

Southland | Murihiku
Infrastructure Strategy for
Healthy Rivers
and
Resilient Communities

Environment Southland 2024-2054

DRAFT

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Introduction

Our region, like many others around New Zealand / Aotearoa, is experiencing an increase in climate related events which expose us to risks that are predicted to become more severe and more frequent. This strategy sets out how Environment Southland proposes to respond to the various issues that our environment and our communities are likely to face over the next 30 years.

Southland / Murihiku whenua

- covers an area of approximately 3.1 million hectares,
- is home to approximately 102,600 people, and
- provides us with a diverse and highly valued natural environment.

Our region

- contributes approximately \$7.3 billion to the national gross domestic product (GDP) annually, and
- has critical assets with a capital value of approximately \$100 million (things like roads and railway lines, power supply and telecommunications infrastructure, etc.).

Scientific and technological advances predict that we should expect climate related events and impacts to continue to challenge the resilience of Southland / Murihiku with at least the same degree of frequency, intensity, and duration as experienced during, and since, the 2020 flooding.

What protects all this from the hugely damaging impacts of flooding? Another \$100 million of assets managed by Environment Southland that provides flood protection and land drainage (things like stopbanks, pumps, dams, etc.).

Environment Southland is facing significant challenges, predominantly around climate change, maintenance, community expectations, and funding. The Infrastructure Strategy will ensure that Council can still give surety and confidence to the community.

The functions of Environment Southland have shifted over time in response to changing governments, community expectations, and the environment. Environment Southland and the River Catchments Boards, who had a long history in the area, made decisions using the best information that they had available at the time. However, not enough money was put aside for maintaining assets, which has resulted in some of the challenges that will be dealt with in this strategy. This strategy has been prepared using information and data contained in a National Institute of Water and Atmospheric Research (NIWA) report, "Climate Change Impacts in Southland: A Report for the Southland Regional Council" (Wellington: NIWA, 2018), which offers the most currently available data for Southland / Murihiku. It is important to note that this report is expected to be either updated or replaced during the period of the 2024-2034 Long-term Plan (LTP), and as Environment Southland places a high priority on working with the most current data, any work resulting from this Infrastructure Strategy will use any new information and / or data that is available at the time.

It is important to note that in the short term our focus is on immediate flood protection and river management needs, including gravel management, while we plan and position ourselves for the transition to alternative ways of managing floodplains over the medium and longer-term. It is not viable to keep building higher and higher stop banks. One alternative is nature-based initiatives such as wetlands for water retention, native plantings and restoring old channels. This is something we have already started to explore.

Environment Southland recognises the importance of tikanga Māori and values its relationship with both Ngāi Tahu (through the four Southland papatipu rūnanga) and ngā matawaka (other Māori who are not Ngāi Tahu) living within Southland / Murihiku. Environment Southland continues to develop its relationships with rūnanga in Southland through Te Ao Mārama Inc (the Iwi liaison entity representing Southland three rūnanga for resource management and local government issues) and with Te Rūnanga o Ngāi Tahu, the iwi authority.

Moving forward, the challenges of climate change are the primary driver for ensuring that our assets are suitably maintained, so that they can manage risks associated with natural hazards, enable economic productivity, and provide for community wellbeing. It is important that these assets are considered not only for the next 10 years or 30 years, but 100 years plus. They must be managed in a way that ensures the required outcomes and levels of service are delivered in the most cost-effective manner to present and future generations.

What is the purpose of this strategy?

The central and most important purpose of the Infrastructure Strategy is to give confidence to the community who rely on the effective performance of the councils' assets, have a level of confidence for their safety, wellbeing and economic outcomes. This means that the community have a clear understanding and level of preparedness for what the council is committing to delivering, for healthy rivers and resilient communities.

In summary, the purpose of the Infrastructure Strategy is to:

- identify significant infrastructure challenges and issues for Council over the next 30-years;
- consider and assess potential management options;
- identify a preferred way to manage these issues;
- outline the associated service and financial implications of managing these issues;
- to develop a risk assessment framework to inform council's decision-making;
- provide the regional community with visibility and understanding of the issues and the long-term planning and investment needs associated with the provision of the flood protection and river control assets over that timeframe.

Legislative framework

Any Infrastructure Strategy is balanced on top of national policy and legislation. The most important to this strategy is the Local Government Act (2002) (LGA) which sets out the requirements for infrastructure strategies and asset management planning. The figure below summarises the key legislation currently enacted, with the darker boxes signalling coming changes.

Local Government Act 2002 Section 101B

- Covers the purpose, intent and detail of what is to be included within an Infrastructure Strategy, this includes: identification of issues, how the council intends to manage assets, budgeting, costs and assumptions on which it is based.

National Policy Statement for Freshwater Management 2020

- Te mana o te wai - refers to the fundamental importance of water and recognises that protecting the health of freshwater protects the health and well-being of the wider environment.
- Directs integrated management approach to freshwater in accordance with the principle of ki uta ki tai (from the mountains to the sea).
- Local authorities must actively involve tangata whenua in freshwater management.

National Adaptation Policy & Legislation

- Adapt and thrive: Building a climate-resilient New Zealand.
- New Zealand's first national adaptation plan.
- A national direction on how to respond and adapt to climate change, covering communities, economies, homes, and infrastructure assets.
- Specific actions required of councils are currently unknown but will play out in the life of this 30-year strategy.

1, 2

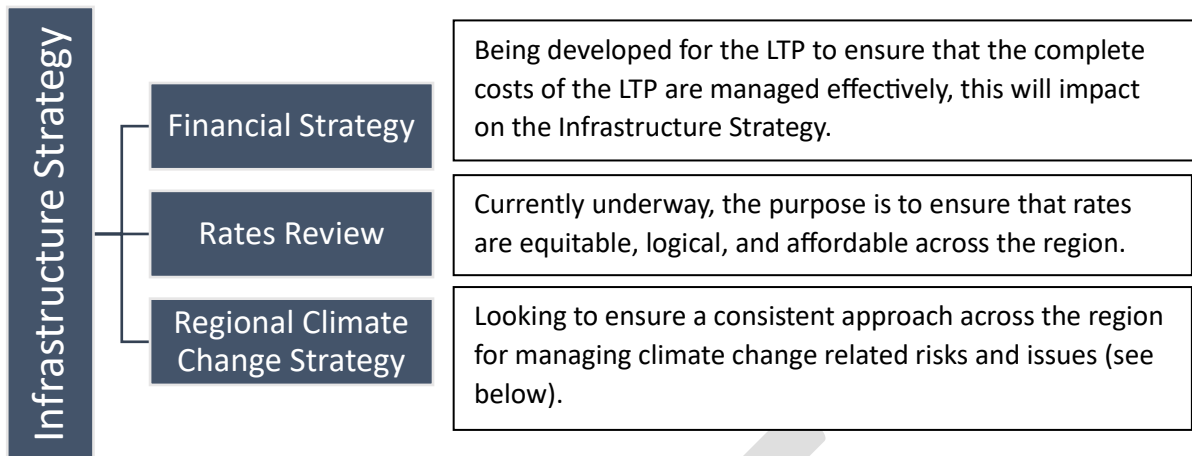
Strategic alignment

This strategy does not sit in isolation, it is interconnected and dependent upon many other parts of the council's plans and strategies as well the national policy and legislation described in the previous paragraph.

There are also three other important policies or strategies that are being reviewed alongside the development of the Infrastructure Strategy. These are depicted below.

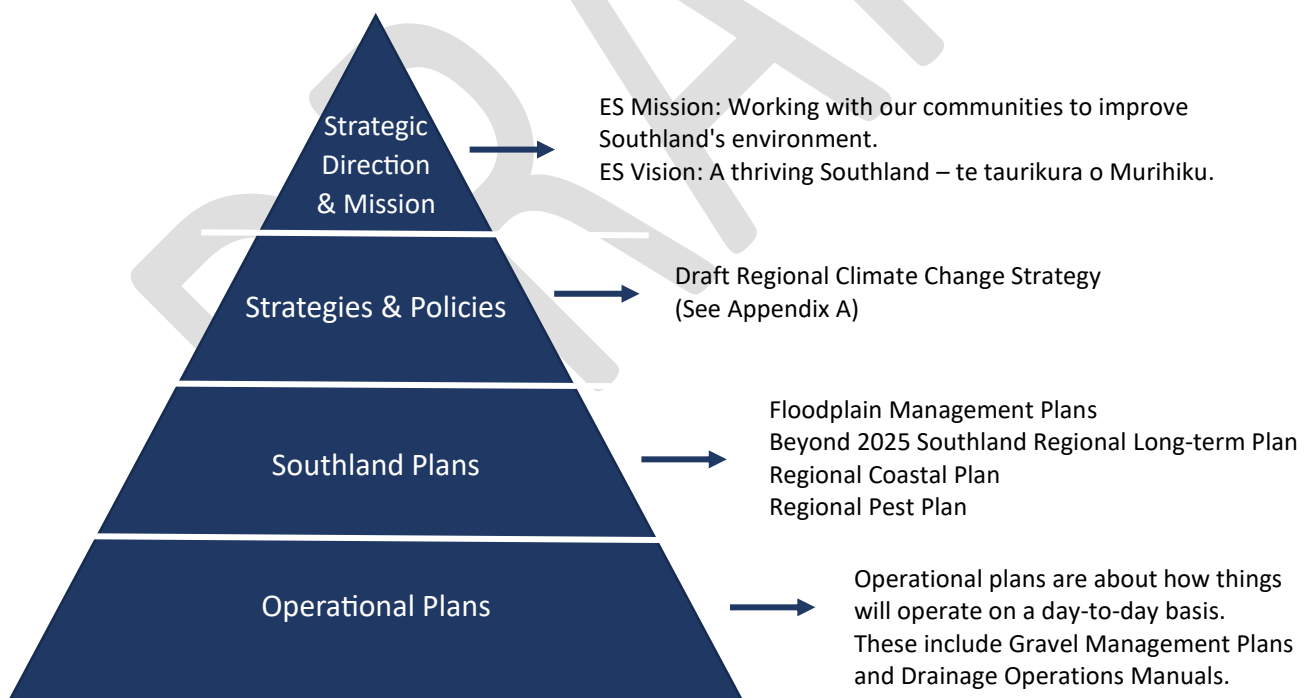
¹ [Three Waters Reform Programme - dia.govt.nz](https://www.dia.govt.nz)

² [National adaptation plan | Ministry for the Environment](#)



The Murihiku Southland Regional Climate Change (RCC) Strategy is a collaborative piece of work that is underway with Southland councils alongside Te Ao Mārama Inc. This work is about building an inclusive partnership to define a regional strategic response to a changing climate. This means that there is an agreed approach and aligned values in how the councils collectively respond. The core principles and aspirations of the RCC Strategy are incorporated into the Infrastructure Strategy. More detail around this can be found in Appendix A.

Other than these strategies currently under review, there are other Environment Southland documents that interlink with the work of the Infrastructure Strategy:



Strategy Scope

This strategy has been prepared for the flood protection and river control works infrastructure as required under the LGA. It covers the following infrastructural assets:

Flood Protection	River Management & Control Works	Associated Resourcing
<ul style="list-style-type: none"> • Stopbanks • Culverts • Dams • Lake Hawkins Pump Stations & Drain 	<ul style="list-style-type: none"> • Weed control & vegetation management • Siltation prevention • Erosion management • Bank stabilisation 	<ul style="list-style-type: none"> • Staff structure for adequate resources to ensure assets are maintained as expected • Budget for climate modelling and data gathering

Matters related to land drainage management schemes are currently being dealt with outside of the flood protection and river control activity. In addition, the budget within the Infrastructure Strategy for climate data is essentially around the gathering of information only. Any adaptation pathways that need to be developed as a result of this data will need to be accounted for through the wider LTP budget.

Other items that are considered outside of the scope of this strategy include:

- Powerlines
- Bridges
- Monitoring sites
- Resource consents
- Depots, offices and buildings
- Fleet
- Software

Assumptions

As per the LGA 2002, it is essential to include the assumptions on which the Infrastructure Strategy is based. This table represents a summary of the assumptions identified, however, full analysis of these assumptions can be found in Appendix B.

Assumption	Description – what does this mean?	Why make this assumption?	Risk	Likelihood of occurrence
Population growth is linear.	That the population of the region will continue to grow in the same way it has been.	To forecast the number of rates, levels of service, and protection required.	Low	Medium
That insurance will continue to provide cover for Environment Southland assets.	That assets will continue to be insured and covered for significant events.	To budget appropriately for insurance premiums, otherwise, a significant budget would need to be put aside to self-insure assets.	Low	Medium
Life cycles of assets will remain stable, despite climate change variables.	That the fixed assets will last as long as they were intended, even if the weather or	To be able to plan and budget for maintenance, upgrades and replacements with a high level of certainty.	Medium	High

	frequency of floods increase.			
Policy and planning will limit growth in flood prone areas.	If new developments are in places where they cannot be protected by existing or planned infrastructure, they will not be protected in the future.	Planning and budgeting can only be made on existing developments, it cannot provide for an unknown amount of development in areas that may require new or further flood protection.	Medium	Medium
New legislation will likely impact infrastructure requirements.	New national policy and legislation will change the responsibilities, or requirements, of the council regarding its assets.	To ensure that the strategy builds in a contingency to allow for new requirements, for example the national contingency plan or managed retreat of particular areas.	High	High
That national climate modelling is achievable, and that national data will be available in the next 12 months, with regional data available by 2025.	That modelling will have a level of certainty that will be useful for regional planning.	To ensure that the current flood protection assets can withstand modelled scenarios to an agreed level of protection.	High	High

Regional Overview

Māori

The four main Papatipu Rūnaka in the region are Waihōpai, Awarua, Hokonui, and Ōraka Aparima. Together, they have been actively engaged in delivering essential support services for Māori in Murihiku Southland, encompassing social welfare, healthcare, education, and overall well-being.

Between 2013 and 2018, the Māori population experienced a notable increase of 2,900 individuals, reflecting a remarkable growth of 25%. Concurrently, the Pacific ethnic group also saw substantial growth, with an increase of 606 people, constituting a significant 32% rise³. In contrast, the European population registered only a modest 6% growth, resulting in a decrease of 2.4 percentage points in the European share of the population. These statistics serve as a clear indication that the region's demographic landscape is undergoing a transformation, prompting the need to identify and implement strategies to accommodate and support this evolving diversity effectively.

The region recognises the pivotal role of marae in fostering cultural preservation and community cohesion. Marae serve as vibrant centres for the celebration of traditions, the cultivation of connections, and the cultivation of a profound sense of belonging. Furthermore, marae provide a platform for the integration of a wide array of social services and the development of papakāinga housing. This holistic approach is exemplified by the notable advancements at Murihiku and Mataura Marae, as well as Te Rau Aroha Marae in Motupōhue Bluff, where the collective vision of a close-knit, thriving community is steadily taking shape. These initiatives underscore the region's steadfast commitment to inclusivity, equity, and the well-being of all residents as they navigate a path towards a more promising future⁴.

To help promote and develop its relationship with Māori, Environment Southland together with six other local authorities in Southland/Otago, signed with Te Ao Mārama Inc the Charter of Understanding He Huarahi mō Ngā Uri Whakatapu - A Pathway for the Generations Coming Through.

The revised Charter was re-signed by all the parties at Hokonui Rūnanga marae on 7 March 2016. The Charter of Understanding provides:

- the basis for an ongoing relationship between the seven councils and the tangata whenua of Murihiku to assist in developing the capacity of Māori to contribute to decision-making processes;
- a foundation for consultation on a wide range of local government issues;
- for the recognition and willingness of Te Ao Mārama Inc to assist all councils in consultation with all ngā matawaka (other Māori who are not Ngāi Tahu) living in Murihiku. This is important in terms of Māori contribution to decision making in the Southland region, particularly as the responsibilities of the Council under the Local Government Act in relation to Māori are with all Māori, not solely the local iwi.

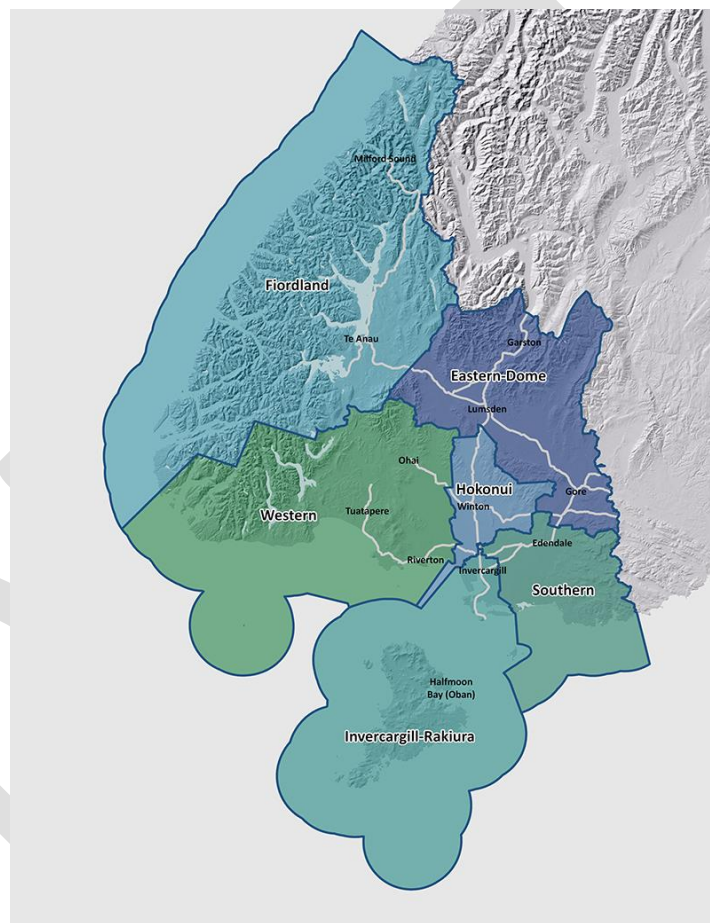
³ <https://beyond2025southland.nz/nov/wp-content/uploads/2023/06/B2025-Plan-FINAL-Compressed.pdf>

The Charter is based on a co-management model, and is unique in the South Island. It sets out the basis and conduct of the councils and rūnanga in the context of the Local Government Act 2002 and Resource Management Act 1991 and provides the basis for Māori to contribute to the decision-making process via Te Roopu Taiao.⁵

Environmental context – geography, population, economy and climate today

Geographic

Environment Southland's activities cover a geographical area of 3.1 million hectares, ranging from the beautiful, rugged coastline of the Catlins in the South East, lush rolling farmland of Central Southland, stunning fiords and mountains of Fiordland in the South West and to Stewart Island to the South, rich in native fauna and flora. Southland has the longest of any coastline in New Zealand with a total of 3,400km, one seventh of New Zealand's total.



Picture 1 – Constituencies across Environment Southland region

The area is serviced by three other local authorities: Invercargill City Council, Gore District Council and Southland District Council. Major centres in this region include Gore, Invercargill, Bluff, Lumsden, Riverton/Aparima, Tuatapere, Winton and Oban.

The region is broken up into six different constituency areas, meaning that a councillor from each of these areas is elected and sits on the Environment Southland Council. These constituencies are Fiordland, Western, Invercargill-Rakiura, Southern, Hokonui and Eastern-Dome.

⁵ <https://www.es.govt.nz/about-us/partnership-with-iwi>

Population

The Southland region's population has increased from 97,750 in 2015 to 102,400 in 2022, which is a 5.7% increase, compared with a national increase of 11.2%. This slow increase, which is less than the national average, is also paired with a higher proportion of people over the age of 65 (18.3%), compared to 16.4% nationally. With a slower than national average increase and slightly higher proportion of people aged over 65 (18.3%).

	2022	2054	Change
EMPLOYMENT	55,610	64,260	+8,650
POPULATION	102,400	120,930	+18,530
HOUSEHOLDS	41,690	50,110	+8,420
ANNUAL GDP	\$7,290M	\$11,270M	+\$3,980M

Picture 2 -Projected growth across the region⁶

Regarding ethnicity, there is a proportionately higher percentage of Europeans in the Southland population, when compared to the national average of 70%. The population of Southland at the 2018 Census was 97,467 with Maori making up 14,484 of this population. For non-Maori the region has experienced very steady growth, rising from 90,876 in 2006 to 93,342 in 2013. For Maori, the region experienced an increase from 10,422 in 2006, 11,607 in 2013 to 14,484 in 2018. This steady growth rate is expected to continue at a rate of 2.0% according to the Ministry of Business, Innovation & Employment (MBIE)⁷.

It is also important to note the impact of the ageing population on industry in the region. Research shows that one in five farmers are over 65 and that the industry is struggling to retain young people.⁸

Economic context

As of the 2018 census, 52.5% of people were in full time employment with 3.1% being unemployed. This has remained fairly steady since the 2006 census⁹. On a broader level, the regions GDP has grown slower than the rest of New Zealand, growing 1% compared to the national average of 2.3%.¹⁰

The main industries are Agriculture, Forestry & Fishing (22.3%), Manufacturing (14.4%), Electricity, Gas & Wastewater Services (6%), Construction (5.3%), and Health Care and Social Assistance (5%).¹¹

⁶Beyond Southland 2025 Regional Long Term Plan. Available: [B2025-Plan-FINAL-Compressed.pdf](#) ([beyond2025southland.nz](#)) Page 18

⁷ <http://webrear.mbie.govt.nz/>

⁸ <https://www.mbie.govt.nz/business-and-employment/employment-and-skills/regional-skills-leadership-groups/southland-murihiku/local-insights-report/previous-local-insights-reports/local-insights-report-june-2023/>

⁹ <http://webrear.mbie.govt.nz/summary/new-zealand?accessedvia=southland>

¹⁰ Beyond Southland 2025 Regional Long Term Plan. Available: [B2025-Plan-FINAL-Compressed.pdf](#) ([beyond2025southland.nz](#))

¹¹ Beyond Southland 2025 Regional Long Term Plan. Available: [B2025-Plan-FINAL-Compressed.pdf](#) ([beyond2025southland.nz](#))

State of the Environment and Climate Change – What is happening in the region?

Anyone, and everyone who lives in the Southland region has been confronted by the combination of significant flooding events and extended dry periods, shedding light on the intricacies of the current state of the region's environmental dynamics. In February 2020, the region witnessed a major flood in the Matakura catchment, resulting in the evacuation of more than 4,500 residents, along with an extraordinary air evacuation of tourists from Milford Sound. This event left a lasting impact across environmental, social, cultural, and economic dimensions.

In addition, over the past two summers (2021-22 and 2022-23), Southland experienced periods of dry weather and drought in certain areas, leading to challenges such as reduced pasture, stock water shortages, animal health concerns, and implications for urban water supplies. These contrasting environmental conditions have prompted the need for a comprehensive understanding and adaptable responses to ensure resilience and community cohesion in the face of varying challenges.

The climate in Southland is undergoing significant changes, marked by several key trends. A report by NIWA specifically for the Southland region has provided a wealth of information to help understand, model and prepare for the changing climate¹². Firstly, there have been increases in both annual mean and minimum temperatures, with the most prominent warming seen during the Autumn season. This warming is accompanied by a decrease in annual frost days and a rise in annual hot days, defined as temperatures of 25°C or higher, along with more frequent high-temperature extremes. Additionally, heatwave days have become more common, especially in the northern regions of the Ōreti and Matāura catchments.

Precipitation patterns are also shifting. There's been an increase in annual rainfall, particularly during the winter season. However, some areas, such as Fiordland, Waiau, and the southern extents of the Ōreti and Matāura catchments, have experienced a decrease in the number of annual wet days. Conversely, central parts of the region have seen an increase in annual wet days, and heavy rainfall events are expected to occur three to four times as frequently compared to the current climate. For example, in Matāura with these heavy rainfall events it is expected that there will be 10% more rainfall and an increase of 15% greater river flow.

¹² National Institute of Water and Atmospheric Research (NIWA), "Climate Change Impacts in Southland: A Report for the Southland Regional Council" (Wellington: NIWA, 2018), 10-15

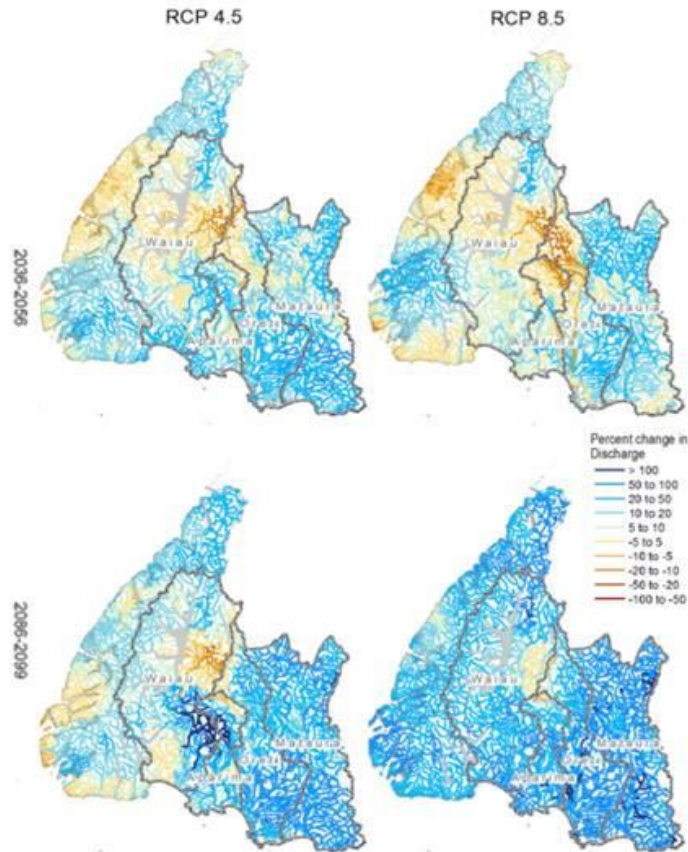


Figure 8-7: Percent changes in multi-model median of MAF across Southland for mid (top) and end of century (bottom).

Picture 2 – Increased precipitation across Southland over the next century¹³.

River flow rates have shown seasonal variations, with spring and autumn seeing increases, while summer experiences stability or slight decreases. Winters have become more stable or increasing in flow, especially in the Waiau and northern parts of the Ōreti and Matāura catchments. Furthermore, River Mean Annual Flood (MAF) levels are anticipated to rise.

These climate changes have various impacts, with the most notable being:

- Water supply reliability is becoming more variable across Southland, with some areas experiencing increased reliability while others face decreased reliability.
- Drought conditions are projected to increase significantly, especially in central and northern Southland, with a 20% to 30% rise.
- High intensity river flow events are likely to increase, with an estimated 15% river flow during flood events.
- The risk of wildfires is also expected to grow, along with longer fire seasons.
- Sea level rise continues to affect the region, intensifying storm tides, floods, coastal erosion, and groundwater levels in coastal and estuarine areas.

¹³ *Southland climate change impact assessment*. Prepared for Environment Southland, Invercargill City Council, Southland District Council and Gore District Council. August 2018

The 2018 NIWA report also emphasized the continuing influence and additional “climate noise” of natural variations in climate patterns, including the following three large-scale oscillations that influence climate in New Zealand:

1. The El Niño-Southern Oscillation (ENSO), which occurs every two to seven years, with impacts lasting around a year;
2. The Interdecadal Pacific Oscillation (IPO), which can last from 20 to 30 years; and
3. The Southern Annular Mode (SAM), which can last for several weeks, but changes phases quickly and unpredictably.

The report also emphasizes the influence of natural climate variations such as ENSO, IPO, and SAM, which add complexity to climate projections.

In summary, Southland is witnessing a transformation towards a more dynamic and less predictable climate characterized by increased warmth, precipitation, extreme weather events, hot days, heatwaves, droughts, wildfires, and intense rainfall. These changes pose challenges to both natural ecosystems and human activities. Climate-sensitive planning and action are necessary to address the combined effects of anthropogenic change and natural variability, with the recognition that early investment in mitigation measures can yield greater benefits for regional freshwater resource management.

With this understanding of changes in climate, there are implications for how infrastructure is managed by the council.

Geophysical Hazards for the region

The Southland region, situated adjacent to the active boundary between the Pacific and Australian tectonic plates, faces significant seismic activity risks in common with the broader New Zealand area. Within Southland, there are several active faults that potentially pose hazards to the region's infrastructure. Notably, there is a 75% probability of a major rupture occurring in the southwest segment of the Alpine Fault within the next 50 years, with a four out of five chance that it will be a magnitude 8+ event¹⁴. Additionally, earthquake risks are prevalent, originating from the Puysegur Subduction Zone in the southwest of the South Island¹⁵.

According to available information, the region anticipates a Modified Mercalli VIII earthquake event with a return period of 475 years, accounting for amplified ground shaking due to underlying soil characteristics. Notably, the lower-lying areas in the Invercargill Region exhibit a high to very high susceptibility to liquefaction.

Furthermore, the Southland Region's lower-lying areas demonstrate varying levels of susceptibility to tsunami risks, with potential triggers ranging from seismic events originating across the Pacific Basin to those from the Puysegur Subduction Zone. This heightened tsunami risk is also associated with an increased potential for landslides following seismic activity. For instance, the 2003 earthquake resulted in over 400 landslides on steep slopes in Fiordland. These landslides are generally linked to specific rock types distributed across the region, including schist and semi-schist in the northeast, serpentine in a band from Mossburn north to the Hollyford, soft Tertiary mudstone, and hard, strong

¹⁴ AF8 Project - AF8 <https://af8.org.nz/> [Alpine Fault magnitude 8]

¹⁵ Invercargill City District Plan 2019 - <https://icc.govt.nz/public-documents/invercargill-city-district-plan-2019/>

Fiordland plutonic rocks. Ground subsidence is most likely to occur above underground coal mines or over areas of unconsolidated fill ¹⁶.

Vigilance, preparedness and good maintenance of existing assets are all crucial to mitigating the impacts of these geophysical hazards in the Southland region.

Current asset stack – how are they currently performing?

The many assets across the region are each given a condition grade or score to provide an indication of the condition following onsite inspections. The detailed listings of assets and their individual condition scores are held in a database by the Catchment Operations team and are updated on an ongoing basis. The scores use the following assessment that is a standard approach for Regional Council's:

Condition Grade	Rating	Description
1	Very Good	Structurally sound with some cosmetic defects that have no effect on performance.
2	Good	Structurally sound but with some evident minor defects.
3	Moderate	Adequate structure with some minor defects visible that may develop into significant defects in the long-term. Assets anticipated to be at a condition grade 3 for the majority of their useful life.
4	Poor	Structurally significant defects identified likely leading to loss of stability in the medium-term. Majority of assets anticipated to be near end of useful life.
5	Very Poor	Structural integrity at early stages of failure and/or complete failure anticipated in the short-term.

The current asset stack can be represented by looking at a breakdown of the stopbanks, culverts and dams, as shown in the three tables below.

Table showing current condition of Stopbanks compared to last LTP

Stopbank Condition		
Grade	2021 LTP	Proposed LTP
1	0%	0.02%
2	20%	11.32%
3	52%	74.28%
4	23%	12.14%
5	4%	2.06%

¹⁶ Amplified ground shaking and liquefaction susceptibility, Invercargill City. Glassey & Heron 2012 - <https://icc.govt.nz/wp-content/uploads/2014/11/Liquefaction-Report-2012.pdf>

Table showing current condition of Culverts compared to last LTP

Culverts/Structures Condition		
Grade	2021 LTP	Proposed LTP
1	3%	3.89%
2	18%	12.37%
3	53%	59.36%
4	10%	16.25%
5	16%	8.13%

Table showing current condition of Dams compared to last LTP

Dams Condition FY22-23		
Grade	2021 LTP	Proposed LTP
1		
2		
3	100%	100%
4		
5		

Progress since 2021 plan

There has been good progress since the 2021 plan. Progress has particularly been made in the following areas:

- Shovel ready projects¹⁷ have now been completed.
- A focus on ensuring all assets have been assessed and have a grading score.
- Conditions of stopbanks has changed due to the increase in number of assets that now have a condition grading score.
- Projects such as 'Slow the Flow' have gained significant traction.

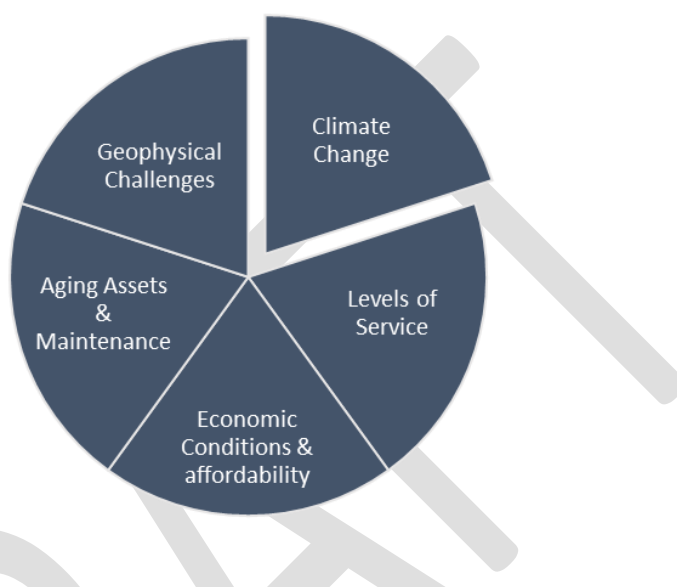
Areas that have remained challenging in this period, include lack of complete data across the asset base and lack of resources to manage defects.

¹⁷ Shovel ready projects refers to projects that were developed under government funding of \$13.9 million as part of an economic revival initiative post Covid-19. These included the Waimumu Stopbank upgrade, Gore Town Stopbank Upgrade, Wyndham Town Stopbank Upgrade and Maitaha Stopbank Protection works.

Significant challenges and decisions required

In developing this draft Infrastructure Strategy, council has taken a ground up approach. We have looked at our current infrastructure and the way we fund it and asked the question “is the current state fit for the future?” The work done leading into developing this Strategy would indicate that it is not. Council is of the view that a more region wide approach should be taken and that we focus on community resilience and building and maintaining appropriate climate resilient infrastructure.

Five key challenges that require significant decisions have emerged. These are depicted below:



Climate Change

Background

As discussed in the previous section, Southland's climate is undergoing significant changes, marked by rising temperatures, reduced frost days, and increased rainfall, particularly in winter¹⁸. River flow rates vary seasonally, with spring and autumn increases. These changes have various impacts, including variable water supply reliability, more frequent droughts, increased river flow intensity, growing wildfire risks, and the ongoing influence of natural climate variations.

Modelling, data and science regarding the climate changes specific to the Southland region are predominantly based on a NIWA report from 2018. This data provides a strong indication of what is required of the infrastructure based on this information. However, the challenge is that climate change is not linear. The data and modelling is changing as rapidly as the climate itself, therefore building a Long-term Plan based on ‘snapshot’ data is problematic for Environment Southland. Therefore, the challenge is how do we give surety to our community over levels of service and costs when the demands on the infrastructure may be changing rapidly and as our understanding of these demands change.

Options

- Option 1: Assume that the forecasts are accurate and plan for what has been modelled based on the 2018 data.
- Option 2: Budget for new data and science to ensure that the council has the latest information.
- Option 3: Plan for the next three years using the 2018 data, budget for new data and science, meaning the strategy may need to change if the modelling or data changes significantly.

¹⁸ National Institute of Water and Atmospheric Research (NIWA), "Climate Change Impacts in Southland: A Report for the Southland Regional Council" (Wellington: NIWA, 2018)

Councils approach to managing the issue

Environment Southland recognises the need to give certainty to its ratepayers and community as a priority in these challenging times. Therefore, it is proposing option 3 as the preferred option to manage this challenge. That way, focus and priority can be given to projects that require attention based on the 2018 data, while allowing for new modelling and data to be developed and made available.

Summary

Issue or Challenge	The climate change data for Southland relies heavily on the 2018 NIWA report, but the non-linear nature of climate change presents a challenge for building long-term plans and ensuring service levels and costs for the community remain stable as infrastructure demands evolve rapidly.
Why is it an issue	If new data is made available it may change the focus or priority of plans, making it difficult to commit to levels of service and stable costs.
Options	<ol style="list-style-type: none">1. Assume that the forecasts are accurate and plan for what has been modelled based on the 2018 data.2. Budget for new data and science to ensure that the council has the latest information.3. Plan for the next three years using the 2018 data, budget for new data and science, meaning the strategy made need to change if the modelling or data changes significantly.
Council's preferred approach	Option 3 – Budget for new data, while focussing on the next 3 years.

Levels of Service

Background

Levels of Service refer to the standards and expectations that a council sets for the delivery of various services to the community.

Previously for flood protection assets, in general, Environment Southland has made a commitment to the community to provide assets that protect against a one in 100-year flood event in urban areas and a one in 20-year flood event in urban areas.

However, with climate change in mind, Environment Southland, and a number of other regional councils, consider that the traditional method of providing a level of service through this way may be undeliverable and misconstrued. For example, with climate change modelling, there may be what is considered a one in 20-year flood event two years in a row, which can cause confusion, and doesn't seem fair to provide the community with this level of service.

Options

There are three main options for developing levels of service:

Option 1: Continue with traditional levels of service.

Option 2: Develop community performance measures.

Option 3: Utilise design standards.

Councils approach to managing this issue

In response to the shifting environmental landscape, Environment Southland has adopted a forward-thinking approach to manage flood protection assets and services. Historically, the organization had committed to safeguarding against a one in 100-year flood event in rural areas and a one in 20-year flood event in urban areas. However, recognising the influence of climate change, it acknowledges that this conventional approach may no longer be practical or transparent. Climate change modelling has raised the possibility of consecutive one in 20-year flood events, leading to confusion and inequity in the level of service provided. In light of this, Environment Southland is considering embracing design standards as a more adaptive and resilient approach to ensure flood protection assets are equipped to withstand the challenges posed by climate change. This option reflects the organization's commitment to safeguarding communities effectively in an era of changing environmental dynamics.

Summary

Issue or Challenge	Traditional levels of service may be deceptive and unrealistic.
Why is it an issue	A changing climate is increasing the occurrence of flood events
Options	<ol style="list-style-type: none">1. Stay with current levels of service approach – for example one in 20-year flood event protection.2. Develop community performance measures – for example commitment to maintenance, responding promptly in flood events.3. Commitment to design standards – for example that a flood bank can hold 1,000 cubic meters of water flowing per second (cumecs) in a flood event.
Council's preferred approach	Option 3 – Commitment to design standards.

Economic Conditions & Affordability

Background

The region's economic conditions have an impact on the ability of communities to pay for the services provided, particularly in the period of the post COVID-19 pandemic. There are increasing pressures on the current level of funding to deliver more. In the future, there may be less funding available to fund flood protection. The affordability of the levels of service may be impacted by changes to the levels of natural risk, increased input costs, reduced returns from land use and changes to the cost of compliance. There is a strong link between social and economic trends. Trends such as an ageing population, urban drift and social inequality all have an impact upon the ability to fund infrastructure. The construction sector within the Southland region is currently under some pressure. This is expected to continue for the short to medium term, and possibly beyond. This has an impact upon the availability of suitable contractors and consultants, costs and ability to deliver within expected timeframes.

Options

Option 1: Current practice of prioritised work programmes using community consultation. The approach involves implementing prioritized work programs in consultation with the community to ensure affordability, maintaining existing funding policies, and regularly evaluating market conditions to account for construction cost increases in program estimates and contingencies.

Option 2: Enhanced market evaluation and forecasting. To address the evolving challenges, the approach includes enhancing the evaluation and forecasting of market trends, costs, and resource availability. There will also be a comprehensive review of funding strategies to determine their suitability, along with targeted consultations with communities to ensure affordability. Advanced decision-making tools will be developed, and procurement practices will be improved, including the exploration of longer-term, large-scale contracts to offer increased certainty in the execution of projects.

Councils approach to managing the issue

The council's preferred approach to managing the challenges posed by the region's economic conditions and changing funding dynamics is Option 1 - Current practice of prioritised work programs using community consultation. This approach involves implementing prioritised work programs in consultation with the community. It aims to ensure affordability while maintaining existing funding policies. Additionally, regular evaluations of market conditions are conducted to account for construction cost increases in program estimates and contingencies.

Under this approach, the council places a strong emphasis on community engagement and consultation to align projects with the community's needs and financial capabilities. By regularly reviewing market conditions, the council seeks to adapt to changing economic circumstances and cost factors. This approach reflects the council's commitment to maintaining a practical and community-focused strategy, especially in light of the economic challenges posed by the post-COVID-19 pandemic period and other socioeconomic trends affecting infrastructure funding.

Summary

Issue or Challenge	Economic challenges post-COVID-19 are straining funding for flood protection
Why is it an issue	It is impacting affordability, while demographic shifts and construction sector pressures complicate infrastructure funding and project delivery.
Options	<ol style="list-style-type: none"> 1. Current practice of prioritised work programmes using community consultation 2. Enhanced market evaluation and forecasting.
Council's preferred approach	<p>Council recognises the need to balance both the demand for current and additional services with the community's ability to pay. The balance is achieved through the prioritisation of work requirements, sustainable revenue and financing policies and an awareness of community needs.</p> <p>Given increasing pressures upon affordability, it is appropriate to keep under review the full range of scheme beneficiaries to assess if current funding policies continue to be appropriate. Council will continue to improve its monitoring of economic indicators and trends to anticipate the responses needed. The development of improved criteria and methodology around this will better inform decision-making.</p> <p>Opportunities will be identified for cost efficiencies in the way work delivery programmes are procured. Council's approach is to continue with current practice but to increasingly apply improved methods of evaluating market conditions and forecasting costs and resource requirements.</p>

Aging Assets

Background

Many of Council's assets were constructed and/or upgraded over the 1960s to 1990s period and will continue to provide a predicted useful life provided the maintenance programme is continued. These assets are critical in providing community resilience and ensuring people and property are safe from hazards associated with flooding. They also contribute to regional economic productivity and social wellbeing.

In addition, community, tangata whenua, and central government expectations in relation to environmental outcomes continue to increase over time. There is a strong community focus on water quality and Te Mana o Te Wai. Flood protection infrastructure is often located in areas of high environmental, recreational or conservation values and these values may be impacted by that infrastructure. Council's strategy is to achieve multiple outcomes wherever possible. This will be progressed by actively managing scheme effects, full regulatory compliance, and achievement of a range of outcomes including biodiversity and recreational opportunities.

Options

Option 1: Reduced maintenance: Assets could be allowed to decline.

Option 2: Continue to maintain to current standard: Assets maintained as at present.

Option 3: Renew assets to a higher standard: Forecast future growth and demand may drive a higher level of service.

Councils approach to managing the issue

Council expects to continue to undertake renewal programmes that ensure assets provide the level of service agreed with communities. This may lead to increased financial requirements due to expected impacts of climate change, higher environmental performance requirements and regulatory compliance. The practice of replacing 'like with like' is to be continually evaluated and technological improvements incorporated where this may extend asset life or reduce lifecycle costs.

These matters will be incorporated into decision-making processes conducted with communities and based on the best information available. It is forecast that approximately \$156 million operational work maintenance programmes will be undertaken in the next 10 years and approximately \$648 million over the next 30 years. \$200 million of capital renewals will take place over the next 30 years. Council's approach is to renew assets to a higher standard, while noting that in some instances, this will require intervention and increased costs if the same level of service is to be provided.

Summary

Issue or Challenge	Many assets are reaching the end of their lifespan and a decision is required around what to do with these assets.
Why is it an issue	Cost of many assets expiring or needing extensive maintenance around the same change will mean a significant increase in budget and resources.
Options	<ol style="list-style-type: none">1. Reduced maintenance2. Continue to maintain to current standards3. Renew assets to a higher standard.

<p>Council's preferred approach</p>	<p>Option 3: Council expects to continue to undertake renewal programmes that ensure assets provide the level of service agreed with communities. This may lead to increased financial requirements due to expected impacts of climate change, higher environmental performance requirements and regulatory compliance. The practice of replacing 'like with like' is to be continually evaluated and technological improvements incorporated where this may extend asset life or reduce lifecycle costs.</p> <p>These matters will be incorporated into decision-making processes conducted with communities and based on the best information available. Council's approach is to renew assets to a higher standard, while noting that in some instances, this will require intervention and increased costs if the same level of service is to be provided. Environment Southland can resource the asset improvement/maintenance programme regionally but could not carry out significant capital upgrades without central government investment. This approach must also be considered in the context of the other issues identified that follow.</p>
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Geophysical Challenges

Background

Southland is prone to severe storms, potential tsunamis, and seismicity risks. Extreme events such as tsunamis, coastal storm surge, land instability and earthquakes pose significant threat to infrastructural assets and the services they provide.

There will always be risks associated with flood management infrastructure. Residual risks are those that exist despite protection being in place. Such risks may be associated with power supply outages, poor maintenance, vandalism, failure or overtopping. A significant portion of Council's assets are sited on 'liquifiable' soils making them prone to damage in a major earthquake.

Options

Option 1: Management of infrastructure based on risk and assets criticality.

Option 2: Focused strategies to raise awareness of hazards and risks.

Council's approach to managing the issue

To minimise damage to flood protection assets and to respond effectively, Council will develop plans and processes that will:

- Take a risk management approach;
- Identify critical assets;
- Incorporate climate change impacts into asset management processes;
- Seek to reduce the damage potential of natural hazards on assets;
- Develop strategies to enable timely response following a natural hazard event;
- Ensure funding policies are robust and appropriate.

Council will regularly review its disaster funding provisions to ensure that it can respond following adverse natural hazard events. Residual risk areas are to be identified and incorporated into the regional asset management plan and communicated to council, the territorial councils and the wider community.

Summary

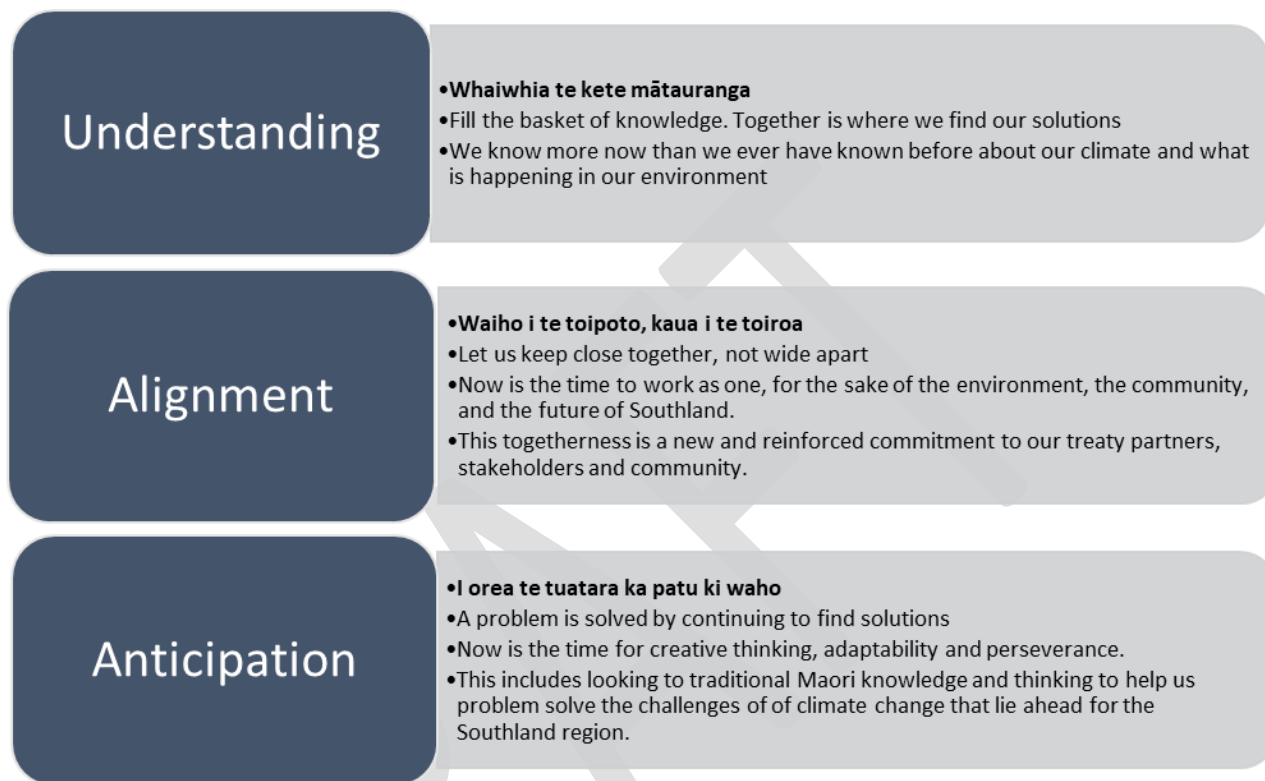
Issue or Challenge	Infrastructure assets are at risk of damage from geophysical hazards.
Why is it an issue	It is an issue because it will likely impact on levels of service, budgets and resourcing if and when geophysical hazards eventuate.
Options	<ol style="list-style-type: none">1. Management of infrastructure based on risk and assets criticality.2. Focused strategies to raise awareness of hazards and risks.
Council's preferred approach	The preferred approach is to continue with current practice but to actively raise community awareness of natural hazards and risks. This is consistent with Council's strategy to increase community understanding of risks and resilience.

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What is the plan?

Principles of how we will manage these challenges

Moving forward, the principles of how the council manages these challenges has been aligned with the principles identified through the Regional Climate Change (RCC) Working Group. Of the seven principles identified by the RCC (see Appendix A for full details), the three identified as the most important to this infrastructure strategy are Understanding, Alignment and Anticipation.



These principles will be applied to our approach along with these other key principles:

Decisions are aligned with the council's strategic direction and priorities

Council seeks to meet the needs of the community and support the delivery of those services set out in the Council's Long-term Plan. The Council has reviewed its strategic direction and priorities for the 2024–2034 period. We will ensure that infrastructural services are managed in alignment with Council's strategic direction. A key strategic priority is to increase community understanding of risks and resilience. In this regard, Council will continue to maximise opportunities to inform the community as to areas of natural risk and the measures in place to manage these risks.

Collecting and maintaining best possible data and information

Sound decisions are dependent upon the ongoing collection and management of appropriate information. Council places high importance on regular river surveys, condition and performance surveys and structural inspections and auditing to inform work programmes and associated activities. This also enables us to identify and ensure appropriate management of our most critical assets. Improving the quality and accuracy of our data that informs these decisions is an ongoing activity that Council is committed to.

Responding to demands for new capital

Council will consult with communities in relation to requests for any new capital work initiatives. Funding will be agreed based on Council's revenue and financing policy – a requirement of the Local Government Act 2002. In general terms, this means that costs will be met by those that benefit or contribute to the need for the capital work. Environment Southland can resource the asset improvement/maintenance programme regionally but could not carry out significant capital upgrades without central government investment. In addition, without the most up to-date data and modelling it is unachievable to accurately determine what the future communities' needs will be.

Service sustainability

We intend to carry out regular reviews of the long-term sustainability of our river and flood protection assets and the service they provide. This is recognised as being necessary considering potential challenges associated with climate change impacts, tangata whenua and environmental expectations, and affordability.

Appropriate replacement of existing infrastructure (renewals)

Different infrastructure assets will deteriorate at different rates over time. This may lead to underperformance of the asset, increased risk of failure and increased maintenance requirements. Undertaking asset renewals is an appropriate way to extend an assets working life and these are planned to deliver the most efficient use of expenditure and to help with the application of current costs to proposed renewals or planned renewals programming.

Moving forward priority will be given to addressing the serviceability of current stopbanks, with renewal priority being given in the first five years to stopbanks that are grade three or above. It is also important to note that any future renewals beyond those that are already identified or known, it is likely that construction methodologies and materials may be different, therefore accounting for this in a Long-term Plan is problematic.

Infrastructure Investment Programme

To provide clarity on the foundation of our Infrastructure Strategy investment program, several key assumptions have been established:

- Council's renewals are based on historic asset data and the current knowledge held within the Catchment Operations Division. The assumptions developed through this process have been adopted into the infrastructure strategy. All capital renewal expenditure is based on the continued provision of current levels of service.
- Policy and planning frameworks will limit growth and development in flood prone areas. Therefore, there will be only limited associated impact on additional growth-related investment.
- Responding to major natural hazard events is assumed to be funded through insurance and disaster reserves.
- Inflation adjustments have been made using BERL inflation indices as the basis for calculating our basket of goods.
- Considering the significant investment required, co-funding from government will need to be a necessity and therefore it is assumed that this will be a viable option.

These assumptions collectively form the basis of our Infrastructure Strategy investment program, ensuring that our approach is grounded in historical data, responsive to policy frameworks, and adequately prepared for contingencies related to natural hazards and inflationary pressures.

Prioritisation and Climate Change

Current climate modelling has informed how we should prioritise projects within this current LTP. The climate change impacts and how they relate to the infrastructure is depicted in the table below.

Modelled climate change issue	Infrastructure impacted	How this will be managed in the strategy
Increased flow in the rivers	Stopbanks	Prioritise stopbank maintenance Exploration and evaluation of nature-based and other innovative solutions
Increased rainfall intensity events	Stopbanks & detention dams	Prioritise critical stopbank or detention dam upgrades Exploration and evaluation of nature-based and other innovative solutions
Predicted sea level rise increasing	Increased need for new sea walls, or in some areas plan for managed retreat,	Evaluate new regional data as it becomes available
Increased risk of wildfire, drought, increased sediment.	Stopbanks integrity through excessive heating can cause increased failing risk.	Development of floodplain management plans Exploration and evaluation of nature-based and other innovative solutions

Increased sedimentation through the catchments	Carrying capacity of flood banks could be reduced if beds are raised.	Prioritise gravel management strategy
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Key Projects & Programmes – A focus on the first three years

The first three years of the Infrastructure Strategy are critical to ongoing success. This is focused on three areas:

1. **Staff** – ensuring that the council is equipped and resourced appropriately to manage the required planning, development, and maintenance of assets, and respond to events.
2. **Immediate renewals programme** – The immediate focus of our infrastructure investment programme centres around critical renewal projects in Lumsden, Winton, and Waihopai where modelling and data is available to inform solutions. More details of these three projects can be found in Appendix D.
3. **Maintenance Programme** – Environment Southland is proposing to elevate the maintenance standards of its flood protection infrastructure, aiming for level two in urban areas and level three in rural regions, as assessed on a scale of one to five (see table on page 16). Currently, only 0.08% of Southland's GDP is allocated to flood control and protection efforts. Given the pressing challenges posed by climate change, as discussed in the climate change section above, it has become imperative to ensure that our flood protection measures and stopbanks are not only adequately maintained but also resilient to the evolving climate conditions.

By committing to these key projects in areas most vulnerable to climate-related risks, Environment Southland aim to safeguard the region's resilience and protect communities from the potential consequences of a changing environment.

Floodplain Management Plans – How we will collectively manage areas and the risks

A Floodplain Management Plan leverages the data and modelling we have to translate it into practical tools for shaping our future climate adaptation efforts. Its primary purpose is to pinpoint the regions with the highest vulnerabilities and risks associated with various scales of flooding events. By doing so, it lays the foundation for devising tailored mitigation strategies in distinct locations to address the diverse challenges posed by different event magnitudes. This strategic approach not only equips us with a comprehensive flood risk management strategy but also opens doors for meaningful engagement with Southland communities. It provides an avenue to foster dialogue on climate adaptation science, flood risk reduction, and community resilience, ensuring that the community is informed and actively involved in the process.

Furthermore, the Floodplain Management Plan serves as a catalyst for proactive responses within the community. It acts as a blueprint to ensure that the right scientific research, modelling, and planning efforts are underway to safeguard the region from flood-related hazards. By identifying risks within each catchment area and promoting Integrated Catchment Management, the plan ensures that mitigation measures are strategically implemented in the most appropriate locations. Ultimately, it aligns with our commitment to meeting all responsibilities under the four wellbeing's — social, economic, environmental, and cultural — through a well-coordinated and community-driven approach to floodplain management.

The Murihiku Slow the Flow project will provide Murihiku Southland with the opportunity to pilot a floodplain approach to identifying nature-based flood solutions. Nature-based solutions are 'soft infrastructure', such as wetlands, increasing soil retention, increased vegetation, and are often located in the upper to mid reaches of the catchment. The project has been funded by Ministry for the Environment and will be completed by June 2025.

With this in mind, the following areas will be prioritised for developing floodplain management plans:

- Co-design with mana whenua that enables the use of all knowledge to define the problem.
- Identify high risk areas and collaborate on developing mitigation options.
- Data gathering from across the region.
- Floodplain management plans have been used nationally and internationally for some time,.Exploring and evaluating what is already utilised across the country will benefit the development of Southland plans.

A Range of Solutions

There are a number of possible future solutions that have not been specifically budgeted for within this Infrastructure Strategy in addition to more traditional infrastructure approaches including:

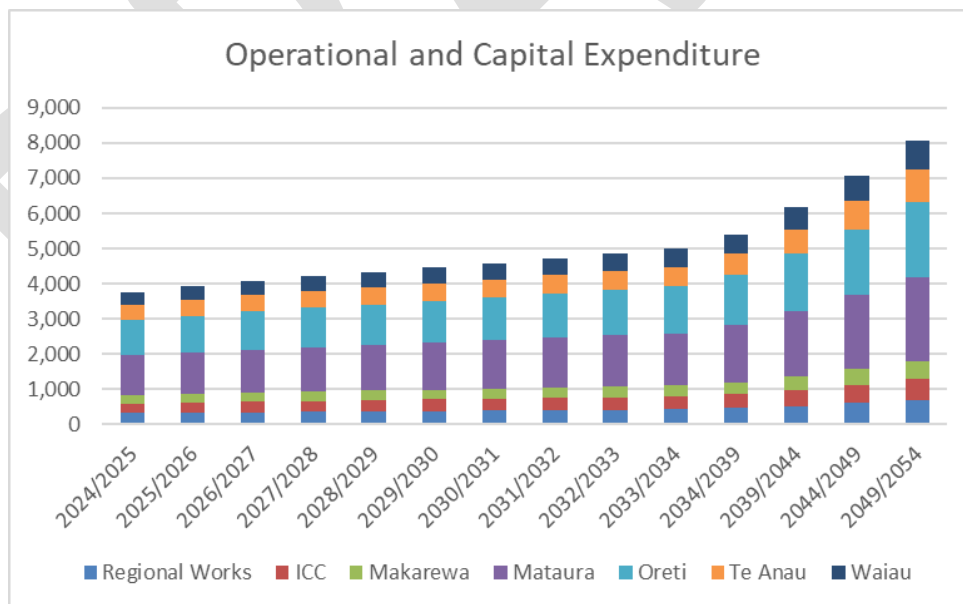
- Land purchases or changes to land use
- New innovative solutions

The first step in exploring and evaluating the range of options and solutions is to develop capacity and capability within Environment Southland to complete this work and is the focus of the first three years of the strategy.

The Budget

Total Expenditure

In Environment Southland’s commitment to address the challenges outlined in the Significant Challenges section of this strategy, council anticipates allocating a total of \$355 million from 2024 to 2034 and an estimated \$492 million over the remaining years of the strategy.



The tables below summarise the spread of capital:

Table 1 Summary Table – Years 1-10

Operating and Capital Expenditure	Year 1 2024/2025	Year 2 2025/2026	Year 3 2026/2027	Year 4 2027/2028	Year 5 2028/2029	Year 6 2029/2030	Year 7 2030/2031	Year 8 2031/2032	Year 9 2032/2033	Year 10 2033/2034
Personnel and Direct Costs	2,190	2,729	2,831	2,930	3,036	3,143	3,249	3,358	3,474	3,588
Consultants	273	285	297	305	314	324	332	342	351	361
Cost of Works	4,908	5,126	6,706	6,905	7,105	7,317	7,517	7,728	7,946	8,163
Depreciation	526	564	589	631	659	669	711	745	768	794
Finance Costs	914	887	2,036	2,346	2,949	3,456	3,979	4,516	5,067	5,635
Overheads	1,102	1,165	1,226	1,271	1,311	1,349	1,389	1,427	1,465	1,508
Transfer to Reserves	59	63	67	70	73	77	80	83	86	89
Capital Expenditure	1,825	8,457	4,120	25,513	24,720	25,682	26,229	27,078	27,726	28,401
Total	11,797	19,277	17,871	39,972	40,168	42,016	43,485	45,276	46,883	48,539

Table 2 Summary Table Years 11-30

Operating and Capital Expenditure	Years 11-15 2034/2039	Years 16-20 2039/2044	Years 21-25 2044/2049	Years 26-30 2049/2054
Personnel and Direct Costs	19,794	23,283	27,386	32,213
Consultants	1,956	2,235	2,554	2,918
Cost of Works	44,243	50,547	57,749	65,978
Depreciation	3,970	3,970	3,970	3,970
Finance Costs	28,174	28,174	28,174	28,174
Overheads	7,542	7,542	7,542	7,542
Transfer to Reserves	485	554	633	723
Capital Expenditure	0	0	0	0
Total	106,164	116,305	128,008	141,518

**All numbers shown are in \$000*

Infrastructure Strategy

Financial Forecasts of Annual Operating and Capital Expenditure 2024-2054

Combined Summary

	Year 1 2024/2025	Year 2 2025/2026	Year 3 2026/2027	Year 4 2027/2028	Year 5 2028/2029	Year 6 2029/2030	Year 7 2030/2031	Year 8 2031/2032	Year 9 2032/2033	Year 10 2033/2034	Years 11-15 2034/2039	Years 16-20 2039/2044	Years 21-25 2044/2049	Years 26-30 2049/2054
	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000
Funding Sources														
Separate Rates	8,830	9,649	12,553	13,241	14,209	15,073	15,975	16,894	17,831	18,789	101,833	116,344	132,921	151,861
Lease Area Allocations	450	450	450	450	450	450	450	450	450	450	2,250	2,250	2,250	2,250
Interest on Rating District Funds	48	48	48	48	48	48	48	48	48	48	238	238	238	238
Gravel Income	184	193	200	206	212	219	225	231	238	244	1,323	1,511	1,727	1,973
External Recoveries	459	480	499	514	529	545	560	575	592	608	3,294	3,763	4,299	4,912
Proceeds from Asset Sales	47	17	46	18	-	56	19	53	20	-	-	-	-	-
Transfer from Asset Reserves	142	50	119	53	-	169	58	137	61	-	-	-	-	-
Capital Grants - Shovel Ready	-	-	-	17,709	18,221	18,764	19,276	19,819	20,377	20,934	-	-	-	-
Local Share - Shovel Ready	1,635	8,391	3,955	7,733	6,499	6,692	6,875	7,069	7,268	7,467	-	-	-	-
	11,797	19,277	17,871	39,972	40,168	42,016	43,485	45,276	46,883	48,539	108,938	124,106	141,436	161,234

Operating and Capital Expenditure

Personnel and Direct Costs	2,190	2,729	2,831	2,930	3,036	3,143	3,249	3,358	3,474	3,588	19,794	23,283	27,386	32,213
Consultants	273	285	297	305	314	324	332	342	351	361	1,956	2,235	2,554	2,918
Cost of Works	4,908	5,126	6,706	6,905	7,105	7,317	7,517	7,728	7,946	8,163	44,243	50,547	57,749	65,978
Transfer to Reserves	59	63	67	70	73	77	80	83	86	89	485	554	633	723
Depreciation	526	564	589	631	659	669	711	745	768	794	3,970	3,970	3,970	3,970
Finance Costs	914	887	2,036	2,346	2,949	3,456	3,979	4,516	5,067	5,635	28,174	28,174	28,174	28,174
Overheads	1,102	1,165	1,226	1,271	1,311	1,349	1,389	1,427	1,465	1,508	7,542	7,542	7,542	7,542
Capital Expenditure	1,825	8,457	4,120	25,513	24,720	25,682	26,229	27,078	27,726	28,401	-	-	-	-
	11,797	19,277	17,871	39,972	40,168	42,016	43,485	45,276	46,883	48,539	106,164	116,305	128,008	141,518

Notes

1. Costs included here are the direct costs of the River Management function relating to the catchment districts. Costs of the land drainage function are not included.
2. Years 11-30 have had inflation applied by individual years, with the figures shown being the sum of the 5 year group.

Assumptions

Inflation rates are based on the 20 year average of October 2023 BERL "Planning and regulation" and "Water and environmental" (Table 7) adjustment percentages as applied in the Long-term Plan apart from Personnel and Direct costs which apply the BERL "All salary and wage rates-local government sector" adjustor (Table 3). These rates were adjusted to reflect the professional judgement of Council.

Interest on Rating District funds is at 3% and will apply from the 2024/2025 year.

Any major damage events will be covered by insurance and rating district funds.

Costs are based on the 2024/2025 budget, and are funded in accordance with the Revenue and Financing Policy.

Policy adopted of increasing and/or maintaining individual rating district's reserves and working capital balances determined by Council's "Reserves Expenditure Policy".

Infrastructure Strategy

Financial Forecasts of Annual Operating and Capital Expenditure 2024-2054

(See Notes and Assumptions on Combined Summary sheet)

	Year 1 2024/2025	Year 2 2025/2026	Year 3 2026/2027	Year 4 2027/2028	Year 5 2028/2029	Year 6 2029/2030	Year 7 2030/2031	Year 8 2031/2032	Year 9 2032/2033	Year 10 2033/2034	Years 11-15 2034/2039	Years 16-20 2039/2044	Years 21-25 2044/2049	Years 26-30 2049/2054
	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000	\$000
Regional Works														
Operating and Capital Expenditure														
Personnel and Direct Costs	2,190	2,729	2,831	2,930	3,036	3,143	3,249	3,358	3,474	3,588	19,794	23,283	27,386	32,213
Consultants	273	285	297	305	314	324	332	342	351	361	1,956	2,235	2,554	2,918
Cost of Works	1,204	1,258	2,684	2,764	2,844	2,929	3,009	3,093	3,180	3,267	17,709	20,233	23,116	26,409
Depreciation	526	564	589	631	659	669	711	745	768	794	3,970	3,970	3,970	3,970
Finance Costs	914	887	2,036	2,346	2,949	3,456	3,979	4,516	5,067	5,635	28,174	28,174	28,174	28,174
Overheads	1,102	1,165	1,226	1,271	1,311	1,349	1,389	1,427	1,465	1,508	7,542	7,542	7,542	7,542
Capital Expenditure	1,825	8,457	4,120	25,513	24,720	25,682	26,229	27,078	27,726	28,401	0	0	0	0
	8,034	15,346	13,782	35,761	35,834	37,551	38,898	40,559	42,032	43,554	79,146	85,437	92,742	101,227
Catchments														
Aparima Rating District	324	339	353	363	374	385	395	406	418	429	2,326	2,658	3,037	3,469
ICC Rating District	277	289	301	310	319	328	337	347	356	366	1,984	2,267	2,590	2,959
Makarewa Rating District	238	248	258	266	274	282	289	298	306	314	1,703	1,946	2,223	2,540
Mataura Rating District	1125	1175	1222	1259	1295	1334	1370	1409	1448	1488	8064	9213	10526	12026
Oreti Rating District	997	1042	1083	1116	1148	1182	1214	1249	1284	1319	7148	8167	9330	10660
Te Anau Basin Rating District	426	445	463	476	490	505	519	533	548	563	3053	3488	3985	4552
Waiau Rating District - Cost of Works	317	330	342	352	362	373	383	394	405	416	2254	2575	2942	3362
Waiau Rating District - Transfer to Reserves	59	63	67	70	73	77	80	83	86	89	485	554	633	723

Appendix A – Regional Climate Change Working Group

At a regional hui held in July 2022, clear direction was received that local government agencies need to be working together to establish a regional approach to responding to our changing climate in Murihiku Southland.

Environment Southland and Te Ao Mārama inc initiated discussions to create an inter-agency working group as a starting point for bringing councils together – with Gore District Council, Invercargill City Council and Southland District Council being key partners in developing a regional approach.

A working group with governance representatives from each of these agencies was established in early 2023; called the Regional Climate Change Working Group (RCCWG). While this is an informal working group, and not a formal joint committee, it has been instrumental in enabling cross-agency discussions to take place.

The diagram below depicts the drafted principles and aspirations for the group.



Appendix B- Assumptions Analysis

Assumption	Description – what does this mean?	Why make this assumption?	Risk Description	Potential Outcome of this risk	Likelihood of occurrence
Primary Assumptions					
Population growth is linear.	That the population of the region will continue to grow in the same way it has been.	To forecast the number of rates, levels of service, and protection required.	That the population of the region increases or changes dramatically.	Decrease in population – that the population will not be able to sustain the rate base required for the asset programme. Increase – that there are more people that are needing to be protected using existing assets.	Medium
That insurance will continue to provide cover for council assets.	That assets will continue to be insured and covered for significant events.	To budget appropriately for insurance premiums, otherwise, a significant budget would need to be put aside to self-insure assets.	That insurance is no longer an option for council assets.	That the council will be required to budget for replacement value of its own assets.	Medium
That private insurance will continue to provide cover for private assets despite changing levels of service.	That property owners will continue to be able to access insurance, even though the wording of the levels of service may change.	To ensure the council can make the most appropriate decisions on levels of service.	That the change in levels of service detrimentally impact homeowners.	That property owners do not have insurance protection due to the councils change in level of service wording.	Medium
That climate modelling is achievable, but accuracy will be variable.	That modelling will have a level of certainty that will be useful for regional planning.	To ensure the current flood protection assets can withstand modelled scenarios to an agreed level of protection.	That the modelling is vastly different from the actual climate change impacts.	That the assets will not be fit for purpose against vast climate changes in the region and cannot protect the community to agreed levels of service.	High

Life cycles of assets will remain stable, despite climate change variables.	That the fixed assets will last as long as they were intended, even if the weather or frequency of floods increase.	To be able to plan and budget for maintenance, upgrades and replacements with a high level of certainty.	That assets deteriorate much quicker than planned.	That the asset renewal cycle will need to be shorter with much greater investment.	High
Policy and planning will limit growth in flood prone areas.	If new developments are in places where they cannot be protected by existing or planned infrastructure, they will not be protected in the future.	Planning and budgeting can only be made on existing developments, it cannot provide for an unknown amount of development in areas that may require new or further flood protection.	That areas are developed on with increased flood risks.	That more budget will be required to develop new assets in areas that were not planned for.	Medium
New legislation will likely impact infrastructure requirements.	New national policy and legislation will change the responsibilities, or requirements, of the council regarding its assets.	To ensure that the strategy builds in a contingency to allow for new requirements, for example the national contingency plan or managed retreat of particular areas.	That there may be increased expectations put on the council.	That more budget will be required to managed increased expectations of the council.	High
Secondary Assumptions					
Projected price changes.	That cost of maintenance and equipment will increase.	To ensure that the budget is fit for purpose.	That cost of equipment becomes untenable.	That proposed budgets will not cover the increased costs of equipment.	Medium
Enforcement Approach will favour proactive education where appropriate.	That when enforcement is required and relates to infrastructure the approach taken will favour proactive education over punitive enforcement, where appropriate.	To ensure that a rational approach is taken when there are non-compliance issues that need to be addressed.	That punitive enforcement will be long and drawn out and impact on the ability to deliver projects and protect the community.	That planned projects will not be able to proceed due to extended enforcement issues.	Low

Appendix C – Levels of Service

The table below depicts the previously agreed levels of service:

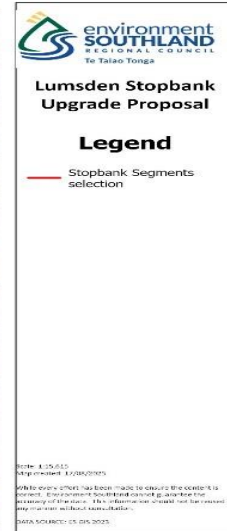
Flood Protection Standards	
Urban Level of Service	Maintain urban areas banks to achieve a 1% Annual Exceedance Probability (AEP) Standard of Protection (SoP) until 2050 (2020/21 baseline required) - caters for a one in 100-year annual return period flood.
Rural Level of Service	Maintain rural banks at the current levels to achieve a 5% AEP SoP by 2050 (2020/21 baseline required) caters for a one in 20-year annual return period flood.

The existing levels of service can be confusing (given that a one in 100-year flood event, may be happening more than once in a 100-year period). To alleviate this confusion and to give the community more surety over what they can expect from their flood protection assets, levels of service will be established using design frameworks and capacity. This will need to take a transitional approach which is considerate of any information gaps that may exist due to the age of some of the assets. The current level of service will remain until certainty around design framework and capacity is established.

Appendix D – Priority Projects

The first projects that need to be addressed are at Lumsden, Winton and Waihopai.

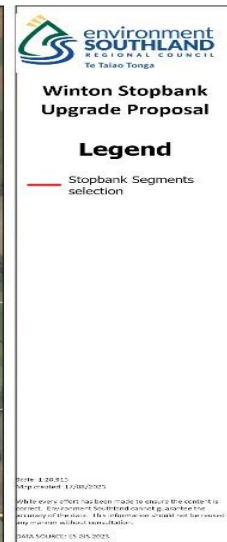
Lumsden – Year 3



1:50 yr with 3m crest 2.5:1 batter = \$2.1m

1:100 yr with 3m crest 2.5:1 batter = \$2.3m

Winton – Year 2



1:50 yr with 3m crest 2.5:1 batter = \$1.9m

1:100 yr with 3m crest 2.5:1 batter = \$3.5m

Waihopai – Detention Dam

The purpose of this project is to build a secondary detention area to assist with providing increased flooding capacity. There is currently no mechanism to have water in this area enter back into the Waihopai channel which is a significant risk. Part of a larger project to be delivered across several years, the first stages within the LTP will involve a feasibility study and design options.

DRAFT