

# Narrative for Ruamāhanga Whaitua Committee Scenarios Social Impact Assessment

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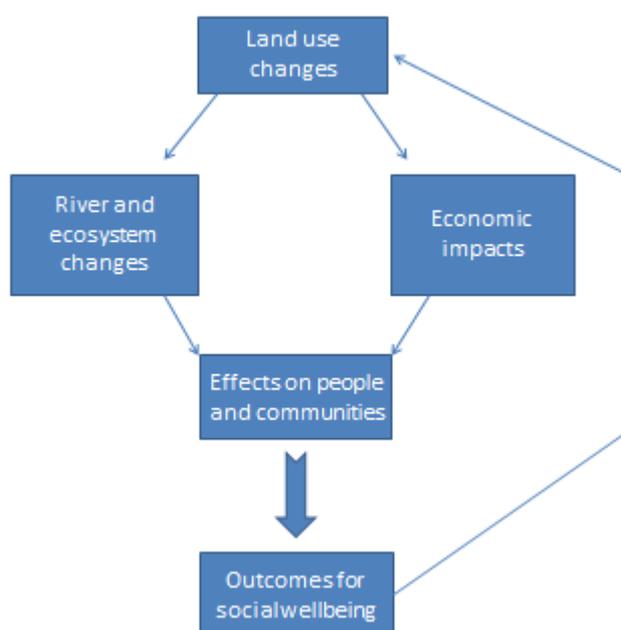
## Introduction

This narrative follows from the social baseline report completed in 2016. This social narrative is written for the Ruamāhanga Whaitua Committee. It will become part of a consolidated social assessment report later this year. The social narrative builds on other outputs in the collaborative modelling project and considers social impacts likely to stem from the management option changes envisaged in the scenarios.

## Scenario assessment

The collaborative modelling project has considered three main scenarios developed by the Committee for future land and water management options in the Ruamāhanga catchment. The social impact analysis has further considered the social implications of the outputs from the modelling. From a social perspective, the results of policy and planning options are seen as linked, as shown in Figure 1. Changes in land uses and management practices will drive economic impacts and result in changes to rivers and their ecosystems. Both sets of effects will in turn flow into effects on people and communities and potentially result in changes to outcomes for social wellbeing. Furthermore, acknowledging the complex nature of social-environmental systems, this narrative recognises that, as social well being changes, there is a feedback loop to land use as people and communities adapt and respond to the combined sets of effects (positive and negative).

Figure 1 Linkages to social wellbeing outcomes



The Ruamāhanga Whaitua Committee agreed on a set of scenarios that were tested by the collaborative modelling teams. The scenarios assessed by the team included a range of possible management options, where the results could inform the policy discussions of the Committee and their advice to the Regional Council in developing a catchment-specific chapter for the Regional Natural Resources Plan. Broadly, the scenarios comprised three, integrated packages of policy and planning along with a number of specific but separate management options that could be included alongside any scenario. Each scenario was tested to three points in the future: 2025, 2040 and 2080.<sup>1</sup>

- 1) Business as usual (BAU): The business as usual scenario runs existing policy, practice and investment into the future. Key changes in resource management under this scenario include wastewater treatment plants progressively discharging to land, and stock exclusion from water bodies - in accordance with the Proposed Natural Resources Plan rules.
- 2) Silver: The management options in the Silver scenario are intended to correspond to a moderate effort to improve water quality across the whaitua. It envisages actions to manage sediment, wastewater, water allocation, wetlands and on-farm practices. In general, management actions occur in longer timeframes than with the Gold Scenario
- 3) Gold: The Gold scenario represents the highest and most aspirational effort for making water quality improvements across a broad range of activities and issues in the whaitua. It also envisages actions to manage sediment, wastewater, water allocation, wetlands and on-farm practices. Management options happen in shorter timeframes– for example, all wastewater treatment plants discharge only to land by 2025 versus 2040 for Silver.

The components of the scenarios are shown in Table 1, a summary from the economic analysis that allows quick comparison between scenario elements.

*Table 1: Summary of scenarios modelled for economic effects*

Mitigation option	BAU	Silver 2025	Silver 2040	Silver 2080	Gold 2025	Gold 2040	Gold 2080
Retirement of steep slopes	retire rate		X	X	X	X	X
Space planting on steep slopes	Planting rate	X	X	X	X	X	X
Additional riparian planting (+5m)					X	X	X
Stock exclusion	X	X	X	X	X	X	X
WWTP discharge to land	Staggered	60%	100%	100%	100%	100%	100%
Minimum flow and allocation set	X	X	X	X	X	X	X
On-farm mitigation options	Tier 1	Tier 1	Tier 2	Tier 3	Tier 2	Tier 3	Tier 3

Source: economic impact analysis. Note: x = mitigation option included

The farm mitigation options (in addition to retirement of very steep land, tree planting on steep slopes, additional riparian planting, and exclusion of stock from water ways) include effluent storage and disposal to land, water (irrigation) and nutrient management to reduce infiltration, soil management to reduce sedimentation of waterways, stock exclusion from waterways and enhanced biodiversity of riparian areas.

<sup>1</sup> Scenarios to be tested for the Ruamāhanga Whaitua, Greater Wellington Council, unpublished manuscript.

Although the scenarios are the main focus, the modelling team examined aspects of a number of other management options for the Committee to consider. These possible additional actions included:

- Returning the Ruamāhanga River to Lake Wairarapa and closing the Lake Onoke outlet between January and March each year, and increasing the depth of both Lake Wairarapa and Lake Onoke by 1m.
- Managed aquifer recharge – a high level scenario to test the idea
- Additional water allocation rules including minimum flows set to better meet cultural values
- Additional or enhanced areas of wetlands.

Where possible, comments are made below about social impacts of these additional options, noting that in some cases modelling has only considered limited aspects of a particular additional action and the three scenarios were the principal focus of our work.

### **The social effects of potential changes to farm systems**

The economic assessment has considered impacts of policy and planning decisions on land use, farm systems and mitigation options (including extensive pole planting and retirement of some land). The social impacts of the effects of these decisions on farming systems relate to the farm sectors that are most affected, and the freshwater management units (FMUs) where these land uses are located. The economic effects that flow through to social impacts include changes for on and off farm income and expenditure, as indicated by the modelling of net farm revenue. The main land uses in terms of agricultural revenue are listed in Table 2.

*Table 2: Total net agricultural revenue by farm type – baseline*

Land use type and key FMUs <sup>2</sup>	Total net revenue	Percent of total
Dairy	\$59,452,530	30.9
Sheep and beef	\$74,721,075	38.8
Other land use	\$58,330,085	30.3
<b>Total net agricultural revenue</b>	<b>\$192,503,691</b>	100
Eastern hill rivers FMU	\$43,489,735	
Valley floor streams FMU	\$44,296,246	
Western hill rivers FMU	\$39,053,737	

Source: economic impact analysis

Effects of the three main scenarios on Farm Gate Revenue, Regional Economic Output and Regional Employment are explored in the economic modelling. These results show that net agricultural revenue will change as shown in Table 3, with the economic analysis finding that the on-farm effects are concentrated in sheep and beef farms that carry out the bulk of pole planting and retirement of land from grazing, and the Eastern Hills FMUs.

<sup>2</sup> These sectors generate Catchment employment of 1,148 MECs (modified employment count) engaged in the combined categories of Sheep and Beef/Cattle farming, and the Dairy Cattle farming sector is responsible for 639 MECs (see section 5 of the baseline report).

Table 3: Percentage change in on-farm, net agricultural revenue

Parameter	BAU	Silver 2025	Silver 2040	Silver 2080	Gold 2025	Gold 2040	Gold 2080
Total net agricultural revenue	-0.6%	-11%	-21%	-22%	-19%	-24%	-24%
Total dairy net revenue	-1.3%	-13%	-15%	-16%	-16%	-18%	-18%
Total S&B net revenue	-0.4%	-16%	-39%	-43%	-34%	-46%	-46%
Other land use net revenue	0.0%	-2%	-3%	-3%	-2%	-3%	-3%
Eastern hill rivers FMU	-1.3%	-11%	-29%	-33%	-25%	-35%	-35%
Valley floor streams FMU	-0.7%	-11%	-13%	-13%	-13%	-14%	-14%
Western hill rivers FMU	-0.8%	-12%	-21%	-23%	-20%	-25%	-25%

Source: economic impact analysis

The negative effect of on farm revenue identified by the economic analysis has a flow-on effect for regional economic activity because on-farm activity flows into employment and expenditure throughout the region. Results from regional economic analysis give an indication of the scale of these on-farm changes from a regional perspective, as an employment effect (Table 4).

Table 4: Change in regional employment (FTEs<sup>3</sup>)

Land use	BAU	Silver 2025	Silver 2040	Silver 2080	Gold 2025	Gold 2040	Gold 2080
Dairy	0.0	-33.0	-51.6	-56.9	-58.4	-74.0	-74.0
Sheep, Beef & Dairy Support	-5.9	-54.8	-111.9	-117.5	-118.1	-132.0	-132.0
Total	-5.9	-87.8	-163.5	-174.4	-176.5	-206.0	-206.0

Source: economic impact analysis

The negative employment effect of BAU is negligible but the effect increases with the Silver and Gold scenarios over time, reaching its greatest effect in the Gold 2080 scenario of just over 200 FTEs. It should be noted that because of the restrictions on available data for regional economic analysis, and the nature of flow-on effects, these results are spread over all sectors for the whole Wellington region, not the catchment or the Wairarapa area.

It is also important to consider that the modelled changes are spread over an extended period of time (60 years). Past experience of structural adjustments in rural New Zealand, as well as short-term adjustments, suggest that rural areas have adapted to change in a largely positive way when viewed in the longer term. Nonetheless, the costs of mitigation are likely to cause stress to farm budgets and to farm households, at least in the shorter term. To some extent the effect of a reduction in farm revenue will be mitigated by sheep and beef households themselves because of the high number of working proprietors (often couples) and their ability to reduce farm expenditure and drawings in the shorter term and to find alternative sources of income in the longer term, as seen in previous periods of change. However, the economic impacts on farmers will be stressful and some assistance with adjustment is strongly recommended.

<sup>3</sup> FTE = full-time equivalent. One FTE can be assumed to equate to 1.5 people employed, to allow for part-time and casual employment.

## **Effects of employment change on population and communities**

Additionally, it is important to consider that any reduction in employment will flow into the population of the area. Population loss can be calculated using the FTE loss as a base, but any such projected losses are made without allowing for compensatory factors discussed below. Using a population multiplier of 2.2<sup>4</sup> the effect of the Silver scenario could represent a loss of between 190 people in 2025 and 390 by 2080. The Gold scenario could represent a loss of up to 450 by 2080. Direct losses of this nature could have effects on rural areas and communities, especially allowing for the fact that much of the effect is concentrated in the Eastern hill country areas. Population losses could transfer into effects on rural schools and local organisations that are sensitive to any loss of students or members. This means there could be a negative effect, at least in the short term, for small rural communities and the five larger towns of the sub region that service the potentially affected rural areas. In the longer term, any effect on population is most likely to be subsumed by other social-economic factors.

## **Additional effects on the form of the countryside**

A reduction in farm revenue will push farmers to look for economies of scale and therefore could lead to some amalgamation of farm holdings in all land use types. Furthermore, a reduction in farm revenue is by implication a potential reduction in farm household drawings, which is likely to push the members of affected households to look for alternative sources of income, which in the past have included innovative crops and land uses, multiple job holding (off-farm employment) and alternative enterprises on and off farms. This effect is likely to be greatest with the Eastern hill country sheep and beef farms that are indicated as affected. An option facing some dry-land farmers will be to subdivide their land into lifestyle blocks and rural residential subdivisions – an effect that is moderated by existing land uses, age of a farmer/ farm couple and farm succession planning, proximity to population centres, and proximity to work opportunities in the Wairarapa, and to the major commuting route by rail or road into Wellington City. This subdivision effect is much less likely on properties that are already farmed intensively in dairy farming or horticulture, such as grapes, and in the areas distant from major population centres.

## **Effects on the social value of waterways and human health**

This assessment has found (Section 6.4 of the social profile) that freshwater in the Wairarapa region is the setting for a wide variety of outdoor recreation activities that are important to both locals and tourists. It confirms that the waters of the catchment have multiple social values for the people and communities of the Wairarapa,<sup>5</sup> as confirmed by wide ranging engagement undertaken by the Ruamāhanga Whaitua Committee, which also reinforces values established in the Proposed Natural Resources Plan.<sup>6</sup> In addition to the considerable benefits of fresh water to farming from stockwater

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<sup>4</sup> The population multiplier for the catchment is estimated as 2.2 (based on the total population for the catchment in 2013 and total MECs for the catchment in 2013).

<sup>5</sup> The concept of social value of water builds on the economic concept of Total Economic Value.

<sup>6</sup> Eg., Schedule F: Ecosystems and habitats with significant indigenous biodiversity values; Schedules I: Important trout fishery rivers and spawning waters.

supplies and irrigation, social benefits include urban and rural drinking water supplies, wastewater disposal, outdoor recreation, amenity values and lifestyles, cultural activities and mahinga kai.

These social benefits of fresh water include employment and outdoor activity, and these are both determinates of human health. But human health is also potentially affected through pathogens and nitrogen in drinking water and through pathogens and cyanobacteria affecting contact recreation. Pathogens in fresh water are therefore a principal concern in relation to social values. The specific attributes considered in the NPS for Freshwater Management for human health in water used for recreation are E. coli in lakes and rivers and phytoplankton (cyanobacteria) for lakes and lake-fed rivers.

The amended NPS guidelines are (Table 5):

Category	Percentage of Exceedances over 540 cfu/100 mL	Median E.coli per 100 mL	95 <sup>th</sup> percentile E.coli per 100 mL	Percentage of exceedances above 260 cfu/100 mL
Blue (Excellent)	< 5 percent	≤ 130	≤ 540	< 20 percent
Green (Good)	5–10 percent	≤ 130	≤ 1,000	20–30 percent
Yellow (Fair)	10–20 percent	≤ 130	≤ 1,200	20–34 percent
Orange (Intermittent)	20–30 percent	> 130	> 1,200	> 34 percent
Red (Poor)	> 30 percent	> 260	> 1,200	>50 percent

The Updated (2017) National Objectives Framework (NOF) makes it compulsory to meet certain values and provides guidance as to the meaning of these numeric bands in social terms (for ecosystem values, outdoor recreation uses and human health).

- The blue band (A = excellent) means that there is very low risk to human health as indicated by the measure of E. coli. The category allows a full range of recreational activities in a range of flows, including primary contact recreation. Primary contact recreation includes those activities where there is occasional immersion or the potential to ingest water, such as water skiing.
- The green band (B = good) means there is some (low numerical) risk to human health from primary contact recreation.
- The yellow (C = fair) band means the water is below an acceptable standard for primary contact but still suitable for secondary contact, such as boating or wading - limbs in contact with the water but not the head.
- The orange band (D = intermittent) means high risk to human contact
- The red band (E = poor) presents very high risk to human contact.

Under (2017) amendments to the NPS for freshwater management,<sup>7</sup> the current national objective is to maintain or improve water quality in a region and at least provide for secondary recreation (ie the bottom line lies between the yellow (C) and orange (D) bands. Water bodies must achieve improvements overall in water quality and meet at least the two compulsory national values set for

<sup>7</sup> <https://www.mfe.govt.nz/fresh-water/what-government-doing/national-direction/national-policy-statement-freshwater-0>

ecosystem health, and human health for secondary contact. In addition, the Whaitua Committee has determined through its engagement processes that significant improvements should be achieved on the catchment waterways, moving them between one or more bands, at least in the longer term (through to 2080).

Results modelled for E. coli in the Ruamāhanga waterways for each scenario are summarised by Jacobs in a map of results for modelling points on the river system and lakes (Figure 1 – see the Jacobs map). These results are in turn assessed against the NPS amended standards (Table 5). The results reflect the combination of mitigation and management tools for each scenario.

The modelling of E.coli found that stock exclusion and dairy effluent management is effective on the base load of E.coli, but what drives the swimming (contact recreation) categories the most is the ‘event loads’ which cause high results. With the Silver scenario, eight sites show an improvement from the baseline. The same eight sites improve as well with the Gold scenario but earlier, by 2025 or 2040 rather than 2080. The sites and their changes from the baseline (Gold scenario) are as follows:<sup>8</sup>

- Huangarua Ponoatahi Bridge from orange baseline to yellow from 2025
- Mangateretere at SH2 from orange baseline to green from 2025
- Parkvale Weir from orange baseline to yellow from 2040
- Ruamāhanga at Te Ore Ore from orange baseline to yellow in 2025
- Tauanui River Mouth from orange baseline to yellow in 2025
- Taueru Gladstone Te Whiti from red baseline to orange from 2025
- Waiohine at Bicknells from green baseline to blue from 2025
- Waipoua at Colombo from green baseline to blue from 2025.

As noted in section 6.5 (see Table 21 of the social baseline), monitoring data indicates that parts of the Ruamāhanga River are sometimes unsuitable for swimming and there is evidence that as a result recreational activities are reduced or displaced to other sites. The modelling results for E.coli suggest that under BAU this situation will continue to decline but improvements are achievable at key points through the types of tools envisioned in the scenario analysis, maximised at Gold 2080.

In addition, modelling of the E.coli results for Lakes Wairarapa and Onoke found that Lake Wairarapa has a small reduction in E. coli loads but no shift in the NOF bands for the Lake, which is in the blue band already. Return of the Ruamāhanga into Lake Wairarapa increases the E coli load of the lake as the river water is a lower quality than the lake. However, the modelling shows these bacteria quickly die off in the lake, which remains largely of high standard for E. coli, and the water flowing into Lake Onoke improves (verses having it flow into that lake directly as at present). Lake Onoke already has issues with water quality and is highly valued for recreation purposes, food gathering and mahinga kai<sup>9</sup> so the return of the river to Lake Wairarapa may bring net social benefits through the dilution effect achieved.<sup>10</sup> An increase in water level may affect adjoining farmland and wetland areas (biodiversity) but this lake-level effect is not assessed.

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<sup>8</sup> After Jacobs (2017).

<sup>9</sup> Community and iwi feedback supports improvements to Lake Onoke in particular.

<sup>10</sup> Allen, Mathew (2017). Memo to the Greater Wellington Council: Lakes Wairarapa and Onoke scenarios, in comparison to baseline. Environmental research Institute, University of Waikato.

Overall, there are improvements identified for social values of water ways and human health, especially for levels of E. coli and suitability for contact recreation, and these should lead to improved social outcomes. In addition to benefits to outdoor recreation, it is useful to consider there is a potential feedback loop to an increasingly multifunctional countryside and the ability of the sub region to attract additional businesses, small farmers and amenity migrants, innovative land uses and off-farm economic activities.

### Effects on the social value of waterways and ecosystem health

The scenario analysis shows that the tools envisioned under Silver and Gold scenarios will result in some improvements for the amount of sediment and nutrients entering waterways of the catchment (Table 6).

Table 6: Summary of the environmental response to the different scenarios.

	BAU 2040	BAU 2080	Silver 2025	Silver 2040	Silver 2080	Gold 2025	Gold 2040	Gold 2080
<i>Environmental parameters (% change)</i>								
Sediment loss <sup>11</sup>	-9.3%	-15.3%	N/A	-26.9%	-36.8%	N/A	-30.1%	-32.9%
N losses	0%	0%	-8.1%	-8.7%	-8.7%	-9.0%	-9.1%	-9.1%
P losses	0%	0%	-18.1%	-43.4%	-52.1%	-32.4%	-52.6%	-52.6%

Source: economic impact analysis

The benefits from potential reduction of N and P into waterways, combined with reduced sedimentation and shading from riparian planting, will result in ecological benefits for the rivers, streams and lakes, measured in terms of indicators such as periphyton (especially cyanobacteria), macroinvertebrates, and trout size and abundance. It is inherently difficult to model the ecological effects of such complex interrelationships. The ecological analysis to date indicates that in the longer term (Gold 2080) there should be improvements to the recreational and aesthetic attributes of the catchment over BAU. Rivers that show the most gains are the Huaranga, Taueru, Waipoua, Waingawa and Tauherenikau.<sup>12</sup>

Trout size and abundance are crucial to angling activity, which is already reported as poor to medium for the reaches investigated. The analysis showed it is difficult to obtain gains in factors such as habitat area and water clarity for trout and other fish species such as eels and inanga. Improved stream-bed management (reduced bulldozer activity for flood management and allowing an improved pattern of pools and riffles to form) and better stream bank cover could well provide better results for fish populations, and the Committee is investigating these options further.

Overall, the improvements to the social value of waterways from improved ecosystem health should lead to gains for outdoor recreation, aesthetics and amenity values. Additional, targeted actions along the main bed of the river and in specific waterways and wetlands, including restoration efforts and better stream-bed management should add to these gains. The full package of actions will require a coordinated, strategic approach from the Council as well as community groups and individual landowners.

<sup>11</sup> There was no information on sediment loss provided for 2025.

### **Effects on costs of living**

It is probable that the upgrade of waste and storm water systems, such as disposal of waste water to land envisioned in the scenarios, will have an effect on the cost of doing business and the cost of living for households because these costs are allocated through rates, capital charges or requirements for expenditure by property owners. There are potential distribution issues (equity issues) arising from allocating costs via a property rating system, depending on the method that the territorial authorities use to fund the proposed mitigation options. At this point no costs for upgrading infrastructure are available and no funding approach is confirmed. Spending power (ability to pay) will vary across household demographic groups and business types and size. In simplest terms, the lowest income quintile households (described in Section 4.5) have the least spending power and are likely to be the most affected in percentage income terms, while people and businesses with high capital values are likely to carry the most rates per person or household despite their income level. This effect is of concern because of the high level of social deprivation identified for areas of the main towns of the catchment (social baseline section 10 and Annex 2 maps) and may require an assistance programme for vulnerable households.

### **Effects on social equity and community cohesion**

It is highly likely that costs (direct costs) and benefits (indirect positive and negative effects) will be spread unevenly across groups in the communities of the catchment, complicating the process of decision making around proposed plan policies and rules. A paper on equity considerations in freshwater management for the Ruamāhanga Whaitua Committee to consider, points out that equity is relevant to the tasks of the Committee because planning affects who has access to and benefits from water as a result of the land uses affected, the quality of water and aquatic habitat available to the community, and who bears any costs, including with respect to future generations.<sup>13</sup>

For example, the economic analysis found that the farming community will bear costs of on-farm mitigation, pole planting and retiring land from grazing. There could be a negative flow-on effect to those employed in the farm sector, including farm contractors and farm service providers and these economic effects will flow into the wider community.

Urban populations will bear the costs of enhanced wastewater treatment, costs reflected in rates bills/rentals and potentially in capital contributions for new connections to town sewerage systems (cost of housing). Rural populations could incur costs from any new rules around septic tank systems – including capital costs and annual running costs (electricity and higher maintenance for modern systems).

On the other hand, those most likely to benefit from reduced E.coli or improved ecological status of waterways include those who drink water, and river users who enjoy natural and amenity values of the waterways. These people are most heavily represented in the population centres of the towns and amongst visitors to the area, including those from outside the Wairarapa.

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<sup>13</sup> Sinner, Jim (2016). Equity considerations in freshwater management. Prepared for Greater Wellington Regional Council and the Ruamāhanga Whaitua Committee, Cawthron Institute, Nelson.

Equity issues can also result from over allocation of a resource, such as the ability to abstract water and also to discharge into it. Because of the complex nature of river systems, an action in one part affects those using the resource downstream. So it is important that the mechanisms employed to manage water are seen widely to be fair to as many people as possible. This can include using tools such as planning rules, resource consents for land and water uses, or water charges that apply as widely as possible. Decisions must be weighed carefully for any possible equity issues or perception of equity issues (lack of clarity of purpose or unfairness can add to this problem). Any real or perceived social inequity in the communities of the catchment is likely to have a further social impact because it can reduce social cohesion.

In counter balance to this effect, social cohesion can be improved across the catchment by a shared knowledge of collective action to solve environmental problems, either at the regional level or at the local level through community investment in actions, and through local initiatives such as stream or wetland restoration and enhancement projects, for example. Positive environmental outcomes and awareness also have the potential to drive future positive economic and social outcomes, including employment and healthy lifestyles, through environmentally proactive communities. An additional benefit is the ability to promote an area that produces a wide range of food and beverage products alongside a vibrant visitor economy close to Wellington and on a main tourist route, as described in the social baseline.

### **Management of change**

Past experience in rural areas of New Zealand shows that when economic and social restructuring takes place as a result of external drivers of change (such as commodity price cycles, new technologies or government policies) then people, communities and towns can and will adapt. The ability to adapt (often referred to as resilience) will vary depending on the extent that the change is spread over a large number of people and communities or focused on one place, and the available social, financial, human, physical and natural capital in affected communities.

It is also apparent that the ongoing result in terms of positive and negative outcomes for social wellbeing will depend on the process of change management that is put in place in support of policy and planning changes. This process could include, for example:

- Assistance to local councils for upgrading wastewater treatment and stormwater
- Assistance to vulnerable urban households for increased costs or rate relief
- Assistance to farm operators for adopting new technology and innovation/farming systems within a rural-economy and sustainability strategy
- A local training and employment strategy based around existing providers such as Taratahi to take advantage of work in mitigation actions and new land uses
- Working with local organisations such as East Coast Rural Trust to support farmers working through periods of change and increased levels of stress
- Working with urban and rural stakeholders to identify a range of water storage options with multiple functions including enhanced flow regimes
- Integrating outdoor recreation planning and management with a regional visitor strategy
- A development strategy and supporting actions for the visitor sector
- Encouragement for community based environmental management and restoration projects, including EnviroSchools.

The assessment summary (Table 7) assumes there will be a process of active change management and support for those most negatively affected, along with active ongoing management by GWRC and other relevant local and central government agencies to maximise benefits and outcomes from new policies and plans. These aspects are being considered by the Council as part of a developing programme for implementing the Ruamāhanga Whaitua Implementation Programme.

### **Summary of social wellbeing outcomes**

Table 7 provides a summary of social wellbeing outcomes<sup>14</sup> based on the above narrative. Briefly, by outcome listed:

- Economy, business activity, income and employment – a short term (5-10 years) negative effect based on the outcomes for farm revenue and employment but a strong recovery in the longer term as the rural and wider economy adapt
- Physical and mental health – a short term effect on mental health as farmers adapt to the stress of change; gains to physical and mental health from improved water quality and increased outdoor activity in the longer term
- Outdoor areas, natural environment and open space – gains over time with ecological and aesthetic improvements
- Lifestyles, leisure and recreation – gains over time with improvements to the natural environment
- Lifelong learning and education – Benefits over time from enhanced knowledge and interest in the environment including citizen science, plus gains from work training to take part in mitigation and restoration activities and economic diversification
- Personal, community and public safety and freedom from risk – benefits over time as water changes between bands of risk for contact recreation
- Housing, living space, neighbourhood & sense of place – benefits over time from enhanced sense of place, living environment and local actions
- Goods and services, retail and commercial space, transport and communications – short-term negative effect following reduction in farmer expenditure but improvements over long term from economic diversification
- Family, social attachment and support (social cohesion) – some conflict and initial loss of social cohesion as all groups adjust to the changes taking place, turning to positive outcomes over time
- Participation in community and society (including equity) initial uneven results for some groups, especially low-income urban populations and some farmers, along with an increasing interest in participating in positive community actions and outcomes.

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<sup>14</sup> See the outcomes by wellbeing framework table presented in the social assessment baseline report.

Table 7: Summary of likely social wellbeing outcomes by scenario

Element of Social Wellbeing	BAU	Silver 2025	Silver 2040	Silver 2080	Gold 2025	Gold 2040	Gold 2080
Economy, business activity, income and employment	-	↓	↑	↑↑	↓	↑	↑↑
Physical and mental health	↓	↓	↑	↑↑	↓	↑	↑↑
Outdoor areas, natural environment and open space	↓↓	↑	↑	↑	↑	↑	↑↑
Lifestyles, leisure and recreation	↓	↑	↑	↑	↑	↑	↑↑
Lifelong learning and education	-	↑	↑	↑↑	↑	↑	↑↑
Personal, community and public safety and freedom from risk	↓↓	-	↑	↑↑	-	↑	↑↑
Housing, living space, neighbourhood & sense of place	-	↑	↑	↑↑	↑	↑	↑↑
Goods and services, retail and commercial space	-	↓	-	↑	↓	-	↑
Transport and communications	-	↓	-	↑	↓	-	↑
Family, social attachment and support (social cohesion)	↓	↓	↑	↑↑	↓	↑	↑↑
Participation in community and society (including equity)	↓	↓	↑	↑↑	↓	↑	↑↑

**Assessment scale**

<b>Much worse</b> ↓↓	<b>A bit worse</b> ↓	<b>Same or very little change</b> -	<b>A little bit better</b> ↑	<b>A lot better</b> ↑↑
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**Summary and conclusions**

Environmental and economic analysis has not distinguished much difference between the Silver and Gold scenarios. Similarly, the social analysis has found that the social benefits from the Silver Scenario are almost up to the benefits from the Gold Scenario, particularly in relation to E.coli modelling results and the potential gains for recreational uses of waterways, especially for contact recreation. The differences between scenarios appear to relate mostly to timing and the gains from additional riparian planting – offset by the costs to rural land holders. Overall, the combination of benefits to human health and lifestyles favours the Gold scenario in the longer term, through improved river and lake environments, wetlands and riparian planting, and new land uses, along with a community committed to environmental management backed by a diverse, more resilient and sustainable economy. The Silver scenario looks to have less social cost in the shorter term but with lesser gain.

The results indicate that, from a social perspective, the Committee will have to consider additional tools to those modelled in the scenarios in order to achieve desired outcomes for water ways while building social support. In implementing the full suite of tools through a sub-regional (Whaitua) chapter of the Plan, the Committee should consider who benefits and who bears the cost. The Committee should also consider the benefits from a phased approach, with adaptive management

(monitoring and adjustment as required) to maximise social support – with a programme aimed initially at Silver 2040 as a minimum and then making additional adjustments over a specified period of time to achieve an advanced set of measures in the longer term. The final set of policy and plan changes should include a change management programme to support the efforts of urban areas, farmers, rural communities, and ecological restoration groups in adjusting to change and achieving the best mix of environmental, social, cultural and economic outcomes in the most equitable way possible.

Economic and ecological effects will flow into effects on people and communities and potentially result in changes to social wellbeing outcomes. These social effects, both positive and negative, are likely to be distributed unevenly. By acknowledging the complex nature of social-environmental systems, it is possible to understand better that positive social well being outcomes require proactive management for affected groups. Flexibility in policy making, and well-targeted change, will assist people and communities to adapt and respond by taking advantage of new opportunities from environmental improvements.