Our Land and Water

National Science Challenge

Rural Professionals Fund

A risk assessment approach for prioritising actions in Farm Environment Plans with Mahinga Kai values.

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1. Executive Summary

This project was funded by DairyNZ, with co-funding from the Our Land and Water National Science Challenge Rural Professionals Fund.

The project co-developed and produced a geospatial tool that is available through a webpage. The beta tool allows users (initially dairy farmers) to identify and prioritise management practices and mitigation options for water quality that are optimised to their farm by a typology data set, giving bespoke solutions for each farm. The tool also locates and presents the nearest or most appropriate water quality data set, so users understand their catchment context and the main issues to further prioritise the selection of on-farm actions.

Feedback on the beta version of this tool has been received from various end-user testing groups, including Dairy Environment Leaders (DEL), dairy farmers (during DairyNZ Farmers Forum 2021), rural professionals, and dairy company environmental/sustainability staff. Feedback was collected quantitively and qualitatively, with surveys suggesting general support for the tool, the approach to testing and the added value it brings to farm environment planning.

This tool is novel and designed to help users to target and prioritise the best water quality actions at the least cost. The tool achieves this by:

- Prioritising on farm actions based on contaminant reduction effectiveness
- Providing bespoke, farm specific prioritisation of actions based on each farm's geophysical characteristics
- Giving confidence to act as each recommendation is backed up by peer reviewed science
- Providing up to date water quality information, allowing users to understand their local water quality challenges
- Providing further information for each action, so users have access to current best practice guides

The on-line beta version is going through user-interface development but in the meantime available via the following link: https://farmapt.dairynz.co.nz

2. Project background

The Action for Healthy Waterways reforms will require mandatory and enforceable freshwater farm plans (FW-FPs) as part of wider Farm Environment Plans (FEPs). FEPs delivered in a robust and consistent manner have the potential to offer farmers a practical, farm-specific approach that can risk assess for key contaminants, and facilitate prioritisation of appropriate mitigation actions to reduce the impact of their businesses on the freshwater environment. There are currently many FEP providers, spanning Regional Councils, dairy companies and fertiliser companies, to environmental consultants.

To maximise on the potential effectiveness of FEPs, and to promote up-take on-farm it is key that established and developing mitigations, and Good Management Practices (GMP) are implemented in a consistent and standardised way. Such a standardised approach is currently lacking and is needed to underpin the creation of time bound and SMART actions plans, and provide consistency to mitigation prioritisation that gives farmers confidence to act. A comprehensive body of scientific knowledge underpins established mitigation actions for priority contaminants (Nitrogen (N), Phosphorus (P), Sediment and *E.coli*) via farm-scale studies relative to cost-effectiveness, and this can be further refined according to dairy typology (Monaghan et al., 2021a; 2021b; McDowell et al., 2021) and priority contaminant(s) at catchment or sub-catchment scale. FEPs also offer a framework to capture, report and demonstrate sector practice change. The beta tool developed as part of this work

delivers capacity for transition by reaching out to a large audience to promote rapid uptake and implementation of mitigation actions via a standardised pathway.

3. Project overview

This freely available online-spatial mitigation action prioritisation resource tool has been designed for use when preparing for environmental risk discussions with landowners and the development of Farm Environment Plans. It has been co-developed by DairyNZ, the Our Land and Water National Science Challenge, and AgResearch.

External funding ($50K) was secured from the Our Land and Water Rural Professionals Fund to co-develop this tool building upon 20 years of mitigation science research conducted by AgResearch and others: https://public.flourish.studio/visualisation/3488994/.

The beta tool links users to the most up-to-date science and resources, physical parameters of a farm, and helps prioritise FEP mitigation actions based on key water quality attributes, to ensure on-farm effort is targeted and advice is consistent.

The beta tool is designed to guide the selection and prioritisation of actions for inclusion in a FEP, as well as directing users to useful resources, information, and guidelines.

The functionality enables users to:

- select a farm boundary via an interactive map of New Zealand
- access farm physical data relating to climate, soil, slope, and wetness (i.e., typology)
- view surface water quality data (and associated water quality attribute bands)
- prioritise mitigation actions by contaminant and effectiveness
- view a description/guidance for each mitigation action, and sources of relevant information.

The tool developers acknowledge that no two farms are the same, and so each farm will have a unique solution for a given question. This tool therefore has been designed to be used in conjunction with expert knowledge and on-farm visit(s) to ascertain both site specific practice(s) and farmer goal(s)/outcome(s). The tool has not been designed to inform catchment load reductions in limit-setting processes.

4. Methodology and deliverables

The beta prototype is available and can be accessed at https://farmapt.dairynz.co.nz. This platform gives users access to updated information on mitigations and practices to reduce contaminants.

Login details are as follows:

- User: guest
- Password: letmeseethis

The tool

The information below steps the user through the process of locating a farm boundary, identifying landscape features and catchment water quality, and the recommended mitigation options based on cost effectiveness.

Screen shots:

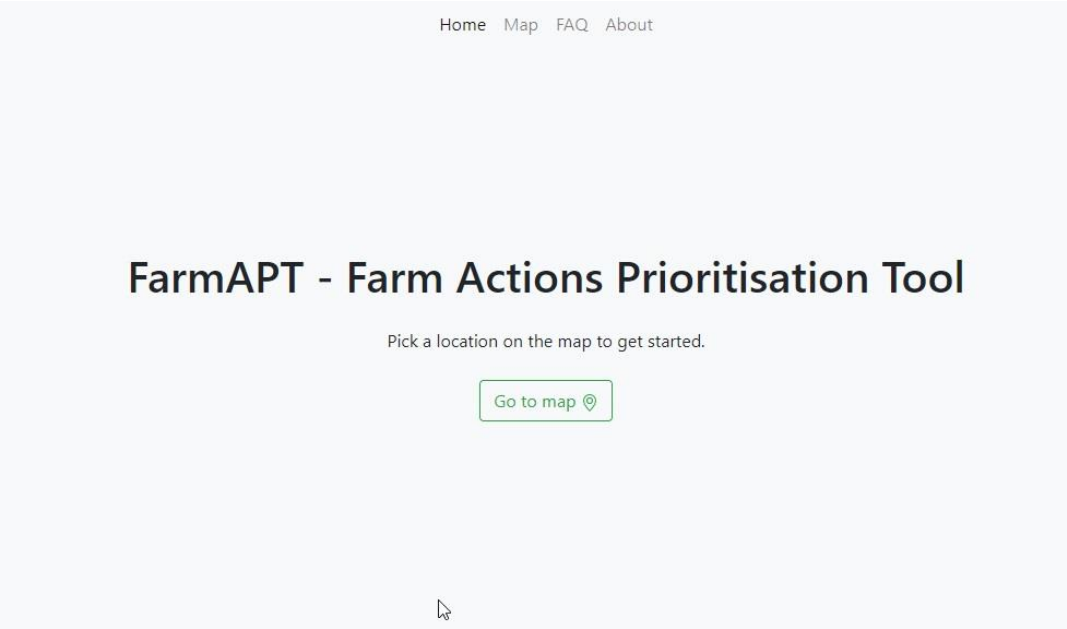

Figure 1: Tool landing page

Figure 2: Interactive map to selected farm property title(s)

Location

Property titles

1. 214068
2. 97213

Typology

Climate: Cool | **Warm**

Soil: **Light** | Well draining | Poorly draining

Slope: **Flat** | Rolling

Wetness: Dry | **Moist** | Wet | Irrigated

Surface Water Quality

Nitrogen

TON 1.42	mg/L	B	Recorded at site EW-00012
NH4 0.71	mg/L	C	Recorded at site EW-00012
TN 3.29	mg/L	Q4	Recorded at site EW-00012

Phosphorus

DRP 0.021	mg/L	D	Recorded at site EW-00078
TP 0.1	mg/L	Q4	Recorded at site EW-00012

Bacteria

E. coli 1400	CFU/100ml	D	Recorded at site EW-00012

Sediment

Clarity 0.93	m	D	Recorded at site EW-00078

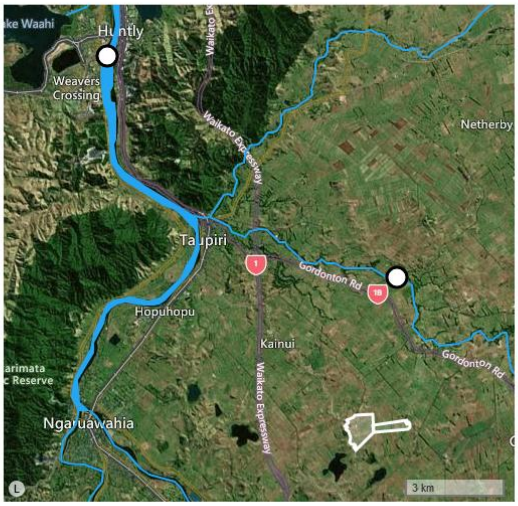

Figure 3: Farm property information, typology and surface water quality data

Figure 4: Mitigation actions prioritised and scored

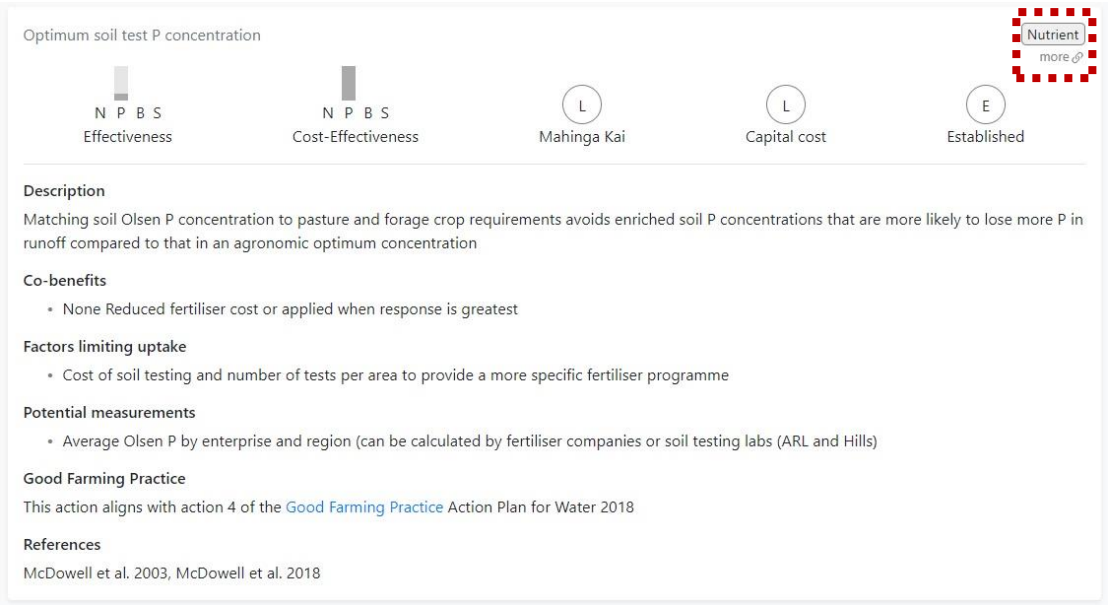

Figure 5: Example mitigation action and associated text.
[Red box highlights interactive link to more information and DairyNZ resources]

Information and resources underpinning the tool.

- Catchment Water Quality Context

Water quality data is retrieved from the closest monitoring site downstream of the farm. When a farm spans multiple sub-catchments, the site with the poorest water quality indicator is automatically selected. If no sites are located downstream of the farm, the first upstream site is used if, and only if, the farm and the upstream site are within the same sub-catchment.

Water quality state is reported as 5-year medians over the 2015-2019 period. Raw data can be accessed on LAWA's download page and water quality results will be updated as new data is uploaded into LAWA.

If no monitoring site could be associated with a farm, or none of the sites has data for a specific contaminant, modelled water quality state is used instead. The model outputs come from NIWA's 2013-1017 modelled river water quality state. The complete dataset is available on MfE's data portal. The modelling methodology is described in the accompanying report.

Note that *E. coli* was not part of the modelled dataset when the prototype was being developed but is available now and will be included in future iterations of the tool.

- Typology

Twenty dairy farm typologies have been developed through other DairyNZ/AgResearch/OL&W work and are classified by a combination of climate, slope drainage and wetness categories (Monaghan et al., 2021a; 2021b; McDowell et al., 2021). A typology is defined by a combination of the following four geophysical attributes driving nutrient and contaminant losses:

- Climate:
  - Cool = < 12°C mean annual temperature
  - Warm = ≥ 12°C mean annual temperature

- Slope:
    - Light = profile available water at 60 cm
    - Well-draining = FSL drainage class 1, 2 or 3
    - Poorly draining = FSL drainage class 4 or 5

- Soil drainage:
    - Flat = up to 7°
    - Rolling = 7° or steeper
- Wetness
    - Dry = mean annual rainfall < 1,100 mm
    - Moist = mean annual rainfall < 1,700 mm
    - Wet = mean annual rainfall ≥ 1,700 mm
    - Irrigated = at least 50% irrigated land

References:

- Monaghan, R, Manderson, A, Basher, L, Smith, C, Burger, D, Meenken, E & McDowell, R, (2021a): Quantifying contaminant losses to water from pastoral landuses in New Zealand I. Development of a spatial framework for assessing losses at a farm scale. DOI: 10.1080/00288233.2021.1936572
- Monaghan, R, Manderson, A, Basher, L, Spiekermann, R, Dymond, J, Smith, C, Muirhead, R, Burger, D, & McDowell, R, (2021b): Quantifying contaminant losses to water from pastoral landuses in New Zealand II. The effects of some farm mitigation actions over the past two decades, New Zealand Journal of Agricultural Research. DOI: 10.1080/00288233.2021.1876741
- McDowell, RW, Monaghan, RM, Smith, C, Manderson, A, Basher, L, Burger, DF, Laurenson, S, Pletnyakov, P, Spiekermann, R, & Depree, C, (2020): Quantifying contaminant losses to water from pastoral land uses in New Zealand III. What could be achieved by 2035? New Zealand Journal of Agricultural Research. DOI: 10.1080/00288233.2020.1844763

➢ Mitigation action prioritisation system

A database of 53 dairy mitigation actions for water quality were compiled and underpin the efficacy of mitigation options in the beta tool. Mitigation effectiveness references the following literatures resources:

- McDowell, RW, Schallenberg, M, Larned, S, (2018) A strategy for optimizing catchment management actions to stressor–response relationships in freshwaters. Ecosphere 9:e02482
- McDowell, RW, Wilcock, RJ, Hamilton, D, 2013. Assessment of Strategies to Mitigate the Impact or Loss of Contaminants from Agricultural Land to Fresh Waters. Ministry for the Environment, Wellington, New Zealand. RE500/2013/066. Wellington (NZ): Ministry for the Environment; p. 46.
- McDowell, RW, Monaghan, RM, Smith, C, Manderson, A, Basher, L, Burger, DF, Laurenson, S, Pletnyakov, P, Spiekermann, R, & Depree, C, (2020): Quantifying contaminant losses to water from pastoral land uses in New Zealand III. What could be achieved by 2035?, New Zealand Journal of Agricultural Research, DOI: 10.1080/00288233.2020.1844763
- Monaghan, R, Manderson, A, Basher, L, Spiekermann, R, Dymond, J, Smith, C, Muirhead, R, Burger, D, & McDowell, R, (2021): Quantifying contaminant losses to water from pastoral landuses in New Zealand II. The effects of some farm mitigation actions over the past two decades, New Zealand Journal of Agricultural Research, DOI: 10.1080/00288233.2021.1876741
- Our Land and Water National Science Challenge - https://ourlandandwater.nz/news/actions-to-include-in-a-farm-environment-plan/
- Menu of practices for dairy farms to improve water quality in Southland and Waikato.
- DNZ nitrogen and phosphorus Body of Knowledge (internal documents)
- McKergow, LA, Tanner, CC, Monaghan, RM, Anderson, G, (2007) Stocktake of diffuse pollution attenuation tools for New Zealand pastoral farming systems. NIWA Client Report: HAM2007-161; p. 111.

The 53 dairy mitigation actions were scored (low, medium, and high) for the following attributes using based on the literature above, and expert knowledge (contracted Dr Ross Monaghan at AgResearch):

1. **Effectiveness** is the relative reduction in contaminant loss for Nitrogen (N), Phosphorus (P), sediment, and *E. coli*:

    - Low = limited reduction in loss
    - Medium = moderate reduction in loss
    - High = significant reduction in loss

2. **Cost-effectiveness** is the relative cost ($) in terms of the quantity of contaminant that could be mitigated for N, P sediment, and *E. coli*:

    - Lowly cost-effective = relatively high cost to mitigate each unit of contaminant
    - Moderately cost-effective = relatively moderate cost to mitigate each unit of contaminant
    - Highly cost-effective = relatively low cost to mitigate each unit of contaminant

Mitigations were categorised as either **'established'** or **'developing'** (Monaghan et al., 2021b and McDowell et al., 2021):

- Established mitigations: a long history and are well established, having been tested over a range of conditions, and include stock exclusion, wintering off paddock, dairy effluent management, and fertiliser management. Practises that are based on sound and agreed first principles, but may not be validated over a wide range of conditions, are also included in this category.
- Developing mitigations: developed over a few years (commonly ≤ 3) and validated at only a small number of locations, and include various edge-of-field mitigations, in-stream sorbents, controlled drainage, management of critical source areas, and retention dams and bunds

3. **Capital cost** to the farm business is provided for 'established' mitigations:

    - Low = limited input of time and expenditure. Limited practice change required.
    - Medium = moderate input of time and expenditure. Some practice change.
    - High = significant input of farmer time and significant expenditure. Significant practice change required.

4. **Mahinga kia** values (benefits) provided by mitigation actions:

    - Low = limited reduction in contaminant loss provides a limited contribution to Mahinga Kai benefits
    - Medium = moderate reduction in contaminant loss provides moderate contribution to Mahinga Kai benefits
    - High = significant reduction in contaminant loss provides a significant contribution to Mahinga Kai benefits

A Mahinga kai literature review was conducted (see **Appendix 1**) and found limited information available to determine quantitative benefits of mitigation actions Mahinga kai benefit. Consequently, the scoring system developed related to the general benefit in water quality improvement that could be achieved through implementation of a particular mitigation action. The approach is primarily Canterbury focused due to this region being where most work on a Mahinga kai assessment approach has been undertaken. The scoring system (Low-Medium-High) developed for Mahinga Kai had not

been peer reviewed nor workshopped with Māori at the time of writing this report (June 2021) and will be necessary to ensure community buy-in and uptake. Further research and investigation is also required to determine a nationally recognised framework, not just for Mahinga kai, but for other overarching values are held by tangata whenua, such as a rivers Muri, Taonga and Kaitiakitanga. These values are recognised as having regional differences and prioritises, and consequently the development of a national framework was considered out of scope for this work.

5. **GHGs**: a simple GHG assessment score for each of the 53 dairy mitigation actions was developed by AgResearch (as of 28 May 2021) in response to end-user testing and feedback. The scores have not yet been incorporated into the beta prototype tool (see section 7 – Next Steps) and may be superseded by work planned under the He Waka Eke Noa programme.

In addition to the metrics outlined in 1-5 above, each mitigation action was aligned with one of the '21 **Good Farming Practice Principles**'. This has been done to allow alignment with dairy sector agreed monitoring and reporting metrics through the Dairy Tomorrow Strategy. Here the sector has agreed to monitor and report progress towards every dairy farmer meeting GFP for each of the relevant 21 principles.

5. End-user testing of beta version

The beta tool was tested with three categories of end-user:

1) Rural professionals including some Regional Councils,
2) Dairy Environment Leaders,
3) Farmers (Table 1).

Table 1: End-user prototype testing sessions

Session	End-user	Date / Venue	No of attendees
1	Rural professionals including some councils	25 March 2021 Zoom workshop Survey Monkey Survey	21
2	Dairy Environment leaders	15 April 2021 Zoom workshop	10
3	Farmers DairyNZ Farmers' Forum 2021	29 April 2021 Interactive workshop session	Circa 100 farmers

1) Rural Professionals

Twenty-one rural professionals attended an online Zoom workshop.

Ten attendees completed post-workshop feedback survey via Survey Monkey.

A summary of rural professional feedback captured during the workshop and subsequent online survey is presented in Tables 2 and 3.

Table 2: Summary of Rural Professional Workshop Notes

Likes	Adjustments to enhance	Adjustments to enhance 2	Risks	Comments
Big picture view	Include Trend data	Include regional plan/sub catchment specifics	Highlights contribution to catchment in terms of pointing the finger	
Potential to integrate with other tools	Make this happen	n/a	Can tool use each others data for value add (cost vs benefit)	Which other tools to work with ?
Water quality links	Expand reporting to same reporting parameters as national reporting	Include Trend Data	Themes and discussion gets lost in the detail	
Resource links	Include regional plan info and requirements	n/a	Info not available and sites constantly updating	Cost of keeping all the links live and data up to date
Its farm specific	Ability to target part areas of a property	Ensuring pulling on local specific data, at good level of detail	Become too complex	
Good tool for dairy only	Wider enterprise selection e.g. Beef and Sheep	n/a	Costs to include this and to get pan industry agreement on the output	Time required to get agreement (MENU's took 2-3 years)
Simplicity of toll	Enhancing reporting and farmer engagement output	Ability for open fields to add commentary	None	
Starting point for action options	Greater mitigation option by enterprise	Include GHG	Difficult to use on complex farms	Does not line up with regional council expectations of appropriate actions for the farm/risk
Covers of basic contributors to risk	Ability to change some parameters to show how they change action selection.	Ability to include farm management/systems influencers in risk matrix	Becomes too complex and output is taken as right due to input detail. Getting Council acceptance/ agreement for use in their region	E.g. changing between flat and steep when a crop being grown to show that risks reduce

Table 3: Summary of Rural Professional post-workshop feedback survey via Survey Monkey.

Likes	Dislikes	Additional functionality
• Simple to use • Easy interface • Catchment water quality context via LAWA • Good high level discussion tool • List of actions and linked to evidence (research) • Prioritised by cost-effectiveness • Ability to select the farmland titles • Supports the farm planning process	• Lack of fine scale farm / paddock resolution • The geospatial interface • Outcomes are quite generic • It is quite busy with the GMP's - less is more	• Ability to bookmark or highlight actions • Ability to manually select soil type • The ability to customise actions at the farm-scale • Ability to override the dominant typology • Link to Regional Council requirements and data • Link to long term water quality trends and other landscape features • Ability to select / deselect options • Ability to select actions completed • Ability to export actions as a document and print • Include slope and soil maps • Link to groundwater quality • Legend for the water quality information • Ability to further refine the scale of the typologies (i.e. fine scale) • Ability to link to useful to link to other available info, like Canterbury maps, LIDAR data, Land Use Capability (LUC) maps etc. • Show on farm risk areas based on soil, drainage, slope, LUC, waterway layers • Add in 3 tick boxes beside each mitigation - fully implemented, in progress, planned • Link to region specific GIS info to make it more property specific • Link to catchment water quality

In general attendees found the tool easy to use and would recommend the tool to colleagues and many thought the tool would benefit from an on-line training course, as summarised by the following statistics:

- 90% of respondents were confident in using the tool effectively
- 50% of respondents were 'very and extremely' confident in using the tool effectively
- 70% of respondents felt that they would require a 'short online course' to be able to use the tool effectively
- 30% of respondents felt that they would require 'no' training to be able to use the tool effectively
- 80% of respondents said they would use the tool moving forward. Reasons included:
    - As a pre-visit identifier of key mitigations for that landscape
    - Good staring point for FEP planning and mitigation options
    - Value for RCs as we scope mitigations to include in FMU Action Plans
    - Useful to demonstrate to farmers the cost effectiveness of the mitigations they are using or plan to use
    - Useful tool to objectively link a property to the wider environmental context
    - Water quality history for a farm and compare current monitoring
- Reasons for not using the tool moving forward included:
    - Recommended GMPs not adequately filtered to what's relevant for the property
    - No ability to export or select or tailor to a farm
- 80% of respondents said they would be 'likely or very likely' to recommend this tool to a colleague

Other general comments from respondents included:

- Tools like this are essential going forward, may not be perfect and will evolve over time - but good start
- Be good to see the tool applied to other farming landscapes (e.g., sheep and beef, short, cropping). Good at getting data out to farmers, what about getting data in? (For example, for FEP planners writing FW-FPs wanting to record which mitigations farmer has selected for their farm)
- Engage with Regional Councils
- Extend to sediment and hill country
- Include all currently available spatial data
- Add GHG mitigation co-benefits

2) Dairy Environment Leaders

Ten DEL farmers attended an online Zoom workshop.

The DEL session was informative in terms of providing supporting clarity on the scope of the target end user audience – i.e., the development of a resource tool that can '*take all farmers along on their FEP journey*'.

It was evident that dairy sector leaders would personally prefer greater functionality to operate at a finer-scale on-farm, and with the ability to input their own farm specific data. However, this tool was not designed to operate at this level as other platforms already fill that gap (e.g., MitAgator). The tool however fills a niche by operating at a national scale by linking to the dairy typology work (Monaghan et al., 2021 and McDowell et al., 2021).

DEL farmers thought the tool should be designed to help farmers with less environmental experience or who hadn't yet developed their FEP. Quotes from DEL farmers include:

"*it will be a very important resource tool for those farmers starting their FEP journey, whereas the farmers on this call are a long way down this journey and are wanting something to answer much more complex problems at a finer resolution at the farm scale; it is a very beneficial resource tool for all farmers*."

"*you have a worthwhile tool, but rather than aim it for the likes of DEL/me etc aim it as a 'starting point' for further discussion. It would assist folks to 'know where to start'. I believe it is at this sub DEL level that the knowledge gap is greatest. If it contains too much detail from the start etc it could become overwhelming. Or else plan to put out a 'basic/starter' version and later look to include more options for more detail*."

Requested additional functionality from the DEL farmers included:

- Agility to override default settings in the tool
- Ability to add your own polygons and data
    - What are the logistics around data storage and maintenance?
- Need to algin both water quality and GHG mitigation actions
- Ability to produce a plan or final summary report
- Consideration for how to seek Regional Council endorsement
- Ability to recognise the co-benefits of actions
- Further develop the Mahinga kia scores beyond the Environment Canterbury resources to offer regional level specificity

3) Farmers' Forum

Approximately 100 farmers attended the '*Getting the best bang for your environmental buck*' interactive session where we were able to capture farmer feedback on the tool.

High-level audience feedback at the end of the workshop included:

- Liked the ability to prioritise and rank actions
- Gives options you may not have thought about
- Wanted the ability to login and save actions
- Wanted the ability to deselect / delete actions already completed
- Useful to have link to weather forecast
- Too many actions, but on the other hand it is good to have a wide range of mitigations to consider
- Liked the ability to prioritise using a range of factors
- Liked the ability to isolate and prioritise actions
- Typologies are too high level – not to a fine scale
- What about farm scale typology differences?
- Would use it to get a general idea of options
- Good starting point to an FEP
- Liked ability to prioritise scenarios
- Liked that there are actions in the tool that are not commonly used
- Ability to 'tick' actions done
- One farmer noted that the water quality site for their farm was up-stream (limitation of spatial location of monitoring site data)
- Is it designed for the farm scale or the catchment scale?
- Spatial resolution / coverage of water quality monitoring sites / regional council sites

- Need to be able to get catchment water quality data context
- Need better data resolution for water quality
    - Within farms
    - Within catchment
- Can you add GIS / map data into this tool? e.g. google earth / google maps
- Training sessions would be best delivered using the farmers' own farm
- Be good link to soil and topography maps
- Is typology too general i.e. too coarse scale resolution?
- How does it fit with audits?

When asked approximately 50% of the audience raised their hands to indicate that they would be confident to use the tool.

A summary of the farmer feedback is presented in Table 4.

Table 4: Summary of Farmers Forum workshop feedback

Likes	Dislikes	Additional functionality
• Interactive • Broad range of options • Easy • Ability to rank using cost-effectiveness • Free • Can search per land title • Head start to FEP • Great as a review tool • Gives ideas of what to do • Big picture planning • Gives catchment targeted solutions • Gives a starting point • User friendly • Links to resources helpful and informative • Good to get options / ideas for your farm for when Tiaki turn up • Reasonably east to move around • Identified the nutrient to mitigate and then lists possible priorities • Information tool	• Data is too general • Not farm specific • Turning the info into actions would need an expert • Water quality upstream is limited by location	• Ability to tick off actions completed, to-do etc. • Ability to login and save actions • Link to soil maps, LiDAR • Emissions data synergies • Include groundwater quality • Greater ability to sort and prioritise • Ability to selected property specifics e.g. irrigation and waterways • Select farm by supply number • Select by typing address • Explanation of the water quality bands (A – D) and what they mean • Needs a key of abbreviations e.g. for N, P, B and S, Mahinga kia, • Ability to select / deselect different blocks of a farm • Ability to export actions • Name the sub-catchment / catchment you are in • Improve grey scale colour scheme • Ability to save selected actions • Link to your current FEP • Use short video resources rather than narrative text • Heaps more water quality testing sites needed • Need for Regional Council endorsement • Link to Regional / National policy that applies to your farm

6. Peer-reviewed publication

A peer-reviewed publication was prepared and has been accepted in the journal 'Nutrient Cycling in Agroecosystems' in support of the approach adopted in the development of this tool. It advocates that on-farm mitigation actions in freshwater farm plans should be quantitative, risk-based, and focussed on the most significant catchment water quality priorities, and their cost-effectiveness. The geospatial layer tool developed as part of this work enables end-users to do to take this approach.

7. Next Steps (beyond the scope of this project)

Next steps for the mitigation action prioritisation and resource tool include:

- Customer experience design
    - Mapping the end-user journey (why, when, where, and how they use it)
    - Determine core messaging (benefits, purpose, use cases, etc)
    - Develop a go to market plan (defining activity to get uptake – launch and medium term)
    - Develop extension and uptake plan.
- Productionise the final tool
    - Working with Digital Services and external IT support services DairyNZ will move the beta tool into the DairyNZ production environment,
    - Incorporate end-user feedback,
    - Develop the user interface,
    - Include GHG scores for water quality mitigation actions
    - Include the final link to the tool on the DairyNZ website for open access use
- Scope resource to peer-review, workshop and further develop the Mahinga Kia basic scoring system.
- Continue to liaise with relevant stakeholders to ensure widespread uptake and use, and attribution for DairyNZ work and initiative in this space.
- Progress with Regional Council endorsement for the tool.
- Develop a tool maintenance requirement and future ownership plan.
- In agreement with OLW (as discussed with Rich McDowell) the productionised version of the tool may be considered for publication on the NZIPIM platform.