

# The capacity for change and what it might cost

Presentation to the Food, Farming  
and Freshwater Roadshow on the  
Catchment Synthesis project

Otautau, 20 June 2024



# The Catchment Synthesis project

- Undertaking research in three catchments – Tukituki, Te Hoiere and Waihao-Coastal South Canterbury
- This research is seeking to estimate the scope of land practice and land use change that might be required to achieve the agreed water quality outcomes for those catchments within 20 years.
- Yes – that means we need to use models...
- But the research will then attempt to validate if such changes are actually achievable at an individual farm business level.
- The work is also novel in that we are looking to ensure that the modelling design and inputs reflect farmer preferences and other external factors, not just the [assumed] financial drivers.



# What we are trying to find out

- What actions have farmers undertaken in their catchment to improve water quality so far?
- What further actions to improve water quality might farmers be prepared to adopt?
- What appetite is there for land use change?
- Do we have enough tools in our toolbox to achieve desired water quality in these catchments?
- And if we deployed them, will we still have viable farming communities?



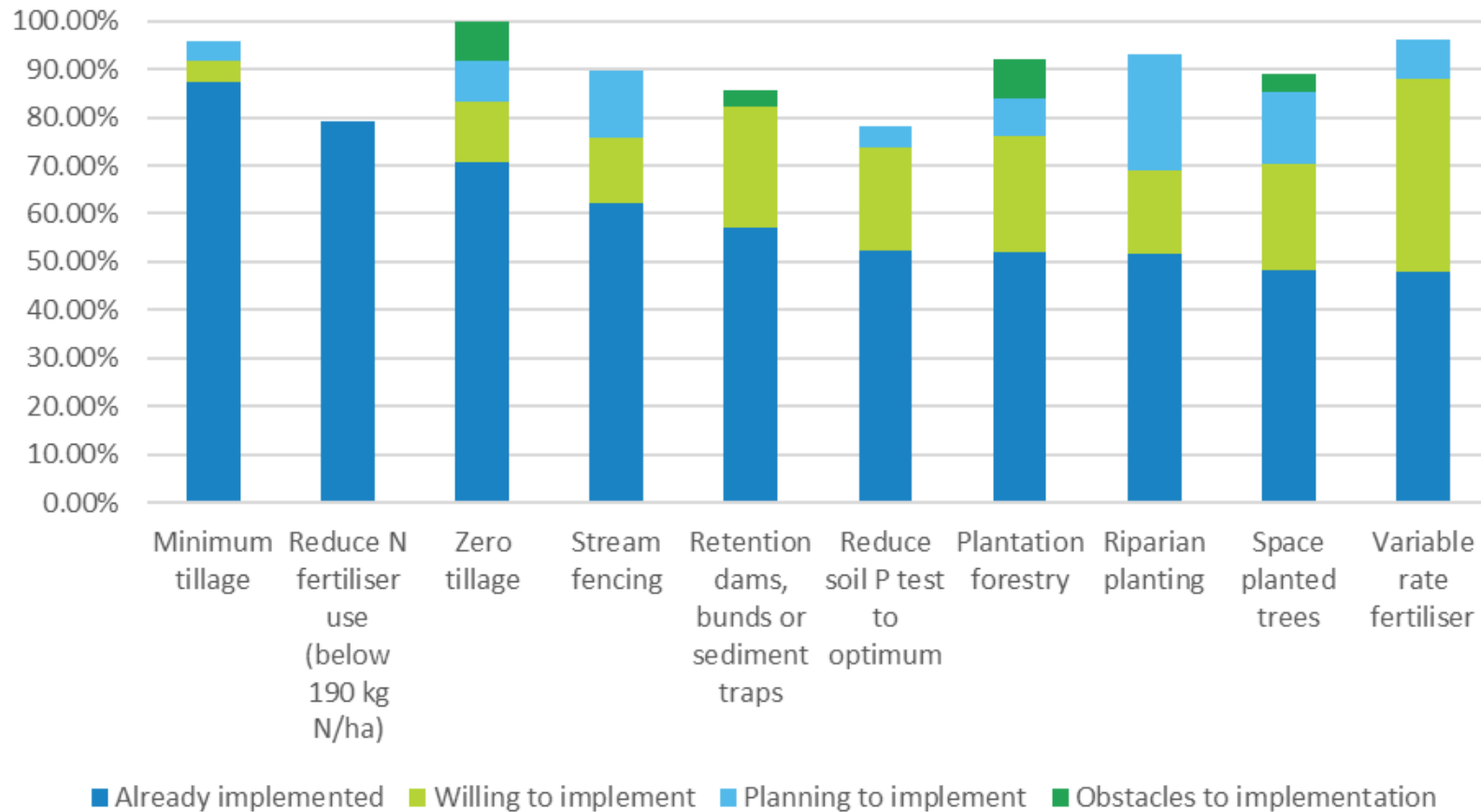
# Our approach

- Interviewed farmers and invited online survey responses in all three catchments – 47 in Tukituki, 16 in Te Hoiere and 9 in Waihao-Wainono.
- Analyzed all the responses.
- Mapped catchments into land use typologies.
- Created farm system/land use models for each individual typology.
- Identified 33 applicable water quality mitigations and determined their expected impacts (contaminant and cost) for every land use typology in every catchment.
- Created mitigation cost curves for each typology, with the order of mitigations based on farmer preferences.
- Built two catchment models and analysed multiple scenarios.
- Analyzed feasibility of change with farmer case studies.

# Current water quality actions

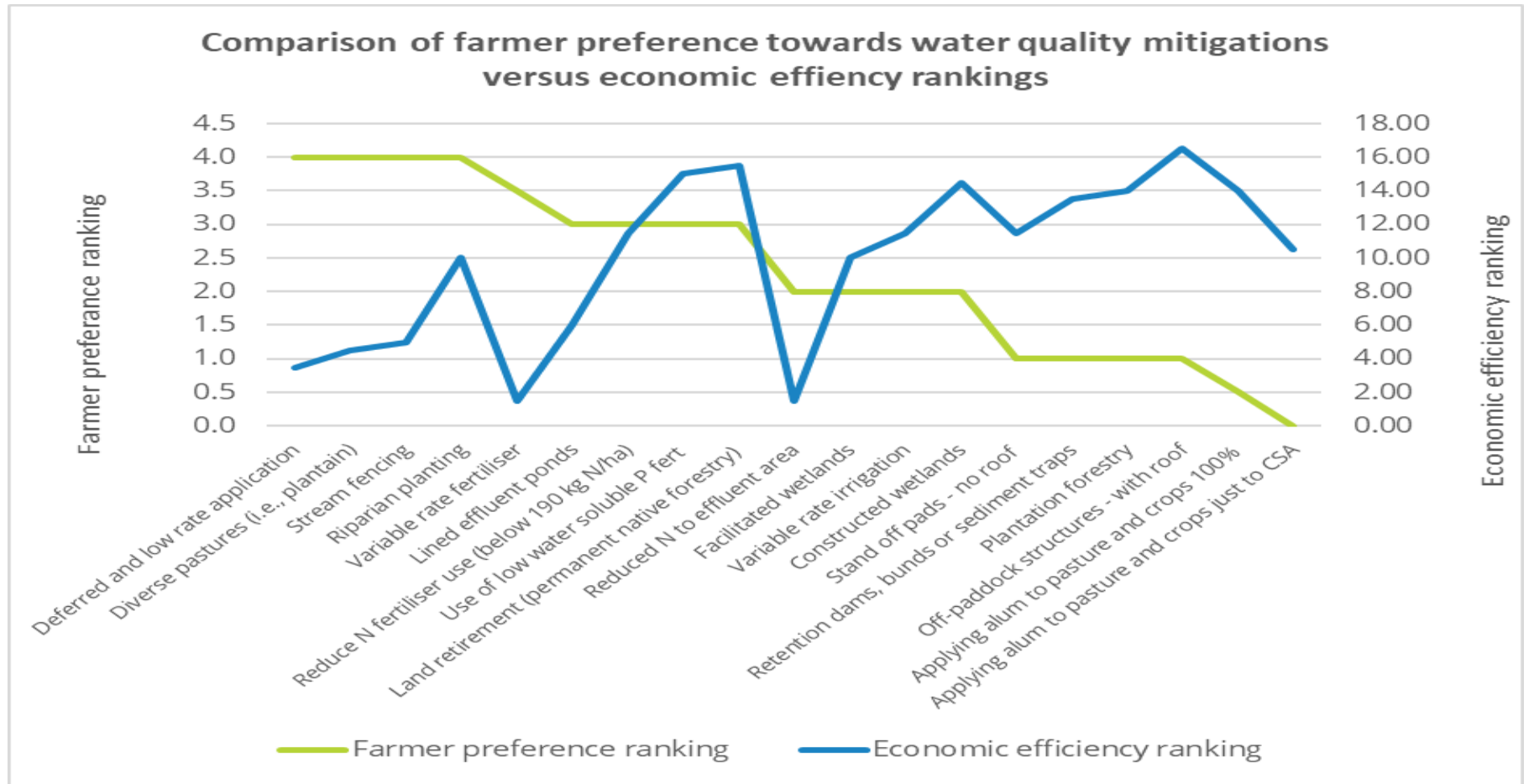


Most commonly implemented water quality actions on sheep and beef breeding and finishing





# What things do farmers want to do (and what does it cost?)





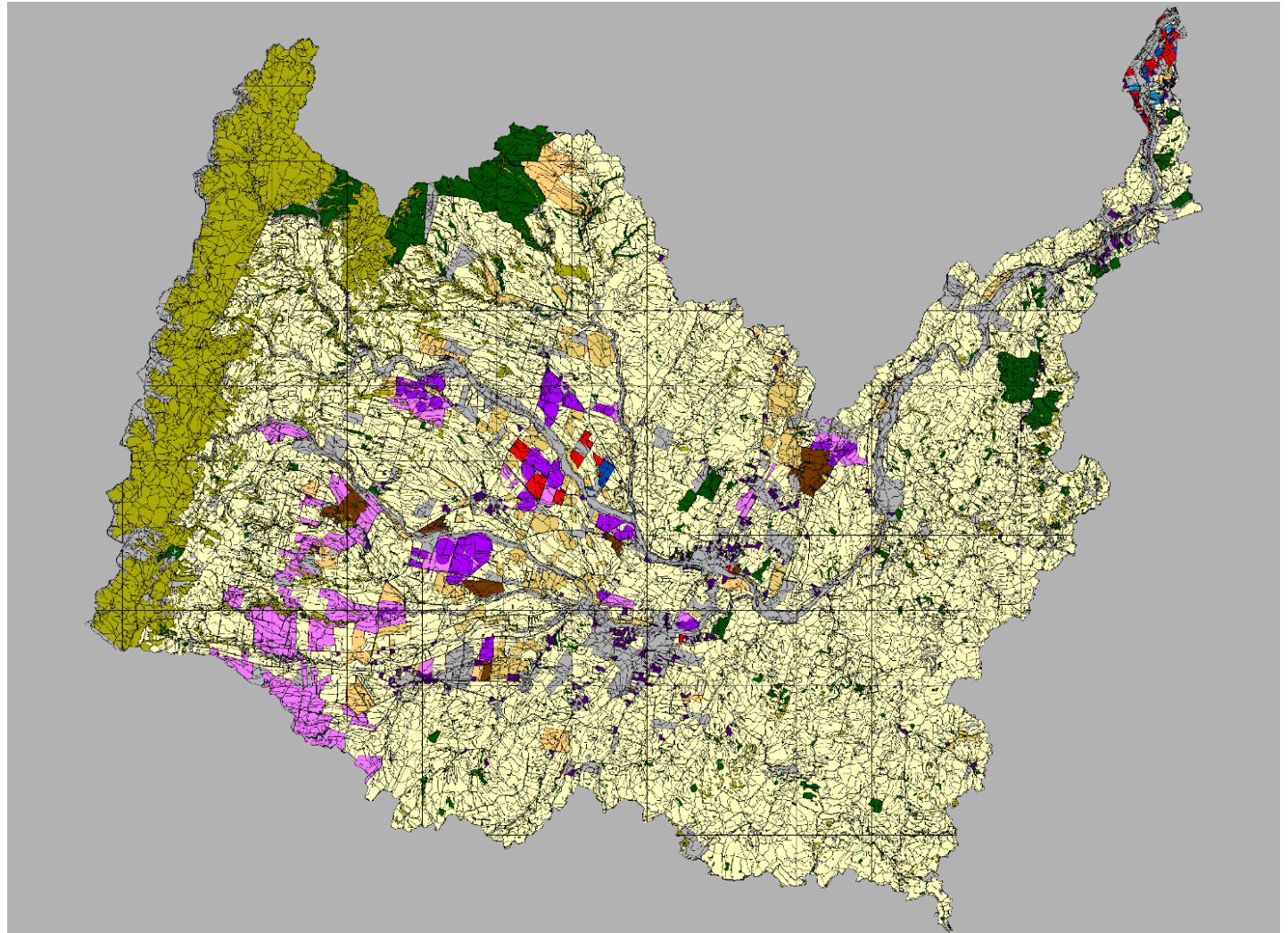


# From the Tukituki today...

## 107,600 ha total area

- 10,570 ha dairying
- 178,336 ha sheep, beef & deer
- 13,387 ha exotic forestry
- 26,829 ha of indigenous forest
- 1,476 ha arable

22 discrete land use typologies



# To where farmer-led change might take us...

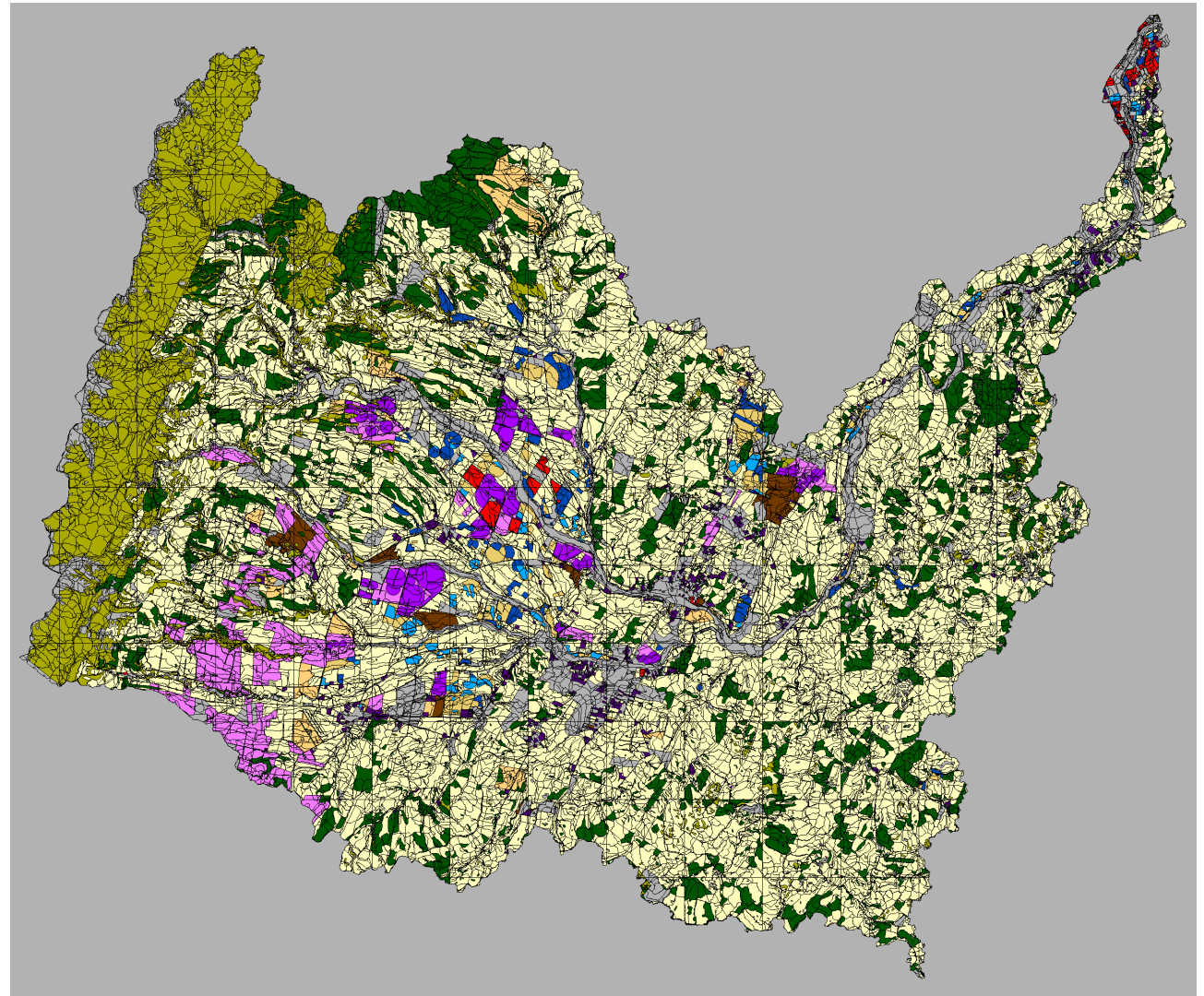


Observed change	No increase in irrigation
-----------------	---------------------------

Profitability	-17%
N	-49%
P	-41%
TSS	-60%
<i>E. coli</i>	-63%
CH <sub>4</sub>	-21%

## Critical catchment achievement of NPS-FM targets

N	5%
P	46%
TSS	85%
<i>E. coli</i>	46%





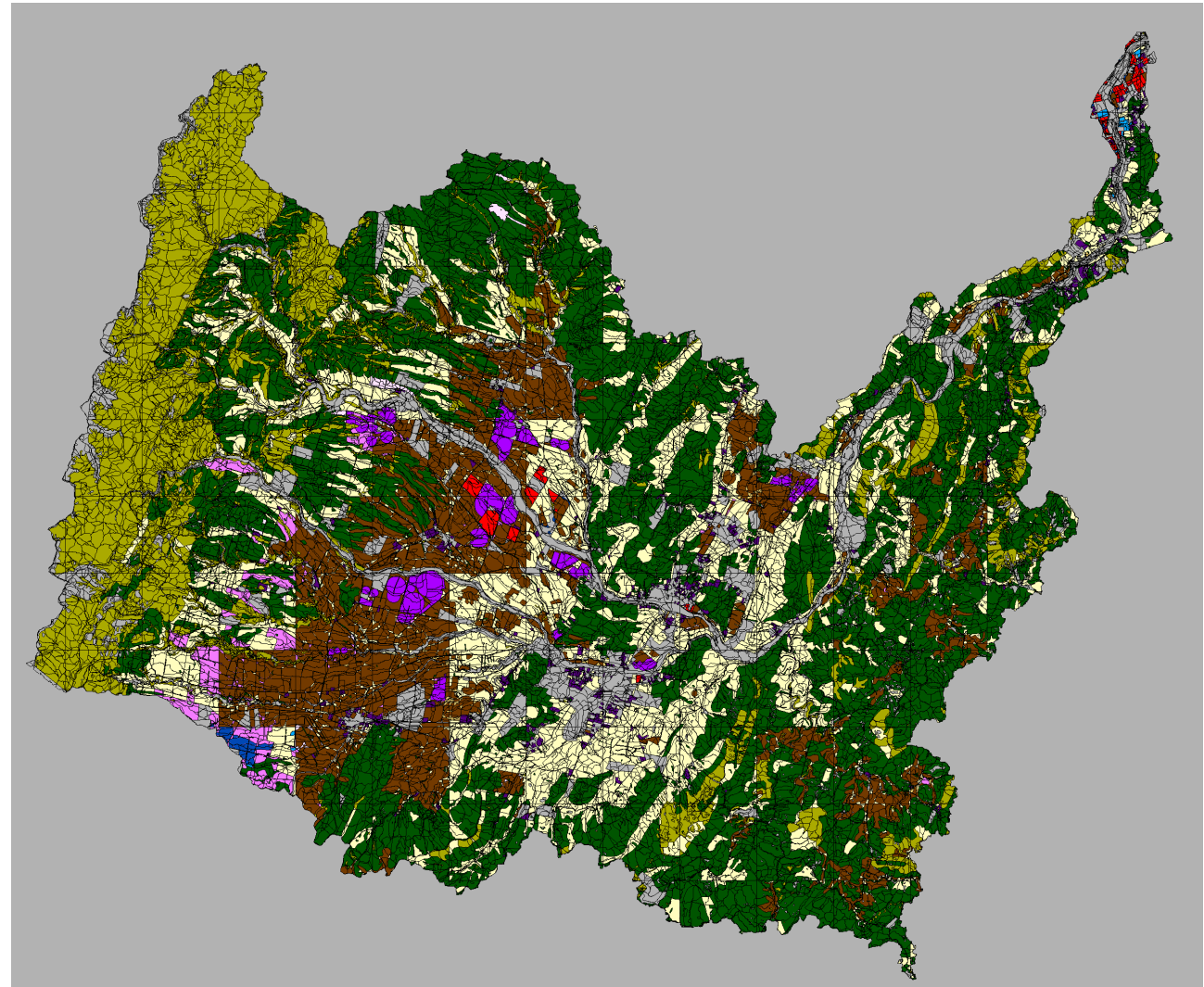
# ...to somewhere beyond that...



Observed change	No increase in irrigation
Profitability	-31%
N	-67%
P	-65%
TSS	-68%
<i>E. coli</i>	-79%
CH <sub>4</sub>	-48%

Critical catchment achievement of NPS-FM targets	
N	60%
P	80%
TSS	85%
<i>E. coli</i>	89%



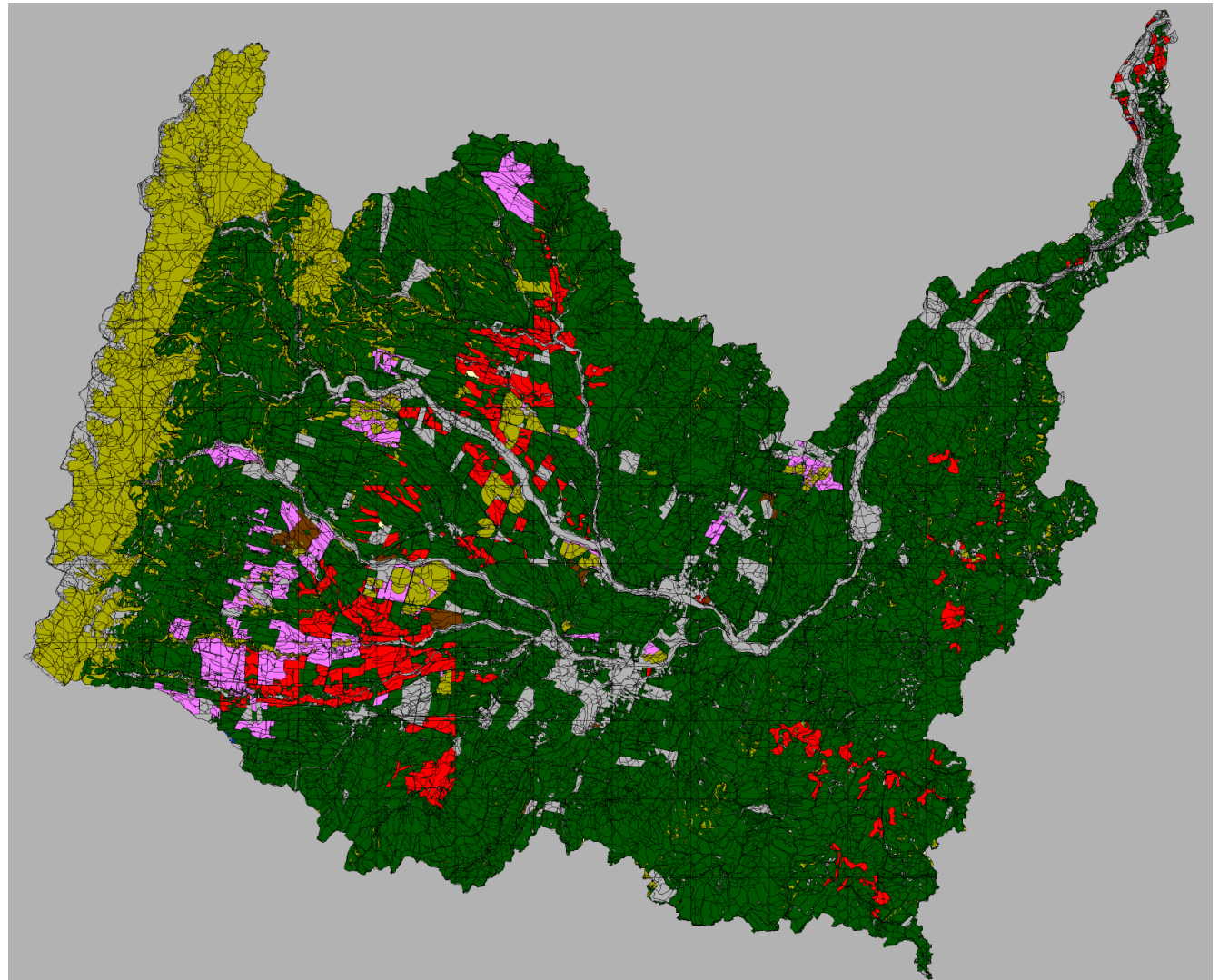
# ..or to where the NPS-FM requires...



Observed change	No increase in irrigation
Profitability	120%
N	-74%
P	-64%
TSS	-68%
<i>E. coli</i>	-78%
CH <sub>4</sub>	-90%

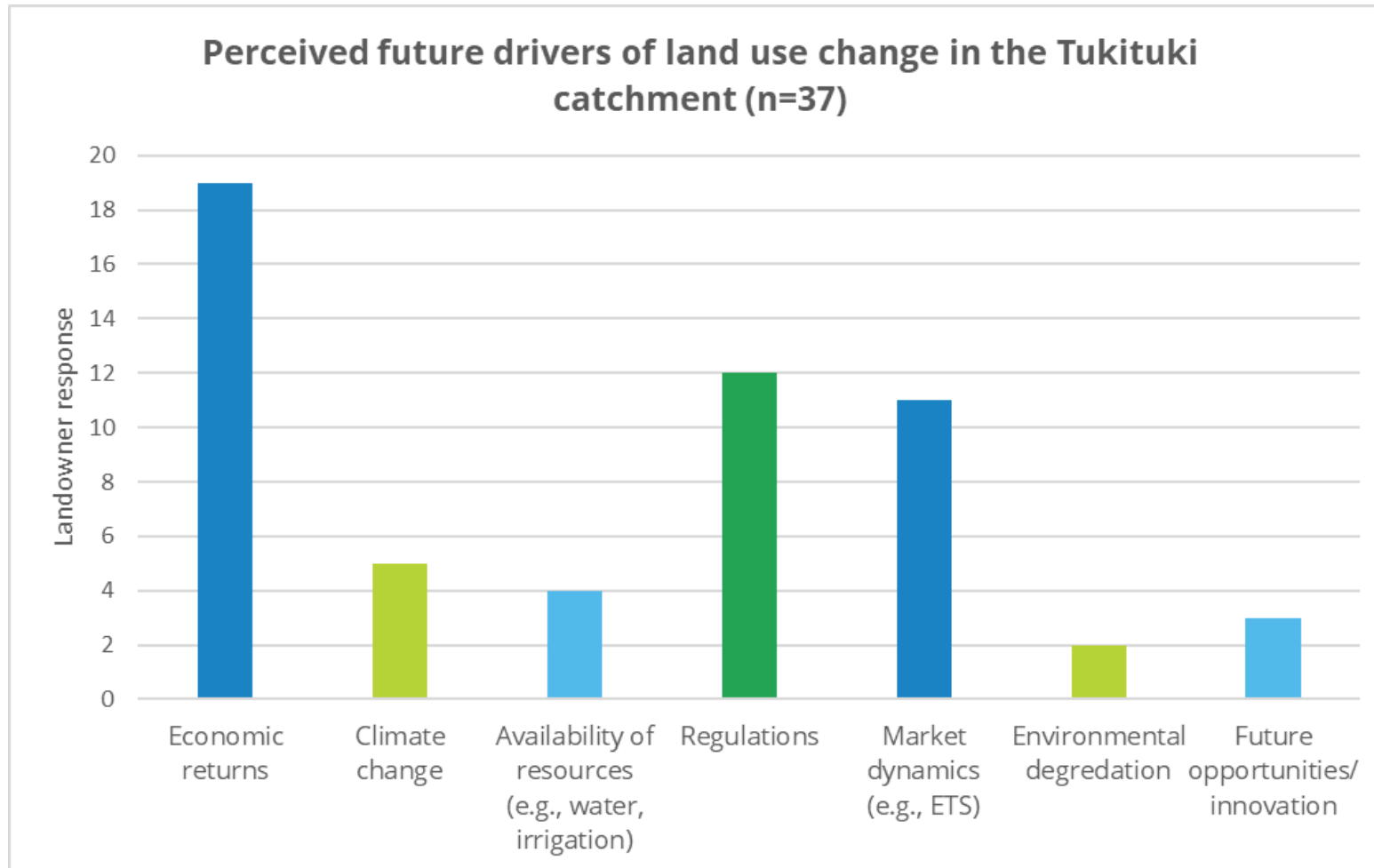
  

Critical catchment achievement of NPS-FM	
N	98%
P	80%
TSS	85%
<i>E. coli</i>	86%



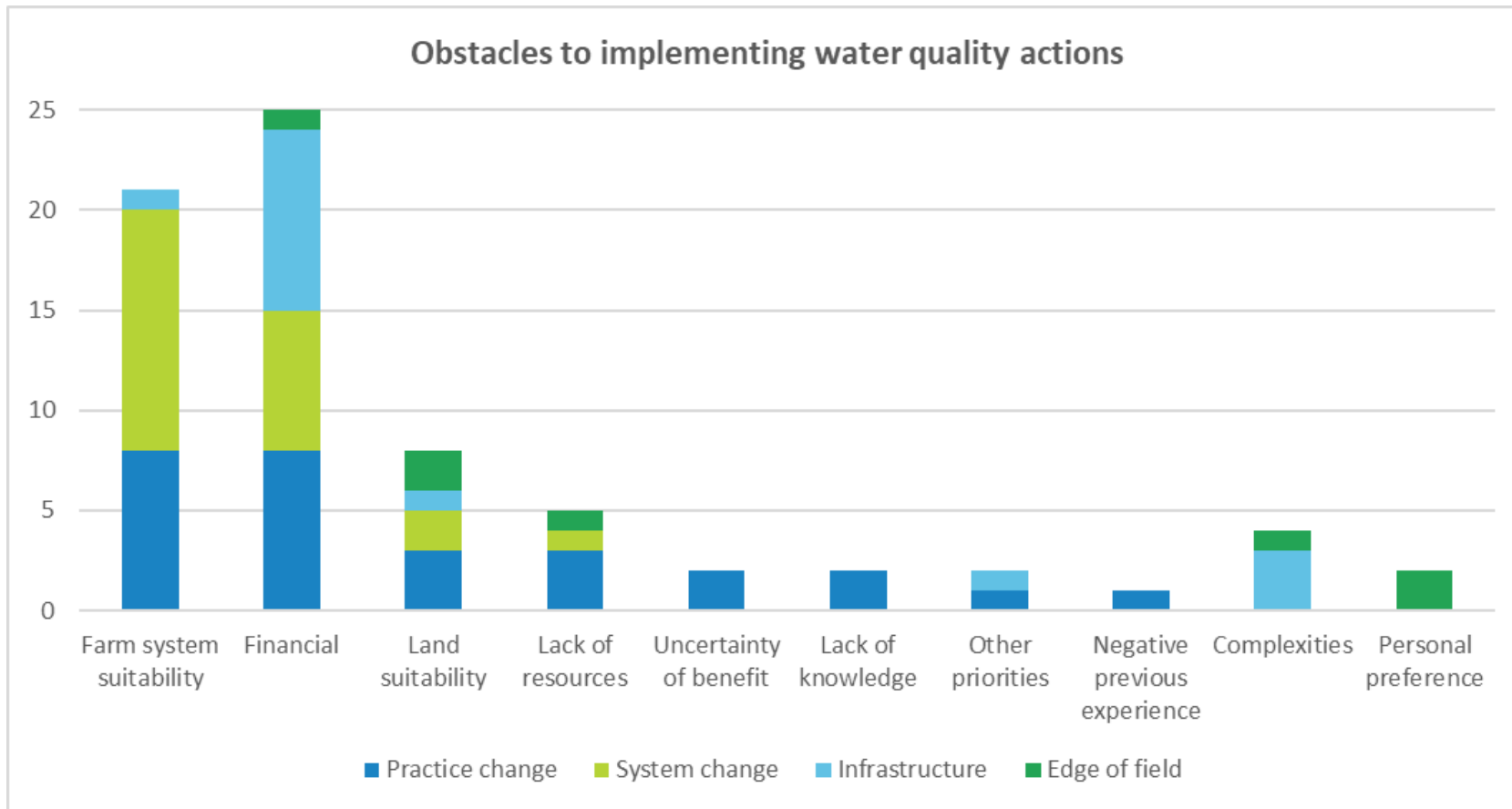


# Potential future drivers of land use change in Tukituki





# Barriers to land use change in Tukituki







# What farmers have told us about land use change

**“Would love to do [horticulture] but the farm is just unsuitable”**

**“Planting a good farm into pines is a waste”**

**“Don’t like pines - would rather plant it in something else and earn special credits off it if we could”**

**“Do not believe that planting trees on good productive land is a responsible use of the land. We do have some land in forest, but what is in pasture now, we would not consider putting in[to forest]”**

**"There is not enough water, need more allocation to move into arable horticulture, Ruataniwha dam would have to go ahead before we see land use change on the lower country.**



# Key insights

- Farmers are undertaking a wide range of water quality mitigations.
- Farmers show some preparedness to mitigate at a greater cost than land use change.
- Generally, farmer preference for mitigation aligns with typical cost-efficacy assessments.
- Assumptions on profit maximization ultimately see forestry as an increasing land use.
- Land use change will be unavoidable in some catchments under current policy settings.



# Where to from here?

- Mitigation alone is insufficient.
- Land use change critical and reliant on high[er] value, lower impact land uses. Water is a potential enabler.
- Profitability under future land use combinations might nominally be higher, but the feasibility of farmers and community to transition highly uncertain.
  - Levels of debt, cadence of revenues, access to capital.
  - Social license.

Will we be able or prepared to collectively implement the level of change needed to achieve the quality of water we want or have been prescribed we need to have?



This document is meant exclusively for discussion and general information purposes at the time of writing and may be subject to change as further public information becomes available or market conditions change. The information is believed to be reliable, however Perrin Ag Consultants Ltd does not guarantee the correctness or completeness and does not accept any liability in this respect. Before adopting or implementing any concepts contained herein, an individual assessment from a suitably qualified person should be sought.



 [@perrinag](https://twitter.com/perrinag)

 [www.facebook.com/perrinag](https://www.facebook.com/perrinag)

 [www.perrinag.net.nz](https://www.perrinag.net.nz)