

# Mapping and Managing Riparian Zones

## Landcare Research LINK Seminar

Ministry for Primary Industries  
Manatū Ahu Matua



*Dairy***NZ** 



**LANDCARE RESEARCH**  
**MANAAKI WENUA**

# Today's seminar

## Outline:

- 30 mins on “Riparian Planner” background
- 15 mins of live demonstration
- Q&A

## Key messages:

- A simplified, user-friendly & effective tool
  - Digital, accountable & transparent
- ...to **actually** enhance water quality



# The DairyNZ Why? Freshwater Reform & Sustainable Dairying

Two big drivers for enhanced water quality, nationwide...

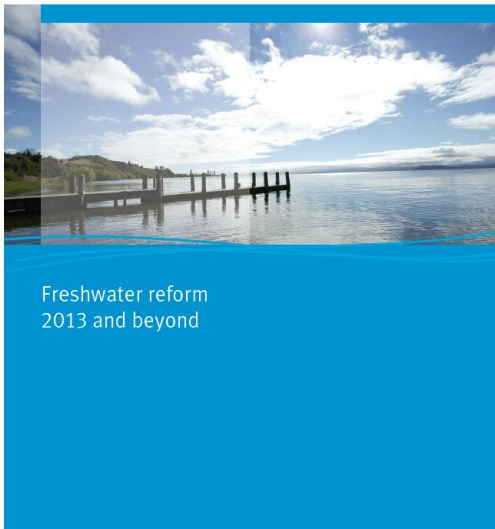
“Water Accord” – Industry commitment on x8500 farms

- Stock exclusion (2017)
- Crossings (2018)
- Riparian plans (2020)
- Actions complete (2030)

DairyNZ responsible for:

- Reporting (3<sup>rd</sup> party audits)
- Farmer guidance & **tools**

New Zealand Government

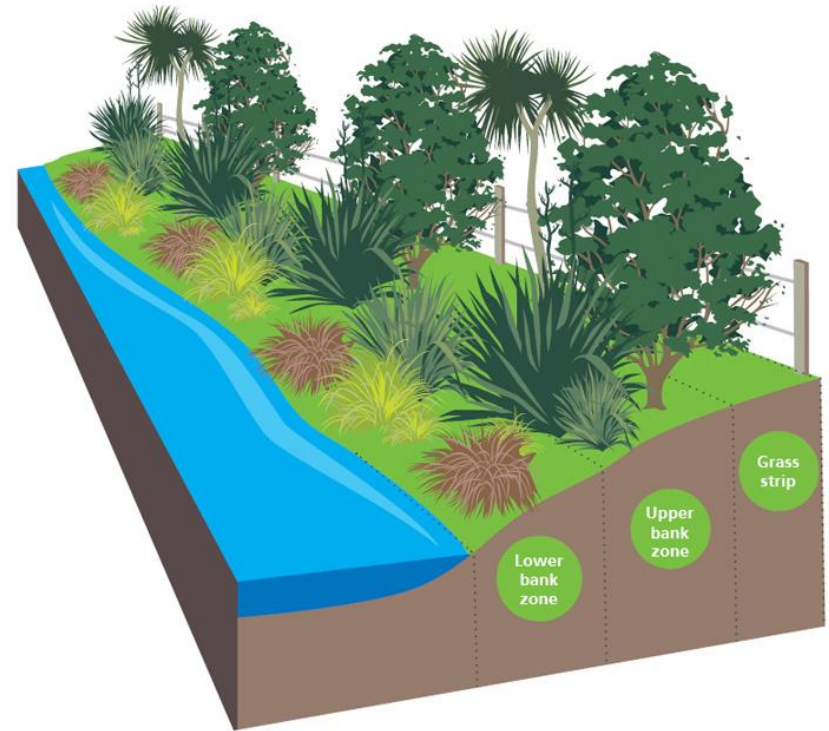


# The DairyNZ Why?

## Filling the Industry toolbox

Riparian management  
**enhances water quality...**

- Stock exclusion – bankside erosion & direct defecation
- Grass filters – strip N, P & *E.coli* (cut & carry)
- Plantings – cool water, shade weeds & offer habitat



So, there must already be a practical riparian tool yes? Yeah nah.

# The LR Why? Riparian management & biodiversity

- Our focus (in this space): biodiversity and ecosystem research
- Understand ecosystem services sustainability and specifically how riparian networks operate
- Focused around how these systems work in an agricultural land use context

# The LR Why? Riparian management & biodiversity

*Riparian networks form dynamic links between terrestrial and aquatic ecosystems, mediate exchange of cross-ecosystem subsidies, provide valuable ecosystem services and sustain under-represented biodiversity*

Some of the key areas of research focus presently are

- How to improve mitigation benefits
- Measuring multiple functions/services
- Creating resilient catchments
- Scaling up to national scales



This research aims to help us understand the critical role riparian networks play



# The LR Why? Riparian management & biodiversity

## An example... Mangawara Wetland Project

- Restoring habitat & enhancing water treatment
- Floating wetland for treatment
- 93% removal of nitrate & 80% total P from water leaving



# The LR Why? Riparian management & biodiversity

Another example – UAV's monitoring on-farm

- Can we use LiDAR or Multispectral imagery to determine extent, continuity, slope and vegetation condition?
- Scoping study





# The LR Why? Integration with our Informatics programme

- Building on work under our Nature Services ‘brand’
- Leveraged our experience in spatial mapping web delivery and science/applied science data services to stakeholders
- Future potential to integrate new techniques and technologies for measuring wetland/riparian ecosystems
- Partnership will allow us to further develop opportunities to assist in getting evidence-based decision making into the agricultural space such as the important dairy sector

# The DairyNZ Development story...

Farmers & rural professionals wanted:

- Better water quality
- Easy to use
- Low cost

Industry needed (more):

- Auditing & Reporting
- Consistency



# The DairyNZ Development story...

## Don't believe us?

# The DairyNZ Development story – Roll-out & Support

Councils & professionals (now) regional training sessions

Farmers (2017+) training, guides & videos (...Field Days)



**More time for farmers - less time with paperwork**

Introducing the Riparian Planner - your online tool for creating quick, easy and effective riparian plans

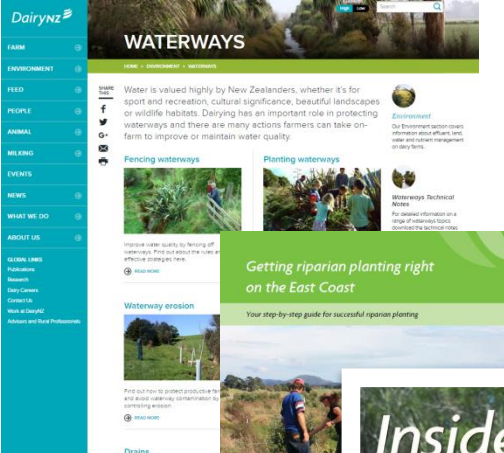
(Region : workshop date : location)

The dairy industry has committed to every dairy farm having a riparian management plan by 2020. Riparian plans are increasingly part of consent obligations. Farmers need **your support and advice** to get their plan sorted.

Join a workshop for rural professionals near you, and walk away with:

- access to an intuitive online tool to make your job easier;
- skills to add to your service offering and the potential to grow your client base;
- knowledge at your fingertips - easy mapping, built-in calculators, regional plants;
- the confidence you can deliver a riparian plan - quickly, effectively and to budget;

Register [here](#) to secure your place for a session delivered by DairyNZ - **free of charge** and **in your region**.



The screenshot shows the DairyNZ website interface. The main heading is 'WATERWAYS'. Below it, there are several articles and guides, including 'Fencing waterways', 'Planting waterways', 'Getting riparian planting right on the East Coast', and 'Waterway erosion'. The website has a blue sidebar with navigation options like 'FARM', 'ENVIRONMENT', 'FEED', 'PEOPLE', 'RURAL', 'MILKING', 'EVENTS', 'NEWS', 'WHAT WE DO', 'ABOUT US', 'SUPPORT', 'CONTACT', and 'WORK WITH US'.



The cover of 'Inside Dairy' magazine features a farmer in a red shirt standing in a field. The title is 'Inside Dairy' with the tagline 'Your levy in action'. Below the title, it says 'FARMER LEADERSHIP' and 'Getting involved beyond the gate'. At the bottom, there are two small text boxes: 'Farmers get a voice with role makers' and 'Water Accord'.



# The LR Development story – Getting under the hood

Technical bits first...

- Web App in current web frameworks: Angular, Bootstrap, .Net, PostGIS database
- Web mapping with OpenLayers
- Consumes four different spatial services (LINZ, Landcare Research) all in the Cloud
- Authentication by a 3<sup>rd</sup> party cloud provider (Auth0)
- Web App and database hosted in the Cloud (Azure)



# The LR Development story – Getting under the hood (Step 1)

**DairyNZ** RIPARIAN PLANNER | LANDCARE RESEARCH MANAAKI WHENUA

**Nathan Guy** Save

1. Describe Plan | 2. Map Waterways | 3. Plan Actions | 4. Get Summary

Fill out the information unique to your property. Entering a verifiable supply number will let the tool locate the associated property on the map.

Plan name:

Start year:

Supply Company:

Supply Number:  Verify

Save

WATERWAYS

20 m

# The LR Development story – Getting under the hood (Step 2)



LINZ NZ Aerial  
Imagery



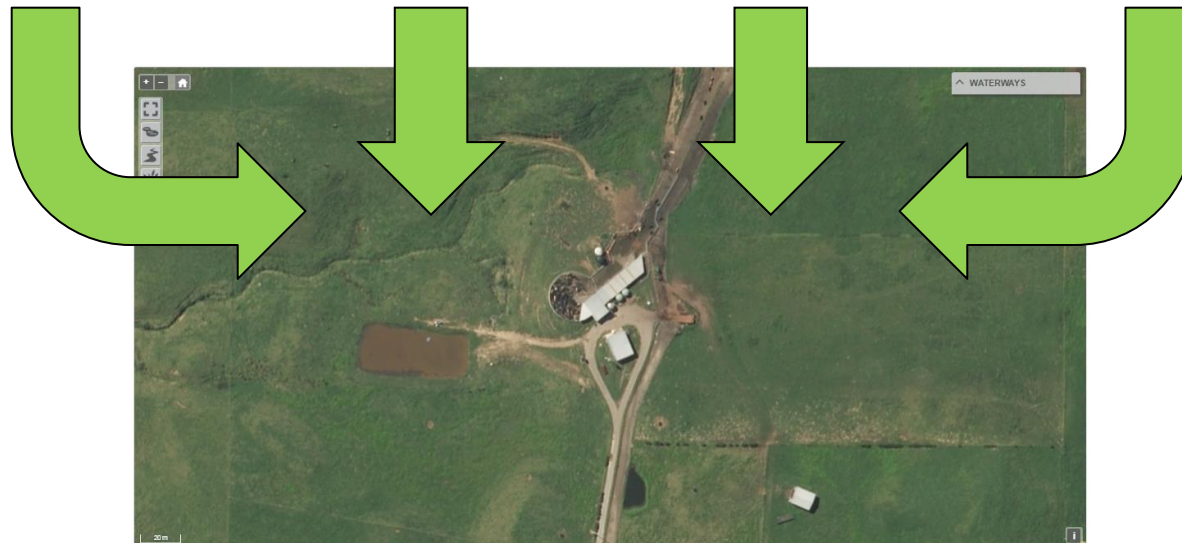
LINZ  
Cadastral



LR  
Topographical



LR Regional  
Boundaries



# The LR Development story – Getting under the hood (Step 2)

lan

2. Map Waterways

3. Plan Actions

4. Get Summary

es and trace its waterways on the map below.

zooming and dragging the map. Then use the tool buttons on the left to define your property's boundary, and to trace its waterways. Select a tool to see more information on how to use it.

h Actions step, review and update the information for each waterway using the waterways list on the top right of the map.

WATERWAYS

- Boundary wetland
- Main river
- Ephemeral creek
- Shed wetland
- Ephemeral 2

Edit Waterways

Shed wetland

Waterway name: Shed wetland

Waterway type: Wetland

Area: 3,070m<sup>2</sup>

Perimeter: 370m

Accord waterway (Waterways at least 1m wide by 30m deep and significant wetlands.):  No

Stock excluded:  No

Length of fencing required to complete stock exclusion (m): 370

Predominant vegetation type: Grass

# The LR Development story – Getting under the hood (Step 3)

1. Describe Plan
2. Map Waterways
3. Plan Actions
4. Get Summary

Fill in the boxes below to plan costs, actions and effort per year for each waterway.

For further information on how to carry out riparian planting please refer to the information and downloadable guides found on [Planting Waterways](#).

Edit the planning costs to change the default plant and fencing costs used in the calculations.

Edit planning costs

Action	Estimated total cost	2016/2017 Total: \$19,140 Plants: 910 <small><a href="#">What's this?</a></small>	2017/2018 Total: \$23,560 Plants: 1820 <small><a href="#">What's this?</a></small>	2018/2019 Total: \$18,351 Plants: 2882 <small><a href="#">What's this?</a></small>	2019/2020 Total: \$11,036 Plants: 1552 <small><a href="#">What's this?</a></small>	2020/2021 Total: \$4,772 Plants: 504 <small><a href="#">What's this?</a></small>										
<p>^ <b>Main river</b></p> <ul style="list-style-type: none"> <li>This Waterway is <b>eroding</b>. Planting here to stabilise banks is a priority. Low eroding banks may be able to be remediated with pole plantings. If the eroding bank is higher than 1.5m, please seek advice from your regional council.</li> </ul>																
Site preparation <small><a href="#">What's this?</a></small>	\$0	\$ <input type="text" value="0"/>	\$ <input type="text" value="0"/>	\$ <input type="text" value="0"/>	\$ <input type="text" value="0"/>	\$ <input type="text" value="0"/>										
Planting <small><a href="#">What's this?</a></small>	<div style="border: 1px solid #008000; padding: 5px;"> <p style="text-align: center; margin: 0;"><b>\$22,770</b></p> <p style="margin: 0;">length to plant: 1,198m</p> <div style="display: flex; align-items: center; margin: 0;"> <span style="margin-right: 5px;">0m</span> <div style="flex-grow: 1; border: 1px solid #ccc; position: relative;"> <div style="background-color: #008000; width: 50.3%; position: absolute; top: -2px; left: -2px;"></div> </div> <span style="margin-left: 5px;">2380m</span> </div> <p style="margin: 0;">percentage to plant: 50.3%</p> <p style="margin: 0;"><small>Number plants allocated from a total of 4,140</small></p> <div style="display: flex; align-items: center; margin: 0;"> <span style="margin-right: 5px;">4144</span> <div style="background-color: #008000; width: 100%; height: 10px;"></div> </div> </div>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">Plants <input type="text" value="910"/></td> </tr> <tr> <td style="text-align: center;">\$ <input type="text" value="5005"/></td> </tr> </table> <p style="font-size: small; margin-top: 5px;">119 plants for the upper bank zone; 791 for the lower bank zone.</p>	Plants <input type="text" value="910"/>	\$ <input type="text" value="5005"/>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">Plants <input type="text" value="910"/></td> </tr> <tr> <td style="text-align: center;">\$ <input type="text" value="5005"/></td> </tr> </table> <p style="font-size: small; margin-top: 5px;">119 plants for the upper bank zone; 791 for the lower bank zone.</p>	Plants <input type="text" value="910"/>	\$ <input type="text" value="5005"/>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">Plants <input type="text" value="910"/></td> </tr> <tr> <td style="text-align: center;">\$ <input type="text" value="5005"/></td> </tr> </table> <p style="font-size: small; margin-top: 5px;">119 plants for the upper bank zone; 791 for the lower bank zone.</p>	Plants <input type="text" value="910"/>	\$ <input type="text" value="5005"/>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">Plants <input type="text" value="910"/></td> </tr> <tr> <td style="text-align: center;">\$ <input type="text" value="5005"/></td> </tr> </table> <p style="font-size: small; margin-top: 5px;">119 plants for the upper bank zone; 791 for the lower bank zone.</p>	Plants <input type="text" value="910"/>	\$ <input type="text" value="5005"/>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">Plants <input type="text" value="504"/></td> </tr> <tr> <td style="text-align: center;">\$ <input type="text" value="2772"/></td> </tr> </table> <p style="font-size: small; margin-top: 5px;">66 plants for the upper bank zone; 438 for the lower bank zone.</p>	Plants <input type="text" value="504"/>	\$ <input type="text" value="2772"/>
Plants <input type="text" value="910"/>																
\$ <input type="text" value="5005"/>																
Plants <input type="text" value="910"/>																
\$ <input type="text" value="5005"/>																
Plants <input type="text" value="910"/>																
\$ <input type="text" value="5005"/>																
Plants <input type="text" value="910"/>																
\$ <input type="text" value="5005"/>																
Plants <input type="text" value="504"/>																
\$ <input type="text" value="2772"/>																
Ongoing maintenance <small><a href="#">What's this?</a></small>	\$2,500	\$ <input type="text" value="500"/>	\$ <input type="text" value="500"/>	\$ <input type="text" value="500"/>	\$ <input type="text" value="500"/>	\$ <input type="text" value="500"/>										



# The LR Development story – Getting under the hood (Step 4)

1. Describe Plan

2. Map Waterways

3. Plan Actions

4. Get Summary

Review and print a summary of your plan, a tailored plant list and a map.

For further information on how to carry out riparian planting please refer to the information and downloadable guides found on Planting Waterways.

Download report

Overview

By Year

Plant List

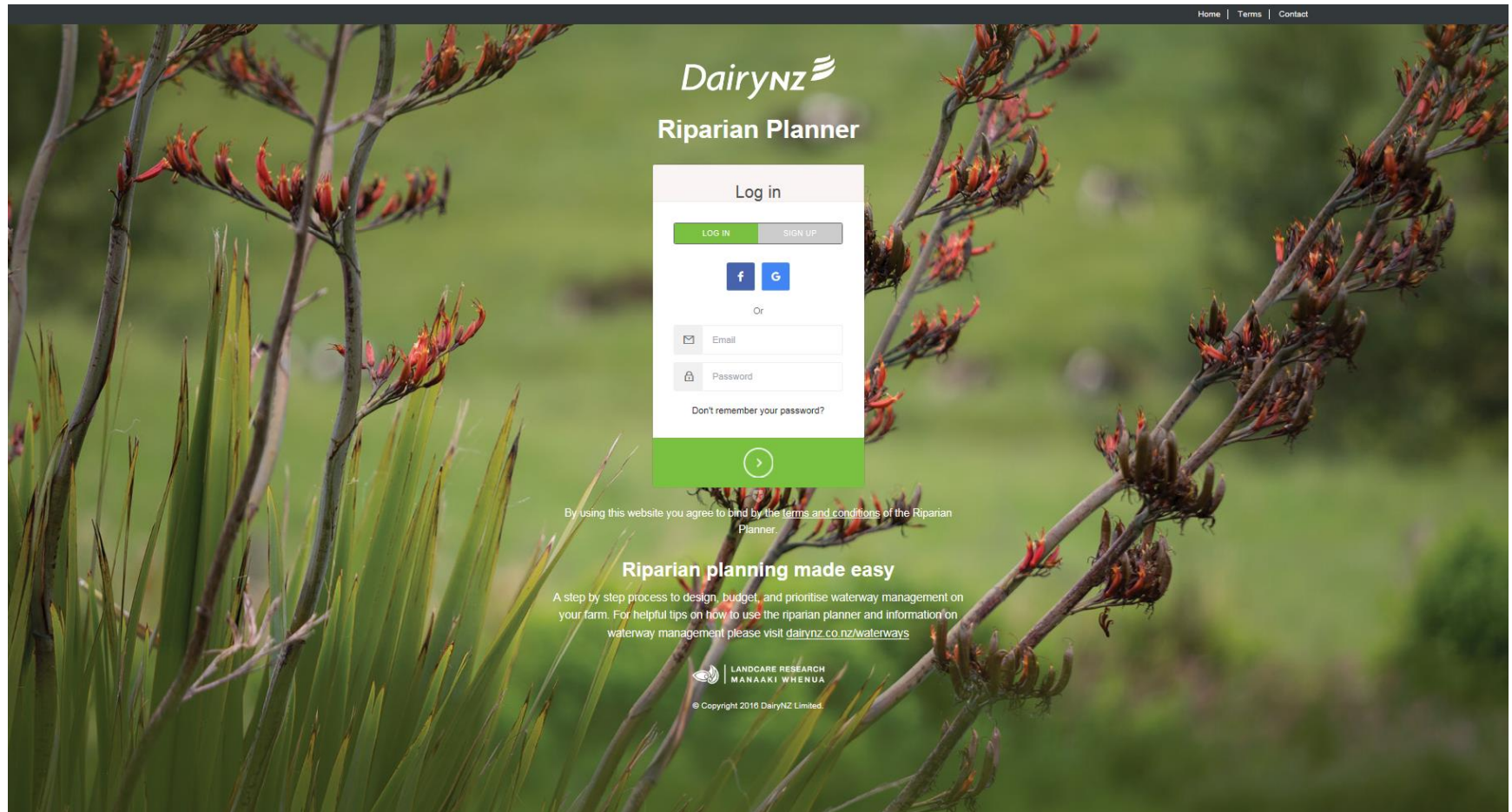
Map

Waterway	Actions				Total cost
	Action	Estimated cost	Start	Finish	
<b>Main river</b> <i>Accord Waterway - eroding - both sides managed - predominantly grass</i>	Site preparation	\$0			\$25,270
	Planting (50%)	\$22,770	2016	2020	
	Ongoing maintenance	\$2,500	2016	2020	
	Other costs	\$0			
<b>Shed wetland</b> <i>Wetland - predominantly grass</i>	Site preparation	\$0			\$16,875
	Fencing (370m)	\$2,035	2016	2016	
	Planting (100%)	\$10,840	2017	2018	
	Ongoing maintenance	\$1,500	2017	2019	
	Other costs	\$2,500	2016	2020	
		2018: Pest traps			
		2017: Pest traps			
		2018: Pest traps			
		2019: Pest traps			
		2020: Pest traps			



# Riparian Planner: A live demo

## Does it hit the mark?



Home | Terms | Contact

**DairyNZ**  
Riparian Planner

Log in

LOG IN SIGN UP

f G

Or

Email

Password

Don't remember your password?

>

By using this website you agree to bind by the [terms and conditions](#) of the Riparian Planner.

**Riparian planning made easy**

A step by step process to design, budget, and prioritise waterway management on your farm. For helpful tips on how to use the riparian planner and information on waterway management please visit [dairynz.co.nz/waterways](http://dairynz.co.nz/waterways)

LANDCARE RESEARCH  
MANAAKI WHENUA

© Copyright 2010 DairyNZ Limited.