engineering was crucial to the seedlings survival, ie, the right plant in the right place, wet tolerant plants along the stream edge.

The September and February earthquakes followed and deposited huge quantities of liquefaction silt and other unwanted material into the river. The river was dredged to rebuild its capacity to carry flood flows.

The snow fell during the first winter.

However, much to many people's surprise the seedlings survived and grew throughout these events The capacity of the river to carry flood flows was restored. After 18 months the installation is performing really well. The species engineering and function, that is the placement of specific species with regards to their growth, form and tolerances, is starting to show through.

Effectively the WET riparian installations are working billboards within the productive landscape, showing what is possible. Saying "it can't be done" is no longer an excuse. As these installations further develop they are becoming part of the visual landscape and an opportunity to add to people's perception of what is possible. They have considerable demonstration and education value to accelerate good management practices.

However, they can also act as a catalyst for poor practice as, in their enthusiasm, landowners may poorly interpret and undertake inappropriate installations and practices. That can lead to failure and disruption to the drainage function of the waterway. Species should not be installed along the waterway edge if they are likely to topple, invade or compromise the drainage function - that's a really good way to get on the wrong side of drainage engineers and drainage committees.

We are also seeing an increase in the spraying of banks which can result in instability and accelerate the movement of sediments to the waterway.

Within the thousands of native species that have evolved within our landscape we have the plants that can carry out specific functions to benefit our purposes. Some of them have some quite quirky attributes that we can apply to our specific requirements.

In the past we have deployed the excavators or reached for the spray to solve a problem. However, we have a host of native plants that could be put to good use – it's just about understanding how. Perhaps it is important that we start to consider how to put the natural environment first and to fit our requirements around it.

Sustainable Drain Management in Selwyn/Waihora -*healthy waterways within productive land*

The Sustainable Drain Management Programme is WET's new 3 year project to further investigate options for improving drain management. This is an ambitious initiative but important as the surface water that enters Te Waihora/Lake Ellesmere flows along classified drains.

In the past our riparian landscape has been managed primarily for the purpose of land drainage with little other consideration. While this is vital for the production and habitation of the district, perhaps our waterways also have other uses that now require increased attention. Then the trout will be bigger and more prolific! More information and updates on this project can be found on a Sustainable Drain Management page on the WET website.

I would like to think that future generations can enjoy the opportunity and experiences that I have had recreating in and around the waterways of Te Waihora. The chance to build a meal around something other than what the supermarket wants to sell me or put it back in the river to live another day - I want that choice.

Stephen Brailsford, March 2012