



**For now &
our future**

Environmental issues in Murihiku/Southland

7th June 2023

From the team you've heard...



- Loss of wetland extent and function
- Eutrophication (excess nutrients) – e.g. periphyton
- Nitrate levels in groundwater
- Air quality (PM₁₀)
- Aging population
- Changing flood risk

Our 'burning platforms'



- Burning platform is a metaphor used to explain the necessity of change despite fear of unknown consequences.
- Purpose was to identify the worst environmental issues in the region (i.e. problem definition) by LTP portfolios
- Must have Southland specific science to justify the issue statement

Defining 'issues'



- Adapted MfE criteria:
 - Current issue or future issue
 - Spatial extent and scale
 - Magnitude of change
 - Irreversibility and lasting effects of change
 - Impact on the things people value

Coast and Marine environmental issues

Issue	Current or future issue?	Spatial extent and scale	Magnitude of change	Irreversibility or lasting effect	Impact on things people value	Score
We have one of the worst estuaries in NZ (NRE) and another in the top 25% of worst NZ estuaries (JRE) for eutrophication, sedimentation and nutrient levels	Current	Moderate	High	High	Moderate	10
Warming sea temperatures are resulting in increased biosecurity incursions (e.g. spread of undaria), degrading ecological health (e.g. coral bleaching in Fiordland) and southern migration of coastal species (e.g. snapper).	Current	Moderate	Moderate	High	Moderate	9
Sea level rise and increased storm surges resulting in coastal erosion especially Colac and Curio Bays where rapid coastal and dune erosion is affecting townships. Also future risks to near-coast infrastructure, landfills and coastal ecology.	Current	Low	Low	High	High	8
Contaminant discharges to coast and coastal erosion risk to land fill at Tiwai industrial site. Extent, scale, and impacts unknown at this stage.	Current	Low	Low	Unknown	Unknown	2

To obtain score, High = 3; Moderate = 2; Low = 1

Coast and Marine - the unknowns



What we did not have information or supporting evidence for:

- Waituna Lagoon – still at risk of a tipping point?
- Condition and extent of biogenic habitats (e.g. kelp forests)
- Freshwater / coastal interface (how one affects the other)
- Loading capacities for Fiords, Rakiura
- State and extent of our intertidal and subtidal ecosystems
- Remediation methods, options and effectiveness
- Where the ‘hotspot’ areas are (conflict between marine protected species and human activities)
- Legacy impacts (e.g. historic land fills)

Climate change & Community Resilience environmental issues



Issue	Current or future issue?	Spatial extent and scale	Magnitude of change	Irreversibility or lasting effect	Impact on things people value	Score
Flood frequency and intensity is increasing. Projected to get worse under climate change projections.	Current	High	Moderate	High	High	11
Water shortages and droughts are projected to increase in frequency and intensity.	Current	High	Moderate	High	High	11
Predicted sea level rise and storm surges adversely impacting on coastal infrastructure	Future	Low	Low	Low	Moderate	5
Predicted sea level rise resulting in loss of coastal ecosystems and species e.g. coastal turfs.	Future	Low	Low	High	Unknown	5
Predicted sea level rise, storm surges and changing flood frequency poses an erosion and contamination risk to coastal and riparian landfills.	Future	Low	Low	Low	Unknown	3

To obtain score, High = 3; Moderate = 2; Low = 1

Climate change & Community Resilience

the unknowns



What we did not have information or supporting evidence for:

- Changes to water security
- Behaviour change
- Community well-being

Air Quality environmental issues



Issue	Current or future issue?	Spatial extent and scale	Magnitude of change	Irreversibility or lasting effect	Impact on things people value	Score
According to HAPINZ report, Invercargill has the highest rates of premature deaths from air pollution (PM _{2.5} and NO ₂)	Current	Moderate	Moderate	Low	High	8
Regularly failing to meet NZESAQ air quality standards PM ₁₀ in Invercargill airshed and sometimes failing to meeting standards in Gore airshed.	Current	Moderate	Moderate	Low	Moderate	7

To obtain score, High = 3; Moderate = 2; Low = 1

Air Quality – the unknowns



What we did not have information or supporting evidence for:

- the spatial distribution of PM₁₀ across the Invercargill and Gore airsheds
- air quality in the smaller townships across Southland



Regional Leadership environmental issues

Issue	Current or future issue?	Spatial extent and scale	Magnitude of change	Irreversibility or lasting effect	Impact on things people value	Score
The Southland economy is more reliant on a sole industry (i.e. primary industries) than any other region in NZ. For example, agriculture forestry and fishing represents over 17% of Southland's GDP and 8% of NZ GDP. Within this sector, the workforce is aging (over 20% of farmers and farm managers over 60 years).	Current	High	Low	Low	Moderate	7
Southland has the second lowest education rate in NZ (second to West Coast)	Current	High	Low	Low	Moderate	7
Lower internet access in Southland than national average (higher in rural areas, particularly poorer rural towns)	Current	Moderate	Low	Low	Moderate	6
Southland has an ageing population. Lower than national average population grouping aged 20-30. Younger populations denser in urban areas.	Current	High	Low	Low	Low	5

To obtain score, High = 3; Moderate = 2; Low = 1

Regional leadership – the unknowns



What we did not have information or supporting evidence for:

- Community cohesion, levels of trust
- Quality of life (actual and perceived)
- Economics (state, trends, impacts, willingness to pay)

Water and Land environmental issues

Issue	Current or future issue?	Spatial extent and scale	Magnitude of change	Irreversibility or lasting effect	Impact on things people value	Score
Nutrient, sediment and <i>E. coli</i> loads in many of our rivers, lakes and estuaries are significantly over allocated if we wish to meet minimum acceptable standards or a state of hauora.	Current	High	High	Moderate	High	11
We are one of a few regions where native vegetation and wetlands continue to be removed. Between 2012 and 2018, Southland had the greatest amount of loss of indigenous land cover area of any region in NZ.	Current	High	Moderate	High	High	11
All freshwater bathing sites pose very high public health risk. 67% of monitored freshwater bathing sites fail to meet the national bottom line for <i>E. coli</i> and all sites are graded as 'very poor' using public health assessment grades.	Current	High	Moderate	Moderate	High	10
Southland is in the top three regions in NZ with the highest (i.e. worst) levels of nitrates in groundwater (along with Canterbury and Waikato)	Current	Moderate	Moderate	Moderate	High	9
About half of all bores monitored have microbial contamination (indicative that it is unsafe for human consumption)	Current	Moderate	High	Moderate	Moderate	9

To obtain score, High = 3; Moderate = 2; Low = 1

Water and Land environmental issues

Issue	Current or future issue?	Spatial extent and scale	Magnitude of change	Irreversibility or lasting effect	Impact on things people value	Score
The number of sites requiring cyanobacteria health warning alerts is increasing over time. This reflects cyanobacteria becoming more widespread and is happening earlier in the season.	Current	Moderate	Moderate	Moderate	High	9
Fragmentation and loss of habitat of native species (freshwater, marine and terrestrial issue).	Current	High	Moderate	Moderate	Moderate	9
Out of 86 shallow lakes assessed in Southland, 60% were below the draft target attribute state of B band (mesotrophic) i.e. are overly enriched with nutrients. 38 lakes (or 44%) were classified as eutrophic (C band) and 14 lakes (or 16%) as supertrophic (D band).	Current	Moderate	Moderate	Moderate	High	9
About a third of our sites are below the national bottom line for macroinvertebrates and nearly half of our sites are showing deteriorating trends.	Current	High	Moderate	Moderate	Moderate	9
State of wetlands that do exist is poor as 100% of studies wetlands have invasive weeds and animals. Many are experiencing damage due to grazing and/or drainage which reduces their ability to function, provide ecosystem services and can result in wetland collapse.	Current	High	Moderate	Moderate	Moderate	9

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Microplastics are being identified in taonga species (freshwater fish tissue).	Current	Moderate	Moderate	Moderate	Moderate	8
About a third of our sites are below the national bottom line for macroinvertebrates and nearly half of our sites are showing deteriorating trends.	Current	High	Moderate	Moderate	Moderate	9
Soil damage and loss is occurring which may result in long term loss of productivity	Current	Low	Low	Moderate	Low	5
Over-allocation of Mataura River flow to water users subject to the Mataura Conservation Order. Note that records indicate actual water use likely complies with the Order however, minimum flow under the MCO is lower than hauora and ecological outcomes would suggest it needs to be.	Current	Low	Low	Low	Moderate	5

Water and Land environmental issues

Issue	Current or future issue?	Spatial extent and scale	Magnitude of change	Irreversibility or lasting effect	Impact on things people value	Score
Herbicide contamination in drinking water supplies (human health risk) and in freshwater ecosystems (surface and groundwater). Mid-Dome spraying operations known to have resulted in exceedance of environmental and drinking water standards.	Current	Unknown	Moderate	Low	Moderate	5
While there is little scientific data on the state of emerging organic contaminants in Southland, agricultural chemical use and pesticides used in agriculture and horticulture have been identified as greatest risk.	Current	Unknown	Unknown	Unknown	Unknown	0

To obtain score, High = 3; Moderate = 2; Low = 1

Water and Land – the unknowns



What we did not have information or supporting evidence for:

- Emerging contaminants
- Changes to indigenous vegetation and habitat in freshwater
- Groundwater ecosystems (stygofauna)
- Threatened species and taonga species
- Lakes – state, trends, drivers
- How ‘pristine’ ecosystems are changing and their threats

Biodiversity & Biosecurity environmental issues



Issue	Current or future issue?	Spatial extent and scale	Magnitude of change	Irreversibility or lasting effect	Impact on things people value	Score
Ecosystem modifying pests e.g. wilding conifers, underia, possums expanding in distribution across the region	Current	High	High	Moderate	Moderate	10
100% of our studied terrestrial ecosystems have weeds and invasive animals	Current	High	Moderate	Moderate	Moderate	9
Out of region natives becoming naturalised in our region - i.e. moving South with climate change e.g. Taupata Coprosma robusta which is killing Titi chicks in their burrows.	Current	Low	Moderate	Moderate	Moderate	7
Bioaccumulation of toxins in the environment (e.g. mammals, birds, shellfish) due to control operations of weeds and invasive animals. This can be damaging to non-target species and human health risks from consumption/contact.	Current	High	Low	Low	Moderate	7
Climate change will change pest and disease distributions - increasing the region's vulnerability to new incursions and pest expansions (some pests may diminish)	Future	High	Unknown	Unknown	Unknown	3

To obtain score, High = 3; Moderate = 2; Low = 1



Biodiversity & Biosecurity – the unknowns

What we did not have information or supporting evidence for:

- Rare and important species
- Bioaccumulation of toxins
- Changing climate impacts
- Much of what is happening on private land

The 'burning platforms'



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We are one of a few regions where native vegetation and wetlands continue to be removed. Between 2012 and 2018, Southland had the greatest amount of loss of indigenous land cover area of any region in NZ.	Current	High	Moderate	High	High	11
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