



Manaaki Whenua
Landcare Research

Social implications of the ZIP Addendum for Ōrarī, Temuka, Ōpihi and Pareora

Prepared for: Environment Canterbury

April 2019



Social implications of the ZIP Addendum for Ōrari, Temuka, Ōpihi and Pareora

Contract Report: LC3448

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Summary

The recommendations in the *Zone Implementation Programme Addendum* for Ōrarī, Temuka, Ōpihi and Pareora are expected to have a marginal to moderate impact on the environmental performance of farms in the short term through reduced use of groundwater and surface water in dry conditions, the exclusion of stock from waterways, reduced erosion, and lower nitrate and phosphorus emissions.

The recommendations on protecting cultural sites, mahinga kai, biodiversity and forestry are judged to have negligible effects on farming activities and practices in the shorter term, and slightly favourable effects on tourism and recreational activity in the Zone in the foreseeable future.

The economic impacts of the recommendations on water allocations and water quality are likely to be severe for some farms in localities where groundwater and surface water allocations are substantially changed and, in the longer term, where there are nutrient hot-spots. However, from a regional perspective, these recommendations are likely to have only a marginally unfavourable economic effect on agriculture in aggregate across the Zone. They are judged to have moderately favourable effects on tourism and recreation. Therefore, the recommendations are expected to have a favourable effect overall on community well-being and community groups. The composition of the community is unlikely to change noticeably because of the recommendations.

On the one hand, the recommendations will increase the cost of, and scope for, intensification of agriculture, thereby reducing its capacity to adapt to change. On the other hand, the expansion of commercial and culturally related tourism improves the diversity of the regional economy and so increases its adaptive capacity. On balance, greater diversity across the economy probably outweighs the constraints on adaptability within agriculture.

1 Introduction

The Orari-Temuka-Opihi-Pareora (OTOP) Zone Committee is a partnership between Papatipu Rūnanga (Te Rūnanga o Arowhenua and Te Rūnanga o Waihao), Environment Canterbury, and Timaru, Mackenzie and Waimate District Councils. The committee produced a *Zone Implementation Programme Addendum*, which contains statutory and non-statutory recommendations for the sustainable management of freshwater resources in the OTOZ, along with recommendations to protect and enhance cultural values and biodiversity in the Zone.

Manaaki Whenua – Landcare Research (MWLR) was contracted to provide a qualitative assessment of the effects of these recommendations. The Zone has experienced rapid growth in, and intensification of, agricultural activity in the past decade or so, which has contributed to increasing pressure on water resources in the Zone. The recommendations were to be assessed in terms of on-farm environmental performance, community well-being and composition, community groups, and community adaptive capacity.

2 Methods

Given the limited time, information and resources available, the assessments were made using a simple chain of reasoning based on three propositions:

- The recommendations were primarily intended to modify agricultural activity and practices.
- The magnitude of changes in community composition, community groups and community adaptive capacity would be roughly proportional to changes in the magnitude of changes in the environmental performance of farms.
- Farmers are unlikely to modify their practices in the short term (less than 5 years) unless compelled to do so.

The third proposition is based on evidence suggesting that practice change occurs relatively slowly in agriculture, even where change is likely to create an advantage for the farmer (Kaine et al. 2008; Kaine & Wright 2017). It is reasonable to suppose that change will occur even more slowly on farms when that change is likely to have an unfavourable impact on profitability (Kaine et al. 2004).

Given these propositions, the impact of the recommendations on the community was assessed as negligible or marginal if the recommendation depended on voluntary changes in resource use and practices on farms. Recommendations that involved compulsory change were judged to have a marginal, moderate or considerable impact depending on the proportion of farmers in the Zone that would be affected.

The composition of the community in the Zone has remained remarkably stable over the past two decades despite substantial changes in agriculture over that time (Kalaugher & Wright 2016). This suggests that the recommendations are unlikely to have a noticeable effect on community composition unless they create dramatic changes in agriculture.

The assessment was based on material contained in OTO Water Zone Committee 2018¹, Kalaugher & Wright 2016, Kalaugher & Walsh 2017, Kalaugher & Kaine 2018, and Harris 2019.

3 Analysis of recommendations

3.1 Recommendations to recognise and protect sites of cultural significance

The Zone is in the takiwā of Te Rūnanga o Arowhenua and Te Rūnanga o Waihao. Cultural beliefs, values and practices that underpin the interactions of mana whenua with the catchments in their takiwā include mauri, kaitiakitanga, whakapapa, rangatiratanga, manaakitanga, mahinga kai and the philosophy of ki uta ki tai – a mountains-to-the-sea approach to looking after water resources.

The Zone contains sites that are treasured because they:

- play an important role in maintaining balanced and robust ecosystems, which includes wetlands, springs and freshwater areas
- are associated with historical events such as battles and the actions of ancestors, or possess a quality of sacredness or restriction because of certain events or circumstances
- are traditional camp sites, or historical sites of importance such as trails, pā sites, canoe mooring sites, ovens, and rock art.

The principal recommendations for protecting sites of cultural significance were that regional and district councils work with Papatipu Rūnanga to develop statutory and non-statutory measures to protect these sites (ZIPA 2018: 20–22).

A proper assessment of these recommendations is not possible because the detailed provisions have not yet been developed. However, these recommendations do not compel private landholders to immediately refrain from activities that may damage or destroy sites of cultural significance. Consequently, the recommendations are unlikely to have any economic impact on farming activity in the foreseeable future. They are also unlikely to have a substantial impact on commercial tourism, as the public is unlikely to have access to culturally significant sites on private land, whether the sites are protected or not.

These recommendations may have some favourable impact on commercial tourism where culturally significant sites are on public land. In this regard they may also promote greater community cohesion and well-being.

¹ For convenience, from now on this document will be cited using the abbreviation for the document title, ZIPA 2018.

3.2 Recommendations to protect and enhance mahinga kai

The National Policy Statement for Freshwater Management (NPS-FM) enables freshwater outcomes to be set for mahinga kai if this is desired by iwi and communities. Mahinga kai refers to all types of food and resources, and to the places food and resources are gathered. In this context mahinga kai is of particular importance to Te Rūnanga o Ngāi Tahu, Te Rūnanga o Arowhenua, and Te Rūnanga o Waihao.

The principal recommendations regarding protecting mahinga kai were as follows (ZIPA 2018: 22):

- 1 Regional and district councils work with Papatipu Rūnanga to develop statutory and non-statutory measures that would provide improved water quality for safe harvesting and consumption of mahinga kai and improved quality and quantity of freshwater mahinga kai species for customary gathering.
- 2 Farms that are required to have a Farm Environment Plan (FEP) include the protection of mahinga kai in lakes and streams on the property as an objective and the FEPs are to include maintaining or enhancing native vegetation and riparian strips and appropriate pest control to protect and/or enhance mahinga kai.
- 3 Farms that are required to have a Management Plan (MP) include a description of how mahinga kai can be protected through their MP.

These recommendations do not immediately compel private landholders to refrain from activities that may damage or destroy mahinga kai, except, possibly, with respect to landholders who are required to have an FEP.

For landholders with FEPs, the additional provisions are restricted in that the provisions only apply to protecting mahinga kai in surface waters on their properties: they are not required to consider the downstream impacts of their actions. These provisions are only likely to apply to a small fraction of properties in the Zone. Consequently, these recommendations are unlikely to have any economic impact on farming activity in the foreseeable future. They are also unlikely to have a substantial impact on commercial tourism, as the public is unlikely to have access to mahinga kai on private land unless the harvesting and consumption of mahinga kai become the foundation for tourist ventures.

These recommendations may have some favourable impacts on the quantity and quality of mahinga kai over and above those provided by recommendations on water allocation and water quality. In this regard they may also promote greater community cohesion and well-being.

3.3 Recommendations to protect biodiversity

The term 'biodiversity' describes the variety of all biological life, including all animals and vegetation, and the ecosystems they collectively form. Protecting and enhancing the diversity of species (no matter how small), and genetic and habitat diversity, provides resilient communities and enhances a wide range of ecosystem services, including those that support natural environments, agricultural and industrial activities, and human health

and well-being. The protection of significant indigenous vegetation is a matter of national importance and is key function of district and regional councils.

The principal recommendations regarding protecting biodiversity were (ZIPA 2018: 24–25):

- 1 Any areas of 'Significant Indigenous Biodiversity' mapped by district councils should be identified in FEPs and MPs, and methods to comply with any relevant rule relating to any areas of Significant Indigenous Biodiversity must be detailed in the plan.
- 2 Ōrarī Gorge, Milford Lagoon and Orakipaoa Creek be classified as 'waterbodies of high naturalness' and the protection afforded to high naturalness waterbodies be extended to a number of other named lagoons, lakes, streams and wetlands in the Land Water Regional Plan.
- 3 Channel straightening, water body realignments and clearance of riparian and native vegetation be prevented unless they result in no net loss of any indigenous biodiversity or habitat in the affected reach.
- 4 Informing landholders of rules relating to clearing vegetation.
- 5 When reviewing district plans councils recognise the role indigenous vegetation plays in the health of water catchments and include provisions controlling general clearance of indigenous vegetation and large scale earthworks in rural zones; ensure that provisions relating to identified areas of significant indigenous biodiversity offer effective protection of those areas from clearance or other disturbances and control other land use activities to manage any actual or potential effects on these areas; and include provisions for maintaining and enhancing indigenous biological diversity.

These recommendations are unlikely to be relevant to landholders unless there are areas of significant indigenous biodiversity on their properties, or waterbodies of high naturalness lie within or alongside their properties. These recommendations are unlikely to dramatically affect current farming activities but may constrain the expansion or intensification of some farms in the future, primarily by restricting the clearance of riparian and indigenous vegetation. To the degree that landowners may be required in the future to undertake activities to protect areas of significant biodiversity and the margins of waterbodies of high naturalness, this will require some increase in capital and maintenance costs associated with fencing and controlling weeds and pests.

Overall, these recommendations are unlikely to have any marked economic impact on farming activity in the region in the foreseeable future. They may have a substantial impact on commercial tourism and local recreation in the future by preserving the naturalness of some water bodies at sites the public can access. In this regard the biodiversity recommendations may also promote greater community cohesion and well-being.

3.4 Recommendations for forestry and water yield

District councils are required to protect areas of significant indigenous biodiversity in areas considered Significant Natural Areas or Outstanding Natural Landscapes. This requirement may limit forestry in these areas and landscapes.

Catchments are considered flow sensitive when river flows depend on rainfall, there is limited ability to store water, and evapotranspiration exceeds rainfall in summer months (ZIPA 2018: 26). Flow-sensitive catchments have very low summer flows compared with annual mean flows and are vulnerable to reductions in flow. Hence, regional councils may limit new forestry in flow-sensitive catchments because forestry increases evapotranspiration in a catchment, thereby increasing the severity of low flows in streams over summer (ZIPA 2018: 26). Regional councils may also manage forest harvest where it may affect the quality of water in lakes and streams, particularly impacts related to higher sediment loads.

The principal recommendations regarding forestry were (ZIPA 2018: 26–27):

- 1 Avoid new forestry in flow sensitive catchments in the zone and to classify the Upper Orari Catchment as a flow sensitive catchment.
- 2 Prevent new forestry in areas of outstanding natural landscape and significant natural areas to protect biodiversity.
- 3 Regional and district councils consider the effect of forestry and other land use changes on biodiversity, water quality and water yield outcomes in upper catchments. This was to include recognising the importance of protecting and maintaining tussock cover, that erosion control is managed with species other than invasive and/or plantation forestry species, and that councils control invasive species of forestry trees.

These recommendations would prevent the development of new forestry plantations in much of the Zone. Given forestry is one of the smallest industries in the Zone in terms of contribution to employment and regional GDP, these recommendations will have a negligible effect on the regional economy and the community.

To the degree these recommendations preserve river flows, thereby contributing to the preservation of irrigated agriculture, tourism, recreation and mahinga kai, they may promote community cohesion and well-being.

3.5 Recommendations to improve water quality

Although farming is an important sector in the local economy, there is a desire in the community to limit the discharge of nutrients from farms because there is widespread concern about water quality in the Zone, including threats to drinking-water, mahinga kai and ecological, cultural and recreational values. Consequently, water quality targets were set for groundwater, spring-fed streams, rivers and lakes in the Zone (ZIPA 2018: 31–35).

The key measures for reducing the impact of farming on water quality are the recording and implementation of industry-agreed good management practices by all farms, the development and implementation of FEPs and a nutrient budget as a component in resource consents for high-risk farms, the development and implementation of FEPs for farms in areas of high phosphorus risk (which may include measures in addition to good management practices to restrict emissions), and stock exclusion from waterways across the Zone.

Regarding urban and industrial sources of pollution, the key measures were that industrial activities adopt the best practicable option for the treatment and disposal of discharges, and that operators of reticulated stormwater networks need to apply for a discharge permit and prepare stormwater management plans.

The main recommendations with respect to preserving or improving water quality were (ZIPA 2018: 35–37):

- 1 High risk farming activities be required to obtain a resource consent, to operate at Good Management Practice and to prepare and implement an audited FEP with a nutrient budget.
- 2 Farms with winter grazing of either cattle or deer on a total area exceeding 20 ha in the High Runoff Risk Phosphorus Zone be required to obtain a resource consent and to prepare and implement a FEP.
- 3 Low risk farming activities to be subject to a Management Plan describing the implementation of Good Management Practices.
- 4 Livestock should be excluded from all rivers, and from drains and watercourses that discharge to a river or surface water body.
- 5 Livestock are excluded from springheads where they discharge to a river or surface waterbody, or where they are within an area identified as a culturally significant site.
- 6 Establish a nitrogen load limit for industrial discharges and for industrial activities to adopt the Best Practicable Option (BPO) for the treatment and disposal of discharges.
- 7 Operators of reticulated stormwater networks were to apply for a discharge permit on or before 30 June 2018 [sic] and prepare a stormwater management plan.
- 8 Ground and surface water replenishment schemes such as Managed Aquifer Recharge and/or Targeted Stream Augmentation are enabled to improve freshwater quality across the zone.
- 9 Protect water quality at several swimming sites by including them in a register of protected swimming sites.

Under these recommendations, farmers with operations that are classified as low risk will be required to prepare and implement management plans detailing the implementation of good management practices. These plans will not be audited and, in principle, need not be implemented until 2025. Furthermore, the good management practice guidelines indicate that farmers are to undertake practices as far as they are practicable, possible or reasonable, and to consider and take account of environmental factors when making decisions (Canterbury Water 2019).

Given this context, it seems reasonable to suppose that few farmers are likely to implement practices that will substantially reduce farm profitability in the short term. Hence, the recommendations regarding water quality are unlikely to provoke significant changes in the operation of low-risk farms (ones that are not in nutrient hot-spots) or impose substantial costs on them.

Farmers with operations that are classified as high risk will be required to obtain a resource consent and to create management plans that incorporate good management practices with respect to limiting nutrient emissions and, in some circumstances, a nutrient budget. These plans would be audited and, in principle, contain requirements that must be implemented upon granting of the consent. Consequently, these plans are likely to compel some change in the management of fertiliser, grazing and supplementary feeding, and riparian strips on high-risk farms. This will raise the costs and reduce profitability and managerial flexibility on affected farms.

Three areas in the Zone were identified as nutrient hot-spots: Fairlie Basin, Levels Plains and Rangitata Orton (ZIPA 2018: 41, 60–63). Compulsory implementation of farm practices in addition to good management practices, or, implicitly, reductions in farm production, were recommended (ZIPA 2018:) to further reduce emissions in these hot-spots. Farmers would be required to implement additional practices (or reduce production) to achieve a 10% cut in emissions by 2030 (ZIPA 2018: 41, 60–63). Further action to reduce emissions by another 5 to 10% could be required by 2035 (ZIPA 2018: 41, 60–63).

An economic assessment of the impact on agriculture of the recommendations for water quality in the nutrient hot-spots was undertaken by Harris (2019). This assessment evaluated the potential impact of changes in farm management practices on the profitability of irrigated and dryland dairy, beef and sheep, and cropping farms. While the impact of the practices on the profitability of dairy farms could be modelled, the impact of the practices on the profitability of drystock, cropping and dairy grazing could not be modelled (Harris 2019). Consequently, the reduction in nutrient emissions for drystock, cropping and dairy grazing was assumed to occur by reducing production in proportion to the required reduction in emissions (Harris 2019: 15).

The economic analysis indicated actions to reduce emissions by more than 10% would probably have severely unfavourable effects on the profitability of arable farms and sheep-beef farms in the hot-spots, especially farms with high levels of debt (Harris 2019: 24). However, should farmers need to reduce emissions by more than 10% they will have 10 years to fully implement remedial measures.

From a regional perspective the results of the analysis indicated that the effects of changing practices or production to reduce nitrate emissions by up to 10% are minor with farm profitability declining by around 5% and economic activity, household income, and employment declining by less than 1% in aggregate across the Zone, and regional economic activity and employment declining by less than 1% (Harris 2019: 27-28). These effects would probably be offset to some extent by an increase in tourism and recreational activities resulting from improved water quality, but tourism and recreational activities were not included in the economic analysis.

Overall, the recommendations regarding water quality are likely to have a minimally unfavourable economic impact on farming activity across the region in the foreseeable future, that is, the next ten years. Most farming enterprises in the Zone will not be affected by these recommendations. Some high-risk farms could be moderately affected, but these effects can be, and most likely will be, deferred for nearly 10 years. In the longer term these recommendations will raise the costs of, and possibly constrain, the intensification of farms in the Zone.

These recommendations may have a moderate impact on commercial tourism and local recreation in the future by preserving or improving water quality in most areas. While the recommendations regarding water quality might heighten conflict and tension within the community in the short term, they will promote greater community cohesion and well-being in the long term. The effects on the composition of the community appear to be negligible, at least in the short term.

3.6 Recommendations to change water allocations

There are growing pressures on waterways in the Zone: some water resources across the Zone are considered over-allocated, and several waterways are under pressure from low flows. These pressures are intensifying with the expansion of dairying and the risks of a drying climate.

Several recommendations were made regarding water allocation to alleviate these pressures across the Zone. Specific recommendations were also made regarding flow and allocation regimes for Temuka and Opihi. The principal general recommendations of interest here were (ZIPA 2018: 38–40):

- 1 A change in the method for assessing stream depletions from groundwater extraction.
- 2 The installation of on-farm water storage to maximise efficient use of water and enhance reliability be allowed.
- 3 Existing allocations for surface water are to be capped at current level of abstraction.
- 4 Groundwater abstraction is to be capped at current volume of abstraction.
- 5 Holders of surface water or stream-depleting groundwater permits be able to convert to using deep groundwater.
- 6 Prohibit any new abstraction, other than for community drinking water supplies, where a limit has, or will be, exceeded.
- 7 Restrict renewal of water permits, or changes in conditions of permits, to actual use to reduce over-allocation.
- 8 Allow water to be brought into the zone from outside the catchment.

An economic assessment of the impact on agriculture of the recommendations for water allocations was undertaken by Harris (2019). This assessment evaluated the potential impact of changes in ground and surface water allocations on the profitability of dairy, drystock and deer farms. The assessment was partial in that changes in the management to offset reduced allocations (such as investing in farm storages, changing pasture and crop mix, purchasing supplementary feed, or converting from shallow to deep aquifers for groundwater) or changes in land use (such as partially converting from dairying to drystock production) were not included in the analysis.

Data on water use indicate that most farmers do not use their full water entitlement. This may be because farmers may hold some entitlement in reserve as a strategy for offsetting low flows in summer. This means that any reduction in allocation translates to a less than proportionate reduction in actual use water. It also suggests the analysis is likely to

overestimate the impact of reduced allocations on agricultural production. In addition, agriculture in the Zone has successfully weathered many changes in the past (Kalaugher & Wright 2016).

The analysis indicated that reduced allocations would probably have severely unfavourable effects on farm profitability, economic activity, household income and employment in the Temuka irrigation blocks, and moderately unfavourable effects in the South Ōpuha and Ōpihi Rockwood irrigation blocks (Harris 2019).

However, from a regional perspective, the results of the analysis indicate that the effects of the reduced allocations would be much more moderate with farm profitability, economic activity, household income and employment declining by 5% or less in aggregate across the Zone, and regional economic activity and employment declining by less than 1% (Harris 2019: 27-28). These unfavourable effects would probably be offset to some extent by an increase in tourism and recreational activities resulting from improved flows in waterways, but tourism and recreational activities were not included in the economic analysis.

Overall, the recommendations regarding water allocations are likely to have a moderately unfavourable economic impact on farming activity across the region in the foreseeable future, assuming water will not be imported into the catchment.

These recommendations may have a moderate impact on commercial tourism and local recreation in the future by preserving the flows and possibly improving water quality in some publicly accessible water bodies during the summer. Although the recommendations regarding water allocations are likely to increase conflict and tension within the community in the short term, they will promote greater community cohesion and well-being in the long term.

4 Implications and conclusion

The implications of the recommendations for the Zone in terms of the key social indicators identified by Kalaugher & Wright (2016) are summarised in Table 1. The recommendations in the *Zone Implementation Programme Addendum* are expected to have a marginal to moderate impact on the environmental performance of farms across the region in the short term through reduced use of groundwater and surface water in dry conditions, the exclusion of stock from waterways, reduced erosion, and lower nitrate and phosphorus emissions.

The recommendations for protecting cultural sites, mahinga kai, biodiversity and forestry are judged to have negligible effects on farming activities and practice in the shorter term, and slightly favourable effects on tourism and recreational activity in the Zone in the foreseeable future.

The economic impacts of the recommendations on water allocations and water quality are likely to be moderate to severe for farms in localities where groundwater and surface water allocations are substantially changed and, in the longer term, where there are

nutrient hot-spots. However, from a regional perspective these recommendations are only likely to have marginally unfavourable economic effects on agriculture but moderately favourable effects on tourism and recreation. Therefore, the recommendations are expected to have a favourable effect overall on community well-being and community groups. The composition of the community is unlikely to change noticeably because of the recommendations.

On the one hand, the recommendations will increase the cost of, and scope for, intensification of agriculture, thereby reducing its capacity to adapt to change. On the other hand, the environmental impacts of the recommendations and the associated benefits for tourism, recreation, and cultural activities are expected to be distributed across the Zone and the expansion of commercial and culturally related tourism will improve the diversity of the regional economy and therefore increase its adaptive capacity. Also, agriculture in the Zone is highly versatile and has weathered many changes in the past (Kalaugher & Wright 2016). On balance, greater diversity across the economy probably outweighs constraints on adaptability within agriculture.

Table 1: Summary assessment

	Protecting culture	Protecting mahinga kai	Protecting biodiversity	Forestry	Protecting water quality	Protecting water flows
Farm environmental performance	Yellow	Yellow	Orange	Yellow	Green	Green
Community composition	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Community well-being	Orange	Orange	Green	Orange	Green	Green
Community groups	Orange	Orange	Orange	Yellow	Green	Orange
Community adaptive capacity	Yellow	Orange	Orange	Yellow	Green	Orange

Notes: Negligible (Yellow) Marginal (Orange) Moderate (Green)

Adapted from Kalaugher & Wright (2016, 55)

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