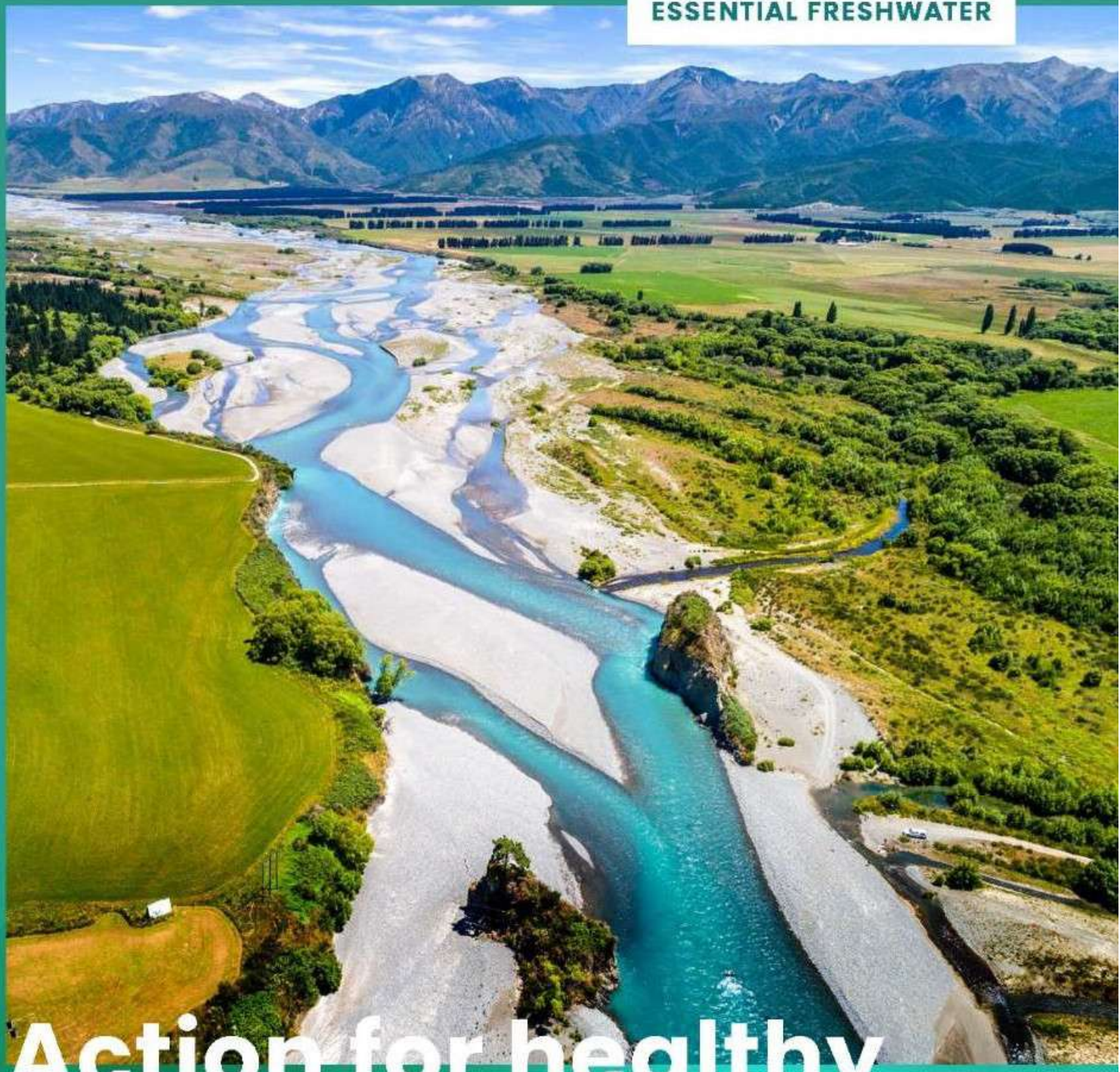
ESSENTIAL FRESHWATER



Action for healthy waterways

A discussion document on national direction for our essential freshwater

Ministry for the Environment
Manatū Mō Te Taiao

New Zealand Government

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Message from the Ministers

New Zealanders value our freshwater. Our rivers and lakes, and how we care for and use them, are a fundamental part of who we are. We respect the mana of our freshwater – Te Mana o te Wai.

New Zealanders want to be able to swim, fish, gather mahinga kai, and enjoy freshwater as our parents and grandparents did. We also need clean water to drink and irrigation to support a sustainable economy.

Freshwater quality has deteriorated seriously over recent decades. We have known about this since 2004 when the then Parliamentary Commissioner for the Environment Dr Morgan Williams published the *Growing for Good* report highlighting that water pollution was getting worse. Sadly, the problems are not yet under control and urgent action is needed.

This Government is committed to stopping the degradation of New Zealand's waterways so that water quality is materially improving within five years, and to restoring them to a healthy state within a generation.

We need to reduce the amount of pollution (nitrogen, phosphorus, sediment, *E. coli* and other contaminants) entering our waterways from our cities and from our farms.

We are proposing new requirements to make real change as quickly as possible. However, freshwater degradation issues have been decades in the making, so we want to ensure the pace of change is manageable and appropriate support is in place.

New requirements must be practical and enduring. This means they need to be science-based, predictable, understood by the public, and underpinned by effective regulation and enforcement.

We acknowledge that many farmers have already started addressing the degradation of New Zealand's rivers. This good work will be built on, with a focus first on catchments where the risk of further damage is greatest.

The proposals in this document have been developed with a view to upholding Te Mana o te Wai. This is a concept for all New Zealanders. It refers to the integrated health and wellbeing of waters as a continuum from the mountains to the sea. We acknowledge there will be more to do to achieve this.

We thank our advisory group Kāhui Wai Māori for its advice on these issues. We also thank the other advisory groups who have worked closely with us to test and advise on policy options – the Freshwater Leaders Group, the Science and Technical Advisory Group, and the Regional Sector Water Subgroup. All the members of these groups have made valuable contributions.

Advisory group views are reported in this document.

The proposals in this document will set clearer expectations for all New Zealanders to contribute to protecting and restoring freshwater. Some of the actions required will differ depending on where people live and how they make a living.

Farmers and growers make many day-to-day decisions that directly impact on land and water resources. We have drawn on the knowledge and expertise of farmers and growers on our advisory groups, and talked with many who have already made changes to reduce their environmental impact.

We believe we can take the necessary urgent action on freshwater while sustaining a viable primary sector.

We will continue to work with the primary sector through the transition to more sustainable land and water use. In the 2019 Budget we announced a significant investment of taxpayer funding to help.

We believe there is also a role for primary sector processors to play in achieving our freshwater outcomes. Some, such as Synlait and Miraka dairy companies, already provide financial incentives for good environmental management and we will be encouraging others to follow their lead. Positive recognition of good performance is as important as regulating poor performance.

Urban areas need to invest in better separating sewage from stormwater and stopping pollution and loss of streams and wetlands.

Some of our most degraded freshwater environments are in urban areas, even though these form a small proportion of overall waterways. With almost all of New Zealand's population growth taking place in urban areas, it is important to ensure this growth isn't at the expense of the environment. People in urban areas should be able to enjoy their local waterbodies. We are looking for feedback on options for improving how freshwater is managed in urban environments, including measures to protect streams from land reclamation.

Alongside the Essential Freshwater programme, the Government is also undertaking the Three Waters Review of drinking water, wastewater and stormwater services. This work is intended to ensure New Zealanders can be confident that drinking water is safe to use, sources of drinking water are adequately protected, and wastewater and stormwater are managed in environmentally sustainable ways.

Regulatory change developed within the Three Waters Review will be progressed through a number of avenues, and some proposals have been included in this document because they need to complement the Essential Freshwater reforms. We are seeking feedback on these proposals.

The Government is implementing policies to combat climate change, protect biodiversity, provide for sustainable urban development while protecting highly productive land for food growing, plant the right trees in the right places, and reduce waste. This includes reforming the Resource Management Act and establishing the independent Climate Change Commission.

Action for healthy waterways is one part of our broader plan to build a productive, sustainable and inclusive economy that supports the wellbeing of all New Zealanders.

There is a lot happening, and a lot to consider. We look forward to hearing your thoughts.

Hon David Parker
Minister for the Environment

Hon Damien O'Connor
Minister of Agriculture

Hon Nanaia Mahuta
Minister of Local Government

1 Overview – the health of our nation depends on the health of our freshwater

The health of our people, our environment, and our economy depends on the health of our freshwater. But our water is suffering as a result of human activity – urban development, agriculture, horticulture, forestry, and other activities – and because of a lack of robust regulation, monitoring, and enforcement.

Urgent action is required.

The Government has three objectives:

1. **Stop further degradation** of New Zealand's freshwater resources and start making immediate improvements so that water quality is materially improving within five years.
2. **Reverse past damage** to bring New Zealand's freshwater resources, waterways and ecosystems to a healthy state within a generation.
3. **Address water allocation issues** having regard to all interests including Māori and existing and potential new users.

This document sets out a package of proposals to achieve the first two of these objectives. Beyond this, we will continue to work on broader system reform, including water allocation.

Within five years, the Government expects environmental reporting to show evidence of improvement in water quality. Because every catchment is different, the time required for improvements to show up will be different. It will take decades to restore the health of our

waterways to the state our communities want, but these proposals set out a shared direction and get us started. Some catchments are under greater pressure and need more action, more quickly.

Overall, this package strengthens the obligations on all New Zealanders to protect and restore our waterways. We describe this shared responsibility as upholding Te Mana o te Wai – the health and wellbeing of the water.

Te Mana o te Wai is a concept for all New Zealanders. It refers to the essential value of water, and the importance of firstly sustaining its integrity and health, before providing for essential human health needs and then for other consumption. The Government agrees with this concept.

The Government will continue to work with Māori to address their rights and interests in freshwater, particularly in the context of addressing allocation issues.

Further work is needed on institutional/oversight arrangements for the freshwater management system, together with strengthening compliance and enforcement, establishing more durable funding of the system, and improving science and information to inform decision-making.

A healthy waterway is an ecosystem that includes the plants, fish, birds, insects and other invertebrates in and on the banks of the waterway, with enough clean water flowing through.

To encourage a holistic approach to managing water – ki uta ki tai – we are bringing together proposals to strengthen the regulation of both freshwater and three waters infrastructure (drinking water, wastewater and stormwater services).

Many people, including farmers and growers, are already taking action to reduce their impact on freshwater. However, their efforts are undermined by those who are not. We want to acknowledge positive efforts and follow good examples wherever we can, and make sure everybody contributes.

The proposals in this document put a stronger focus on improving all aspects of ecosystem health and set out proposed new processes and standards for reducing pollution within the current system. However, they will not deliver the improvements all New Zealanders want unless they can be translated into real actions on the ground. This is a big ask of councils, ratepayers, and land and water users. Budget 2019 included a significant investment in support for regional councils, and implementing aspects of the package such as farm planning.

While there will be costs in implementing this package, there are also costs from not acting. The environmental issues currently facing New Zealand have immediate significant costs (such as the costs of restoring degraded waterways) as well as future costs (such as decreased productivity due to soil erosion). Generally, environmental interventions are cheaper and more cost-effective the sooner they are implemented.

The proposals will be delivered through national direction under the Resource Management Act 1991 (RMA), in the form of a new National Policy Statement for Freshwater Management (NPS-FM), National Environmental Standards (NES) for Freshwater, Sources of Drinking Water, and Wastewater, and Section 360 regulations. We have restructured and redrafted the current NPS-FM to improve clarity and reinforce a holistic approach to freshwater management.

1.1 Summary of proposals

We are seeking your views on the proposals summarised below.

Proposal	RMA direction	What will be different
Set and clarify policy direction (section 4 of this document)		
Introduce a new freshwater planning process that will require councils to have new plans in place no later than 2025.	RMA amendment bill	Better, faster, more nationally-consistent freshwater management plans and implementation.
Strengthen and clarify the requirement to manage freshwater in a way that gives effect to Te Mana o te Wai; this refers to the integrated and holistic health and wellbeing of waters as a continuum from the mountains to the sea.	NPS-FM	The health and wellbeing of the water will be put first in decision-making; providing for essential human needs, such as drinking water, will be second, and other uses will be third.
Restructure and redraft the NPS-FM to improve clarity and reinforce a holistic approach to freshwater management	NPS-FM	Councils and the communities they represent will find it easier to put the health and wellbeing of the water first because they will have stronger and clearer direction.
Strengthen the requirement to identify and reflect Māori values in freshwater planning, with two options set out in this document for feedback.	NPS-FM	Iwi and hapū values for freshwater in a region will be a focus for freshwater management.
Support renewable energy targets by exempting major hydro-electric schemes from some freshwater management requirements.	NPS-FM	Status of major existing hydro-electric schemes will be clarified. This is not expected to result in any change to current consent requirements for managing water flows and environmental impacts.
Raise the bar on ecosystem health (section 5)		
Broaden the focus of national direction and planning to a more holistic view of ecosystem health and require better monitoring and reporting.	NPS-FM	Land and water resources will be managed so that in a generation our freshwater will be healthier for people, animals, native fish, trout and salmon, plants and other species that live in or alongside waterways.
New attributes (indicators of ecosystem health) to be monitored and maintained or improved: • nutrients (nitrogen and phosphorus) • sediment • fish and macroinvertebrate numbers • lake macrophytes (amount of native or invasive plants) • river ecosystem metabolism • dissolved oxygen in rivers and lakes.	NPS-FM	Land and water resources will be managed to maintain or improve ecosystem health in each catchment. This is likely to require different actions in different catchments, including reducing soil loss, reducing nutrient run-off, and/or investing in upgrading wastewater and stormwater infrastructure.
Higher standard for swimming in summer.	NPS-FM	Greater efforts to reduce contamination where people want to swim.
Protect urban and rural wetlands and streams.	NPS-FM and new Freshwater NES	There will be no more draining or development of wetlands. Remaining streams in urban and rural areas will not be piped or filled in unless there is no other option, for example to provide a crossing.

Proposal	RMA direction	What will be different
Protect threatened indigenous freshwater species.	NPS-FM	Land and water resources will be managed in a way that helps indigenous species thrive.
Provide for fish passage.	NPS-FM and Freshwater NES	Fish that need access to the sea to breed will face fewer barriers.
Improvements to setting minimum water flows and reporting on water use.	NPS-FM and regulations	Better management of water allocation within the current system.
Support the delivery of safe drinking water (section 6)		
Strengthen requirements to assess and control risks to drinking water sources.	Amended NES for Sources of Human Drinking Water	Tighter management of land use in areas that are sources of drinking water supply so drinking water is not contaminated.
Improve ecosystem health by better managing stormwater and wastewater (section 7)		
Set minimum standards for wastewater discharges and overflows and require all operators to follow good practice risk management.	Proposed Wastewater NES and proposed Water Services Act	There is less pollution of rivers, lakes, groundwater and the sea from stormwater and wastewater.
Improve ecosystem health by improving farm practices where needed (section 8)		
Ensure all farmers and growers have a plan to manage risks to freshwater.	Freshwater NES	There is less pollution of rivers, lakes and groundwater from agriculture and horticulture because all farmers and growers understand and manage environmental risks and follow good practice. All farmers and growers have a farm plan by 2025.
Tightly restrict any further intensification of land use through interim measures until all regions have operative freshwater management plans.	Freshwater NES	From June 2020, changes such as new irrigation or conversion to dairying will only happen where there is clear evidence it will not increase pollution.
Reduce nitrogen loss in catchments with high nitrate/nitrogen levels through interim measures until all regions have operative freshwater management plans.	Freshwater NES and/or farm plan	In catchments with high nitrate/nitrogen levels there will be a reduction in nitrogen loss within five years.
Exclude stock from waterways.	New regulations and farm plan	There will be more fencing and wider setbacks to keep stock out of waterways, reduce erosion, and capture contaminants before they reach the water.
Apply standards for intensive winter grazing, feedlots and stock holding areas.	Freshwater NES or industry standards	There will be less erosion and less pollution of waterways from nutrients, sediment and pathogens.

To support these proposals, the Government is investing in information, tools and advice that will help communities restore waterways and improve practices (section 9). The structure of this document follows these broad areas, shows how proposals would be implemented under the RMA (section 2), and discusses potential impacts (section 10) and interactions with other regulations (section 11).

These proposals are one part of the Government's comprehensive approach to improving the state of our waterways and our environment, and moving to a sustainable, low-emissions economy.

Copies of the draft NPS-FM, Proposed Freshwater NES and Draft stock exclusion section 360 regulations are available on the Ministry for the Environment's website.

Action across a catchment

This diagram shows proposed actions intended to limit pollution and improve the health of our waterways.

1.2 Input from network of advisory groups

The policy proposals outlined in this document arise from the Essential Freshwater work programme launched in October 2018, as set out in the documents *Essential Freshwater: Healthy water, fairly allocated* and *Shared Interests in freshwater: A new approach to the Crown/Māori relationship for freshwater*. This work programme was delivered by a multi-agency taskforce based at the Ministry for the Environment (MfE), informed by the views of a network of advisory groups which have all provided their own advice to Ministers on the regulatory package set out here and broader issues, set out in their reports. The views of these groups are noted throughout this document.

The Freshwater Leaders Group

The Freshwater Leaders Group (FLG) brings together expertise and input from leaders across the primary sector and agribusiness, environmental non-government organisations, and other voices from the community. It has acted as a sounding board for proposals and challenged analysis.

"New Zealanders have a deep connection to waterways. Freshwater is central to all New Zealanders whether as part of daily life, recreation, business or holding a special cultural significance. Over many years the quality of New Zealand's waterbodies has become degraded. Although the Resource Management Act (RMA) has provided for sustainable management, water quality continues to decline in many catchments around New Zealand today. It is becoming increasingly clear that more must be done.

"The urgent need to take further action to stop our freshwater from becoming worse, and to return our freshwater bodies to a healthy state, is widely recognised. To improve water quality, major changes are needed to the way that we as a country protect and manage our land and water.

"Farming to provide food and fibre is a fit and proper activity and its use of water means that it will have an environmental footprint and some waterbodies will not be 'pristine'. But it needs to be carried out within environmental limits."

You can read the full Freshwater Leaders Group report on the Ministry for the Environment's website.

Te Kāhui Wai Māori

Te Kāhui Wai Māori (KWM) has brought the insight, skills and perspectives of a broad range of Māori experts with significant experience and leadership in the primary sector and agribusiness, freshwater science and mātauranga Māori, local government, resource management law and policy, and flax roots whānau, hapū and iwi advocacy. It has built on previous work by the New Zealand Māori Council and the National Iwi Chairs Forum: Freshwater Iwi Leaders Group.

"Aotearoa New Zealand's current resource management system is broken. It is failing to achieve its purpose and has become complex, dysfunctional and inaccessible. Our waters are sick. We must heed the cry to make our waters well again. Diverse communities all over Aotearoa New Zealand are hearing these cries. Te Mana o te Wai is the korowai that should frame and inform structural and system reform. We set out a programme of action for our nation to journey together in implementing a managed transition to a new system of care and respect for water. It is time for a new system.

The Kāhui Wai recommendations to restore the health of our wai are:

1. Embed Te Mana o Te Wai principles and obligations to guide all activities.
2. Recognise and resolve iwi/hapū customary title and rights in water within the next 3 years, including the implications in practice of this recognition.
3. Declare a moratorium on additional discharges and water-related consents for 10 years.
4. Reform the RMA in line with the directive of this paper.
5. Consider enacting a stand-alone complementary Water Act to reinforce the significance of water as a taonga for the nation.
6. Establish an independent national regulatory Te Mana o te Wai Commission.
7. Develop new accountability and partnership requirements for local government.
8. Develop mandatory Māori measures of wellbeing in the National Policy Statement for Freshwater Management National Objectives Framework.
9. Design and implement a national funding system that emphasises water user pays. Options for use of funds include an ongoing clean-up fund for at-risk catchments.
10. Implement a Te Mana o te Wai Capacity and Capability Strategy to guide the investment in, and development and empowerment of, the leaders of Te Mana o te Wai to enable this structural and system reform.
11. Implement a National Freshwater Science Strategy, that extends beyond biophysical factors and includes Māori measures of health, to underpin Te Mana o te Wai.
12. A new water allocation system must conform with Te Mana o Te Wai and iwi/hapū rights and obligations, including the recognition of the long held exercise of ahi kā by Māori landowners. No allocation based on grandparenting and no perpetual rights.

The KWM Te Mana o Te Wai Report makes a number of central system-wide and structural recommendations that reach beyond the package of regulation set out in this document. They are fundamental. Among them are reform of the RMA, consideration of a stand-alone Water Act, new requirements for local government, a strategy to develop Te Mana o te Wai capacity and capability, a science strategy that includes Māori measures of health and a new water allocation system that must conform with Te Mana o Te Wai and iwi/hapū rights and obligations."

You can read the full Kāhui Wai Māori report on the Ministry for the Environment's website.

The Science and Technical Advisory Group

The Science and Technical Advisory Group (STAG) has overseen the technical and scientific basis for proposals, and given extensive input into the ecosystem health measures and other proposals.

> "This [STAG] report highlights a strong focus by STAG on the health of the environment and the waterbody. We recognise that recommendations in our report could, depending on the way they are incorporated into policy, have very significant economic and social implications for individuals and communities in some parts of New Zealand. At the same time, they will require substantial investment in both capacity and capability in freshwater science and management in New Zealand, especially in relation to regional council monitoring and reporting. However, it is explicitly not within our remit to consider such implications in developing our recommendations.
>
> "Our focus has been on the freshwater ecosystems themselves and in this respect our recommendations are aligned with the first obligation of Te Mana o te Wai – the first obligation is to the water, to protect its health and its mauri."
>
> You can read the full Science and Technical Advisory Group report on the Ministry for the Environment's website.

The Regional Sector Water Subgroup

The Regional Sector Water Subgroup (RSWS) has contributed views and experiences of regional councils, who are required to manage freshwater on behalf of their communities and to promote environmental, social, cultural and economic wellbeing.

The regional sector will ultimately be responsible for implementing and enforcing most of the proposals, and has substantial experience with the challenges of implementing the current NPS-FM, regional plans, and various Treaty settlement arrangements relating to freshwater management.

> "In the early days of the Resource Management Act (1991), New Zealand's water quality challenges were strongly linked to point source discharges. By improving technology and resource consent conditions, point source discharges have improved significantly, demonstrating that the current resource management system can work. However, the gains made by improving point source discharges have been largely overshadowed by land-use intensification. Successive governments, industry and the economic system encouraged land development and intensification, including subsidising large scale land clearance and wetland drainage.
>
> "As New Zealand works to address the significant challenges these past behaviours have created, we all need to take responsibility to improve water quality. Major progress is being made to improve catchment management and tighten local environmental regulations in different parts of the country.
>
> "The Regional Sector strongly supports the Government's intent to improve water quality and wants to ensure that the likely impacts of the new proposals on communities are well understood and factored into the pace of change. We need to take landowners and communities with us. It is also essential that the new proposals can be practically implemented in the stated timeframes, noting that significant capacity and capability issues exist across all sectors."
>
> You can read the full Regional Sector Water Subgroup report on the Ministry for the Environment's website.

1.3 Broader reform of the freshwater management system

As well as the immediate steps proposed in this document, we are continuing to work more broadly on the future shape of the system for managing freshwater.

The proposals here are intended to better enable councils to set limits for a sustainable level of nitrogen (and other pollutants) in each catchment. To reduce nitrogen discharge levels to meet those limits, there needs to be a system for allocating allowances to discharge nitrogen into water. This would have to provide for new entrants and the development of currently underdeveloped land. We anticipate consulting on this issue at a later date.

Proposed targets for emissions in the Climate Change Response (Zero Carbon) Amendment Bill are also likely to result in changes in the decisions New Zealanders make at home, at work, and on the farm.

The proposals for freshwater also link with the Government's priority to safeguard our indigenous biodiversity and reduce the extinction risk for 4000 threatened plant and wildlife species.

MfE is continuing to work with the Department of Conservation (DOC), the Ministry for Primary Industries (MPI) and others, to understand how climate, biodiversity and water policies interact and can deliver co-benefits.

Resource management reform

The Government has a two stage process for reforming the resource management system, including freshwater management.

Stage one is an amendment bill, later this year, to reduce complexity, increase certainty, restore previous public participation opportunities, and improve RMA processes.

Stage two is a comprehensive review of the resource management system, focused on the RMA.

A panel of experts will lead the review and will deliver a plan for resource management reform by mid-2020.

The review will address urban development, environmental bottom lines, and effective participation, including by Māori.

1.4 Advisory groups call for significant change

The advisory groups KWM, FLG and RSWS are clear that significant change is required, and rapidly, to return waterways to the state that all New Zealanders want.

RSWS also considers that all New Zealanders, urban and rural, have a responsibility for improving freshwater ecosystems.

FLG, STAG and RSWS support the intent behind the proposals set out in this document, as taking immediate steps toward stopping further damage and improving ecosystem health.

KWM supports the need for reform to take immediate steps toward stopping further damage and improving ecosystem health, but are not confident that the current policy proposals will deliver on these outcomes.

All groups support Te Mana o te Wai as the overall framework for managing water resources. It is a concept that resonates across cultures.

FLG advises that a 'precautionary approach' should be applied; where there is uncertainty, regulations should favour the protection of freshwater values.

Managing the change

Advisory group members acknowledge proposed new rules would have an impact on land and water users in both urban and rural parts of New Zealand.

The RSWS supports many of the changes proposed, some of which the sector sought, such as the streamlined planning process and specialist water commissioners to sit with local accredited elected members to comprise freshwater hearings panels.

The RSWS has substantial concerns about the scale and speed of the impacts and capacity and capability throughout New Zealand to achieve the change.

It seeks careful assessment and consideration of these by government, and the need for targeted science support, before setting requirements and timeframes. Getting the detail right in regulatory settings will also be critical to ensure they are appropriately targeted, implementable and effective.

The RSWS wants to ensure that change is targeted to where it is needed most. Specifically, where the NPS-FM has already been given effect to, that transitional arrangements are provided so these plan provisions are not required to be reworked.

KWM and FLG are of the view that New Zealand society has failed to adequately protect ecosystem health, and must now front up to the changes required. Both KWM and FLG consider that all New Zealanders, both urban and rural, have a responsibility for improving ecosystem health.

KWM and FLG want the proposed new rules in this package to deliver swift change to poor practices that are contributing to high contaminant loads reaching waterways.

It is acknowledged that the transition to healthier ecosystems across all of New Zealand will take decades, but KWM and FLG support clearly setting expectations and direction so everyone has a clear view of the path forward, to inform their decision-making.

It will be essential to provide well-developed guidance material to assist and support farmers to meet expectations and operate in line with new regulations.

KWM, FLG and RSWS agree that monitoring and enforcement will be critical, to ensure New Zealand water resource users are doing what they are supposed to. KWM proposes a national approach to monitoring, compliance and enforcement, with hapū involvement.

The advisory groups have all raised concerns about whether there is adequate capacity and capability in the system to do what's required as quickly as possible. KWM is clear that this is not an excuse for not making change. Commitment to rapid change requires leadership from central and local government through targeted resourcing.

The RSWS would like to see the Crown's investment in science refocused to prioritise and support improving freshwater quality.

New national body to oversee water

KWM and FLG recommend wider changes to the freshwater resource management system.

KWM says Aotearoa New Zealand's current resource management system is broken. It is failing to achieve its purpose and has become complex, dysfunctional and inaccessible.

Both KWM and the FLG recommend the establishment of a new, independent national body to oversee freshwater management implementation. KWM proposes this is named Te Mana o te Wai Commission, with at least 50 per cent of the appointed Commissioners to be Māori. It should be independent of the government and be sustainably resourced to design and implement the Te Mana o te Wai Structure and Systems Reform.

The proposed commission's role would include setting national direction, auditing or monitoring regional or local authority functions and duties, providing technical support, calling-in applications at the local catchment level where appropriate, and advice to regional councils and enforcing compliance.

See the KWM report (paragraphs 42-46) and the FLG report (paragraphs 67–70).

The RSWS believes that stronger central leadership and system stewardship is needed.

The RSWS recommends a review of the current system and consideration given to how the current system can work better, rather than creating a new institution. Existing institutions such as the Ministry for the Environment, the Parliamentary Commissioner for the Environment, and the Office of the Auditor General need to be strengthened.

1.5 Path forward

In the next 12 months New Zealanders can expect to see:

- whole-of-government investment in supporting actions that will stop further damage to our waterways and start to reverse past damage. This includes helping farmers understand and plan for improvements in farm practices, supporting councils to apply and enforce controls as quickly and effectively as possible, and investing in catchment-level protection and restoration activity and in systems and technology such as Overseer® that will help monitor and manage pollution
- public discussion and feedback on proposals outlined in this document, followed by decisions. Implementation of new rules by central government and regional councils would begin from June 2020
- detailed planning on how and when to implement support for new and improved practices
- debate on amendments to the RMA to speed up the process for regional councils to develop and implement regional water management plans
- a public conversation on nitrogen discharge allowances and discussions on more comprehensive reform of the RMA.

By 2025 New Zealanders can expect to see:

- evidence of material improvements in freshwater quality
- regional councils managing land and water resources in a way that reflects community/iwi/hapū values and will improve freshwater health in a generation
- catchment-level limits on resource use to better manage pollutants, set at a point that sustains ecosystem health
- urban water service providers and rural water users implementing plans to reduce their environmental impact and manage risk
- farmers and growers supported with information and advice as they move to more sustainable land use
- nationally-consistent measurement and monitoring in place to track progress, enforce limits where required, and inform further work.

1.6 Questions

The Government welcomes your feedback. The questions below, and at the end of each section, are a guide only. You do not have to answer all the questions and all comments are welcome. See section 12 for how and when to make a submission.

1. Do you think the proposals set out in this document will stop further degradation of New Zealand's freshwater resources, with water quality materially improving within five years?
2. Do you think the proposals will bring New Zealand's freshwater resources, waterways and ecosystems to a healthy state within a generation?
3. What difference do you think these proposals would make to your local waterways, and your contact with them?
4. What actions do you think you, your business, or your organisation would take in response to the proposed measures?
5. What support or information could the Government provide to help you, your business, or your organisation to implement the proposals?
6. Can you think of any unintended consequences from these policies that would get in the way of protection and/or restoration of ecosystem health?
7. Do you think it would be a good idea to have an independent national body to provide oversight of freshwater management implementation, as recommended by KWM and FLG?
8. Do you have any other comments?

2 Implementing improvements through the Resource Management Act

The Resource Management Act 1991 (RMA) is the main piece of legislation that sets out how we manage our environment. Its purpose is the sustainable management of natural and physical resources. For freshwater, the RMA regulates how water is taken, used, dammed or diverted, and how pollutants can enter water.

2.1 Central government sets direction for local government to follow

The Government is responsible for making regulations that councils and water users have to follow. As well as administering the RMA, the Government provides 'national direction' for water through national policy statements, national environmental standards, and other regulations.

These give councils specific instructions about how to achieve the outcomes the Government considers nationally important (eg, protecting the health of freshwater ecosystems and of people).

2.2 NPS-FM provides national direction for managing water

The National Policy Statement for Freshwater Management 2014 (NPS-FM), which was amended in 2017, is currently the main source of national direction about how regional councils should manage freshwater.

It contains a National Objectives Framework (NOF) which guides regional decision-making. This requires that every regional council, in consultation with its community, sets out a long-term vision for waterbodies in its region and identifies corresponding values for each freshwater management unit (FMU). The council must then set freshwater objectives and target attribute states[1] to ensure those values are provided for.

The council must then work out what needs to be managed to achieve those target attribute states (eg, contaminants, flow, habitat or land use), set limits on these things, and develop rules about resource use to achieve the objectives they've set.

Councils must also monitor the extent to which the long-term vision and the target attributes states are being achieved.

[1] Attribute means a measurable characteristic that can be used to assess a particular component of a value applied to water, for example fish numbers, sediment or nutrients.

Catchments and groundwater

The catchment of a waterbody, like a river, lake or estuary, is the area of land that catches rainfall and drains water to that waterbody. The boundary is usually defined by ridges. However, a surface waterbody can also be fed by groundwater, in which case the catchment might include the area for the groundwater system feeding the surface waterbody.

Groundwater is water that seeps below ground, where it is stored in the soil or in the space between rocks.

A freshwater management unit is all or any part of a waterbody or waterbodies and their related catchments, for management purposes.

2.3 Iwi and hapū demonstrating leadership

Many Treaty of Waitangi legislative arrangements, relationship and governance agreements, mātauranga Māori freshwater projects, and iwi and hapū planning documents are providing leadership by influencing freshwater management and community attitudes to water. These sit alongside the rules set by central and regional government.

2.4 Communities and water users taking action

Many communities and water users have established their own initiatives to protect and restore local waterways and catchments.

In towns and cities, ratepayers are investing millions in upgrading systems to reduce sewage and other pollution getting into rivers, lakes and estuaries. For example, Auckland Council is planning to spend $7 billion over 10 years to upgrade water infrastructure. More is needed, and through the Three Waters Review the Government is looking at how that can be achieved.

There are hundreds of catchment restoration groups operating across New Zealand.

Thousands of farmers have invested in measures to reduce water pollution – using new systems and technology to deal with effluent so it doesn't pollute waterways; fencing streams and planting millions of plants; reducing fertiliser use; setting land aside for wetlands, bush reserves, or to prevent erosion; and investing through their industry groups in research to reduce their environmental footprint.

However, voluntary efforts by some are not going to be enough. Central and local government must set clear rules and regulations to ensure all land owners know what's expected and why, and ensure everyone is contributing.

2.5 New national direction

In this document we are consulting on three types of regulation to strengthen national direction on freshwater:

1. **National policy statements (NPSs):** NPSs are issued by the Government to provide direction to local government about matters of national significance which contribute to meeting the purpose of the RMA. NPSs are implemented in regional and district planning documents.
2. **National environmental standards (NESs):** NESs are issued by the Government to set nationally-consistent rules for the ways particular activities or resource uses are to be carried out. NESs apply to all people undertaking activities regulated in the NES.
3. **Regulations made under section 360 of the RMA (section 360 regulations):** section 360 regulations set technical and/or complex requirements for specific activities, duties or other RMA matters.

In addition, the Government has decided to introduce new reporting requirements on wastewater and stormwater network operators to provide greater transparency, and to require regional councils and water suppliers to monitor and report on changes to the quality of drinking water sources. These obligations (discussed in section 7) may be set out in a new Water Services Act as part of reforms to the regulation of Three Waters infrastructure.

2.6 Interactions with other regulations

The proposed NPS and NESs have been developed in the context of several other government resource management priorities, particularly the proposed National Policy Statement on Urban Development, the proposed National Policy Statement for Indigenous Biodiversity, and the proposed National Policy Statement for Highly Productive Land.

These national direction tools are intended to be compatible and to enable good decision-making that provides for New Zealand's environmental, social, cultural and economic wellbeing. Throughout the development of all these national direction tools, there has been careful consideration of how they interact, and how they align with current national policy statements covering various matters of national significance (including transmission activities and renewable energy generation).

See section 11 for further analysis of interactions.

2.7 Interactions with Treaty settlement obligations

We have undertaken an initial analysis to ensure the Essential Freshwater policies are consistent with existing Treaty settlement obligations. For example, the Waikato River, Te Awa Tupua and Ngāti Rangi settlements include obligations on the Crown relating to specific aspects (ie, values and strategy documents) of their settlements when developing national direction.

The consultation period provides an opportunity for the Ministry for the Environment (MfE) and iwi/hapū to work together to ensure settlement obligations are being met, and resolve any issues that may arise.

Freshwater management process

How national direction from government flows through to healthier waterways.

Central government

- Sets requirements through national direction regulations.

Regional councils

- Work with communities and iwi/hapū to understand regional priorities.
- Set objectives for the region that meet or exceed national regulations.
- Make a plan, with assistance from central government, to maintain and improve ecosystem health to meet regional objectives.
- Act on the plan.

Actions to achieve ecosystem health objectives, and all other objectives for the waterbodies, include:

Actions

Manage land use by setting rules and putting conditions on resource consents.

Support land and water users with information about good practice.

Monitor and enforce compliance with rules and consents.

Monitor ecosystem health and report to the community.

Manage water volumes through setting limits on water takes as a condition of resource consents.

Manage stormwater and wastewater by putting conditions on resource consents that local councils, operators, and providers must meet.

Encourage and invest in prevention and restoration, eg, erosion control through planting, wetlands restoration, and/or riparian planting.

3 Context

The way New Zealanders live and make a living is having a serious impact on our environment, including precious water resources, as highlighted in the recent report *Environment Aotearoa 2019*.

The report identified nine priority issues – those that matter most to the current state of the environment. Four issues reflect the pressure we are putting on rivers, lakes, wetlands, estuaries and groundwater:

1. Changes to vegetation on the land are degrading soil and water.
2. Waterways are polluted in farming areas.
3. The environment is polluted in urban areas.
4. Taking water changes flows, which affects freshwater ecosystems.

The report also identifies that climate change is already affecting New Zealand.

These are not new issues. As the document *Essential Freshwater* (October 2018) outlines, the pressure on freshwater is the result of more than 150 years of population growth, and changes in the way we use the land. The damage to freshwater from intensification of agriculture in particular has been known since 2004, when the then Parliamentary Commissioner for the Environment Dr Morgan Williams highlighted it in the report *Growing for Good*.

Freshwater's ability to support life is critical for our threatened indigenous species and ecosystem health in both freshwater and the receiving marine environment. It underpins our agricultural, electricity and tourism sectors.

New Zealanders care about freshwater. Recent research[2] shows 85 per cent think it is the responsibility of all New Zealanders to improve water quality and 60 per cent agree everyone needs to share the cost.

3.1 Current state of our freshwater ecosystems

Waterways are polluted by excess nutrients, pathogens (disease-causing microorganisms), and sediment. Many have been physically changed, for example urban streams have been piped and other waterways have been dammed.

New Zealand has lost 90 per cent of its wetlands to agricultural and urban development.

Estuaries from Northland to Southland are being seriously damaged by sediment smothering the seabed and shellfish. Increasing sediment is also accelerating the expansion of mangroves.

Our freshwater fish and other species are under threat.

Based on models, over 90 per cent of river length in urban areas and about 70 per cent in pastoral farming areas have nitrogen levels that may affect the growth of some aquatic species.

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2 Ministry for the Environment Environmental Attitudes Baseline research 2018.

About 46 per cent of New Zealand's total river length is in pastoral farming areas (the pastoral land cover class) whereas only about 1 per cent of it is in urban areas (the urban land cover class). So while pollution levels are higher in urban areas, there are more rivers by length affected in pastoral areas.

3.2 What are the challenges?

Urban development

Urban waterbodies are highly valued ecosystems that offer refuge to some of our most threatened species. Unfortunately, some of these waterbodies are also amongst the most degraded.

The way we use land in our urban areas is putting pressure on these fragile freshwater ecosystems. Large areas of impervious surfaces such as roofs, roads and pavements can create extreme changes in flow conditions, which affect the habitats of freshwater species and can contribute to flooding.

Stormwater run-off from towns and cities carries contaminants such as pesticides, heavy metals, and litter into the waterways. Stormwater also infiltrates wastewater networks, causing untreated wastewater to overflow into urban streams and harbours. Urban growth and subdivision can lead to the loss of our waterways to culverting, diversions and reclamations. Earthworks can pollute streams with sediment, making them unliveable for many native plants and animals.

However, urban design done well has the potential to help improve freshwater outcomes, especially in greenfield areas where restoration and low-impact design approaches can be undertaken as part of development.

Almost all of New Zealand's population growth will continue to be in urban areas, which provides an opportunity to improve how we manage the effects of urban development on freshwater, and to make more liveable cities – cities where people are connected to their local freshwater environment and enjoy it as a part of their everyday lives. This is already happening in some places. However, the challenge is holding the line on water quality while also enabling growth that keeps pace with demand.

Agriculture and horticulture

Farming brings similar challenges. Converting land to more intensive farming and growing can significantly increase the adverse cumulative effects of contaminant losses, and pollute waterways with sediment, nutrients (nitrogen and phosphorus), and pathogens like *E. coli*. Farm animals that can access waterways directly pollute them with faeces, and also trample stream banks, increasing susceptibility to erosion and destroying habitat for freshwater plants and animals.

Some farming methods have a high impact on waterways if not managed in line with good practice and effective regulations. This includes growing crops that require large quantities of fertiliser, intensively grazing stock on winter forage crops, and holding stock for long periods in constrained areas.

The impact on waterways is a complex interaction between land use, soil types, climates, and crop physiology.

Plantation forests

The sustainable management of forests has a key role to play in protecting New Zealand's water resources. Both permanent and plantation forests play a significant role in providing freshwater resources and ecosystem services, such as water quality, water yield, recreation, and biodiversity. However, plantation forest harvesting can create risk of environmental damage if not managed well.

The National Environmental Standard for Plantation Forestry regulates the way some plantation forestry activities may be carried out and will be reviewed after decisions are made on proposals in this document, to ensure consistency for example in reducing sediment loss at harvesting. See section 11.

Cumulative impacts across catchments

In some cases, each land-use practice might not have a big impact in isolation. But as water travels down the catchment from the mountains to the sea, small individual impacts can have a large cumulative effect. By the time the river has been fed by many streams and drains, and run-off from many farms, these cumulative impacts can significantly degrade water quality and ecosystem health.

This is particularly noticeable in some of our estuaries. For example, historically, mangroves were found primarily in tidal creeks in upper regions of estuaries and harbours. Now increased sediment run-off has significantly increased the area of mangrove colonisation.

It is important to manage the catchment as a whole, and monitor ecosystem health along the way.

Climate change

The impact of climate change has to be considered in water management. *Environment Aotearoa 2019* reported higher land and sea temperatures, more sunshine, drier soils, and altered precipitation patterns. The biggest impact on freshwater health is likely to come from more extreme weather events. Droughts can mean lower flows, while also increasing the demand for stored water, while storms can mean erosion and increased pressure on stormwater systems.

4 Setting and clarifying policy direction

Proposals to require a holistic view of managing land and water resources and enable faster planning.

4.1 Issues

For more than a decade, New Zealanders have been talking about how to limit our impact on freshwater, including through the multi-stakeholder Land and Water Forum that functioned from 2009 to 2018. The current National Policy Statement for Freshwater Management (NPS-FM) was introduced in 2011 and updated in 2014 and 2017, and councils are at various stages in developing water management plans. However, insufficient progress is being made.

Over half of regional councils are not confident of completing plan changes to give effect to the current NPS-FM by 2025. Most have either extended their timeframe to 2030 or indicated they might need to do so. This is far too long. Also, we need to consider the cumulative effect of individual consents under the RMA and the costs of pollution to society and the environment.

Proposed amendments to the NPS-FM set out in this section are intended to provide the clarity that is currently lacking. Changes are also proposed to the RMA to enable faster plan-making processes. By 2025 regional councils would be required to have made final decisions on plans and actions that will improve freshwater ecosystem health. There will be additional support for councils to implement change.

The current NPS-FM directs regional councils to consider and recognise Te Mana o te Wai in the management of freshwater, but local authorities remain uncertain as to what is expected, and how Te Mana o te Wai relates to or adds to other current direction in the NPS-FM.

Incorporating Māori values more strongly into freshwater management would create benefits for the entire community, including those who value freshwater for their own philosophical, spiritual or cultural reasons.

4.2 Te Mana o te Wai

Te Mana o te Wai or 'the mana of the water', refers to the integrated and holistic health and wellbeing of waters as a continuum from the mountains to the sea. It is the fundamental value and concept that protects New Zealanders' special connection with freshwater, while simultaneously sustaining its ability to provide for the future wellbeing of people and our unique ecosystems.

Te Mana o te Wai was first introduced into the NPS-FM in 2014 and its role further strengthened in the 2017 NPS-FM amendments. This work resulted from discussions between the Iwi Leaders Group (ILG) and MfE and involved significant wider consultation. Kāhui Wai Māori (KWM) and MfE have worked together to further clarify the concept and intended outcomes. This understanding and policy development were informed by the current requirements and descriptor of Te Mana o te Wai in the NPS-FM.

In the context of freshwater management, Te Mana o te Wai is conveyed here as a national framework to understand water, that can be applied to inform how decision-making connected to the care and use of water should occur. The framework is broader than the context of the NPS-FM and is relevant across different regulatory and non-regulatory tools and activities, as well as individual actions in relation to the care of freshwater. The framework of Te Mana o te Wai is also not an end-point, but a means by which we make immediate and future decisions that protect and sustain the health and wellbeing of our freshwater now and for future generations.

Te Mana o te Wai establishes a three-tiered hierarchy of obligations, requiring that certain uses for water must be prioritised over others. The health of the water is the first priority. The second priority is providing for essential human health needs, such as drinking water, and the third priority is other consumption and use.

In the context of the NPS-FM, Te Mana o te Wai requires a series of approaches and decisions, including but not limited to:

- applying the hierarchy of obligations
- managing freshwater in an integrated and holistic way
- engaging and discussing with tangata whenua and communities, and incorporating their values into decisions relating to freshwater
- recognising broader values and systems of knowledge to the management of freshwater.

Embedding Te Mana o te Wai across freshwater management systems is a long-term trajectory. The following proposed amendments to the NPS-FM are further steps in that direction.

The objective is to provide meaningful direction to regional councils on how Te Mana o te Wai can inform freshwater management practice that prioritises the mana and mauri (life-force), and overall health and wellbeing, of freshwater bodies.

We recommend reframing Te Mana o te Wai in the NPS-FM by clarifying current provisions, further embedding the concept, and requiring an approach that prioritises the essential value, health, and wellbeing of freshwater bodies. Our proposals are:

1. Clarify the descriptor of Te Mana o te Wai so that it more clearly underpins the whole framework of the regulation. Since expanding the description of the concept in 2017, MfE has been working further to understand better how the concept fits within the overall NPS-FM.
2. Require regional councils to give effect to Te Mana o te Wai when implementing the NPS-FM.
3. Clarify how new and existing components of the NPS-FM relate to Te Mana o te Wai.
4. In particular, every regional council must develop, and articulate in its regional policy statement, a long-term vision that gives effect to Te Mana o te Wai. The long-term vision must:
   - be developed through discussion with tangata whenua and communities about their long-term wishes for waterbodies in the region
   - be informed by an understanding of the history of, and current pressures on, waterbodies in the region
   - express what tangata whenua and communities want their waterbodies to be like in the future.

How these requirements will be reflected and given effect to in the management of freshwater will vary regionally. We have developed these policies with the intention of retaining the flexibility of Te Mana o te Wai to be applied locally, while reducing some of the ambiguity that currently exists.

See Parts 1, 2 and 3 of the draft NPS-FM.

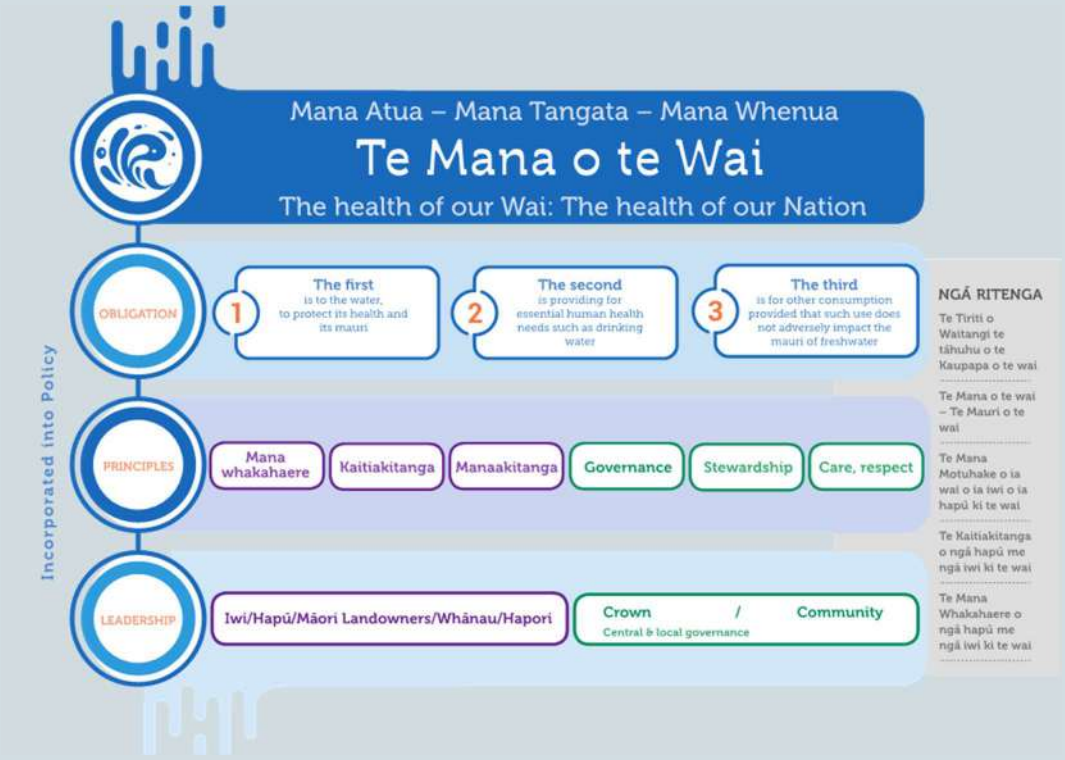
Advisory groups' comments

The Te Mana o te Wai policy framework has been developed through working with Kāhui Wai Māori. There is support in principle from all advisory groups for using Te Mana o te Wai as a framework for freshwater management.

Kāhui Wai Māori acknowledges the Government's commitment to embedding Te Mana o Te Wai in the proposals in this package, but does not consider that the draft NPS-FM released with this discussion document, as currently drafted, yet achieves that aim.

Kāhui Wai Māori perspective

Kāhui Wai Māori have developed the following diagram to describe their framing of Te Mana o te Wai. They have recommended that the principles and obligations set out in the diagram guide all activities relating to the care of freshwater.



4.3 Strengthening Māori values

We have heard that Māori values for freshwater health are not being identified, reflected, incorporated or monitored adequately across the country. We want to improve the ability of iwi and hapū to express their values in freshwater management and planning, and to strengthen and clarify requirements on regional councils to incorporate this information into regional freshwater planning processes.

For tangata whenua, freshwater health focuses on the health of the connections between the environment, water and people, providing an opportunity for freshwater management to better address social values and issues connected to freshwater that are relevant to all New Zealanders. The development and application by tangata whenua of tools, frameworks and methods of identifying, giving effect to, and measuring freshwater health are a central aspect of implementing the NPS-FM.

The current NPS-FM provides national direction on relationships of tangata whenua with freshwater. It recognises the importance of involving tangata whenua in freshwater management, and identifying and reflecting tangata whenua values in freshwater planning. However, the NPS-FM does not compel regional councils to provide for tangata whenua values of freshwater health.

We have identified two ways of responding to the issues outlined. These two proposals are not mutually exclusive and could work together.

We acknowledge that KWM prefers the first proposal and the Government is also supportive of this proposal. We are seeking feedback on both proposals, including what changes may occur as a result, the potential benefits, and impacts.

Proposal 1. Elevate the status of mahinga kai to a compulsory value

Existing compulsory values prioritise biophysical attributes of freshwater health. Mahinga kai[3] is a multi-faceted integrated indicator that addresses more than biophysical measures. This is reflected in the current NPS-FM which describes the mahinga kai values as: 'kai are safe to harvest and eat' and 'kei te ora te mauri – the mauri of the place is intact'. These mahinga kai values are listed as 'other national values', rather than 'compulsory national values'.

We propose to consolidate and elevate both mahinga kai values to become a single compulsory value. This would require regional councils to enable and support tangata whenua locally to develop attributes that represent the specific mahinga kai values in their local catchments. It is not recommended that mahinga kai values are represented by predetermined attributes and bands at a national level, as these values are invariably catchment specific and must align to the relevant species and methods in individual catchments.

Mahinga kai is a widely applicable freshwater value across the country. With mahinga kai already included in the current NPS-FM as an 'other national value', the multi-faceted aspects of mahinga kai are already familiar to regional councils. A number of hapū/iwi have already identified mahinga kai values and attributes in iwi management plans, regional planning documents, and kaupapa Māori assessment frameworks.

As a compulsory value, regional councils would be required to provide for the mahinga kai compulsory value in identified sites or waterbodies, in all freshwater management units, including enabling and supporting tangata whenua to identify attributes, targeting attribute states, and managing requirements for this value.

[3] Mahinga kai generally refers to indigenous freshwater species that have traditionally been used as food, tools or other resources. It also refers to the places those species are found and to the act of catching them. Mahinga kai can also refer to freshwater resources being able to be used for customary practices and use.

Proposal 2. Strengthen priority given to tangata whenua freshwater values

The second proposal would strengthen the priority given to tangata whenua values in freshwater planning.

The current NPS-FM requires regional councils to take reasonable steps to identify and then reflect tangata whenua values in management and decision-making.

The proposal is to create a new 'tangata whenua freshwater values' category in the NPS-FM, giving them the same priority as ecosystem health and human health for recreation.

This would provide stronger direction to regional councils that, where 'tangata whenua freshwater values' have been identified by iwi and hapū for the purposes of freshwater management within a freshwater management unit, then these values need to be incorporated into regional freshwater planning processes.

The policy intent is to maintain flexibility to take a local approach to freshwater management, and provide clearer and stronger direction to regional councils about how to work with hapū and iwi.

Summary of how proposal 2 would work in practice

- Tangata whenua freshwater values would be determined locally by iwi and hapū, and supported by regional councils.
- For all these values, the council would then be required to set attributes, target states, and management requirements. Regional councils would be required to support iwi and hapū to identify and develop this information.
- Regional councils would have to incorporate the outcome into regional freshwater planning processes subject to the RMA.

Draft NPS-FM

The draft NPS-FM provided alongside this document does not currently reflect either of these proposals. Drafting will be completed after consultation and once decisions are made on the preferred approach.

Kāhui Wai Māori comments

In relation to Proposal 1, the multi-faceted aspects of mahinga kai are universal for tangata whenua throughout Aotearoa and central to maintenance of tikanga and mātauranga. Proposal 1 compels regional councils to provide for mahinga kai values in a manner that provides greater certainty under a familiar process.

Proposal 2 complements the consolidation and elevation of mahinga kai to a compulsory value by providing for a broader range of tangata whenua values. As a new proposed value category in the NOF (it appears to sit somewhere between the 'compulsory values' and the 'other values') it is still unclear how this option will work in practice. Clarity is needed around the status of the values and attributes identified by Māori under this option; the express direction that will be given to regional councils to work with and support hapū/iwi to develop tangata whenua values and attributes; how hapū/iwi will be supported to participate; and how councils will be required to incorporate those values and attributes into planning documents.

Kāhui Wai Māori supports Proposal 1. This is because ensuring sufficient compulsion, both in respect of councils supporting hapū/iwi to identify and articulate tangata whenua values and attributes, and ensuring councils must incorporate these into freshwater planning documents, is fundamental to embedding Te Mana o te Wai. We think that clearly identifying mahinga kai as a compulsory value does this. We support Proposal 2 as a supplement to, but not a substitute for, Proposal 1. A critical aspect to the success of both of these options is supporting and resourcing iwi/hapū to ensure tangata whenua values are meaningfully incorporated.

4.4 New planning process for freshwater through amending the RMA

To enable better, faster, more nationally-consistent water management, we propose a new freshwater planning process that will require councils to have new plans in place, consistent with Te Mana o te Wai, no later than 2025 that fully give effect to the new NPS-FM.

This would be achieved through a Resource Management Amendment Bill due for introduction to Parliament in coming months.

Government-appointed freshwater commissioners with specialist skills would form a panel with local councillors, and tangata whenua-nominated representatives to consider council plans, hear submissions and make recommendations. There would be restricted avenues for appeal, balanced by this robust, independent hearing process.

Under this proposal, councils would still be responsible for developing their plans in consultation with local communities, and would make the final decisions following recommendations from the freshwater hearing panel.

Standard RMA planning steps, up to and including public notification, would apply. This includes, but is not limited to, requirements to consult with iwi, prepare evaluation reports, publicly notify planning documents, and call for submissions and further submissions.

There would be restricted avenues for appeal, balanced by this robust, independent hearing process. Existing Treaty settlements and water management agreements linked to those will continue to be honoured.

Full details of this proposal will be available when the Bill is introduced to Parliament.

Facilitating the shift to a new process

MfE would work with regional councils to facilitate the transfer of existing plans and 'work in progress' to the new process; including identifying where plans need updating to include new requirements from the new NPS-FM.

Advisory groups' comments

The FLG, KWM and RSWS support the intent of this proposal, subject to further consideration of the detail. Detailed comments have been provided to MfE.

RSWS supports progressing planning with urgency, but notes there will be a tension between iwi/hapū and community engagement processes, and speed of implementation. There will be capacity and capability issues for participants across the country. In addition, giving effect to Treaty settlements relating to freshwater can take time and proceeding with regional plans too quickly could compromise these processes.

Next steps for proposed new freshwater planning process

This proposal requires amendments to the RMA so there is a different process for seeking feedback. This proposal would be implemented through the Resource Management Amendment Bill. It will then be referred to a select committee which will seek feedback at the appropriate time.

4.5 Directing more integrated management of freshwater

Regional councils have clear responsibilities for freshwater management under the NPS-FM. However, regional councils, unitary authorities, and territorial authorities (city and district councils) have overlapping roles in supporting integrated management of land and water.

City and district councils are uniquely placed to better integrate management, particularly in urban areas, due to their role in managing infrastructure and land use. We propose new policies for the NPS-FM to direct territorial authorities to manage the effects of urban development on water so they are supporting integrated management across freshwater management units.

See Part 3.4 of the draft NPS-FM.

4.6 Exceptions for major hydro schemes to support renewable energy targets

Maintaining adequate flow levels and variability in rivers is essential to ecosystem health. However, in some cases hydro-electric generation has changed water channels and flows to an extent that this can affect the health of downstream ecosystems.

Hydro-electric generation currently provides the majority of our electricity and has a critical role in the wider electricity system due to its size, flexibility and the potential of some schemes to store large amounts of energy.

Climate change action and freshwater health are both priorities for the Government and a careful balance needs to be achieved.

There are ambitious targets for the reduction of greenhouse gas emissions and renewable electricity generation (with electricity demand expected to grow significantly).

The current NPS-FM includes an exceptions mechanism, allowing regional councils to maintain water quality below a national bottom line if it is necessary to secure the benefits of hydro-electricity infrastructure as listed in Appendix 3 of the NPS-FM. However, this appendix has never been populated, and hydro-generators remain concerned over the regulatory risk and uncertainty this creates for them when renewing resource consents (beginning in 2025).

The continued operation of New Zealand's hydro-electric baseload will be crucial in meeting emissions and renewable electricity goals. This includes its ability to operate in conjunction with increased production from wind. Storage flexibility is therefore expected to become more important, not less.

We propose to list the six largest hydro-electricity schemes as exceptions in the new NPS-FM – that is the Waikato, Waikaremoana, Tongariro, Waitaki, Manapouri and Clutha schemes. This would cover about 90 per cent of New Zealand's hydro-electricity capacity and regional councils would have clear direction on how to approach other existing schemes.

Regional councils would be required, when making plans or setting limits, to have regard to the importance of not adversely affecting the generation or storage capacity of a scheme or its operational flexibility.

While other schemes are significant in their own right, we believe there is a need for pragmatism – a general exception would allow too many rivers and lakes to potentially be exempt from national bottom lines.

Waterbodies containing infrastructure outside of the six largest schemes will have to meet national bottom lines under the NPS-FM. So would any future infrastructure within the six largest schemes that materially changed the nature of a scheme, or part of it.

The six largest schemes are built on waterbodies that are, or are likely to be, seen as taonga to local iwi, and are subject to various obligations in existing Treaty of Waitangi settlements. An assessment of this proposal, and others, against existing settlements will be critical and completed before final decisions. The proposal would not impact on the settlement legislation that creates specific regimes for the Waikato and Whanganui Rivers as the settlement legislation means those regimes prevail if the NPS-FM is inconsistent.

Regional councils will still be required to maintain or improve water quality within all waterbodies including, to the extent possible, those subject to this proposal.

All hydro-electricity schemes would remain subject to the RMA and resource consent requirements. Their consents typically include flow regimes and complex conditions designed to manage their environmental impacts, and the proposed exceptions will not lead to declines in water quality.

See Part 3, Subpart 4 of the draft NPS-FM.

Advisory groups' comments

KWM and FLG are opposed to exemptions. The opposition is based on concern that exempting major hydro schemes as described here will work against the principles the Essential Freshwater programme is seeking and limit the effectiveness of measures to improve ecosystem health on rivers with hydro schemes, or may see increased pressure on councils to not seek appropriate mitigation of environmental effects.

RSWS acknowledges the need to maintain energy generation capacity, and seeks clearer direction on this. RSWS is opposed to blanket exemptions for these six schemes, and supports enabling exemptions and offset mitigation requirements at regional council discretion, as an option that can be applied only after full assessment of effects, causes, and management options, including offset mitigations.

4.7 Questions

Te Mana o te Wai

9. Do you support the Te Mana o te Wai hierarchy of obligations, that the first priority is the health of the water, the second priority is providing for essential human health needs, such as drinking water, and third is other consumption and use?
10. Do you think the proposals will have the desired effect of putting the health of the water first?
11. Is it clear what regional councils have to do to manage freshwater in a way consistent with Te Mana o te Wai?
12. Will creating a long-term vision change how councils and communities manage freshwater and contribute to upholding Te Mana o te Wai?

New Māori value

13. Do you think either or both of these proposals will be effective in improving the incorporation of Māori values in regional freshwater planning?
14. Do you foresee any implementation issues associated with either approach?
15. What are the benefits and impacts of either of these approaches?
16. What implementation support will need to be provided?

New planning process for freshwater

17. Do you support the proposal for a faster freshwater planning process? Note that there will be opportunity to comment on this proposal in detail through the select committee process on the Resource Management Amendment Bill later this year.

More integrated management of freshwater

18. Does the proposal make the roles and responsibilities between regional councils and territorial authorities sufficiently clear?

Exceptions for major hydro schemes

19. Does the proposal to allow exceptions for the six largest hydro-electricity schemes effectively balance New Zealand's freshwater health needs and climate change obligations, as well as ensuring a secure supply of affordable electricity?

5 Raising the bar on ecosystem health

Proposals to strengthen the focus on ecosystem health, set more stringent bottom lines, and stop further loss of wetlands and streams.

5.1 Issues

Under the purpose of the RMA, regional councils are responsible for safeguarding the life-supporting capacity of water. Yet many waterways have become degraded over the past 25 years, to the detriment of ecosystem health. Further, the focus of the current NPS-FM means councils have not put adequate measures in place to protect all aspects of aquatic ecosystem health.

The Government recognises that safeguarding the life-supporting capacity of water is critical for the habitat of indigenous freshwater species as well as trout and salmon. Together, a number of proposals in this section clarify and strengthen direction to improve the habitat of both indigenous freshwater species and trout and salmon.

The current National Policy Statement for Freshwater Management (NPS-FM) includes bottom lines for nine indicators, known as attributes, which mostly relate to measures of physical and chemical water quality. In the most recent amendment (2017) a specific monitoring indicator for aquatic life was added (the macroinvertebrate community index).

The Science and Technical Advisory Group (STAG) has considered the available science and provided advice on updated, new attributes and bottom lines. These are set out in this section.

5.2 Focus on holistic ecosystem health – te hauora o te wai

The intent is to broaden the focus of those making decisions that impact on our waterways; so they are considering and managing for all five components that contribute to the health of a freshwater ecosystem.

These are:

1. **Aquatic life** – the abundance and diversity of biota including microbes, invertebrates, plants, fish and birds.
2. **Habitat** – the physical form, structure and extent of the waterbody, its bed, banks and margins, riparian vegetation, and connections to the floodplain.
3. **Water quality** – the physical and chemical measures of the water, such as temperature, dissolved oxygen, pH, suspended sediment, nutrients and toxicants.
4. **Water quantity** – the extent and variability in the level or flow of water.
5. **Ecological processes** – the interactions among biota and their physical and chemical environment such as primary production, decomposition, nutrient cycling, and trophic connectivity.

The draft NPS-FM clarifies the policy intent that freshwater is managed through a National Objectives Framework to ensure the health and wellbeing of waterbodies and freshwater ecosystems is maintained or improved.

In practice, this means regional councils are required to set objectives for each attribute at current state or better (to maintain or improve) and the objective must be above national bottom lines. If the current attribute state is below these bottom lines, it must be improved.

This may require land-use change in some catchments, where more intensive land uses must change to a lower intensity land use, and this brings associated challenges of which land uses must reduce, by how much, and over what time period.

Reporting on ecosystem health

Councils will be required to report against all five components of ecosystem health (aquatic life, habitat, water quality, water quantity, and ecological processes) using at least the new national indicators/attributes.

We are working on a template for a standard summary ‘report card’ that regional councils will be able to use.

See Part 2: Objectives and Part 3, Subpart 2: National objectives framework of the draft NPS-FM.

Advisory groups' comments

In principle, KWM, FLG, STAG and RSWS endorse this holistic approach to ecosystem health, recognising that this is central to Te Mana o Te Wai.

RSWS supports the need to maintain or improve water quality and ecosystem health, but seeks further assessment of the implications. In catchments where water quality improvements are required, implementation and changing current practice will take time.

In some catchments with a large groundwater system, water quality may continue to decline for some time before changes made today take effect and water quality in spring fed streams improves.

In these circumstances, reporting on the actions in place, timeframes, and the trajectory toward improvement would be appropriate. A firm definition allows no headroom so, for example, farming/horticulture may not be able to establish on undeveloped land.

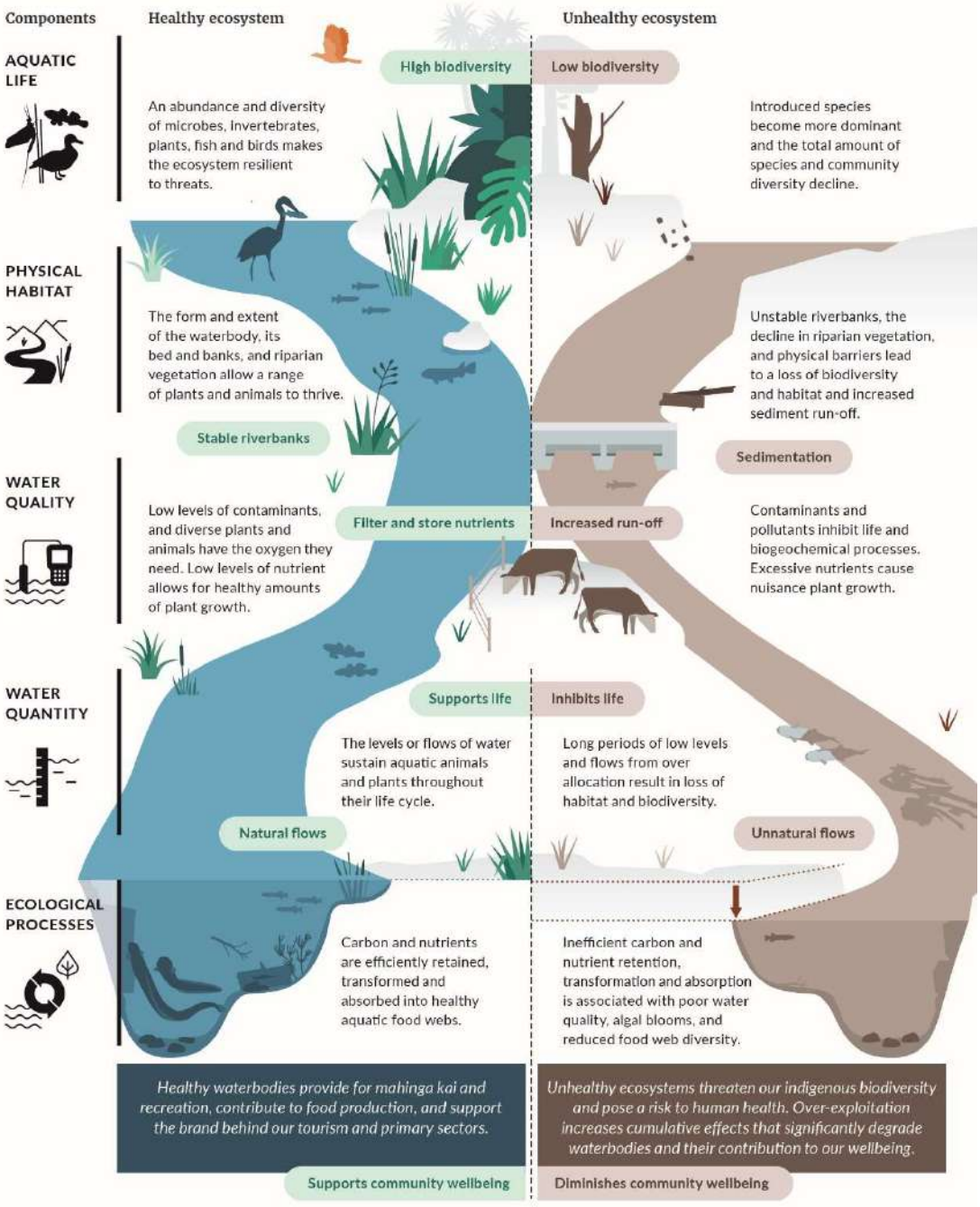
5.3 Ecosystem health – new attributes and new management approach

All attributes for ecosystem health are compulsory and have bottom lines set out in the draft NPS-FM.

The current system is based on setting objectives, or targets for contaminant levels, above bottom lines, and proactively managing land and water use to meet those objectives. We are proposing that councils are required to measure and manage a broader range of ecosystem health attributes, and some of these will require a different, adaptive management approach.

Freshwater ecosystem health

This diagram shows the five components that contribute to freshwater ecosystem health.



Proactive management

For existing attributes, and the proposed new suspended sediment and nutrient (nitrogen and phosphorus) attributes, regional councils are required to set a target that will ensure water quality is maintained or improved, and proactively manage land and water use towards that target.

Monitoring and responding

We also propose that councils be required to measure and monitor a broader range of ecosystem health attributes. In the event the attribute declines, or is below a national bottom line, regional councils would implement an action plan to achieve improvement.

This approach reflects that there may be a wide range of reasons for a deterioration, a variety of actions that might be taken, and the specific actions might depend on the catchment and situation. The best approach may be to undertake monitoring to learn about the catchment, detect possible issues, and then develop an action plan with management actions to respond. The results are evaluated, and actions adjusted on the basis of what has been learned. This allows for decision-making in the face of uncertainty.

An example is the proposed Deposited Fine Sediment attribute which is measured as the proportion of the stream bed smothered by sand, silt and clay. This relates to the Physical Habitat component of the Ecosystem Health Value. This sediment can come from a number of sources as a result of a wide range of processes, depending on the context of the location. The best approach is therefore to:

- investigate the problem (eg, determine that the sediment is mostly clay)
- understand processes leading to the problem in each case (eg, determine if a likely source could be recent earthworks that exposed clay to rainfall)
- develop responses (eg, require better erosion control such as settling ponds and diversion bunds)
- evaluate whether the responses are working.

The table on the following page sets out the six attributes that this adaptive management approach will apply to.

The NPS-FM would set the point at which action is required, using STAG recommendations.

These points are in the tables set out in the STAG report for dissolved oxygen, ecosystem metabolism, fish biotic integrity, macroinvertebrates, macrophytes (lake submerged plant index), and deposited fine sediment.

Indicator and waterbody	What it tells us
Fish (rivers – wadeable[4])	Fish health, including abundance and diversity of species
Macroinvertebrates (rivers – wadeable)	Health of macroinvertebrates Macroinvertebrates are small animals without backbones that live on or just below the streambed and are an important part of the food chain
Dissolved oxygen (DO)[5] in lakes and rivers	Inadequate dissolved oxygen can impair the growth and reproduction of aquatic organisms, and if low enough will kill them
Ecosystem metabolism (rivers)	Carbon and nutrients are efficiently retained, transformed and absorbed into healthy aquatic food webs
Deposited sediment (rivers)	Too much sediment can smother riverbeds
Macrophytes (lakes)	The amount of native or invasive plants growing

Advisory group comments

The STAG endorses the adaptive management approach proposed for these attributes.

5.4 Aquatic life – improving protection for threatened indigenous species

The current NPS-FM does not adequately protect the habitats of threatened indigenous species.

Three-quarters of New Zealand's native freshwater fish species are threatened or declining. Some widespread migratory species, such as kōaro and īnanga (whitebait species), appear to be declining in both abundance and distribution. Fish habitat, including areas where populations are surviving in poor habitat such as farm drains and urban streams, is not always identified and managed.

In some circumstances, threatened species' habitats may need more active management, because of their specific habitat needs and current distribution. For example, kōaro prefer rocky, tumbling streams, particularly in native bush, but may live in modified streams if there is the right habitat.

We propose a new compulsory national value for threatened species, as defined in the NPS-FM, to ensure regional planning identifies and manages threatened species.

See Appendix 1A of the draft NPS-FM.

This proposal aligns with the Government's approach to protecting indigenous biodiversity. See section 11 for more detail.

4 In this context, wadeable means able to be accessed for monitoring purposes.

5 This is in addition to the existing dissolved oxygen attribute.

Advisory groups' comments

The advisory groups support a compulsory value for threatened indigenous species.

This provision focuses specifically on threatened indigenous species, but the advisory groups note that all the ecosystem health provisions together will help improve the environment for all freshwater species, including trout and salmon.

5.5 Aquatic life – providing for fish passage

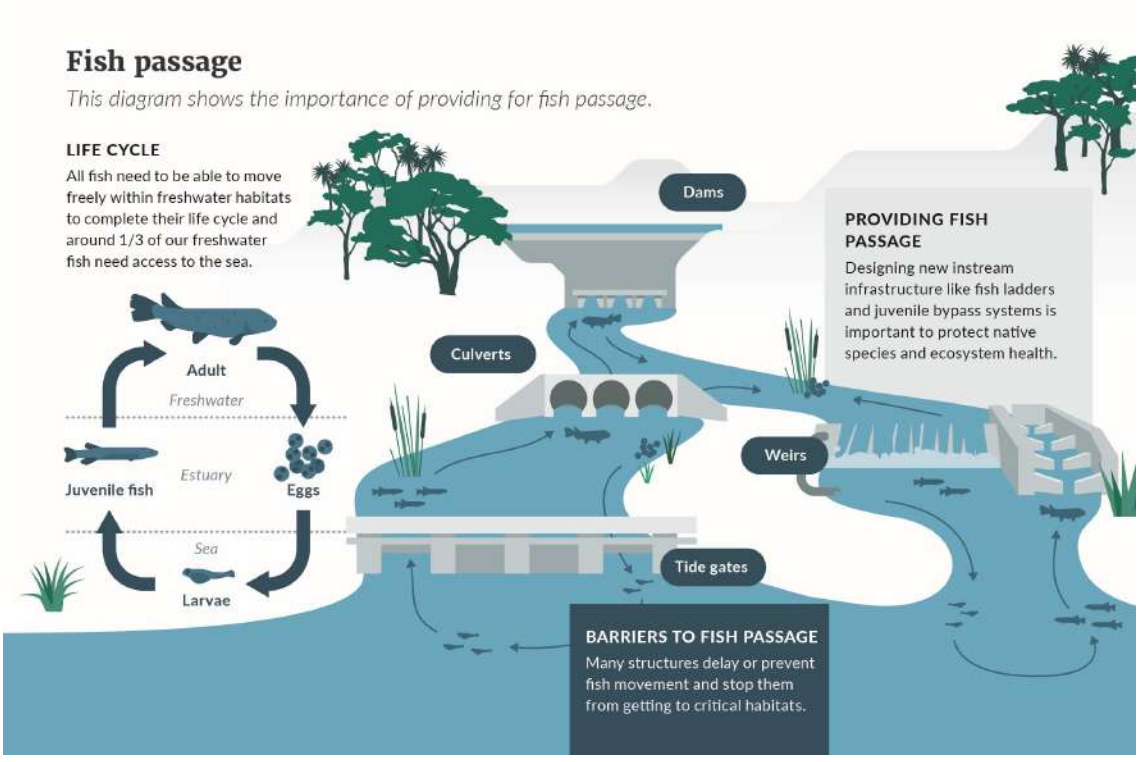
Around one-third of New Zealand's native freshwater fish species need access to the sea. Native fish species (such as tuna/eels and īnanga/whitebait) and sports fish (such as trout and salmon) require access between and within freshwater habitats to complete their life cycles. But many structures such as culverts, dams and tide gates can delay or prevent fish movement and stop them from getting to critical or otherwise suitable habitats.

There are voluntary guidelines for planning and designing new structures, and providing fish passage through existing structures, and an online assessment tool developed by the NZ Fish Passage Advisory Group, available on the Department of Conservation website.

We propose to require regional councils to provide for fish passage in line with these guidelines, both in plan-making and consenting, and in imposing design requirements on some types of new in-stream structures less than four metres high, including:

- ensuring that new structures such as weirs, culverts and tide flap gates be required to meet minimum design standards to enable fish passage
- identifying existing structures and prioritising changes to enable fish passage.

See Part 3 of the draft NPS-FM.



5.6 Habitat – no further loss of wetlands

The RMA defines 'wetland' as including permanently or intermittently wet areas, shallow water, and land water margins that support a natural ecosystem of plants and animals that are adapted to wet conditions. This does not include wet pasture or paddocks where water temporarily ponds after rain, or that contain patches of exotic sedge or rush species, or constructed wetlands.

Coastal wetlands are natural wetlands found around the margins of estuaries and intertidal areas, and include saltmarsh and mangrove areas.

Wetlands are one of our most valuable ecosystems.

Wetlands are an essential habitat for highly diverse flora and fauna, and support a high proportion of threatened species – 67 per cent of freshwater and estuarine fish species and 13 per cent of nationally threatened plant species, as well as critically endangered birds. They have strong cultural importance to Māori, and are a source food and water. They also act as the kidneys of the land and giant sponges by filtering contaminants, contribute to erosion control, carbon sequestration, and buffer against floods and storm surges.

These natural ecosystem services are estimated to be worth over $5 billion per year for inland wetlands and over $16 billion per year for coastal wetlands. However, less than 10 per cent of our original inland wetlands remain. Many coastal wetlands have been historically infilled for development and are under continual pressure from changing land use.

We propose to protect remaining natural wetlands and put tighter controls on certain activities that damage inland and coastal wetlands.

Through the NPS-FM, regional councils would be required to identify all existing natural inland wetlands, monitor their health, set policies to protect them, and think about how to make restoration easier.

Through the new Freshwater NES there would also be restrictions on activities considered the most destructive to inland and coastal wetlands: drainage, damming, diversion, water takes, reclamation, or disturbance of the bed, or clearance of indigenous vegetation. This would take effect from the date the NES-FM comes into force, expected to be June 2020.

See Part 3 of the draft NPS-FM and Part 2 of the proposed Freshwater NES.

These proposals build on the national policy direction for coastal wetlands set out in the New Zealand Coastal Policy Statement. They complement and reinforce proposals for wetland restoration in the proposed NPS for Indigenous Biodiversity (see section 11).

Advisory groups' comments

KWM, FLG, STAG and RSWS support preventing further loss of wetlands. The groups consider that re-creation and restoration of wetlands is important and encourage further consideration of incentives for this work.

5.7 Habitat – no further loss of streams

In cities and towns, rivers and streams are often one of the last refuges for native vegetation, plants, birds and other biodiversity. They are the water most of us live next to and have the greatest connection to. But urban streams have been piped, straightened and channelled to a large extent.

It is more effective to avoid loss of habitats than to attempt to restore them at a later date.

We propose an approach based on a 'mitigation hierarchy'; firstly preventing activities that cause the most damage to stream habitat; then secondly, at times where adverse effects cannot practically be avoided, replacing the stream habitat that is lost. Offsetting, which means that adverse effects in one location can be made up for by improvements in another location, is only appropriate to consider after all potential possibilities to avoid, remedy, or mitigate adverse effects of an activity have been ruled out.

The intention is to protect vulnerable habitats and species and so there is not a cumulative loss of habitat over time.

The NPS-FM will direct councils to avoid infilling of streams and rivers unless specific exceptions apply. Consent applicants will be required to demonstrate that they have exhausted all practical options to avoid, remedy or mitigate any proposed stream loss through infilling, and they will be required to offset or compensate for any stream loss. Councils will also be required to ensure culverting and permanent diversion of streams and rivers do not result in a net loss of extent or ecosystem health.

When stream loss through piping or reclamation cannot be avoided, remedied or mitigated, we propose to provide direction on how residual adverse effects can be offset or compensated for. It is also proposed that councils should report on losses and gains in stream and river habitat.

See Part 3 of the draft NPS-FM.

Interaction with NES for Plantation Forestry

The NES for Plantation Forestry contains its own rules for management of wetlands and streams. See section 11 for more details.

Advisory groups' comments

Advisory groups support greater protection for streams and emphasise that every effort should be made to avoid stream loss, and to remedy or mitigate when it is unavoidable.

5.8 Water quality – new bottom line for nutrient pollution

High nutrient levels (nitrogen and phosphorus) damage ecosystem health. They contribute to algal growth, put pressure on the health of macroinvertebrates and fish and can be toxic at higher concentrations. It is more cost-effective to prevent degradation of waterways, by limiting nutrient pollution, than to attempt restoration after degradation has occurred.

Reducing nitrogen run-off from the land has benefits not only for aquatic ecosystem health, but also for reducing emissions of nitrous oxide, a greenhouse gas produced by bacteria in the soil. Actions that will reduce both nitrous oxide emissions and nitrate leaching to waterways include better management of fertiliser, stock and effluent, afforestation, protection of soil and capture of animal effluent during periods of high risk of run-off, and stock exclusion from streams and wetlands.[6]

Under the current NPS-FM, nutrient limits have been set in some catchments, based on the current periphyton and nitrate toxicity attributes. It is not proposed to change these attributes.

Limiting the growth of periphyton (slime) in practice requires restrictions on nutrients in many waterways. However, this does not apply to all waterways because periphyton does not grow everywhere; it is unlikely to be present in soft bottomed rivers (eg, the Piako River across the Hauraki Plains). About 27 per cent of the length of streams and rivers in New Zealand are soft-bottomed. Currently in these soft-bottomed rivers some councils set objectives for managing nitrogen using the nitrate toxicity attribute – that is, the level that is toxic to some aquatic species.

Currently fewer than half of 16 regional councils have set nutrient limits in some catchments using the current attributes, and are working to implement rules that will gradually reduce nutrient run-off to meet those limits.

STAG considers that the current attributes and bottom lines are insufficient to provide for ecosystem health. It has proposed a new bottom line for nitrogen in rivers at an annual median of 1.0 milligrams per litre of dissolved inorganic nitrogen (DIN) which is a different measure to the toxicity attribute. STAG proposes a bottom line for phosphorus in rivers at an annual median of 0.018 milligrams per litre of dissolved reactive phosphorus (DRP).

Where there is more than one relevant attribute for managing the effects of nutrients, the more stringent one would apply. In hard-bottomed rivers (eg, the Manuherikia River in Otago) managing nutrients to prevent excessive periphyton growth would likely require tighter restrictions on nutrient run-off than the proposed new national bottom lines.

We are seeking feedback on whether to include the new nutrient attribute tables proposed by STAG in the NPS-FM. It is important to understand more about the ecological benefits from limiting nutrients, whether this varies by waterbodies, and what impacts the proposed new bottom lines would have on individuals and communities. Final decisions will not be taken until further analysis has been done.

Good farming practice can achieve some but not all of the reduction in nutrient pollution required to achieve ecosystem health.

Reaching the proposed new bottom lines across the country would mean tighter restrictions on nutrient run-off in some lowland agriculturally-dominated areas, beyond the existing limits, especially in parts of Waikato, Canterbury and Southland.

The map below, based on national scale modelling, gives an indication of how much further nitrogen loads would have to be reduced under the proposed new bottom lines, beyond the impact of the current attributes and bottom lines. The red/orange/yellow areas indicate where further reductions of more than 50 per cent may be required. However, these estimates are indicative only and further analysis is required to fully understand the impact.

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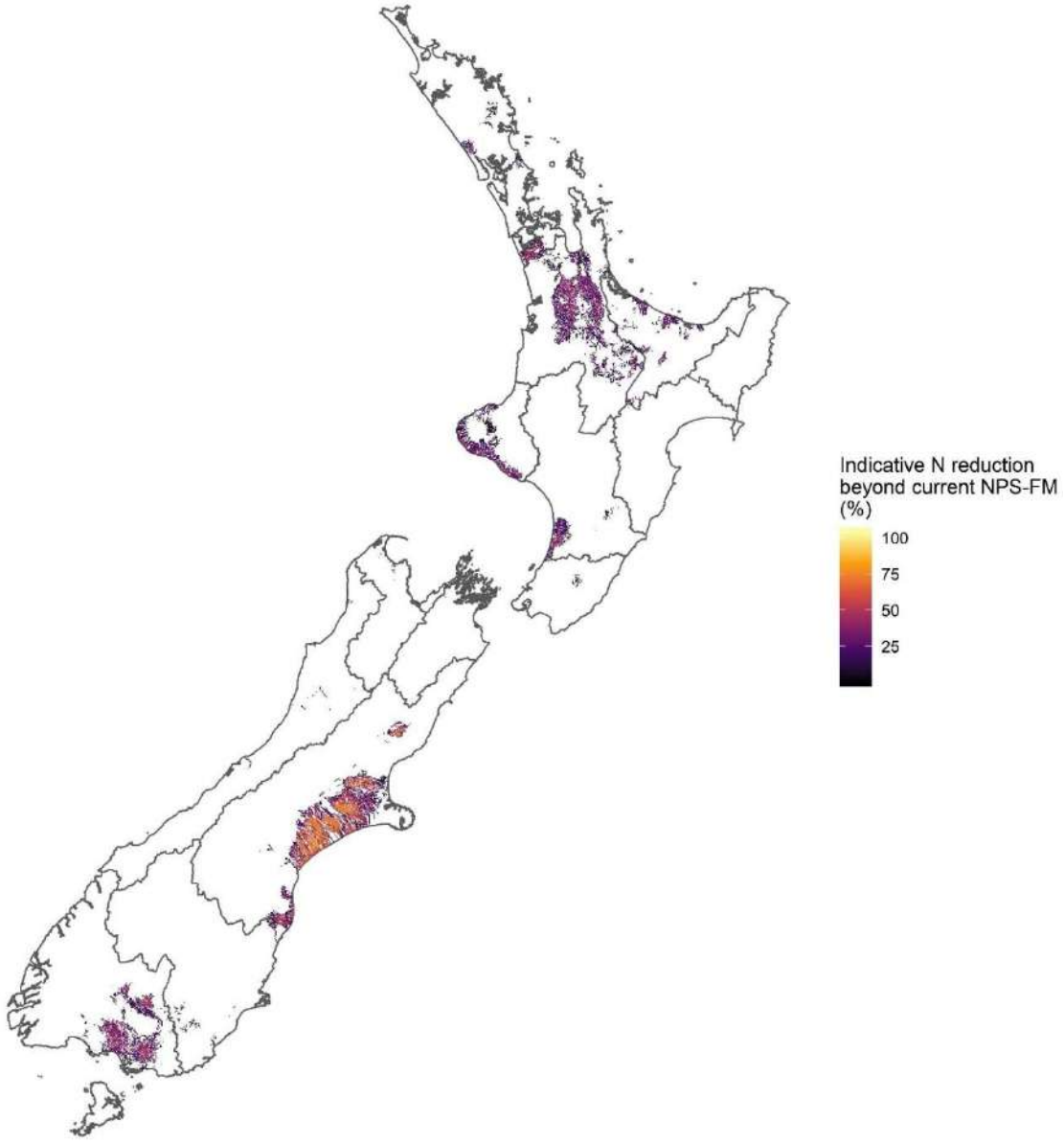
[6] Shepherd M, Daigneault A, Clothier B, et al. 2017. *New Zealand's Freshwater Reforms: What are the Potential Impacts on Greenhouse Gas Emissions?* Motu Economic and Public Policy Research.

Indication of impact of proposed new nutrient bottom lines



No direct comparison to drinking water standard

In Canterbury there has been public discussion about nitrate levels in drinking water. The bottom line for dissolved inorganic nitrogen proposed for freshwater by STAG cannot be directly compared to the current drinking water standard for nitrate; because the impact of chemicals in water is different for freshwater species than for humans. For example, humans can tolerate levels of zinc (eg, in sunblock) that would be toxic to some aquatic species. STAG has considered what level of dissolved organic nitrogen impacts on ecosystem health. STAG was not asked to consider the drinking water standard.

STAG proposes changes to the periphyton attribute

STAG has recommended amending the periphyton attribute in the NPS-FM to clarify the requirements for councils. The periphyton attribute currently allows for less stringent objectives to be set for rivers in a 'productive class'.

These rivers are defined in the NPS-FM, based on assigned climate and geology categories. STAG has recommended that the provision for the 'productive class' be removed. The implication would be that councils could still set less stringent objectives in rivers that would naturally support high periphyton biomass, but these would not be defined for them by the NPS-FM. Councils would be required to conduct their own investigations to demonstrate that their use of less stringent objectives is appropriate.

We are seeking feedback on this recommendation.

STAG has also recommended requiring councils to use a default table to set periphyton biomass thresholds in cases where there are no robust, locally suitable, independently peer reviewed criteria. MfE proposes to publish these tables as guidance, alongside the analyses used to derive them, so they can be used by councils.

Advisory groups' comments

The advisory groups agree that there is a need to reduce nutrient pollution from nitrogen and phosphorus but some had not had time to fully consider the bottom line proposed by STAG.

FLG supports dissolved inorganic nitrogen and dissolved reactive phosphorus being defined as attributes for ecosystem health.

RSWS want to ensure a robust evidence base supports any new bottom lines for nutrient pollution.

5.9 Water quality – reducing sediment

Excessive sediment is one of the most severe stressors on our freshwater and coastal ecosystems. Soil washes naturally into rivers and streams, but human activities have caused major increases in soil loss, which is harming freshwater plant and animal communities.

An example of the impact of increased sediment run-off is mangrove expansion. More sediment run-off has increased the suitability of many estuarine areas for mangrove growth, through increasing muddiness, reducing current flows and exposure, and increasing the height of tidal flats.[7]

Effective long-term management of mangrove colonisation requires a reduction in sediment and nutrient loads from the catchment.

[7] Lundquist C, Carter K, Hailes S, Bulmer R. (2017) *Guidelines for Managing Mangroves (Mānawa) Expansion in New Zealand*. NIWA Information Series No. 85. National Institute of Water & Atmospheric Research Ltd.

⏩ What we do on land has a huge impact on sediments which enter estuaries and raise the height of tidal flats, increasing the area that mangroves can colonise, as shown in this photo.

Photo: *Guidelines for Managing Mangrove (Mānawa) Expansion in New Zealand* (NIWA, 2017). ⏪

There are two types of sediment in waterbodies that need to be managed: suspended fine sediment – material that makes it hard to see through to the bottom; and deposited fine sediment – the material that settles out on the river bottom.

We propose to set new bottom lines for suspended sediment, so councils must set limits for each catchment or freshwater management unit, and manage land and water use to within those limits.

Deposited sediment

For deposited sediment, we propose to require adaptive management – that is, councils monitor levels, and if they exceed a threshold then they would have to take action.

If, after a period (say five years), the amount of sediment being deposited in an estuary is not significantly reducing, we propose that the council would be required to implement further measures each and every year until the issue is under control.

Suspended sediment

We propose to include an attribute for suspended sediment (as measured by turbidity) that includes bottom lines and bands setting out a range of 'attribute states', with a system for classifying rivers, reflecting that the natural levels of sediment in rivers varies widely across New Zealand.

This range is needed because the bottom line in parts of Northland, for example, is different than in Otago because natural conditions are different in the rivers of those regions. Current estimates are that more than 600 catchments have streams or rivers below bottom lines. However, MfE is still examining whether the proposed bottom lines are appropriate in all cases, based on the natural state that could be expected, for example around the Southern Alps.

See the table in Appendix 2A of the current NPS-FM; or the proposed attribute mapped spatially using an online application developed by NIWA, which is available on NIWA's website.

In practice, councils are likely to target efforts to areas with a high risk of natural erosion, such as hill country, and to activities that generate more sediment, such as earthworks and land clearance.

Achieving bottom lines will take time and effort across the country and across sectors. Existing government programmes will support this. For example, sediment loss will be reduced by the One Billion Trees programme and major increases in the Hill Country Erosion Fund, which funds councils and land owners to control land erosion and some sources of sediment.

Proposals relating to stock exclusion and winter grazing (see section 8) will help to reduce sediment.

Interventions to reduce sediment may improve other aspects of ecosystem health. For example, planting stream banks to prevent erosion provides habitat for native species and shading, which improves water temperature.

5.10 Water quality – a higher standard for swimming

E. coli in water is an indicator of faecal contamination and risk of infection or illness from pathogens. High *E. coli* levels in rivers and lakes indicate that people may get sick after swimming.

Regional councils have already set targets for swimmable rivers and lakes, but there is confusion about what 'swimmable' means and whether the current threshold is stringent enough.

There is agreement of the need to review the science the current threshold is based on, through a proposed Quantitative Microbial Risk Assessment, which would enable an update of the 2003 microbiological guidelines.

In the interim, the proposal in this document sets clear standards for swimming in summer, at freshwater places where people popularly swim, or would if water quality was better. The bottom line for these places during the swimming season (1 November to 31 March) would be 540 *E. coli* per 100 ml, which is similar to the A band in the current NPS-FW.

Currently, councils monitor about 290 swimming spots, known as 'primary contact sites'. They would now also prepare action plans that set out what will be done to manage, and where necessary reduce, *E. coli* levels at those sites.

The existing *E. coli* table will continue to apply to all other waterbodies, along with the existing requirement for councils to work towards reducing *E. coli* levels everywhere to contribute to achieving the national swimmability targets set in 2017.

The effect of the change would be that councils would increase their efforts to improve water quality where people want to swim. This may include placing stricter requirements on upstream discharges of wastewater, or on stock access close to popular and monitored swim spots.

Advisory groups' comments

STAG and RSWS see this proposal as a 'holding arrangement' until a proposed Quantitative Microbial Risk Assessment is completed. This is essential and would establish the relationship between disease-causing organisms and bacterial indicator organisms, and would assist in setting thresholds to estimate risks of illness. See the STAG report, Recommendation 13.

STAG and RSWS want this work to be done as soon as possible.

5.11 Water quantity – clarifying requirements for minimum flows

Adequate water flowing through a waterway is an essential component of ecosystem health.

To date, regional plans have focused on setting minimum flows and levels, without describing the extent to which they are safeguarding ecosystem health, and how they will measure success.

Proposed changes will make the current requirements clearer:

- Objectives for freshwater quantity must state the desired ecosystem health outcome.
- Minimum flows and allocation limits must clearly relate to achieving those objectives.

For aquifers connected to rivers and lakes, councils would also be directed to set water levels and allocation limits to achieve the objectives for the groundwater and the surface waterbodies.

Swiftly implementing plans once operative is critical. Ensuring all resource consents are aligned with the newly established allocation limits and minimum flow regimes will be key to delivering the outcomes of this package. As part of the broader RMA reform package, MfE is exploring opportunities to streamline this process.

See Part 3 of the draft NPS-FM.

Advisory groups' comments

The advisory groups see water volume and flow as a very important issue, requiring further work to understand what level of water flow and flow regime is required for ecosystem health.

The full effect of limits will take time to achieve, as it requires review of existing resource consents, either at the time they are renewed or sooner.

5.12 Water quantity – real-time reporting of water use

New Zealand has a mandatory requirement to record the amount of water taken for most water permits. However, there is still a lack of accurate data of the actual amount taken in many cases. These data quality issues have been identified by the Auditor-General[8] and through the Environmental Reporting Programme.[9]

The Resource Management (Measurement and Reporting of Water Takes) Regulations 2010 established a nationally-consistent regime for measuring water use. Since then, advances in technology have produced more effective options, so we propose to update the regulations.

8 https://www.oag.govt.nz/2018/irrigation.

9 *Environment Aotearoa 2019*, page 82.

As of November 2016, water permit holders for every consumptive consented water take over 5 litres per second are required to:

- install a water-measuring device (usually a water meter)
- have this device verified for accuracy
- send a continuous record of water use to their regional council.

Each region has now mostly installed and verified measuring devices. However, the data supplied to councils has often been of patchy quality, limiting its usefulness.

We are proposing to amend the regulations, to mandate telemetry (direct electronic transmission). This requires measuring water use every 15 minutes and transmitting daily electronic records. The requirement would be rolled out over time, starting with consents of 20 litres per second or more two years after the regulations come into force, through to six years for smaller consents.

Up to 11,000 water permits will be affected, though many larger permit holders have telemetry installed, so will already comply. A telemetry unit costs between $600 and $1800 to install. Data transmission may cost up to $20–$30 a month in areas of good cellular coverage, and up to $99 per month without coverage.

Advisory groups' comments

All advisory groups support in principle improving the collection of data on freshwater.

The RSWS notes that having water use measured and reported in this way will help councils maintain healthy flows in waterways. It also notes there may need to be some exceptions, where technology/transmission does not enable telemetry.

KWM and some FLG members recommend also considering the total volume of water take when deciding which users are required to install telemetry devices to measure and report. This would mean that as well as covering those using more than 5 litres per second, the regulation would cover those using a high amount but at a lower rate.

5.13 Questions

Attributes

20. Do you think the proposed attributes and management approach will contribute to improving ecosystem health? Why/why not?
21. If we are managing for macroinvertebrates, fish, and periphyton, do we also need to have attributes for nutrients that have been developed based on relationships with aquatic life?

Threatened indigenous species

22. Do you support the new compulsory national value? Why/why not?

Fish passage

23. Do you support the proposed fish passage requirements? Why/why not?
24. Should fish passage requirements also apply to existing instream structures that are potentially barriers to fish passage, and if so, how long would it take for these to structures to be modified and/or consented?

Wetlands

25. Do you support the proposal to protect remaining wetlands? Why/why not?
26. If this proposal was implemented, what would you have to do differently?

Streams

27. Do you support the proposal to limit stream loss? Why/why not?
28. If this proposal was implemented, what would you have to do differently?
29. Do the 'offsetting' components adequately make up for habitat loss?

New bottom line for nutrient pollution

30. Do you support introducing new bottom lines for nitrogen and phosphorus? Why/why not?
31. If this proposal was implemented, what would you have to do differently?
32. Do you have a view on the STAG's recommendation to remove the 'productive class' definition for the periphyton attribute?

Reducing sediment

33. For deposited sediment, should there be a rule that if, after a period (say five years), the amount of sediment being deposited in an estuary is not significantly reducing, then the regional council must implement further measures each and every year? If so, what should the rule say?
34. Do you have any comments on the proposed suspended sediment attribute?
35. If this proposal was implemented, what would you have to do differently?

Higher standard for swimming

36. Do you agree with the recommended approach to improving water quality at swimming sites using action plans that can be targeted at specific sources of faecal contamination? Why/why not?

Minimum flows

37. Is any further direction, information, or support needed for regional council management of ecological flows and levels?

Reporting water use

38. Do you have any comment on proposed telemetry requirements?

Raising the bar on ecosystem health

39. Do you have any other comments?

Draft NPS-FM (see the draft NPS-FM on the Ministry for the Environment's website)

40. Are the purpose, requirements, and process of the National Objectives Framework clearer now? Are some components still unclear?
41. What are your thoughts on the proposed technical definitions and parameters of the proposed regulations? Please refer to the specific policy in your response.
42. What are your thoughts on the timeframes incorporated in the proposed regulations? Please refer to the specific policy in your response.

6 Supporting the delivery of safe drinking water

Proposals to amend the National Environmental Standard for Sources of Human Drinking Water.

These proposals arise from the Government review of the challenges facing drinking water, wastewater and stormwater services – the Three Waters Review.

As part of this review, the Government has agreed there will be legislation establishing a new framework for drinking water, headed by an independent regulator. This legislation is part of the Government's response to drinking water safety following the lessons learned from the Havelock North incident in 2016 when a drinking water supply was contaminated with *Campylobacter*.

The proposals aim to ensure that better drinking source water protection arrangements are in place following the Havelock North incident.

We are looking for your feedback on the high level proposals on drinking water source protection, to support further policy work and ensure that it appropriately complements other proposals set out in this document. Detailed drinking water source protection proposals will be consulted on at a later date, likely in mid-2020.

6.1 Issues

A key principle of drinking water safety is the implementation of a multi-barrier approach for managing risks to public health. This includes proactively managing risks to source waters, such as rivers, lakes and groundwater, so these waterbodies can be used for community water supply. However, there are currently a number of deficiencies in the arrangements for managing these risks.

Source waters are currently regulated under the RMA and the National Environmental Standard for Sources of Human Drinking Water (Drinking Water NES), but the scope of the current regulation does not cover all activities that can pose risks of contamination. In practice, this means regional councils and territorial authorities are not consistently imposing appropriate controls on land-use activities that can affect the safety of drinking water supplies.

6.2 Proposal

We propose to strengthen the obligations on regional councils and territorial authorities for managing risks to source waters through amendments to the Drinking Water NES. We propose the following amendments:

- Provide direction on setting source water risk management areas, which will define the land area to which the regulations in the Drinking Water NES apply (that is, replacing 'upstream'/'up-gradient' with a spatial criterion). These could be based on the approach proposed in the Pattle Delamore Partners 2018 report *Technical Guidelines for Drinking Water Source Protection Zones*.
- Define the types of activities that must be assessed as potential risks to source waters within the source protection areas, including consent applications that require public notification.
- Expand the scope of the regulations so they apply to all registered water supplies serving more than 25 people (for at least 60 days per calendar year).
- Develop a new approach for managing specific contaminants in source waters, including nitrate-nitrogen, that are challenging for drinking water suppliers to remove with conventional treatment processes.
- Require regional councils and territorial authorities to place appropriate controls on the development and use of land in source water risk management areas, to support the ongoing provision of safe drinking water.
- Require regional councils and territorial authorities to review plan rules for activities located within source water risk management areas, to ensure appropriate controls are in place.

Consequential amendments to other national direction instruments, including the National Policy Statement for Freshwater Management (NPS-FM), may be required to give effect to these proposals. We are also proposing that if a regional council or water supplier has sufficient data to prove that the default source water risk management areas prescribed in the Drinking Water NES are not appropriate for a particular water supply, then the regulations would allow for bespoke source water risk management zones to be established.

Regional councils and territorial authorities would be required to identify any relevant consent applications in source water risk management areas, and notify the relevant water supplier. They must then consider the potential risks to the relevant drinking water supply(s) and determine whether the application must be declined, or meet certain conditions, in accordance with the requirements of the Drinking Water NES.

The proposed amendments to the Drinking Water NES are intended to ensure that councils are placing appropriate controls on activities located within source water risk management areas. They are intended to work in tandem with the proposed changes to the NPS-FM and the new Freshwater NES, which are intended to improve water quality at a catchment scale. For example, regional councils would be expected to set clear and specific freshwater objectives for rivers, lakes and aquifers used for drinking water supply that enable the ongoing provision of safe and reliable drinking water.

Engagement with tangata whenua about their views on source water protection will be an important part of new arrangements. Councils have already likely had discussions on these matters with tangata whenua under the current NPS-FM – either in relation to Te Mana o te Wai, or in meeting their existing obligations on engagement.

The results of this continuing engagement will contribute to regional council decisions on how to regulate source water, which would be communicated to drinking water suppliers.

Next steps

After receiving feedback on these proposals, more work will be done on proposed amendments to the Drinking Water NES, followed by further consultation, likely in mid-2020.

Kāhui Wai Māori, the Freshwater Leaders Group, Science and Technical Advisory Group, and Regional Sector Water Sub-group were not consulted on this policy.

6.3 Questions

43. Do you agree with the proposed amendments to the Drinking Water NES? Why/why not?
44. Are there other issues with the current Drinking Water NES that need to be addressed?
45. Do you have any other comments?

7 Better managing stormwater and wastewater

Proposals to require wastewater and stormwater operators to meet new standards and improve practices.

These proposals arise from the Government review of the challenges facing drinking water, wastewater, and stormwater services – the Three Waters Review. We are looking for your feedback on the high level proposals for wastewater and stormwater regulation, to support further policy work and ensure that it appropriately complements other proposals set out in this document.

Detailed wastewater and stormwater proposals will be consulted on at a later date, likely in mid-2020.

7.1 Issues

Wastewater refers to the contaminated water and sewage that goes down the drain from our homes, workplaces and other community spaces.

Wastewater piped networks and treatment plants in urban areas collect wastewater, treat it, and discharge treated wastewater to land or water. These discharges can still contain contaminants and can pollute aquatic ecosystems if not carefully managed. Unless wastewater is adequately treated, the discharge can also be contrary to the social and cultural values of Māori and communities.

Wastewater can also overflow from the piped networks. These overflows can occur in dry and wet weather either by design (engineered overflow points) or unintentionally (eg, leaky pipes). These overflows can pose short-term and long-term risks to human health and the environment if they are not managed and responded to effectively.

Stormwater refers to the run-off that occurs in built environments from paved or impervious surfaces (eg, roofs or roads) when rainfall cannot infiltrate into soil or vegetation. Stormwater networks are the pipes, rain gardens, and other green infrastructure systems that carry it away.

Historically councils have piped, filled in or reshaped many of the streams that used to carry stormwater away, and added networks of culverts and pipes to towns and cities. The quality of the water in urban waterbodies has declined as contaminants have been washed into them, making many unsafe for recreation or mahinga kai. A disconnect has been created between people and their local waterbodies.

The increase in paved or impervious areas means rain is not absorbed directly into the soil, but washes into stormwater systems, carrying contaminants from road surfaces, and off roofs. In some cases, stormwater systems will struggle to cope with the impact of climate change, as some areas of the country will face more extreme rainfall and the risk of flooding is expected to increase.

The current regulatory system does not provide assurance that wastewater and stormwater management risks are being appropriately managed, or that these services are delivering outcomes that are acceptable for communities and the environment.

7.2 Wastewater

National Environmental Standard for Wastewater Discharges and Overflows

Most wastewater discharges require resource consents from regional councils. A national assessment commissioned by the Department of Internal Affairs found significant variability in consent conditions for wastewater discharge across New Zealand and within regions. This situation makes it difficult for wastewater operators to identify exactly what is required when applying for discharge consents. It also makes it hard for regulators and communities to understand and compare the performance of their wastewater networks, and ensure good outcomes are being achieved for the environment and communities.

We are proposing a National Environmental Standard for Wastewater Discharges and Overflows (Wastewater NES). The new standard would prescribe requirements for setting consent conditions on discharges from wastewater treatment plants and engineered overflow points. These requirements could include:

- minimum treatment standards or ‘limits’ for nationally-applicable wastewater quality parameters, including biochemical oxygen demand, suspended solids and bacteria
- targets or limits on the volume and frequency of wet weather overflows
- methods for monitoring compliance with standards or limits and reporting breaches to regional councils and the public
- approaches for incorporating culturally-acceptable wastewater treatment processes.

Wastewater operators would also have to comply with any other regional council requirements under the National Policy Statement for Freshwater Management (NPS-FM) to ensure the health and wellbeing of waterbodies and freshwater systems is maintained or improved.

Wastewater operators would also be expected to participate in nutrient allocation regimes that may be established in the future.

Next steps

After receiving feedback on these proposals, more work will be done on the proposed new Wastewater NES, followed by further consultation, likely in mid-2020.

Risk management requirements

The management of risks to the environment, people and property is a key function of wastewater providers. However, there is significant variation in how wastewater operators document and report on how they manage these risks. This means regulators and communities can find it hard to understand what risks the wastewater network poses and the actions that are being taken to avoid, remedy or mitigate the risks.

We are proposing a new obligation on wastewater network operators to prepare a risk management plan (RMP).

A RMP would identify risks to the environment, people and property, then outline actions that the operator, territorial authority, and regional council have agreed to take to avoid, remedy or mitigate these risks. At a minimum the plan would account for the following risks:

- environmental – meeting resource consent and/or permitted activity requirements
- people – ensuring public health risks associated with wastewater discharges are reduced to acceptable levels
- social/cultural – demonstrating how community and Māori cultural values will be protected.

The plan would encompass the entire wastewater network and would also be required to consider future demand pressures on the system, such as climatic changes and urban growth and intensification.

In short we see the plan as being a ‘one stop shop’ for parties interested in the risks the networks pose and the actions being taken to address the risks.

Nationally-consistent measures for wastewater

Wastewater operators use a set of measures to monitor the overall performance of their networks. These can include:

- water quality parameters to assess the effect that a discharge is having on water (regional councils also do this)
- other parameters to assess the effect the operation of the plant is having on the wider environment
- the type, frequency and locations of network overflows

- other measures to assess community satisfaction with the network and the financial performance of the operator.

However, these are not always reported in a way that is accessible to the community, and in some cases do not reflect the communities' expectations for the network. This makes it difficult for communities and regulators to understand how their networks are performing and to hold the network operator to account.

Regulators and communities can also find it difficult to compare and benchmark the performance of wastewater networks as there is no nationally-consistent set of performance measures.

We propose to introduce a new obligation for wastewater network operators to report annually on a set of nationally-prescribed environmental performance measures to both their communities and a regulatory agency. This obligation would be set out in a new Water Services Act.

The proposed measures could, for example, include:

- compliance with standards for wastewater discharges and overflows
- sludge disposal practices
- greenhouse gas emissions and energy use
- odour/air quality
- compliance and enforcement actions
- extent to which identified community and iwi values are being upheld.

We will be working with wastewater network operators, regulators, community and iwi to further develop this proposal, so the measures chosen reflect a wide range of community expectations and provide more transparency.

7.3 Stormwater

Risk management requirements

At present, stormwater is managed through multiple pieces of legislation, creating a confusing regulatory system. There is significant variation in the approaches used by stormwater operators to document and report on how they manage risks to the environment, people and property.

As with wastewater (above), this means regulators and communities can find it hard to understand what is being done to manage risk.

One way we propose to address this is requiring stormwater network operators to prepare a risk management plan (RMP).

This is similar to the proposal for wastewater operators outlined above, but would address specific stormwater risks, including at a minimum:

- environmental – meeting stormwater discharge resource consents and/or permitted activity requirements

- people – ensuring public health risks associated with stormwater are managed where community values exist, such as for recreation or mahinga kai
- property – proactively managing the risk of flooding in and around buildings and habitable areas.

The RMP would encompass an entire stormwater network, and would also be required to account for projected future demand pressures such as urban growth and intensification. The plan would also support the integration of land-use planning and three waters servicing.

A number of local authorities already have stormwater management plans that consider these risks. This proposal would formalise what is already emerging as good practice within the industry. We see the RMP as being an important tool to support integrated catchment planning and provide assurances to the wider community.

Stormwater operators would also have to comply with any other regional council requirements under the NPS-FM to ensure the health and wellbeing of waterbodies and freshwater systems is maintained or improved.

Nationally-consistent measures for stormwater

Stormwater operators commonly monitor aspects of their networks, including:

- water quality parameters to assess the effect that the discharge is having on the receiving environment (regional councils also do this)
- flooding events to assess the impacts the network is having on people and property
- other measures to assess community satisfaction with the network, the level of service, and the financial performance of the operator.

However, the measures differ around the country and are not always reported in a way that is accessible to the community. In some cases this monitoring does not cover a wide enough range of indicators which makes it difficult for communities and regulators to understand how their network is performing and hold the network operator to account.

As with wastewater (above) regulators and communities can also find it difficult to compare the performance of stormwater networks across a region or the country.

We are proposing to introduce a new obligation for stormwater network operators, in a new Water Services Act, to report annually on a set of nationally-prescribed environmental performance measures to both their communities and a central regulatory agency. These would cover stormwater discharges, environmental outcomes, resilience, social/cultural indicators, compliance metrics, and other relevant performance information.

We will be working with stormwater network operators, regulators, communities and tangata whenua to further develop this proposal.

National guidance on stormwater policy and network management

Many stormwater challenges can be resolved through applying best practices in water sensitive design and green infrastructure. There are many examples of this around the country, but there is significant opportunity for more consistent application of these practices at a national level.

Water sensitive design and green infrastructure – such as using raingardens instead of pipes – offers many benefits over conventional piped infrastructure by:

- reducing the volume of stormwater through infiltration, attenuation and detention
- providing some level of treatment through uptake from plant species and deposition of sediment
- creating significant amenity benefits by providing green spaces for recreation and habitat.

There are several barriers to wider adoption of green infrastructure in New Zealand, one being a lack of capability to implement green infrastructure successfully over all scales of networks.

Some councils (Auckland Council, Wellington City Council) have developed guidelines to help stormwater practitioners implement water sensitive design at the 'site' scale – individual subdivisions and lots.

However, there is no clear national guidance on incorporating green infrastructure into policy and resource management plan provisions, or on stormwater network design and management. We believe it would be useful to have this guidance on a national scale to provide consistency in good practice and reduce the need for individual councils to 'reinvent the wheel'.

Kāhui Wai Māori, the Freshwater Leaders Group, Science and Technical Advisory Group and Regional Sector Water Sub-group were not consulted on this policy.

7.4 Questions

46. Does the proposed Wastewater NES address all the matters that are important when consenting discharges from wastewater networks? Will it lead to better environmental performance, improve and standardise practices, and provide greater certainty when consenting and investing?
47. Do you agree with the scope of the proposed risk management plans for wastewater and stormwater operators? Are there other aspects that should be included in these plans?
48. What specific national level guidance would be useful for supporting best practice in stormwater policy and planning and/or the use of green infrastructure and water sensitive design in stormwater network design and operation?
49. What are the most effective metrics for measuring and benchmarking the environmental performance of stormwater and wastewater networks? What measures are most important, relevant and useful to network operators, regional councils, communities, and iwi?
50. Do you have any other comments?

8 Improving farm practices

Proposals to restrict further intensification, set new standards for high-risk activities, and introduce freshwater modules in farm plans.

8.1 Issues

New Zealanders have become increasingly aware of their impact on the environment and understand the consequences of degraded ecosystems.

Environment Aotearoa 2019 says many studies at national, regional and catchment scales show that concentrations of nitrogen, phosphorus, fine sediment, and *E. coli* in rivers all increase as the area of farmland upstream increases.

The longer we leave it to reduce pollution, the more we lose – we put at risk our clean water for drinking and swimming, our sense of place, heritage and identity, and the economic benefits we get from products that depend on clean and available water.

It is more cost effective to prevent degradation of waterways than to restore them after degradation has occurred, particularly in systems that have passed ecological 'tipping points' due to ongoing degradation.[10]

[10] Rohr JR, Bernhardt E, Cadotte MW, and Clements W. 2018. The ecology and economics of restoration: when, what, where, and how to restore ecosystems. *Ecology and Society* 23(2): 15.

Many farmers and growers are good stewards of the environment, and understand the benefits to both their business and their community of environmentally-sustainable production.

To ensure all farmers and growers contribute, there needs to be good practice standards across the board and a way of ensuring they are followed.

In this section, we set out proposals to reduce pollution from farmland including horticultural land – both immediate steps to quickly reduce pollution from higher-risk activities, and an enduring approach based on farm planning to support continuous improvement in environmental management.

It will take until 2025 to develop regional plans and rules based on the new National Policy Statement for Freshwater Management (NPS-FM). Because every catchment and region is different, those plans will set different timelines for reducing pollution to meet regional objectives and targets.

To get a material improvement in water quality within five years, we need to start now with some immediate changes.

8.2 Restricting further intensification of rural land use

Intensification occurs when inputs such as irrigation, fertiliser and stock increase per hectare of land, or if a farm converts to a higher intensity land use (such as from sheep and beef farming to dairy farming). Intensification can increase pollution (nutrients, pathogens and sediment) entering waterways.

We are proposing tightly restricting further intensification, so it can only occur where there is evidence it will not increase pollution. The intent is to ensure that if there is any intensification, the net benefit to our people, our environment, and our economy is positive.

By 2025, it is anticipated that regional council implementation of the NPS-FM will prevent intensification beyond what is sustainable for our land and water.

In the meantime, we propose to tightly restrict land-use changes and increases in farm inputs by setting out the requirements that must be met before a resource consent is granted. The restrictions will apply until councils have implemented the new NPS-FM.

We propose to apply restrictions to the following activities:

- increases in the area of land in irrigated pastoral, arable or horticultural production above 10 hectares
- changes in land use above 10 hectares from:
  - arable, deer, sheep or beef to dairy-support
  - arable, deer, dairy-support, sheep, or beef to dairy
  - woody vegetation or forestry to any pastoral use
- increases in forage cropping beyond the area in intensive winter grazing in the past five years; or if the applicant didn't previously carry out intensive winter grazing, then beyond a minimum threshold. We are seeking feedback on this minimum threshold – whether it should be 30 ha or 5 per cent of the property, or 50 ha or 10 per cent of the property, or somewhere between.

For any of these activities, a resource consent will only be granted if the activity does not increase nitrogen, phosphorus, sediment or microbial pathogen discharges above the enterprise or property's 2013–18 baseline (average for this period).

Commercial vegetable growing

We propose that any grower wanting to increase the area of land they use for commercial vegetable growing in a freshwater management unit (beyond their highest area over the past five years) would have to get a consent.

We are seeking feedback on options for resource consent requirements for change to commercial vegetable growing:

- Option 1: No increase in contaminant discharges – the applicant must have a freshwater module in a farm plan and cannot increase nitrogen, phosphorus, sediment or microbial pathogen discharges above the enterprise's 2013–18 baseline (average for this period).
- Option 2: Operating above good management practice – the applicant must have a freshwater module in a farm plan and must operate above good management practice.

See Part 3 of the proposed National Environmental Standards for Freshwater.

Advisory groups' comments

KWM recommends a 10-year moratorium on further intensification of land use and further consumptive water takes. Current intensification restrictions are considered incremental and not sufficient to improve the health of our waterways.

RSWS supports proposals to improve farm practices, including restricting intensification of rural land use where it impacts on water quality, but does not support a moratorium, stating that consent requirements are the appropriate means of assessing whether the intensification is likely to contribute to environmental effects. RSWS would like more detail about the rationale for using increase in irrigation area as a threshold for regulation.

FLG says changes in land use and intensification can result in large increases of contaminant discharge into freshwater. To avoid this, land-use change and intensification need to be restricted. See paragraphs 71–74 of the FLG report.

8.3 Improving farm practices through farm planning

We propose requiring all farmers to have a farm plan with a freshwater module.

Managing the environmental impact of agriculture and horticulture requires different actions depending on the farm type, the location and type of land, the stock and crops being grown, and other local circumstances.

Many farmers and growers are using farm plans to help them understand and respond to the unique environmental situation on their properties.

Modelling in the Horizons and Waikato regions suggests that improved farming practices can lead to large reductions in nitrate leaching (5-20%) and sediment loss (47-70%) while retaining farm viability.

Leading primary sector industry organisations are already committed to all farmers and growers having a plan by 2025, as part of efforts to reduce climate emissions.

MPI is working on a wider integrated farm planning approach that is intended to cover areas such as reducing climate emissions, biosecurity, animal welfare and health and safety. It is working on an online tool so farmers can easily see what their regulatory requirements are.

There is an opportunity to align implementation of farm planning practices to meet freshwater and climate obligations by 2025.

We acknowledge there are costs associated with farm planning – around $3,500 to develop a plan, depending on the degree of preparedness and complexity. We are interested in feedback on options for meeting this cost; and on financing options for other on-the-ground investments to improve freshwater quality.

To ensure farmers and growers have access to quality advice and support, work is progressing on a certification scheme for suitably qualified and experienced farm environment planners. The scheme will assess the competencies and knowledge base of rural professionals working on freshwater modules in farm plans and could be extended to include farm plan auditors. The scheme is intended to provide confidence in the quality of freshwater modules in farm plans prepared by certified farm planners and to help build the farm planning workforce. Certified farm planners will be required to undertake on-going professional development activities. The certification scheme is anticipated to support the requirements in the proposed Freshwater NES.

Mandatory farm planning proposal

The freshwater advisory groups support the concept of farm plans as a valuable tool for farmers, but there are different opinions about whether they should remain voluntary or become mandatory.

We are seeking feedback on whether farm plans should become mandatory.

Making plans mandatory builds on the current approach where farm plans are required in some circumstances by some regional councils including Environment Canterbury and the Hawke's Bay Regional Council.

Freshwater module

The proposed mandatory freshwater module in farm plans would integrate with existing farm planning tools, resource consents, and regional plan rules. It would be signed off by a suitably qualified and experienced farm environment planner.

The freshwater module would have to include a:

- farm map identifying features such as waterways, critical source (discharge of contaminant) areas, highly erosion-prone areas, and other risks to the health of the freshwater ecosystem
- risk assessment across specific activities including irrigation, application of nutrients, effluent application, winter grazing, stock holding areas, stock exclusion, offal pits, and farm rubbish pits
- schedule of actions to manage identified features and address identified risks of on-farm contaminant losses that impact on freshwater ecosystems.

The freshwater module could also include risks to threatened plant and wildlife species, and how these could be addressed. Alternatively, this could be a separate farm plan module.

Existing industry body or agribusiness farm plans in use would be recognised provided they meet national standards.

Under this proposal, freshwater modules would be independently audited and progress would be reported to the regional council.

The introduction of the freshwater module requirements would be phased in, starting with higher-risk activities and catchments where pressure on freshwater is higher.

See Part 3, Subpart 3 of the proposed National Environmental Standards for Freshwater.

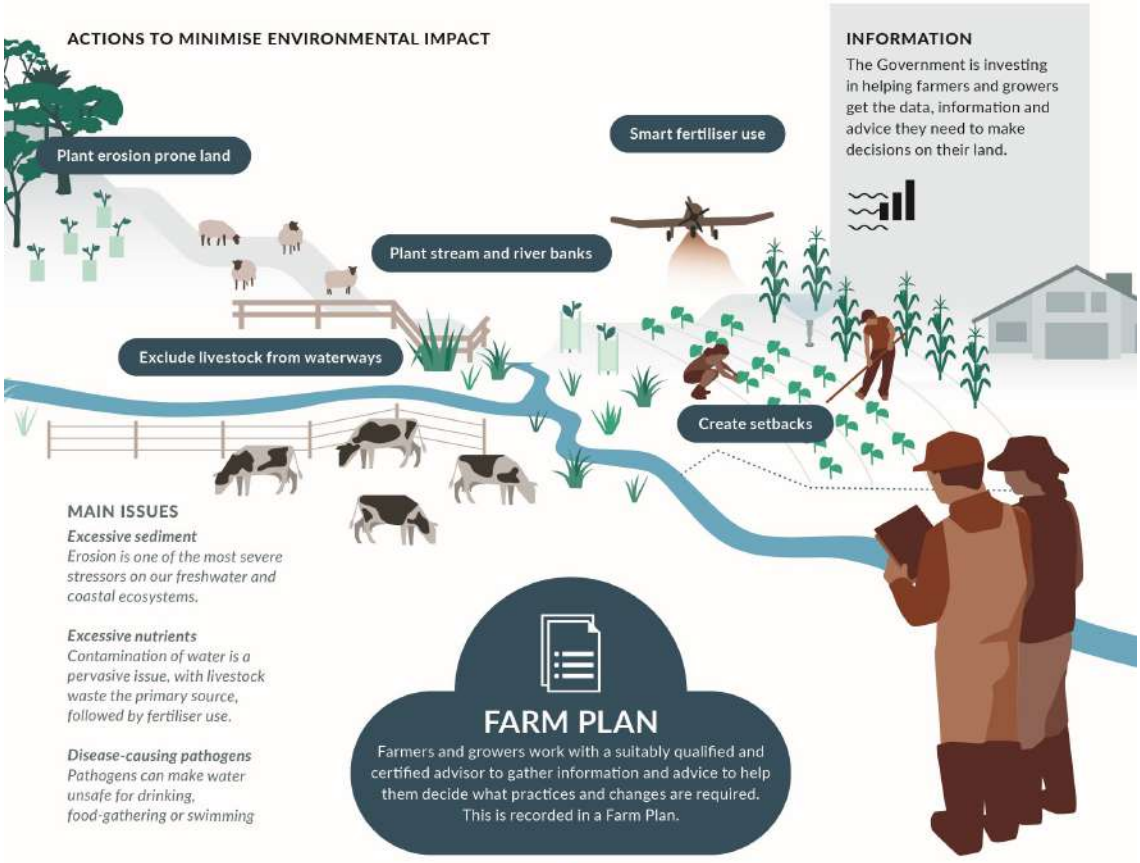
Longer-term development

Over time, as the number of qualified, certified farm environment planning advisors increases, and farmers and growers gain experience in working with these professionals and meeting environmental standards, it may be possible to reduce the reliance on national regulations and put greater emphasis on farm-level decision-making.

Consideration of this shift would depend on whether there is evidence that farm planning is effective in reducing pollution.

Farm plan freshwater module

What farmers and growers need to consider when planning for ecosystem health.



ELEMENTS OF A FRESHWATER MODULE

Including a freshwater module in farm planning is a step towards environmentally-sustainable production, protection of our freshwater environment, and meeting consumers' expectations.

FARM MAP
Include a map identifying waterways and risks to water quality such as sources of contaminants and areas prone to high erosion.

RISK ASSESSMENT
Assess the risk across specific activities including irrigation, application of nutrients, effluent management, stock exclusion, and farm rubbish pits.

ACTION PLAN
Create, implement and maintain a schedule of actions for managing identified features and address identified risks.

Advisory groups' comments

The FLG is unanimously of the view that land and environment plans (LEP), or farm environment plans (FEP) are an important support tool for farmers.

The majority of the FLG hold the view that the regulatory regime for the implementation of rules and policies must not be delivered through farm environment plans, for the following reasons:

- It will be a resource-intensive regulatory framework and slow to implement given current capacity and capability constraints meaning measures to stop decline would be compromised.
- It is unproven and involves the possibly inappropriate devolvement of enforcement and natural resource management to commercial entities.
- The risk of a 'black box' effect where transparency for the public is restricted due to commercial sensitivity.
- Confusion and dilution of lines of responsibility where the regime has multiple levels of auditing leading to inconsistent and/or limited application/enforcement of rules.
- Farmers and land owners would be audited against on-farm actions that are not clearly related to environmental outcomes.
- A blurring of the role of farm planner – support person or enforcer/regulator?

Some FLG members support farm plans/LEPs being mandatory and used at least in part as a regulatory tool. Reasons include:

- Requiring everyone to have a plan is simple and unambiguous. Councils will retain accountability and can use industry capacity and capability to drive change.
- There is significant momentum at ground level to develop environmental plans with strong support from industries and leaders. It would be counter-productive to change the messaging about farm plans at this stage.
- Significant shifts in behaviour are occurring but making plans mandatory will be needed to shift slow movers.

KWM says that FEPs should be mandatory and the requirements for them should be developed using a risk-based approach, using the catchment or the sub-catchment as the basis for assessing risk. However, FEPs should not be used as a tool to ensure regulatory compliance. They can only be used as a tool to help farmers comply with limits and regulations set by central and/or local government. They cannot be used to set limits for environmental performance in their own right.

RSWS supports the use of FEPs by all farmers and growers.

FEPs dramatically improve council's data and ability to model, target and manage environmental risk. RSWS supports FEPs being mandated by government regulation, but implemented in tranches over reasonable time based on risk, starting with those necessary to meet specific regulatory requirements such as stock exclusion or management of high-risk land-use activities. RSWS supports regional councils mandating FEPs through rules in plans where appropriate. RSWS supports regional sector ability to audit, monitor and enforce FEPs.

RSWS would like to see more detail on how implementation might occur and clarity about roles and responsibilities.

8.4 Immediate action to reduce nitrogen loss

Nitrogen contamination of water is a pervasive issue, with livestock effluent the primary source, followed by fertiliser use. It remains one of the most significant impacts of agriculture and horticulture on freshwater health.

Nitrate-nitrogen[11] concentrations have increased in 55 per cent of monitored river sites between 1994 and 2013 with the most significant increases in Waikato, Canterbury, Otago and Southland.[12]

By 2025, it is anticipated that regional council implementation of the current NPS-FM will mean that every council will have a process in place to reduce contaminant losses, including nitrate-nitrogen leaching.

In the interim, immediate action is needed to reduce excessive nitrogen leaching arising from poor management practices, to 'hold the line' on water quality. The catchments to which these interim measures would apply, and how they have been identified, is set out on page 74.

We are seeking feedback on whether other catchments should also be covered by this proposal.

Regions and catchments that have rules or proposed rules to reduce nitrogen leaching through an allocation regime or a good management practice-based cap are excluded from this interim proposal. Those excluded are Canterbury, Otago, Tukituki catchment (Hawke's Bay), Manawatu and the Waikato/Waipa catchment (Waikato).[13]

MfE will closely monitor the performance of these councils. The Government reserves the right to extend the interim measures set out in this section to these catchments, if it appears that council processes already underway are not achieving reductions within five years.

There are three options for rapid reduction of excessive nutrient leaching:

1. Setting a cap in catchments with high nitrate-nitrogen levels, so farms with excessive losses will have to reduce to come under the cap.
2. Setting a national nitrogen fertiliser cap.
3. Requiring farmers in catchments with high nitrate-nitrogen levels to show, in the freshwater module in their farm plan, how they will rapidly reduce nitrogen leaching, and auditing their progress.

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[11] Nitrogen found in water comes in different forms. Total nitrogen is the sum of all nitrogen forms found. Nitrate-nitrogen is highly soluble and leaches through soils very easily. It helps plants grow, but too much in freshwater causes problems, for example growth of slime. Sources include fertiliser and animal waste, and so this form is most relevant in farming catchments. Ammoniacal-nitrogen is another form. It is toxic at high quantities, and comes mainly from direct discharges of pollutants such as untreated sewage.

[12] Ministry for the Environment & Stats NZ (2017). *New Zealand's Environmental Reporting Series: Our fresh water 2017*.

[13] Plans in these catchments are expected to deliver reductions in nitrogen leaching. For example in the Hinds catchment (Canterbury), properties with a nitrogen baseline exceeding 20kg/ha/yr must reduce nitrogen losses 15 per cent by 2025, 25 per cent by 2030, and 36 per cent by 2035.

Option 1: Nitrogen-loss cap in high nitrate-nitrogen catchments

To stop excessive losses resulting from poor practice, we propose to set a per-hectare cap, or threshold, for nitrogen leaching for each sub-catchment with similar soil type and rainfall.

This option would apply in catchments where nitrate-nitrogen levels are in the highest 10 per cent of monitoring sites and regional rules implementing the NPS-FM are not in place. (See the list on the next page)

Every flat or gently rolling (low-slope) pastoral farm in the identified catchments would be required to provide an audited Overseer®[14] nitrogen loss figure to their regional council. 'Low-slope' land is being mapped nationally for the purposes of this proposal and stock exclusion proposals in the following section, with options of mapping parcels with a mean slope of less than or equal to five degrees, seven degrees, or 10 degrees.

The threshold would be calculated based on Overseer® figures across the catchment.

For example, in a sub-catchment with 100 dairy farms, the Overseer® nitrogen losses from the farms would be ranked from lowest to highest. The threshold could be set at the 75th percentile; that is the Overseer® figure for the 75th farm in the ranking. The 25 dairy farms with Overseer® figures higher than the 75th farm would then have to change their practices to get below the threshold.[15] Any sheep and beef farms in low-slope areas with Overseer® figures over the threshold would also have to get below the threshold.

We are seeking feedback on where the threshold should be set. It could be set at the 90th percentile (so the highest 10 per cent of farmers have to reduce nitrogen losses to reach the threshold) or at the 70th percentile, or a point between.

Properties over the threshold would have 12 months to either:

- reduce nitrogen losses to below the threshold
- apply for a resource consent that would only be granted with conditions requiring a plan to reduce nitrogen losses as soon as practical.

We recognise that this is a complex proposal, and we are seeking feedback on what would be required for it to be effectively implemented.

See Part 3, Subpart 4 of the proposed National Environmental Standards for Freshwater.

Option 2: National nitrogen fertiliser cap

Under this option, caps or thresholds for total nitrogen applied in fertiliser per hectare per year would be set, based on research findings and good management practice. The caps would be applied nationally, with a higher threshold set for higher nitrogen-demanding crops and land uses. Further work is needed to develop these caps. All farms and horticultural producers would have to use less than the threshold amount of nitrogen in fertiliser per hectare, or, if they wanted to exceed the threshold of nitrogen in fertiliser per hectare, they would have to get a resource consent.

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[14] Overseer® is software that captures information about how a farm is run and models it to produce nutrient budgets for seven key farm nutrients (including nitrogen) and greenhouse gas footprint reports.

[15] This is similar to the approach in the Waikato Regional Council's proposed Plan Change 1.

We recognise that this is a complex proposal, and we are seeking feedback on what would be required for it to be effectively implemented.

If, following consultation, the Government decides on Option 2, then the proposed Freshwater NES would be changed to reflect this.

Option 3: Farm plan-based reductions

Under this option, farmers in catchments with high nitrate-nitrogen levels would have to show, in the freshwater module in their farm plan, how they will rapidly reduce nutrient leaching.

Progress against the plan would be monitored by independent auditors and the regional council could take enforcement action if required.

This option would apply in catchments where nitrate-nitrogen levels are in the highest 10 per cent of monitoring sites and regional rules implementing the NPS-FM are not in place. (See the list on page 75.) Farmers in these catchments would be among the first required to have farm plans, within two years of the Freshwater NES coming into effect (expected to be June 2020).

High nitrate-nitrogen catchments

The catchments targeted in Option 1 and Option 3 have been identified based on having at least one monitoring site with high nitrate-nitrogen levels, and where regional plan or proposed regional plan provisions specifically addressing high nitrogen-leaching farms are not in place.

The list below does not include catchments with high nitrogen levels in Canterbury, Otago, Tukituki catchment (Hawke's Bay), Manawatu and the Waikato/Waipa catchment because their regional council plans/proposed plans set out a pathway for reducing leaching.

The following catchments (or sub-catchments) have been identified as having high nitrogen levels derived from intensive pastoral farming rather than point sources or horticulture and they and any relevant tributaries are therefore subject to this proposal[16]:

- Northland: Waipao Stream (in the Wairoa River catchment)
- Bay of Plenty: Upper Rangitaiki River (upstream of Otangimoana River confluence)
- Waikato region: Piako River, Waihou River
- Hawke's Bay: Taharua River (in the Mohaka River catchment)
- Taranaki: Waingongoro River
- Wellington: Parkvale Stream (in the Ruamahanga River catchment)
- Tasman region: Motupipi River
- Southland: Mataura River, Oreti River, Waimatuku Stream, Aparima River, Waihopai River.

[16] Map of catchments proposed to be covered by Option 1 and map of catchments proposed to be covered by Option 3 (includes additional horticulture-dominated catchments). These maps are also available through the MfE website.

For Option 3, additional catchments with more diverse land uses would be added:

- Auckland region: Waitangi and Whangamaire Streams
- Wellington: Mangaone and Waitohu Streams.

See Part 3, Subpart 4 and Schedule 1 of the proposed National Environmental Standards for Freshwater.

Advisory groups' comments

All advisory groups agree there is a need to reduce nitrogen losses in nitrogen impacted catchments. There is support in principle for rapid action in highly-impacted catchments.

RSWS supports a focus on nitrogen reduction in nitrogen-impacted catchments, and notes more work is required to determine where and how it should apply, and that it should not apply where there are already detailed nitrogen allocation and management frameworks in place (operative or proposed).

FLG sees targeting excessive nitrogen loss as key to stopping further decline. See paragraphs 55–64 of their report.

KWM considers those under the threshold should also be required to do their part, by being subject to a cap at the threshold and a catchment-based nitrogen reduction target of 10 per cent. Without this commensurate reduction KWM understands that there is no limit on nitrogen discharges from those farmers below the threshold, such that the benefits of the reductions achieved by those farmers over the threshold could be eroded, or even undermined.

FLG and KWM note that in some highly-impacted catchments, it will take more than improving practices to achieve ecosystem health, and some land-use change will be required.

8.5 Excluding stock from waterways

We propose new standards for when stock must be excluded from wetlands, lakes and rivers more than one metre wide.

We also propose that farmers are required to have a freshwater module in their farm plan setting out how and when they will exclude stock from rivers and streams less than a metre wide and drains.

Keeping livestock out of waterways is one of the simplest and most direct ways of protecting waterbodies from pollution.

Excluding stock (particularly those that have a natural inclination to wallow) results in a rapid reduction in faecal contamination and associated risks to human health. In practice, stock exclusion will mean permanent or temporary fencing, but the requirements will allow the use of other technology such as 'virtual' fencing and 'smart' stock collars.

Dairy farmers have made significant progress in voluntarily fencing an estimated 98 per cent of streams that are 'deeper than a red band gumboot and wider than a stride' through the Dairy Accord, and approximately 10,900 metres of streams less than a metre wide have also been fenced.

However, there remain many tens of thousands of kilometres of unfenced streams across New Zealand.

We recognise that the needs of the environment and ability of farmers to make change vary from place to place, and that setting aside land for setbacks and fencing all waterways would be costly – potentially up to $600 million over 10 years. This figure is based on 5 degrees slope and includes the costs associated with putting in new fences and loss of grazing land. The cost of replacing existing fences is also included, but the figure does not include any additional loss of grazing land from moving existing fences further back from the waterway.

We are therefore proposing a two-tier approach; national standards, enforced by regional councils for larger waterbodies; and using farm plans to develop bespoke approaches for excluding stock from smaller streams and drains.

National standards for larger waterbodies

We propose to set minimum requirements for excluding stock from wetlands, lakes and rivers more than one metre wide, in flat and gently-rolling (low-slope) areas within five years, or three years for dairy cattle and pigs; and in other areas where the concentration of cattle or deer is similar to dairy stocking rates.

Low-slope land

Low-slope land is being mapped nationally, and cadastral maps are available online through the Ministry for the Environment website. In the online maps, and the map on the following page, we have mapped three variants. These are based on land parcels with a mean slope of less than or equal to five degrees, seven degrees, or 10 degrees. We are seeking feedback on which variant should be used.

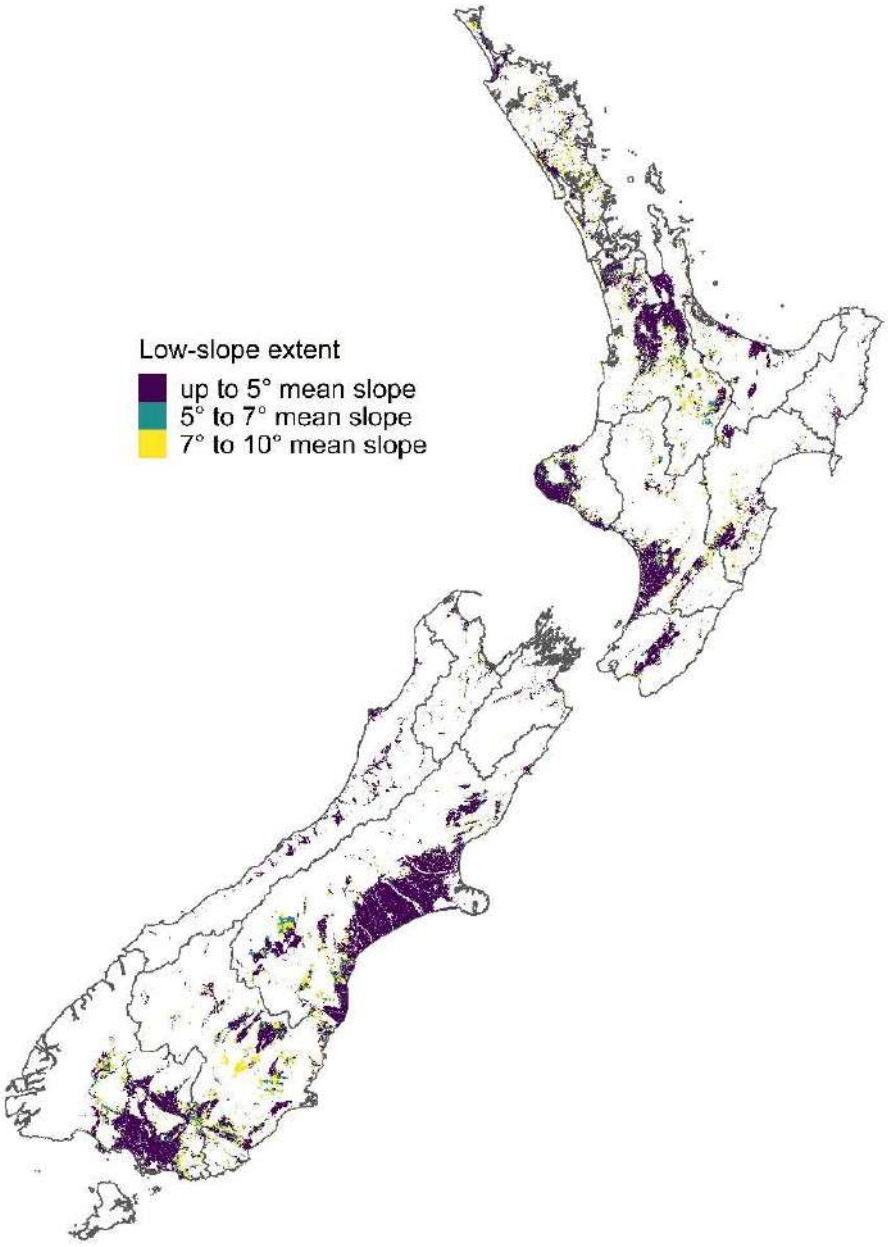
Land outside the low-slope category

In areas that are not mapped as low-slope, stock exclusion is still important, particularly where the land can sustain reasonably intensive uses. The stock exclusion requirements (that is to exclude cattle, pigs and deer) will therefore also apply to areas where:

- at the farm scale, the land has an average carrying capacity equal to or greater than 14 stock units per hectares
- at the paddock scale, the land has a carrying capacity equal to or greater than 18 stock units per hectare (regardless of the average carrying capacity of the farm)
- at the paddock scale, the land is or has previously been irrigated
- at the paddock scale, the land is used for fodder crops when cattle, pigs or deer are on that land.

If these proposals are adopted, it would be necessary to develop a methodology (or identify an existing methodology) to calculate carrying capacity. The methodology could be based on the one used for calculating carrying capacity on Crown Pastoral Land.

National map of low-slope land



Setbacks

Setbacks (space between the fence and the waterway) prevents sediment loss from trampling, pugging and de-vegetation near the waterbody, and allows space for sediment to be filtered out of overland flows. The wider the setback, the more effective it is in removing sediment. Providing a setback also protects spawning areas for fish, and allows riparian plants to shade the waterbody.[17, 18]

For large rivers and streams (more than one metre across) lakes and wetlands, we are proposing to require a setback of five metres, on average across a farm.

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17 Liu X, et al. 2008. *Major factors influencing the efficacy of vegetated buffers on sediment trapping: a review and analysis*.

18 Cawthron submission.

We are seeking feedback on where the setback should be measured from, for example the wet edge of the waterway or the top of the bank.

We are also seeking feedback on what barriers farmers may face in meeting these standards, for example where more time may be needed, or where the terrain makes a five metre setback unachievable.

The requirements would be set in regulations under the Resource Management Act. In practice this would mean regional councils would monitor and enforce compliance, likely using farm plans to record the requirements and timeframes for each individual farm.

Details of the proposed new standards are set out in the Draft Stock Exclusion Section 360 Regulations.

Farm plans for streams under a metre wide and drains

For streams less than one metre wide and drains, farmers would be required to set out a plan for fencing and setbacks in the freshwater module of their farm plan. The timetable, type of fencing and setbacks would be tailored to the individual circumstances of the farm.

This provides more flexibility to take account of individual farm conditions and the best value investment to improve the health of waterways, but less certainty about what stock exclusion and setbacks will be put in place, and when.

Farm plans would be signed off by a suitably qualified and experienced farm environment planner and audited. If the plan is not being implemented then the regional council would be able to take enforcement action.

Advisory groups' comments

Keeping farm animals, and their effluent, out of waterways is seen as essential to uphold Te Mana o te Wai and protect human and ecosystem health.

The advisory groups support in principle defining low slope areas using cadastral based mapping.

KWM says compliance, monitoring and enforcement will also be critical.

FLG says the riparian margin for intensive farming areas and the stocking rate used to defining intensive farming must be soundly based. See also paragraphs 75-83 of its report.

For flood protection and drainage schemes RSWS seeks flexibility around fence placement, access, maintenance requirements, and vegetation management.

8.6 Controlling intensive winter grazing

We propose to require farmers to meet standards for intensive winter grazing.

Intensive winter grazing is on-paddock grazing of annual forage crops, and sometimes supplementary feed is also provided. Grazing a high number of animals in a relatively small area creates a lot of effluent which can contaminate waterways. There is also a risk that the land is trampled into deep mud (pugging), with both pollution and animal welfare consequences.

⏩ Photo shows an example of poor practice intensive winter grazing. ⏪

We propose that winter grazing would only be permitted if the area being grazed meets standards. Farmers would have six months to comply with the new standards after the regulations come into effect (expected to be June 2020).

There are two options for the standards that must be complied with:

1. Nationally-set standards through regulation. A resource consent would be required for winter grazing above a defined area.
2. Current industry-set standards.

Option 1: Nationally-set standards

Under this option, winter grazing would only be permitted if it was below a defined threshold in area and met standards. We are seeking feedback on where the threshold and national standards should be set within the range set out in the table below.

Intensive winter grazing on forage crops ranges for consultation

Factor	Range from	Up to
Threshold – if the area of winter grazing is below this threshold it is permitted, provided standards are met. A consent would be required for winter grazing above this threshold.	No more than 5 per cent of the property or 30 ha (whichever is larger)	No more than 10 per cent of the property or 50 ha (whichever is larger)
Slope threshold – permitted on land with a slope below:	10 degrees	15 degrees
Standard – all winter grazing must be setback from the edge of waterways:	5 metres	20 metres
Standard – pugging extent must be no more than:	10 cm	20 cm (over no more than half the paddock)
Other standards required are: • grazing to be carried out progressively (top to bottom) of slopes • stock to be excluded from critical contaminant source areas • land to be re-sown as soon as possible.		

Option 2: Industry-set standards

Primary sector industry organisations are providing advice to farmers on good practice winter grazing. Under this option, a resource consent would be required for winter grazing not meeting the following standards.

Intensive winter grazing on forage crops – industry standards

Factor	Proposed standard
Slope threshold permitted on land with a slope below	20 degrees
Standard – all winter grazing must be set back from the edge of waterways by:	5 metres
Standard – pugging extent must be no more than:	the depth of the ankle joint of stock (fetlock)

These standards would be supplemented by best practice standard guidance for issues such as strip grazing, protecting critical source areas, and crop cover as part of freshwater modules in farm plans.

If, following consultation, the Government decides on Option 2, then the proposed Freshwater NES would be changed to reflect this.

Any expansion of the area of winter grazing beyond a threshold may be subject to restrictions on intensification, as set out in section 8.2.

Advisory groups' comments

KWM, FLG and RSWS are all deeply concerned at the environmental and animal welfare impacts of poor winter grazing practices. (This issue was outside the remit of STAG.) This is seen to have a negative impact on Te Mana o te Wai.

Some members of advisory groups strongly support regulation at the low end of the range set out in the table for consultation, and some consider pugging should be limited to 5 cm. They want to see standards for all winter grazing (even if the activity does not require a consent) to include:

- providing a dry place for animals to lie
- no activity at all on highly permeable soils where there is a high risk of preferential flow pathways (eg, mole and tile drains or gravelly soil).

RSWS seeks well managed farm systems that protect vulnerable soils and manage critical contaminant source areas. While the RSWS agreed 30 cm pug depth is inappropriately high, it generally doesn't see a pugging depth standard as implementable, and sees this as more appropriately managed through a farm environment plan and applying good management practice.

Other high-risk activities

FLG believes that the following activities should be classed as high risk and regulated:

- irrigation on vulnerable soils
- winter grazing on highly permeable soils (such as gravels or river accretion) or mole and tile drained soils.

See paragraphs 65–70 of the FLG report.

8.7 Restricting feedlots

We propose requiring all feedlots to meet standards, as set out in a resource consent.

Feedlots are defined as areas where stock are confined in pasture-free areas and provided with feed, for more than 80 days in a six month period. This includes both covered and uncovered areas. Feedlots create a higher risk of pollution (nutrients, pathogens and sediment) entering waterways.

There are about five feedlots currently operating in New Zealand.

All new feedlots and any feedlots that do not have a resource consent will be tightly restricted. They will have to get a resource consent and meet standards for managing effluent and siting the feedlot at least 50 metres away from freshwater or coastal marine areas.

See Part 3 of the proposed National Environmental Standards for Freshwater.

8.8 Reducing pollution from stock holding areas

We propose requiring measures to control effluent and contaminant loss from areas where stock are held for a shorter time than in a feedlot but longer than in yards or milking sheds (more than 30 days in a year or more than 10 days in a row).

Holding stock in a concentrated area creates a higher risk of pollution (nutrients and pathogens) entering waterways. To mitigate that risk, stock holding areas would be required to get a resource consent that would set standards for permeability and managing effluent.

Stock holding includes management practices such as feed pads, wintering pads, standoff pads, and loafing pads.

Sacrifice paddocks[19] will not require a resource consent, provided they are more than 50 metres from a waterway.

This proposal does not include stock yards, milking sheds, shearing sheds, or woolsheds.

We recognise this may lead to a large number of consent applications, and we are seeking feedback on what would be required to ensure this proposal could be effectively implemented.

See Part 3 of the proposed National Environmental Standards for Freshwater.

Advisory groups' comments

There is support for national regulation of stock holding areas.

[19] A sacrifice paddock is a small area of the farm used for stock to avoid damage to valuable pasture.

8.9 Questions

Restricting further intensification

51. Do you support interim controls on intensification, until councils have implemented the new NPS-FM? Why/why not?
52. For land-use change to commercial vegetable growing, do you prefer Option 1: no increase in contaminant discharges OR Option 2: farms must operate above good management practices. What are your reasons for this?
53. How could these regulations account for underdeveloped land, and is there opportunity to create headroom?

Farm plan options

54. Do you prefer mandatory or voluntary farm plans (acknowledging that farm plans may be required by councils or under other parts of the proposed Freshwater NES?) What are your reasons for this?
55. What are your thoughts on the proposed minimum content requirements for the freshwater module of farm plans?
56. What are your thoughts on the proposed priorities and timeframes for roll out of farm plans, as set out in the proposed Freshwater NES?
57. Do you have any comment on what would be required to ensure this proposal could be effectively implemented, including options for meeting the cost of preparing, certifying and auditing of farm plans; and on financing options for other on-the-ground investments to improve water quality?

Immediate action to reduce nitrogen loss

58. Which of the options (or combination of them) would best reduce excessive nitrogen leaching in high nitrate-nitrogen catchments? Why?
59. If you are in a high nitrate-nitrogen catchment, what would you have to do differently under these options?
60. In addition to those already identified, are there other high nitrate-nitrogen catchments that should be subject to these options?
61. Do you think the action already underway in five regions (identified in section 8.4) will be effective in reducing excessive nitrogen leaching in those high nitrate-nitrogen catchments?
62. Should there be higher thresholds for farms that produce food products in winter, and if so, which food products?
63. What alternative or additional policies could contribute to reducing nitrogen loss?
64. Do you have any comment on what would be required to ensure this proposal could be effectively implemented?

Excluding stock from waterways

65. Do you support excluding stock from waterways? Why/why not?
66. Do you have any comment on the proposed different approach for larger and smaller waterbodies?

67. Do you have any comment on the proposed five metre setback, or where it should be measured from?
68. Are there any circumstances that are appropriate for allowing exemptions to the stock exclusion regulations? If so, please give examples.

Controlling intensive winter grazing

69. Do you prefer Option 1: Nationally-set standards or Option 2: Industry-set standards? Why?
70. For the proposed nationally-set standards, which options do you prefer for the area threshold, slope, setback, and pugging depth components of the policy?

Restricting Feedlots

71. Do you have any comment on the proposal to restrict feedlots?

Reducing pollution from stock holding areas

72. Do you support the proposal relating to stock holding areas? Why/why not?
73. Do you think sacrifice paddocks should be included?
74. What would you have to do differently if this proposal was implemented?
75. Do you have any comment on what would be required to ensure this proposal could be effectively implemented?

Draft proposed National Environmental Standards for Freshwater

76. Are the definitions used in the policies accurate, and if not, how do you suggest improving them?
77. What are your thoughts on the proposed technical definitions and parameters of the proposed regulations? Please refer to the specific policy in your response.
78. What are your thoughts on the timeframes incorporated in the proposed regulations? Please refer to the specific policy in your response.

9 Support for improvement in catchments and on farms

9.1 Focusing on catchments at higher risk

Every catchment in New Zealand has different land uses and natural conditions, and faces different levels of risk.

There will always be uncertainty as to what pressures catchments face now and in the future, and what impact these pressures will have on our nation's freshwater rivers, lakes and wetlands. This is not a question that can be answered by science alone so we need to 'triage' information from a range of sources to decide where to invest limited resources.

Restoration of freshwater ecosystem health can be very expensive. Limited resources would best be spent stopping catchments from reaching a 'tipping point' (zone of irreversible change) rather than spending considerable resources restoring degraded catchments whilst others are heading towards a similar fate.

Biodiversity loss is permanent. A priority for action should be to prevent the extinction of flora and fauna that rely on our freshwaters, and protect their habitats.

Land use is the primary driver of water quality declines in New Zealand, and so information about land-use intensification must form the primary basis of informing a risk assessment of catchments.

National-level information on catchments

Together MfE and DOC have combined expertise about freshwater biodiversity, ecosystem health, and land-use intensification. This has resulted in the co-development of a model which builds on previous DOC work which prioritised the protection of freshwater biodiversity at the catchment-scale by adding in new information about where land-use intensification could happen and the relative impact of different land uses.

We are using this information to provide a joined up, risk-based approach to prioritising the protection of higher-risk catchments.

Over the coming months we will be sourcing and developing new science to further inform our national-level information. We will also build on existing science and recent data collated as part of *Environment Aotearoa 2019*. We expect this national-level information will be made publicly available.

Exemplar catchments

Alongside this national-level information we are moving to understand how best to leverage and accelerate community-led action, help target investment, and assist with access to a range of other funding support.

The Government recently announced Kaipara as the first catchment where we will be taking this approach. This and other 'exemplar' catchments will provide the opportunity to learn and make partnerships while we continue to build national-level information.

In these exemplar catchments MfE will work collaboratively with agency partners (DOC and MPI), regional councils, iwi/hapū, industry, and communities to identify appropriate measures to help improve the health of waterways from the bottom-up, and to identify gaps that could be filled by regulatory or non-regulatory interventions.

MfE will then help develop integrated catchment management plans and/or scoping projects for community-led activity and initiatives within these catchments that directly improve water quality at a catchment scale.

This exemplar programme complements and supports other work and partnerships already under way across government, industry and communities.

9.2 Practical advice and support for farmers

Budget 2019 provided additional funding for empowering land owners, businesses and Māori to transition to sustainable land use. This includes:

- practical advice, information and tools
- building farm advisor capability
- new farmer-to-farmer programmes for Māori land owner groups
- improving on-farm emissions data
- protecting high-value food exports, and updating the official assurances system.

The Government will work to ensure up-to-date qualifications are available for farm advisors, and improve skills development for rural professionals.

9.3 Making good decisions based on good information

Making good decisions depends on having the best possible information. The Government is investing in helping farmers, industry and central and local government improve the range and quality of the data that informs their decisions. For example:

- including environmental data in farm monitoring, collection and reporting
- improving data quality
- extending the Farm Monitoring Programme.

The Government will expand the range of farm systems and conditions modelled, connections between support tools, and accelerate the recognition of new, more environmentally-friendly technologies in tools, such as Overseer®.

10 Impacts of proposals

10.1 Benefits and costs

The proposals set out in this document outline steps towards stopping further degradation and reversing past damage to New Zealand's waterways. The proposals have impacts in the form of both benefits and costs.

While there are costs in implementing the proposals, there are wide-ranging, long-term benefits for New Zealand's environmental, social, cultural and economic wellbeing. The distribution of these costs and benefits will vary depending on how affected parties currently use natural resources, the characteristics of the natural environment they are operating within and the alternative land-use options available.

The following table illustrates why it is better to take action now to prevent further damage to freshwater ecosystems rather than remediate damage later.

Potential benefits of immediate action on freshwater

Example	Types of benefit	Estimated scale of benefit or problem	Strength of evidence
Te Waihora/Lake Ellesmere – an intermittently open and closed lake	Avoid cost of repairing the resulting damage. Reduce risk to human health (through improved drinking water quality). Improve environmental amenity. Increase access to valued natural resources including for cultural purposes and recreational activities.	An estimated 76 per cent reduction in nitrogen and a 50 per cent reduction in phosphorus loads would be required to meet NPS-FM bottom line objectives for Te Waihora.[20]	Strong
Rotorua Lakes	Avoid costs of lake restoration in future if conditions worsen. Preserve and improve recreational values. Avoid human health risks eg, toxic cyanobacteria blooms. Lakes are sinks for nutrients and sediment and so are more costly to restore once impacted by nutrients.	A $40 million fund has been set up to 'buy' nitrogen off land owners who want to permanently lower their nitrogen discharge, with the aim of buying 100 tonnes of nitrogen by 2022. This is in addition to the cost of cleaning up the lakes.	Strong[21]

[20] Harris S, and Davie T. 2017. *Selwyn Te Waihora zone: Memorandum on the implications of meeting the National Policy Statement for Freshwater Management objectives for lake environments in Te Waihora*. Prepared by Land & Water People for Environment Canterbury.

[21] https://www.rotorualakes.co.nz/economic-impact.

Example	Types of benefit	Estimated scale of benefit or problem	Strength of evidence
Protection of irrigation schemes	Avoided costs. If irrigation water is pulled from waterbodies with high sediment content, it can harm crops and reduce agricultural productivity.	Sediment removal (10,000 m^3/year) from one irrigation water scheme on the south island costs $160,000 per year.	Strong
Fishery resource being protected by ecosystem health objective	Maintain health of rivers and streams for recreation and tourism. Protect fishery resource.	In 2011, DOC estimated the Taupo fishery alone was worth about $70 million annually, and Fish & Game says the total for the country is probably at least $250 million. $20 million Marlborough pāua fishery in decline due to habitat loss, of which much is due to sediment deposition.[22]	Medium
Sediment	Avoid additional treatment costs on hydro-electric facilities from sediment.	As noted in reports provided by a group of New Zealand generators, turbine replacement due to sediment occurs every 5 years at a cost of approximately $1.3 million.	Strong

To date we have focused our analyses of impacts on the proposals that will require the largest changes to land use and management practices. This includes:

- new attributes for nutrients and sediment in the NPS-FM
- proposals to establish practice standards within a new Freshwater NES, which could include limiting high risk land-use activities (stock-holding areas and feedlots), intensive winter grazing of forage crops, restricting intensification of rural land use, and stock exclusion.

Many of the other proposals aim to clarify roles, responsibilities and processes within the existing water management framework. There will be some additional costs to councils where they have to review plans earlier than they might have otherwise, but there are also potential savings where changes make requirements clearer.

There are significant positive social impacts (ie, benefits) associated with improving water quality and providing for Te Mana o te Wai. These include:

- impacts on people's wellbeing, such as better physical and mental health, and the avoidance of water-borne illness
- increased access to valued natural resources, including for cultural purposes and recreation

[22] Larned S, Booker D, Dudley B, Moores J, Monaghan R, Baillie B, … Short K. 2018a. *Land-use impacts on freshwater and marine environments in New Zealand.* NIWA Client Report No. 2018127CH. Christchurch, New Zealand.

- enhancing social connectivity and community cohesion, as farmers improve their social licence to operate
- the creation of new business opportunities derived from improving New Zealand's environmental credentials overseas
- promoting intergenerational equity as we protect New Zealand's natural capital on which future generations will depend upon.

10.2 Magnitude of the benefits and costs

The impact assessment work completed to date can give a general sense of the magnitude of benefits and costs associated with the proposals and how they might affect different groups. The Interim Regulatory Impact Analysis (RIS) provides more detail on anticipated benefits and costs of each proposal. Given the variability in the characteristics of the environment, the studies can't fully represent any one group but they give an indication of the size of impacts and how they may fall.

The data for these studies come from a range of sources which are detailed in the RIS.

The table below provides a summary of the environment and economic benefits and costs that could result from action.

Adoption of best practice and continuing innovation will support the transition to healthier freshwater and more sustainable land management practices.

Proposal	What we get	Impact (positive and negative)
Water quality – new nutrient attributes in the NPS-FM. This includes new values for dissolved inorganic nitrogen and dissolved reactive phosphorus.	More stringent protection from the effects of nutrients, particularly in soft bottomed rivers. Lower incidence of nuisance algal and plant growth. Fewer adverse effects on sensitive macroinvertebrate and fish taxa. Councils would be more strongly directed on how they manage nutrients for ecosystem health compared to the flexibility enabled by the *status quo*.	The proposed attributes would have the most effect in soft-bottomed rivers that do not have a receiving environment (such as a lake or estuary) downstream (approx. 27 per cent of the length of streams and rivers in New Zealand). The most affected regions would be Waikato, Canterbury, Southland and some catchments in Manawatū-Whanganui. While there would be a small impact when viewed as a national average, it would require over 50 per cent additional load reductions in some catchments.[23] Modelling shows: Under the *status quo*, once the rule is fully implemented by councils, the average catchment requires a 27 per cent reduction in nutrient loss, with over 80 per cent reductions required in nitrogen yield in some catchments which currently have high levels of nitrogen discharge into the water. This would require significant land management changes in some areas.

[23] For context, in Canterbury (the region with the largest increases) nitrogen leaching from livestock increased 117 per cent between 1990 and 2017 (from 15,000 to 33,000 tonnes). Ministry for the Environment and Stats NZ. 2019. *Environment Aotearoa 2019*.

Proposal	What we get	Impact (positive and negative)
		Benefit is avoided cost of remediation of waterways.
Water quality – reducing sediment. Suspended sediment attribute with bottom lines and bands; deposited sediment monitoring requirement with trigger thresholds for action plans.	Fish and macroinvertebrate communities do not suffer severe degradation from long-term suspended and deposited sediment levels; where bottom lines are breached, the proposal will require improvement in sediment levels over time, which will improve ecosystem health.	This would be achieved through changes in farming practices and some afforestation. It is supported by government programmes like the Hill Country Erosion Fund and One Billion Trees Programme. The impacts are anticipated to be primarily up-front intervention costs as well as longer-term benefits. Indicative results show strong benefit to cost ratios and we anticipate this will remain true in the final results. Costs borne by resource users, local and central government will vary according to future policy choices related to implementation methods and funding for them (eg, the Hill Country Erosion Fund, regional council environmental grants that support freshwater, land and biodiversity initiatives). Benefits are avoided cost of remediation of waterways; improvements in natural hazard resilience related to landslides and floods.
Improving farm practices: consenting requirements for land-use intensification.	Reduced contaminants entering waterbodies.	$3,000 per consent plus cost of expert opinion to support consent application. Benefit is avoided cost of remediation of waterways.
Improving farm practices: Farm plans.	Reduced contaminants entering waterbodies from improved practices. Some councils already require farm plans and primary sector bodies are already committed to developing farm plans.[24] This widens the use of farm plans to a larger number of farms.	About 28,000 more farm plans at an average of $3,500 per plan ($100 million). Cost of auditing farm plans of $1,500 every 2 years. Costs of implementing actions in farm plans will be variable depending on what is required and nature and size of business. Assume average $15,000 per annum, excluding one-off infrastructure costs. Benefit is avoided cost of remediation of waterways. Potential to increase resilience, could be part of a wider farm plan for managing the farm business. May improve profitability for farm system changes (eg, identifying areas where it is possible to lower fertiliser costs).

[24] Ministry for the Environment. 2019. *Interim Regulatory Impact Analysis for Consultation: Essential Freshwater*.

Proposal	What we get	Impact (positive and negative)
Improving farm practices: reducing nitrogen losses (Option 1: Cap in high nitrate-nitrogen catchments).	Reduced nitrogen losses to waterbodies.	In high nitrate-nitrogen catchments, $3,000 per consent, $500–$5,000 per Overseer® run, plus costs of preparing, implementing and auditing farm plans. Benefit is avoided cost of remediation of waterways.
Improving farm practices: stock exclusion.	Reduced contamination of waterbodies from nutrients, pathogens and sediment.	Nationally, fencing costs are estimated at $600 million for all affected streams over 10 years.[25] Benefits: $983 million if stock excluded only from streams over 1 metre.[26] Under the current proposal the benefits and costs would be larger. Modelling of three types of farms for this proposal[27] showed for a: • 125 ha Waikato/Bay of Plenty dairy farm costs would be about $87,000 • 281 ha North Island intensive (lowland) beef farm cost would be about $89,000 • 571 ha central North Island hill country sheep and beef farm (based on 10 per cent of the farm triggering exclusion) cost would be about $17,000.
Improving farm practices: winter grazing of forage crops. (Option 1: National standards and consent requirements).	Reduced contamination as a result of good management practices.	About 2,000 additional consents at $3,000 per consent if farmers wish to operate outside new standards. Benefits are reduced soil degradation, improved animal welfare, avoided cost of remediation of waterways.
Improving farm practices: stock holding areas and feedlots.	Reduced discharges from stock holding areas and feedlots (nitrogen, phosphorus, pathogens, sediment).	$3,000 per consent and an estimated $72 per cow per year to build infrastructure to hold stock. Benefits are reduced soil degradation, improved animal welfare, avoided cost of remediation of waterways. Good quality stock holding areas may improve productivity.[28]

[25] Ministry for the Environment. 2019. *Interim Regulatory Impact Analysis for Consultation: Essential Freshwater*. These estimated costs include stock exclusion as required by regulation and by farm environment plans.

[26] Ministry for Primary Industries. 2016. *National Stock Exclusion Study – Analysis of the costs and benefits of excluding stock from New Zealand waterways*.

[27] Ministry for the Environment. 2019. *Modelling of Mitigation Strategies on Farm Profitability: Testing Ag Package Regulations on-Farm.* Prepared for the Ministry for the Environment by AgFirst. Wellington: Ministry for the Environment.

[28] Beukes PC, et al. Evaluating the benefits of standing cows off pasture to avoid soil pugging damage in two dairy farming regions of New Zealand. September 2013. *New Zealand Journal of Agricultural Research* 56(3).

Limitations and assumptions of the modelling

The estimates above give an indication of the size of the impacts to help you make a submission as part of this consultation. Given the variability in the environment the studies can't fully represent the impact on any one individual or group and ultimately the size of the impacts will be determined by the policies implemented following this consultation.

It should also be noted that the impact of the policies are not necessarily additive as interventions for one policy interact with interventions for other policies. For instance, any additional fencing that may be needed to meet stock exclusion requirements may also meet the need for fencing under the new bottom lines for nutrient pollution.

A key constraint on the nutrient attribute analysis is that it was based upon national-scale modelled predictions of nutrient concentrations. Zooming into smaller scales will introduce greater uncertainty. Such national-scale analyses are indicative only and cannot substitute more detailed catchment-scale investigations. The national models do not include the 'load to come' from groundwater that has become elevated in nutrients from past land uses.

This modelling assumes that the NPS-FM procedures for setting objectives and limits for periphyton are followed correctly so nutrient reductions to manage periphyton in upper catchments should translate to lower nutrient concentrations in the lower catchment, where rivers tend to be soft-bottomed. It also assumes that the effects of periphyton are managed solely by nutrient management and not by shading, flow manipulation, or other methods.

The full consequences of applying the current and proposed bottom lines have not been fully modelled and quantified. More analysis is required to confirm this national scale modelling at the catchment scale and to understand the significance of the impact at the farm scale.

Given these limitations, in the next section we have characterised how implementation of all the proposals may play out for some land types.

10.3 Impact scenarios

To provide an indication of how the proposals may impact, we have developed three scenarios based on a dairy farm, a sheep and beef farm, and a commercial vegetable growing operation, using average figures wherever available.

There are some policies in the package, such as feedlots, which only impact on small numbers of farmers and therefore have not been included in these scenarios. There are also a number of existing requirements in the current NPS-FM, such as the existing periphyton attribute, which are yet to be implemented in many catchments but have not been included in costing of new policies.

Scenario 1: Lowland dairy farm

Paul and Emma milk 430 cows on just over 150 hectares of low-lying, fertile land, with some rolling hills. This is about the average size for a New Zealand dairy farm. They have a total of 3.2 kilometres of permanent streams running through their property, one kilometre of intermittent streams, and one kilometre of drains. Their operating profit last year was $335,700. The farm is largely pasture, with around 32 hectares of forage cropping, including for winter feed. Paul and Emma have a consent to take groundwater, which they use for domestic use, stock water, and to irrigate the cropping land.

It's expected the costs of just over five kilometres of fencing, installing culverts, installing fish passages, and getting a farm plan, providing regular Overseer® results[29], obtaining a resource consent for winter forage cropping (if needed), and the costs of installing and running a new telemetry unit, combined with retiring around two hectares of land, will be approximately $9,350 per year over 10 years. This equates to 0.8 per cent of gross revenue per year, and an annual reduction in before tax and interest profit from $335,700 to $326,350. If Paul and Emma decided to plant riparian margins, this would add an additional $4,400 per year, which is 0.4 per cent of gross revenue per year.

The end result achieves multiple environmental outcomes on the farm and for downstream communities. Over time, alongside improving habitat and water quality, and the visual appeal of the farm, the plantings provide shade and shelter to help meet animal welfare requirements. The fish passage and stock crossing measures have expanded the habitat and resulted in higher numbers of threatened freshwater species in the catchment.

Real-time water measurement helps Emma and Paul identify and fix leaks in their water supply infrastructure, reduces pumping costs, and provides them helpful data for the water take consent renewal process. Likewise, the riparian fencing has incurred costs but improved Emma and Paul's pasture management. The measures around intensive winter-grazing management have resulted in greatly reduced sediment run-off into farm waterways.

Lowland dairy farm

Activity	Estimated costs over 10 years
Get a farm plan signed off by a suitably qualified and experienced planner by 2025	$3,500[30]
To have farm plan audited by a suitably qualified and experienced person (every two/three years over 10 years)	$7,500
New fencing on 1.5 kilometres of smaller and intermittently flowing waterways identified through their farm plan (other than drains)[31]	$14,000
Fencing one kilometre of drains[32]	$9,500
Replacing 200 metres of existing fencing on larger waterways by 2025[33]	$1,000

[29] Overseer® figures required in high nitrate-nitrogen catchments if a nitrogen-loss cap is introduced, see Option 1, section 8.4 of this document.

[30] Price from $3,500, depending on the diversity of physical conditions and on what farmers want to/can do themselves. Figures from Ministry for the Environment interviews with farmers, March 2019.

[31] Assuming an electric two wire fence, fencing both sides, on flat land at an average cost (labour and material) of $4.67/linear metre. Some farmers may choose to use higher cost fencing if they have sheep as well as dairy, or to reduce ongoing costs. This figure is based on *Modelling for Mitigation Strategies on Farm Profitability: Testing Ag Package Regulations on-Farm* (Ministry for the Environment, 2019), and the *National Stock Exclusion Study – Analysis of the costs and benefits of excluding stock from New Zealand waterways* (Ministry for Primary Industries, 2016),

[32] Assuming a two wire electric fence, fencing both sides, on flat land at an average cost (labour and material) of $4.67/linear metre. This figure is based on *Modelling for Mitigation Strategies on Farm Profitability: Testing Ag Package Regulations on-Farm* (Ministry for the Environment, 2019), and the *National Stock Exclusion Study – Analysis of the costs and benefits of excluding stock from New Zealand waterways* (Ministry for Primary Industries, 2016).

[33] *Modelling for Mitigation Strategies on Farm Profitability: Testing Ag Package Regulations on-Farm* (Ministry for the Environment, 2019), page 17; and *National Stock Exclusion Study – Analysis of the costs and benefits of excluding stock from New Zealand waterways* (Ministry for Primary Industries, 2016).

Activity	Estimated costs over 10 years
Retire about 2 hectares of riparian setback[34]	$40,500
Install two single barrel culverts	$5,000[35]
Riparian planting for two kilometres of the farm's waterways [riparian planting at land owners' choice]	*[$44,000][36]*
Annual Overseer® budget ($1,000 for five years[37])	$5,000
Resource consent for winter forage cropping activities	$3,000
New telemetry unit for their water meter	$4,000[38]
Install two spat ropes	$500[39]
Total over 10 years	**$93,500**
Optional riparian planting costs	*[$44,000]*

Scenario 2: Rolling hill country: sheep and beef farm

Ian and Jo run a family business with 370 hectares of pasture and 10 hectares of bush and scrub. There are about 50 hectares of flat land, and the rest is mostly rolling hill country with some steep land. They farm 2600 sheep and 350 cattle. This makes their farm about average for a New Zealand sheep and beef farm.

Over the next 10 years, it's expected that the costs of just over five kilometres of fencing, installing stock reticulation and culverts, planting poplars, installing fish passages, and getting a farm plan, combined with retiring almost seven hectares of land will be a total cost of $14,850 per year. This equates to 3.2 per cent of gross revenue and an annual reduction in before tax profit from $90,600 to $75,750. If Jo and Ian decided to plant riparian vegetation, this would add an additional $4,200 per year, which is 0.9 per cent of gross revenue.

It will have taken time and effort, but after 10 years the benefits to Ian and Jo's family, to the wider community, and to New Zealand at large will have been significant. Jo and Ian will have been able to explore ways of optimising how they use the property, given the new fencing and protection given to wetlands and streams.

Jo and Ian are likely to have noticed that riparian planting, fencing, stock exclusion, and associated water reticulation have meant stock health improvements, avoided stock loss, and given overall greater productivity. International recognition for New Zealand's stronger environmental credentials means that their products are likely to be gaining in popularity in markets such as the European Union. Through Beef + Lamb NZ, Ian and Jo will also be able

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[34] Cost calculated using $2,747 average earnings before interest tax and depreciation per hectare for dairy farm discounted over 10 years (Ministry for the Environment. 2019. *Modelling of Mitigation Strategies on Farm Profitability: Testing Ag Package Regulations on-Farm*. Prepared for the Ministry for the Environment by AgFirst. Wellington: Ministry for the Environment.)

[35] www.mfe.govt.nz/publications/land/culvert-and-bridge-construction-guidelines-farmers/2-culvert-guidelines.

[36] Three rows of planting on each side of the stream at $22.02 per metre – page 19. *Ministry for Primary Industries Stock Exclusion Costs Report*. MPI Technical Paper No: 2017/11, January 2016.

[37] The immediate action to reduce nitrogen loss is an interim policy (see section 8.4 of this document)

[38] Costs provided by Irrigation. NZ $1,000 for unit plus $25 per month over 10 years, noting that the monthly cost is expected to fall over time; if satellite connection required, the costs would be higher.

[39] Following advice from members of the Fish Passage Advisory Group (S Bowie, Department of Conservation, pers. comm., 2019); and K Hughes, ATS-Environmental, pers. comm., 2019.

to access data around the increase in property value that clean, clear streams and lakes, abundant aquatic life, and protected riparian areas bring at sale time. The vegetation around the protected wetland and rivers will have added an attractive backdrop, while encouraging birds to return.

The Council's riparian programme will have supported planting stream margins and wetlands to reduce the risk of weeds spreading, and to gain biodiversity benefits for terrestrial and freshwater. This will have reduced direct costs to Ian and Jo.

When facing extreme weather, the farm business will be more resilient. Storms will be less likely to cause landslides on their pastures, particularly in the hilly areas. This reduces the risk that farm buildings, fencing, and other infrastructure will be washed away in a major storm. It will also help Ian and Jo's business recover more quickly following severe events, and reduce the risk of a decline in their long-term revenues due to natural hazards. Beyond the farm gate, reduced erosion benefits communities and businesses downstream through avoided dredging, improved fish habitat, increased availability of fish, and an overall increase in mahinga kai species population. This work is key for the protection of the natural environment, on which the livelihoods and wellbeing of current and future generations depend.

Rolling hill country: sheep and beef farm

Activity	Estimated costs over 10 years
Fence 500 metres of streams on flat land [Riparian planting at land owners' choice]	$20,000[40] [$11,000]
Fence 200 metres of streams on hill country [Riparian planting at land owners' choice]	$12,500[41] [$4,500]
Replace 500 metres of fencing by 2035 [Riparian planting at land owners' choice]	$6,500 [$5,500]
Retirement of some productive land which reduces grazing area by about three-quarters of a hectare	$2,500[42]
Fence wetland area over the next five years (at $13.02 per metre) [and plant by choice]	$3,500 [$21,000]
Retire about half a hectare area around the wetland and an additional 15 metre riparian strip surrounding it	$3,000
Farm plan signed off by a suitably qualified and experienced planner	$3,500[43]
Audit of farm plan by suitably qualified and experienced person (every two/three years over 10 years)	$7,500

[40] At $13.02 per metre each side, with reticulated stock drinking water and culverts. Ministry for Primary Industries. 2016. *Ministry for Primary Industries Stock Exclusion Costs Report 2016*. Prepared for the Ministry for Primary Industries by AgriBusiness Group. Wellington: Ministry for Primary Industries.

[41] At $13.66 per metre each side, with reticulated stock drinking water and culverts. Ministry for Primary Industries. 2016. *Ministry for Primary Industries Stock Exclusion Costs Report 2016*. Prepared for the Ministry for Primary Industries by AgriBusiness Group. Wellington: Ministry for Primary Industries.

[42] On the basis of $3,441 per hectare calculated from lost land value in *Impact of possible environmental policy interventions on case study farms*, Macfarlane Rural Business final report to the Ministry for the Environment, 31 May 2019, page 44.

[43] Price from $3,500, depending on the diversity of physical conditions and on what farmers want to/can do themselves. Figures from Ministry for the Environment interviews with farmers, March 2019.

Activity	Estimated costs over 10 years
Retire 5 hectares of erodible land	$17,500[44]
Fence this land (3,000 metres at $16.64 per metre)	$50,000[45]
Plant poplar poles, assuming a 50% subsidy from local/central government	$20,000[46]
Install a fish ramp and two spat ropes by 2025 (timeframes will be set out by the regional council)	$2,000[47]
Total over 10 years	**$148,500**
Optional riparian planting costs	*[$42,000]*

Scenario 3: Commercial vegetable grower on fertile flat land

Bev has a 45 hectare commercial vegetable-growing operation, with 30 hectares on her own property, and an average of 15 hectares of land leased from other landowners within her catchment. She grows squash, peas, sweetcorn, lettuces and beans on mostly flat fertile land. Forty-five hectares is about the average size for vegetable-growing operations in New Zealand.

Over the next 10 years, it's expected that the changes to reduce sediment, reviews of her farm plan, costs of more accurate irrigation, and the upgrade to telemetry for her water take would cost around $9,200 per year. This equates to 1 per cent of total income and an annual reduction in Bev's before tax and interest profit from $397,440 to $388,240.[48] These figures exclude the costs of any actions Bev may need to take for the catchment to meet new nutrient limits.

Many of these initiatives which lead to improved environmental impacts would also lead to increased production and reduced input costs, including lower pumping costs for irrigation, lower fertiliser costs, and lower weed control costs.

The benefits both to Bev and the wider community are considerable, but harder to quantify. An example of this benefit is soil retained on the farm, which means there is less sediment in the river and estuaries downstream, benefitting communities and businesses through avoided dredging, improved fish habitat, and abundance of fish. Flow-on benefits to other businesses in the community would include more work opportunities for rural advisors.

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[44] On the basis of $3,441 per hectare calculated from lost land value in *Impact of possible environmental policy interventions on case study farms*, Macfarlane Rural Business final report to the Ministry for the Environment, 31 May 2019, page 44.

[45] 3,000 metres of fencing at $16.64 per metre – AgriBusiness Group. 2016. *Ministry for Primary Industries Stock Exclusion Costs Report 2016*, page 4.

[46] Macfarlane Rural Business, *Impact of possible environmental policy interventions on case study farms,* 2019.

[47] Example costs provided by the Department of Conservation and private contractor show that the cost for this, depending on the specific local conditions, may range from $1,500 to $3,000.

[48] This figure is based on a 2016 study by Horticulture New Zealand giving the average operating profit for a Hawke's Bay vegetable grower was $8,832 per hectare. Using this figure, the estimated operating profit on a 45 hectare vegetable growing operation would be $397,440. Total income of $20,957 per hectare- *Hawkes Bay Horticultural Nutrient and Financial Benchmarking Results*. Prepared for: Horticulture New Zealand and Hawke's Bay Regional Council by The AgriBusiness Group May 2016, page 14.

Activity	Estimated costs over 10 years
Detailed erosion management plan for Bev's 30-hectare farm plus detailed erosion management plans for 15 hectares of leased land (three times over 10-year period)	$10,000
Planting cover crops over 15 hectares (repeated each year over 10 years)	$12,000
Wheel track ripping for a 45-hectares farm (over 10 years)	$16,000
Installing 10 silt traps and annual maintenance	$17,500[49]
Subscription service providing soil moisture monitoring and accurate irrigation application recommendations	$25,000
New telemetry unit for their water meter	$4,000[50]
To have farm plan audited by a suitably qualified and experienced person	$7,500
Total over 10 years	**$92,000**

Impacts on councils

The proposed additional attributes for ecosystem health make it clear that all aspects of water health need to be managed to prevent decline. This provides clear direction that will reduce debate in hearings and ultimately in the court. Some other proposals remove ambiguity in the current NPS-FM. Together, these will help councils and communities better understand what needs to be done to set achievable and effective environmental outcomes for freshwater in their catchments.

The work required by councils to implement the new requirements will vary depending on the stage the council is already at in its planning. Many councils are staging their implementation of the current NPS-FM. Those that have started may need to update existing plans with new requirements and therefore undertake further modelling and consultation. This may require additional staff for planning and consents, engagement with communities and ongoing monitoring to ensure compliance with the new rules.

The Government is also progressing a new planning process for freshwater which will require councils to have plans in place by 2025. To achieve this the Ministry for the Environment intends to roll out an implementation package to support councils as announced in Budget 2019.

In developing their plans, councils may need resources to support monitoring and additional research to make sure the new objectives developed reflect the current science. Access to the current science is important as it may take a few years for the information needed by councils to become available and this data needs to be robust with defensible cause and effect relationships determined so it can be translated into plans.

Councils are not managing these changes in isolation. They have existing requirements for environmental management, flood protection, and other local authority roles.

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[49] Costs for erosion management plan, cover crops, wheel track ripping and silt traps from. *Erosion & Sediment Control Guidelines for Vegetable Production*. Prepared by Andrew Barber for Horticulture New Zealand June 2014.

[50] Costs provided by Irrigation. NZ $1,000 for unit plus $25 per month over 10 years, noting that the monthly cost is expected to fall over time, If satellite connection required, the costs would be higher.

Under the proposal 'Direction for territorial authorities' district and city councils have a greater role in influencing the effects of urban development on freshwater ecosystem health. This can be achieved as part of high quality urban design. It's more efficient for this to be dealt with in district plans than for an extra set of rules to be developed by regional councils.

Where resource consents are required, councils can recover costs from consent holders or the additional cost will need to be covered by the ratepayers under the Local Government Act.

Impacts for Māori

While we have not specifically modelled the impacts for Māori at a local level (whānau, marae, hapū, Māori-owned businesses), we have begun a high-level initial assessment of impacts. More in-depth impact assessment will be conducted in the coming months.

It is important to consider the unique characteristics, governance and collective ownership of Māori land, cultural values, and rights under the Treaty of Waitangi in addressing water issues.

Māori identity is intrinsically linked to the environment including freshwater bodies, hence why Māori hold a responsibility of katiakitanga or stewardship of the environment. This relationship is described in different whakatauki and pepeha.

We anticipate that our efforts to stop further degradation and loss and reverse past damage will have a positive impact on the mauri and wairua of our waterways where these have been diminished. Halting degradation would also help restore the wellbeing and mana of Māori and the wider communities, and support Māori in strengthening their identity and connection to the water as well as exercising their role as kaitiaki.

In particular, strengthening the role of Te Mana o te Wai and the ability of tangata whenua to express their values and knowledge into the management of freshwater will help ensure Te Ao Māori is further recognised and ensuring that a more holistic and integrated approach is adopted that puts the essential value of the water as the first priority. It will further help ensure that tangata whenua are able to practice tikanga over the management of freshwater values, such as mahinga kai. These changes will influence local decisions that ensure these values are managed for and incorporated in freshwater planning, and for tangible actions to occur on the ground to protect these values.

We also acknowledge that some policies of the Essential Freshwater programme may not meet the possible higher expectations of water quality that Māori hold in relation to freshwater bodies. Additionally, while reduced timeframes (regional councils to give effect to the NPS-FM by 2025) would ensure more rapid action to halt degradation, this may also impact on engagement timeframes with iwi and hapū and their capability and capacity to participate in the process.

It is also important to note that efforts to stop further degradation and loss and reverse past damage will also affect Māori enterprises, particularly in rural communities and for agriculture industries and workers in some areas, and particularly where land may be underdeveloped.

Impacts on urban development

The proposals in this document are likely to have impacts for urban development, in particular the proposals to reduce sediment, prevent further loss of wetlands and streams, and improve integrated planning between regional councils and territorial authorities.

Preventing urban stream loss can result in a wide range of impacts based on the specific nature of the site. Retaining streams may reduce the amount of land available within some new urban developments, which could affect the supply of land and in some cases add to the cost of the development. In these cases, increased costs would likely be passed on to property purchasers.

Some of these development costs can however often be reduced or offset through careful design. Retaining natural stream channel form can reduce the need for expensive stormwater infrastructure and earthworks which can create cost savings. Incorporating stream corridors into green open space networks and reserves, and providing a mix of denser housing and smaller lot sizes can also offset costs while making these units more attractive. These types of approaches are consistent with the aims of the proposed National Policy Statement on Urban Development to provide quality urban environments, as well as with industry trends toward best practice in water sensitive and low impact design.

The proposed direction to territorial authorities in the NPS-FM to manage the effects of urban development on water is not specific about the types of interventions that should be used. However, it is intended that when taken alongside requirements to prevent stream loss and reduce sediment, the outcome would be more uptake of water sensitive design approaches in decisions about urban form and subdivision design.

The benefits of water sensitive design are site-specific, and rely heavily on determining the most appropriate solution for the individual development project. The cost implications of protecting urban streams and applying water sensitive design solutions vary greatly. A number of examples from around the country show that these approaches can be cheaper than conventional development approaches; however, in some cases these reforms may add to development costs.

Retaining and restoring urban streams, and adopting water sensitive design approaches, can provide a range of environmental and community benefits. They include creating shared space for recreation and active transport, improved resilience to natural hazard risk, reduced pressure on stormwater infrastructure outside of the development, improved water quality in downstream receiving environments, benefits for biodiversity and ecosystem health, opportunities for people to connect to the natural environment and express kaitiakitanga, and general amenity. Some of these benefits can even be linked to wider social and community benefits such as improved mental and physical wellbeing.

Managing these impacts

The proposals above include options to help manage these impacts, for instance phasing in of requirements over time, and targeting new requirements to high risk land uses or activities. The Government has also committed to invest in support for change as part of Budget 2019, including $229 million for the Productive and Sustainable Land Use package. This will help with implementation and managing the impacts.

Initiatives included within Budget 2019 provide for:

- on-the-ground advice to farmers
- supporting Māori agribusiness
- information, tools and advice to support farmers making change to more environmentally sustainable and higher value production
- better management of economic and urban growth within environmental limits
- increased tree planting by lowering planting barriers for land owners and improving incentives to support planting
- enhancing community wellbeing and strengthening local governance by funding additional staff to work with local government to make improvements to water services, develop strategies to manage natural hazards and climate change, and improve local government financial sustainability
- improving Crown land management practices to support lower impact land use on the approximately 1.2 million hectares of Crown pastoral land.

Post-consultation impact testing

As part of this consultation we are still exploring options for a number of the proposals included in this document and so don't have total impacts across the package. Once the options are clearer additional impact analyses will be carried out, including assessment of the economic, social, cultural and environmental impacts of the package as a whole. Feedback from consultations will help inform the impact testing.

11 Aligning RMA national direction

11.1 The role of national direction under the RMA

Under the Resource Management Act (RMA), the Minister for the Environment can prepare national policy statements (NPS) that outline objectives and policies for matters of national significance.

There are several different national policy statements covering different matters of national significance (including water, coastal environments, and renewable energy generation), with others under development. Local authorities are required to give effect to all national policy statements through planning documents and must consider any relevant NPS when making decisions under the RMA. Interactions between NPSs should be considered by local authorities when undertaking these functions.

11.2 Alignment with other national direction under the RMA

In addition to this consultation on national direction for freshwater, the Government is consulting on a range of national direction instruments in 2019, including a:

- proposed National Policy Statement on Urban Development to replace the current NPS on Urban Development Capacity
- proposed National Policy Statement for Highly Productive Land
- proposed National Policy Statement for Indigenous Biodiversity.

These national direction instruments are intended to be compatible and to enable good decision-making that provides for New Zealand's environmental, social, cultural and economic wellbeing.

There are also several different current national policy statements covering various matters of national significance (including transmission activities and renewable energy generation). The New Zealand Coastal Policy Statement addresses the coastal environment and is a mandatory policy document with the same effect as an NPS.

At a local level there will always be some trade-offs. Different environmental priorities will need to be resolved in district and regional plans, and this will still be the case even with consistent and well-integrated national direction.

The sections below outline some of the areas where the reforms developed through the Essential Freshwater and Three Waters programmes are likely to interact with other national direction (either proposed or current). These proposals are also taking place alongside other initiatives including the inquiry into local government funding and climate change mitigation and resilience.

National Policy Statement for Urban Development (NPS-UD)

The Government is consulting on a proposed National Policy Statement on Urban Development (NPS-UD). The proposed NPS-UD is intended to provide direction about when and how cities should plan for growth, and how to do this well. More information is available on the Ministry for the Environment website.

The proposed NPS-UD would direct councils to be more strategic about planning how and where development should occur, including identifying areas where evidence shows that urban development may not be appropriate.

Protecting urban freshwater ecosystems and providing for urban development requires local authorities to balance sometimes competing priorities. It is important that the national direction on both freshwater and urban development is well aligned, to give clarity to local authorities on how to balance these matters in urban planning. To do this:

- the NPS-UD provides a mechanism for local authorities to identify areas where development may not be appropriate because of the likely effects on highly valued freshwater environments
- proposals in the NPS-FM and the proposed Freshwater NES preventing further loss of urban streams may promote more compact urban form that recognises the natural values of urban waterways, and prioritises these values when planning
- direction in the NPS-FM to city and district councils is intended to help ensure decisions about managing freshwater in urban environments can be part of wider decisions about urban form
- the proposals related to wastewater and stormwater services will provide further direction and guidance on managing these essential infrastructure services in a way that upholds communities expectations related to freshwater.

Proposed NPS for Highly Productive Land

The Government is consulting on a proposed National Policy Statement for Highly Productive Land (NPS-HPL). More information is available on the Ministry for Primary Industries website.

The proposed NPS-HPL does not intend the absolute protection of highly productive land, or that there should be no net loss of such land in a region or district. Rather, the aim is to require local authorities to consider the value of this resource in their region or district both now and in the future.

There are several proposals within the Essential Freshwater and Three Waters programme that have clear interactions with this proposed NPS. This is because increasing intensive land use on highly productive land may in some areas create trade-offs related to water quality and ecosystem health outcomes.

In addition, the high-level proposals for amending the Drinking Water NES to better manage risks to drinking water sources may constrain land use in some areas, regardless of the land-use classification.

Biodiversity Strategy and National Policy Statement for Indigenous Biodiversity

As a party to the Convention of Biological Diversity, New Zealand prepared a biodiversity strategy in 2000, and is now reviewing and revising this to translate the principles into reality.

Improving habitat for threatened species through the proposed NPS-FM is intended to contribute to the objectives of that convention, by helping to conserve biological diversity.

The Government is consulting on a proposed National Policy Statement for Indigenous Biodiversity. Find out more on the DOC website.

Identifying and protecting the habitat of threatened species is consistent with the approach proposed in the draft National Policy Statement for Indigenous Biodiversity where 'rarity and distinctiveness' is one of the four criteria used to identify significant natural areas.

The proposals within the NPS-FM related to ecosystem health and the protection of wetlands will contribute to improved biodiversity outcomes, as will the new Freshwater NES provisions related to stream loss.

National Environment Standard for Plantation Forestry

The sustainable management of forests has a key role to play in protecting New Zealand's water resources. The National Environmental Standard for Plantation Forestry (NES-PF) regulates the way some plantation forestry activities may be carried out and are intended to manage the environmental effects of these forestry activities.

The proposals in the NPS-FM relating to streams and wetlands will not override the NPS-PF. Once the outcomes of the Essential Freshwater consultation are known, the Government will look at how the rules in the NES-PF and the rules in the Freshwater NES work together.

National Policy Statement for Renewable Electricity Generation

The National Policy Statement for Renewable Electricity Generation 2011 (NPS REG) sets out the objectives and policies for renewable electricity generation under the Resource Management Act 1991. It will drive a consistent approach to planning for renewable electricity generation in New Zealand. It gives clear government direction on the benefits of renewable electricity generation and requires all councils to make provision for it in their plans. The NPS REG works alongside other government initiatives as part of New Zealand's wider response to tackling climate change.

The relationship between the NPS-FM and the NPS REG is not clearly articulated. The proposal in this document relating to renewable generation is expected to assist local authorities to implement both pieces of national direction consistently.

New Zealand Coastal Policy Statement

The New Zealand Coastal Policy Statement (NZCPS) guides local authorities in their day-to-day management of the coastal environment.

There are some key interactions between the Essential Freshwater proposals and the NZCPS, in particular:

- the NPS-FM has policies on protecting estuaries and the downstream receiving environment. There will be a spatial overlap between freshwater and coastal environments
- protections for wetlands under the Freshwater NES will include coastal wetlands.

National planning standards

The national planning standards are a relatively new tool. Two key purposes are to:

- require national consistency across resource management plans
- support the implementation of national policy statements, national environmental standards, or other regulations made under the RMA.

The first set of national planning standards, gazetted in April 2019, focused on the core elements of plans' structure and format, along with standardising common definitions and improving the electronic accessibility of plans. With these foundation standards in place, MfE expects it will be easier for any future planning standards to support the consistent implementation of other national direction in plans.

This discussion document proposes a new NPS-FM. There is a possibility that a planning standard may be required to support components of the NPS. We welcome your feedback on this as part of this consultation process.

Comprehensive review of the RMA

The steps we are taking now to improve freshwater, rural land use, and urban development, and to address climate change, will inform the wider review of the RMA that was announced in July. This will examine the broader and deeper changes we believe are needed to support the transition to a more productive, sustainable and inclusive economy.

The review will recommend ways the system can deliver better outcomes for our built and natural environments. It will be mindful of current challenges, and of those that we can expect from new technology and a changing climate.

11.3 Questions

79. Do you think there are potential areas of tension or confusion between the proposals in this document and other national direction? If so, how could these be addressed?
80. Do you think a planning standard is needed to support the consistent implementation of some proposals in this document? If so, what specific provisions do you consider would be effectively delivered through a planning standard tool?

12 How to have your say

The Government welcomes your feedback on this consultation document. The questions throughout the document are a guide only. You do not have to answer all the questions, and all comments are welcome.

To ensure others clearly understand your point of view, you should explain your reasons for your views and give supporting evidence if needed.

12.1 Timeframes

This consultation starts on 5 September 2019 and ends on 17 October 2019.

When the consultation period has ended, feedback will be collated and reviewed by officials and an independent advisory panel.

Cabinet will then consider final regulations for freshwater.

Consultation on detailed proposals for the National Environmental Standards for Drinking Water, Wastewater and Stormwater will take place later as part of the Three Waters Reform programme. No dates have yet been set for this.

12.2 How to make a submission

You can make a submission in two ways.

1. Use our online submission tool, available at https://www.mfe.govt.nz/consultation/action-for-healthy-waterways.
   This is our preferred way to receive submissions.
2. Write your own submission.

If you are posting your submission, send it to: Freshwater submissions, Ministry for the Environment, PO Box 10362, Wellington 6143. Include:

- the title of the consultation (Action for healthy waterways)
- your name or organisation
- your postal address
- your telephone number
- your email address.

If you are emailing your submission, send it to consultation.freshwater@mfe.govt.nz as a:

- PDF
- Microsoft Word document (2003 or later version).

Submissions close at 5 pm on Thursday 17 October 2019.

12.3 For more information

Please direct any queries to:

Email: consultation.freshwater@mfe.govt.nz

Postal: Freshwater, Ministry for the Environment, PO Box 10362, Wellington 6143

12.4 Publishing and releasing submissions

All or part of any written submission (including names of submitters) may be published on the Ministry for the Environment's website, www.mfe.govt.nz. Unless you clearly specify otherwise in your submission, the Ministry will consider that you have agreed to have your submission and your name posted on its website.

Contents of submissions may be released to the public under the Official Information Act 1982, if requested. Please let us know if you do not want some or all of your submission released, stating which part(s) you consider should be withheld and the reason(s) for withholding the information.

Under the Privacy Act 1993, people have access to information held by agencies about them. Any personal information you send to the Ministry with your submission will only be used in relation to matters covered by this document. In your submission, please indicate if you prefer we do not include your name in the published summary of submissions.

Draft NES Freshwater

National Environmental Standards: Freshwater

Full Draft v 16.1 as at 22 August 2019

Contents

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DRAFT

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Part 1 Preliminaries

1 General definitions

(1) In this Standard-

Act means the Resource Management Act 1991

commencement date means the date on which this Standard comes into force

(2) Terms defined in the National Policy Statement for Freshwater Management 2019 and used in this Standard have the meanings in that national policy statement, unless otherwise specified.

2 Stringency

(1) Regional councils may include rules in their plans that set rules that are more stringent than those required by this Standard.

(2) Any rule in a regional plan that is more stringent than these standards prevails over these Standards.

(3) [placeholder: NPSPF prevails over wetland rules]

3 Charging for monitoring

A local authority may charge for monitoring any activity identified in this Standard as a permitted activity.

Part 2 Wetlands, rivers, and fish passage

Subpart 1 – Wetlands

4 Definitions for subpart 1

In this subpart-

natural wetland means a wetland as defined in the Act (regardless of whether it is a dominated by indigenous or exotic vegetation, and including coastal wetlands), except that it does not include-

a) wet pasture or paddocks where water temporarily ponds after rain in places dominated by pasture, or that contain patches of exotic sedge or rush species; or
b) constructed wetlands; or
c) geothermal wetlands

constructed wetland means a wetland constructed by artificial means that-

a) supports an ecosystem of plants that are suited to wet conditions; and
b) is constructed for a specific purpose in a place where a natural wetland does not already exist

public flood control or drainage means work carried out-

a) for flood control or flood protection purposes, by or on behalf of a local authority, including works carried out for the purposes set out in section 133 of the Soil Conservation and Rivers Control Act 1941; or
b) for the purpose of drainage works by drainage districts, under the Land Drainage Act 1908

nationally significant infrastructure means all or any of the following:

a) State highways:
b) the national grid electricity transmission network:
c) national renewable electricity generation facilities that connect with the national grid, other than the facilities of existing hydro schemes
d) major gas or oil pipeline services (such as the pipeline from Marsden Point to Wiri, and high pressure gas transmission pipelines from Taranaki)
e) any railway (as defined in the Railways Act 2005):
f) rapid transit:
g) airports that have a runway used for regular air transport services by aeroplanes that have a seating configuration of more than 30 passenger seats:
h) commercial ports (as defined in Part A(6) of Schedule 1 of the Civil Defence Emergency Management Act 2002)

existing hydro scheme means any hydro-electricity generating scheme that is operating on or before the commencement date

standard wetland monitoring obligation has the meaning in clause 5

vegetation destruction means destroying any significant indigenous vegetation

5 Standard wetland monitoring obligation

(1) If the standard wetland monitoring obligation is a condition of any consent granted for the purpose of this Standard, the holder of the consent must-

a) monitor the condition of the wetland (in terms of, at least, extent, vegetation, hydrology, and nutrients); and
b) provide the results of monitoring to the consent authority at least annually, or in accordance with any monitoring plan; and
c) advise the regional council if the monitoring indicates a decline in the ecological condition of the wetland.

(2) The advice required by subclause (1)(c) must be given by phone immediately (or as soon as practicable), and be confirmed in writing within 20 working days after the phone advice.

(3) The written confirmation must include a description of the scale of the decline and any known, actual, or likely reasons for it.

6 Standard conditions for nationally significant infrastructure

Any consent granted for activities referred to in this subpart that relate to new or existing nationally significant infrastructure must include at least the following conditions:

a) to the extent that adverse effects on a wetland cannot be avoided, remedied, or mitigated, any residual adverse effects on the wetlands must be offset to achieve a net gain:
b) the person undertaking the activity is subject to the standard wetland monitoring condition for the duration of the consent:
c) the person undertaking the activity must implement best practice erosion and sediment control measures for the duration of land disturbance, and these must be installed before the start of the land disturbance and be maintained until the site is stabilised against erosion.

Vegetation destruction

7 Vegetation destruction- discretionary activities

Vegetation destruction carried out in, or within 10 m of, any part of a natural wetland is a discretionary activity if it is carried out-

a) for the purpose of restoring or maintaining the wetland; or
b) for education or recreation purposes (including the construction and maintenance of structures such as boardwalks and signage that are constructed for educational or recreational purposes); or
c) for the purpose of maintaining or meeting the operational needs of an existing hydro scheme; or
d) for public flood control or drainage; or
e) for the purpose of building, maintaining, or operating any new or existing nationally significant infrastructure.

8 Vegetation destruction - non-complying activity

Vegetation destruction in, or within 10 m of, any part of a natural wetland is a non-complying activity if it is carried out for any purpose other than a purpose identified in clause 7.

Earth disturbance

9 Earth disturbance – meaning

In clauses 9 to 14,

earth disturbance means the disturbance of earth (including soil, clay, sand, rock, and peat),-

a) including by moving, removing, placing, blading, cutting, excavating, cultivating, filling, excavating, or gardening it; but
b) not including disturbance in the course of-
    i) planting indigenous plants for restoration purposes; or
    ii) installing fenceposts; or
    iii) removing pest or weed vegetation using hand-held tools.

earth disturbance for drainage means earth disturbance that involves making new drainage ditches or deepening existing drainage ditches

general earth disturbance means earth disturbance that is not earth disturbance for drainage.

10 General earth disturbance – discretionary activity

(1) Engaging in general earth disturbance in, or within 10 m of, any part of a natural wetland is a discretionary activity if it is undertaken-

a) for the purpose of restoring or maintaining the wetland; or
b) for education or recreation purposes (including the construction and maintenance of structures such as boardwalks and signage that are constructed for educational or recreational purposes); or
c) for the purpose of maintaining or meeting the operational needs of an existing hydro scheme; or

d) for the purpose of building, maintaining, or operating any new or existing nationally significant infrastructure.

(2) Engaging in general earth disturbance in, or within 10 m of, any part of a natural wetland for the purpose of public flood control or drainage is a discretionary activity if the work will-

a) result in a greater than 0.1 m change beyond the wetland's annual median water level; and
b) cause changes in the wetland's seasonal (summer to winter) water level fluctuations (minimum or maximum water levels) that have a detrimental effect on the extent, ecological quality (type and diversity of aquatic plant and animal communities) or functioning of the wetland.

(3) Any resource consent granted for general earth disturbance must include at least the condition that the disturbance is limited to the minimum necessary to do the work.

11 General earth disturbance – non-complying activity

Engaging in general earth disturbance in, or within 10 m of, any part of a natural wetland is a non-complying activity if the work-

a) results in the reclamation of land, or infilling, or damage to or destruction of the wetland's natural hydrological regime, form, function, ecosystem services, amenity values, or ecological values; and
b) is done for any purpose other than a purpose described in clause 10(1) or (2).

12 Earth disturbance for drainage – discretionary activities

(1) Engaging in earth disturbance for drainage in or within 100 m of any part of a natural wetland is a discretionary activity if it is undertaken for the purpose of restoring the wetland to its natural hydrological regime.

(2) Any resource consent granted for general earth disturbance for the purpose of restoring a natural wetland to its natural hydrological regime must include at least the following conditions:

a) a qualified wetland ecologist and hydrologist must establish the natural hydrological regime of the wetland:
b) the person undertaking the activity is subject to the standard wetland monitoring obligation for the duration of the consent:
c) best practice erosion and sediment control measures must be implemented for the duration of the land disturbance, and those measures must be installed before the start of the land disturbance and are maintained until the site is stabilised against erosion.

(3) Engaging in earth disturbance for drainage in or within 100 m of any part of a natural wetland is a discretionary activity if it is undertaken-

a) for-
   i) public flood control or drainage; or
   ii) building, maintaining, or operating any new or existing nationally significant infrastructure; and
b) the work will-
   i) result in a greater than 0.1 m change beyond the wetland's annual median water level; and
   ii) cause changes in the wetland's seasonal (summer to winter) water level fluctuations (minimum or maximum water levels) that have a detrimental effect on the extent, ecological

quality (type and diversity of aquatic plant and animal communities) or functioning of the wetland.

13 Earth disturbance for drainage – non-complying activity

Engaging in earth disturbance for drainage within 100 m of any part of a natural wetland is a non-complying activity if-

a) the work is done for anything other than-
   i) restoring the wetland to its natural hydrological regime; or
   ii) public flood control or drainage; or
   ii) building, maintaining, or operating any new or existing nationally significant infrastructure; and

b) the work will-
   i) result in a greater than 0.1 m change beyond the wetland's annual median water level; and
   ii) cause changes in the wetland's seasonal (summer to winter) water level fluctuations (minimum or maximum water levels) that have a detrimental effect on the extent, ecological quality (type and diversity of aquatic plant and animal communities) or functioning of the wetland.

14 Earth disturbance for drainage – prohibited activity

Engaging in earth disturbance for drainage in any part of a natural wetland is a prohibited activity if the work is done for any purpose other than-

a) restoring the wetland to its natural hydrological regime; or
b) public flood control or drainage; or
c) building, maintaining, or operating any new or existing nationally significant infrastructure.

Water take activities

15 Water take activities – meaning

In clauses 16 and 17, **water take activities** means activities such as taking, using, damming, or diverting water that-

a) are not earth disturbance or vegetation destruction; but
b) result in a change to the water level of a natural wetland.

16 Water take activities – discretionary activity

(1) A water take activity is a discretionary activity if it is undertaken-

a) for the purpose of education or recreation (including the construction and maintenance of structures such as boardwalks and signage that are constructed for educational or recreational purposes), and the change in water level is temporary; or
b) for the purpose of maintaining or meeting the operational needs of an existing hydro scheme.

(2) A water take activity is a discretionary activity if it is done for the purpose of restoring the wetland to its natural hydrological state.

(3) Any resource consent granted for a water take activity for the purpose of restoring a wetland to its natural hydrological state must include the following conditions

a) a qualified wetland ecologist and hydrologist must establish the natural hydrological regime of the wetland:
b) the person undertaking the activity is subject to the standard wetland monitoring obligation for the duration of the consent.

(4) A water take activity is a discretionary activity if-

a) the work is done for-
   i) public flood control or drainage; or
   ii) building, maintaining, or operating any new or existing nationally significant infrastructure; and
   b) the work will-
   i) result in a greater than 0.1 m change beyond the wetland's annual median water level; and
   ii) cause changes in the wetland's seasonal (summer to winter) water level fluctuations (minimum or maximum water levels) that have a detrimental effect on the extent, ecological quality (type and diversity of aquatic plant and animal communities) or functioning of the wetland.

17 Water take activities – non-complying activity

A water take activity is a non-complying activity if-

a) it is not a discretionary activity; and
b) the work will-
   i) result in a greater than 0.1 m change beyond the wetland's annual median water level; and
   ii) cause changes in the wetland's seasonal (summer to winter) water level fluctuations (minimum or maximum water levels) that have a detrimental effect on the extent, ecological quality (type and diversity of aquatic plant and animal communities) or functioning of the wetland.

Subpart 2 – River bed infilling

18 Infilling bed of river

Discretionary activity

(1) The infilling of the bed of a river is a discretionary activity if it is part of an activity-

a) designed to restore or enhance the natural values of the stream or of any adjacent or associated ecosystem; or
b) done for the purpose of building, maintaining, or operating new or existing nationally significant infrastructure; or
c) required for the purposes of flood prevention or erosion control; or
d) for which there are no practical alternative methods of enabling the activity to take place.

(2) Any resource consent granted for the discretionary activity must include at least the following conditions:

a) to the extent that the adverse effects cannot be avoided, remedied, mitigated, any residual adverse effects on the river must be offset to achieve a no net loss; and
b) the person undertaking the activity must-

i) monitor the condition of the river for the duration of the consent; and

ii) inform the consent authority if the monitoring demonstrates that the ecological condition of the river is declining.

Non-complying activity

(3) Infilling the bed of a river is a non-complying activity in any other case.

Subpart 3 – Fish passage

19 Application of subpart 3

(1) This subpart applies only in respect of structures constructed after the commencement date.

(2) Clauses 21 and 22 (about culverts and weirs) do not apply in respect of any river identified by the relevant regional council as one where fish passage for undesirable fish species is to be impeded (in accordance with the requirements of the National Policy Statement for Freshwater Management 2019), except that any person constructing a culvert or weir on such a river must provide the following to the relevant regional council within 20 working days of the construction being completed:

a) the standard fish passage information; and
b) for culverts, information on at least the type or shape of culvert (e.g. pipe, box, arch), material, height, width, length, drop height, slope, culvert substrate, and alignment; and
c) for weirs, information on at least the type of weir, crest shape, width, slope, height, presence of wetted margins, material, backwater distance, and substrate

20 Definitions for subpart 3

In this subpart,

bankfull discharge means the discharge that fills a stable channel to the elevation of the active floodplain

bankfull width means the width of the river channel at the bankfull discharge

culvert means-

a) a pipe or box structure that conveys stormwater flow; or
b) the entire structure used to channel a water body

culvert span means the width of the culvert at the point it intersects with the stream bed

flap gate means a hinged gate that controls tidal or floodwater fluctuations, such as a tide gate or flood gate

maximum allowable water velocity is a measurement defined by the requirements of the weakest species or weakest life stage of a species

passive flap gate means a flap gate that opens due to a positive head differential on the upstream side, and closes due to a positive head differential on the downstream side, but is not controlled by any powered (e.g. electric or hydraulic) automated gate system

standard fish passage structure information means the following information about an in-stream structure:

a) location (Easting and Northing):

b) upstream- and downstream-facing photograph(s) of the completed structure sufficient to allow evaluation of the structure's maintenance requirements over time and likelihood of fish passage impedance:
c) wetted width and bankfull width of the stream prior to works:
d) type of structure (i.e. culvert, ford, weir, dam, or flap gate).

21 Culverts

Permitted Activity

(1) The construction of a culvert that is fixed in or on the bed of a river is a permitted activity, provided the following conditions for fish passage are met:

a) the culvert complies with all relevant rules in the relevant regional plan:
b) the culvert provides for the same fish passage as exists naturally in the area of river bed it occupies:
c) the mean cross-sectional water velocity in the culvert is equal to or less than the mean cross-sectional water velocity found in immediately adjoining stream reaches; and
d) the culvert span is:
    i. equal to or greater than 1.3 x stream bankfull width for streams with a bankfull width ≤3 m; or
    ii. equal to or greater than 1.2 x stream bankfull width + 0.6 m for streams with a bankfull width >3 m:
e) the culvert is an open bottom culvert or the culvert invert is placed so that a minimum of 25% of the diameter of the culvert is below the level of the river bed:
f) the stream bed substrate is present over the full length of the culvert, and it is stable for at least four fifths of the time:
g) the culvert provides for continuity of geomorphic processes (such as the movement of sediment and debris):
h) the person constructing the culvert must provide the following to the relevant regional council within 20 working days of construction being completed:
    i. the standard fish passage structure information:
    ii. information on at least the type or shape of culvert (e.g. pipe, box, arch), material, height, width, length, drop height, slope, culvert substrate, and alignment.

Discretionary activity

(2) The construction of a culvert that is fixed in or on the bed of a river that is not a permitted activity is a discretionary activity.

(3) Any resource consent granted for the discretionary activity must be subject to the following conditions:

a) the culvert is not contrary to the regional council's objectives for aquatic life (as required by the National Policy Statement for Freshwater Management 2019):
b) the person constructing the structure must provide the following to the relevant regional council, within 20 working days of construction being completed:
    i. the standard fish passage structure information:
    ii. information on at least the type or shape of culvert (e.g. pipe, box, arch), material, height, width, length, drop height, slope, culvert substrate, and alignment.

22 Weirs

Permitted activity

(1) The construction of a weir that is fixed in or on the bed of a river is a permitted activity provided the following conditions for fish passage are met:

a) the weir must comply with all relevant rules in the relevant regional plan:
b) the weir provides for the same fish passage as exists naturally in the area of river bed it occupies:
c) the weir fall height is less than 4 metres:
d) the slope of the weir is:
    i. no steeper than 1:30 for a rock-ramp weir, unless the council has identified that inanga or smelt (and any other weakly-swimming species identified by council) do not require passage:
    ii. equal to or less than 1:10 for a conventional weir design where fall height is ≤1 m:
    iii. equal to or less than 1:15 for a conventional weir design where fall height is 1-4 m:
e) roughness elements are present on the weir face, comprising mixed grade rocks of 150-200 mm diameter which are irregularly spaced no more than 90 mm apart to create a hydraulically diverse flow structure across the weir:
f) the weir has a V-shaped lateral profile, sloping up at the banks and providing a low-flow channel in the centre, with the lateral cross-section slope between 5-10°:
g) the person constructing the weir must provide the following to the relevant regional council within 20 working days of construction being completed:
    i. the standard fish passage structure information; and
    ii. information on at least the type of weir, crest shape, width, slope, height, presence of wetted margins, material, backwater distance, and substrate.

Discretionary activity

(2) If the construction of a weir that is fixed in or on the bed of a river is not a permitted activity, it is a discretionary activity.

(3) Any resource consent granted for the discretionary activity must include a condition requiring the person responsible for the construction of weir to provide the following to the relevant regional council within 20 working days of construction being completed:

a) the standard fish passage structure information:
b) information on at least the type of weir, crest shape, width, slope, height, presence of wetted margins, material, backwater distance, and substrate.

23 Passive flap gates

(1) The construction of a passive flap gate is a non-complying activity.

(2) Any resource consent granted for the non-complying activity must be subject to the following conditions:

a) the passive flap gate must comply with all relevant rules in the relevant regional plan:
b) the person constructing the structure must provide the following to the relevant regional council, within 20 working days of construction being completed:
    i) the standard fish passage structure information:

ii) at least, the number of flap gates, dimensions, material, and whether any culverts present.

24 Dams, fords, and non-passive flap gates

Every person who constructs a dam, ford, or non-passive flap gate must provide the following to the relevant regional council, within 20 working days of the construction being completed,-

a) the standard fish passage structure information:
b) for fords, at least drop height, substrate, width, length, material, presence of any culverts:
c) for dams, at least height, whether spillway present, whether fish pass present:
d) for non-passive flap gates, at least the number of flap gates, dimensions, material, and whether any culverts present.

Part 3 Farming

25 Definitions for Part 3

In this Part,-

annual forage crop means a crop grazed in situ, including brassicas, and beet and root crops; but not including perennial pasture, short-rotation grass species, and cereal crops

approved farm environment planner means a suitably qualified and experienced person approved under clause 40

approved auditor means a person approved under clause 41

arable farming means farming where the predominant activity is growing any of the following crops for harvest:

a) grain cereal, legumes, or pulse grain:
b) herbage seed:
c) oilseed:
d) crops grown for seed multiplication:
e) maize grain, maize silage, cereal silage, and mangels

certified FW-FP means an FW-FP that has been certified by an approved farm environment planner in accordance with clause 40

commercial vegetable production means the commercial production on a horticultural farm of vegetable crops for human consumption

critical source area means a landscape feature such as a gully, swale, or depression that accumulates runoff from adjacent flats and slopes and delivers it to surface water body such as rivers and lakes, artificial waterways, and field tiles

dairy cattle means cattle farmed for milk production, and-

a) includes unweaned calves of dairy cows, and bulls on the farm whose purpose is mating with dairy cows; but
b) does not include cattle farmed for beef production or as dairy support.

dairy support means pastoral farming where the animals grazed are dairy cattle not being milked (young animals or mixed-aged cows) that are grazed off the milking platform (ie, the area devoted to

feeding dairy cows on a daily basis during the milking season) either temporarily or throughout the year.

drainage ditch means any artificial watercourse designed, constructed, or used to drain surface or subsurface water; but does not include any swale (shallow depression) whose primary purpose is to direct surface water flow during heavy rain

effective hectare means the area of a farm on which animals are grazed

enterprise means one or more parcels of land held in single or multiple ownership to support the principle land use, or land on which the principle land use is reliant, which constitutes a single operating unit for the purposes of management

farm means a property, area of land, or enterprise used for pastoral farming, horticultural farming, or arable farming, other than a farm engaged in intensive indoor primary production

farm year means a 12-month period beginning on 1 July in any year and ending on 30 June in the next year (as in, 2018/19 farm year)

FW-FP means the Freshwater Module of a Farm Plan, as provided for in subpart 3 of this Part

horticultural farming means farming where the predominant activity is growing food or beverage crops for human consumption (other than arable crops), or flowers for commercial supply

intensive winter grazing means on-paddock grazing where stock are grazed between May to September (inclusive) on an annual forage crop, regardless of whether supplementary feed is also being fed

low-slope land means land classified as low-slope in *[to come: MfE mapping tool*] (ie, land with an average slope of less than or equal to 5, [7],[10] degrees when measured at the land parcel scale)

pastoral farming means farming where the predominant activity involves the grazing of livestock on a farm

pugging means the process of penetration into soil surface by the hooves of grazing animals in wet conditions, causing direct damage to pasture and soil structure

stocking rate means the stocking rate calculated in the Farm Technical Manual (Lincoln) Trafford, G and Trafford, S (Eds); 2011 (available at [*link to come*]

stockholding area means a permanent or semi-permanent area, covered or uncovered, that is constructed to hold livestock at a stocking density that precludes the maintenance of pasture or vegetative groundcover, and-

a) includes feedpads, winter pads, standoff pads, loafing pads; but
b) does not include areas used for animal husbandry purposes, such as stockyards, milking sheds, or woolsheds.

26 Application of Part 3

Nothing in this Part applies to the following:

a) pastoral farms of less than 20 hectares:
b) arable farms of less than 20 hectares:
c) horticultural farms of less than 5 hectares.

Subpart 1 – Livestock control

27 Feedlots

(1) In this clause, **feedlot** means a stockholding area in which livestock-

a) are confined for more than 80 days in a 6-month period; and
b) are completely hand-fed or mechanically-fed

(2) Use of land for feedlots is a discretionary activity.

(3) Any resource consent granted for the discretionary activity must include at least the following conditions:

a) the base of the feedlot must be sealed to a minimum permeability standard of 10^{-9} metres per second:
b) the area must be sited at least 50 m away from waterbodies, water abstraction bores, drainage ditches and coastal marine areas:
c) all animal effluent, or water or bedding material containing effluent, must be collected, stored, and disposed of in accordance with regional council regulations or a current discharge permit:
d) if the consent is granted before the date that is 2 years after the commencement date, the applicant must, by that date, have a certified FW-FP for the farm to which the consent applies.

(4) An application for a resource consent for the discretionary activity made after the date that is 2 years after the commencement date must include a certified FW-FP for the farm to which the application relates.

28 Sacrifice Paddocks

(1) In this clause, **sacrifice paddock** means a paddock used temporarily to hold stock in such a way that the pasture is likely to be severely damaged and will require pasture renovation.

Permitted activity

(2) Use of land for a sacrifice paddock is a permitted activity if the area is sited at least 50 m away from waterbodies, water abstraction bores, drainage ditches and coastal marine areas.

Discretionary activity

(3) Use of land for a sacrifice paddock that is not a permitted activity is a discretionary activity.

(4) Any resource consent for the discretionary activity that is granted before the date that is 2 years after the commencement date must include at least the condition that, by that date, the applicant will have a certified FW-FP for the farm to which the consent applies.

(5) An application for a resource consent for the discretionary activity made after the date that is 2 years after the commencement date must include a certified FW-FP for the farm to which the application relates.

29 Other stock holding

Restricted discretionary activity

(1) Holding stock in a stockholding area for more than 30 days in a 12 month period, or for more than 10 consecutive days, is a restricted discretionary activity.

(2) Any resource consent granted for the restricted discretionary activity must include at least the following conditions:

a) the base of the stockholding area must be sealed to a minimum permeability standard of 10^{-9} meters per second:
b) the area must be sited at least 50 m away from waterbodies, water abstraction bores, drainage ditches and coastal marine areas:
c) all animal effluent, or water or bedding material containing effluent, must be collected, stored, and disposed of in accordance with regional council regulations or a current discharge permit:
d) by the date that is 2 years after the commencement date, the applicant must have a certified FW-FP for the farm to which the application relates.

(3) For the purpose of granting a resource consent for the restricted discretionary activity, discretion is reserved over the following:

a) measures to control run-off and contaminant loss:
b) timeframes for adoption of mitigation measures:
c) requirements for compliance monitoring and reporting.

Discretionary activity

(4) Holding stock in a stockholding area for more than 30 days in a 12 month period, or for more than 10 consecutive days, is a discretionary activity if any condition referred to in subclause (3) is not met.

(5) Any resource consent for the discretionary activity that is granted before the date that is 2 years after the commencement date must include at least the condition that, by that date, the applicant will have a certified FW-FP for the farm.

(6) An application for a resource consent for the discretionary activity made after the date that is 2 years after the commencement date must include a certified FW-FP for the farm to which the application relates.

30 Intensive winter grazing

Permitted activity

(1) Intensive winter grazing on a farm is a permitted activity if it complies with the following conditions:

a) the grazing does not take place on land with a slope equal to or greater than 10 [15] degrees:
b) the grazing does not take place over more than 30 ha [50 ha]or 5% [10%] (whichever is greater) cumulatively or in one contiguous area of the farm:
c) any grazing on sloping land takes place progressively downhill from the top of the slope to the bottom of the slope:
d) stock is not grazed in any critical source area:
e) a vegetated strip of at least 5 m [20 m] that does not include any annual forage crop species is maintained between the grazed area and any water body or drainage ditch, and all stock are excluded from this strip during the grazing:

f) the grazed paddock is re-sown within 1 month, or as soon as practicable, after the end of the grazing:
g) pugging to a depth of more than an average of 20 cm [10 cm] does not occur over more than 50% of the paddock.

Restricted discretionary activity

(2) If intensive winter grazing on a farm is not a permitted activity, it is a restricted discretionary activity if-

a) the grazing does not meet the requirements of subclause (1); and
b) in a freshwater management unit to which clause 31 applies, the total area in annual forage crop does not exceed the highest total area in annual forage crop in any farm year between 2013/14 and 2018/19.

(3) For the purpose of granting a resource consent for the restricted discretionary activity, discretion is reserved over the following:

a) the area of annual forage crop:
b) methods of grazing management (such as requiring that grazing on sloping land occurs progressively downhill from the top to bottom of the slope):
c) methods for protecting critical source areas:
d) provision for vegetated strips to protect waterbodies from stock grazing:
e) provisions for re-sowing the grazed paddock:
f) methods for preventing pugging.

(4) Any resource consent for the restricted discretionary activity that is granted before the date that is 2 years after the commencement date must include at least the condition that, by that date, the applicant will have a certified FW-FP for the farm.

(5) An application for a resource consent for the discretionary activity made after the date that is 2 years after the commencement date must include a certified FW-FP for the farm to which the application relates.

Information note
Intensive winter grazing in certain areas that is not a permitted activity or a restricted discretionary activity may be a discretionary activity – *see* clause 33.

Subpart 2 - Intensification

31 Geographic application of subpart 2

(1) The requirements of this subpart apply only in freshwater management units where national policy statements for freshwater management have not been fully implemented.

(2) For the purposes of subclause (1), full implementation by a regional council means, in relation to a freshwater management unit, that-

a) in relation to the National Policy Statement for Freshwater Management 2014 (as amended 2017), the regional council has
    i. defined limits for the defined attributes and included them in rules in the regional plan; and

ii. included any required objectives and policies in the regional policy statement or plan; or

b) in relation to the National Policy Statement for Freshwater Management 2019, the regional council has-

i. defined limits and action plans for the defined attributes and included them in the regional plan; and

ii. included any required objectives and policies in the regional policy statement or plan; and

iii. published all required action plans.

32 Duration of consents

(1) Any resource consent granted for the purposes of this subpart on or before 31 December 2030 expires on 31 December 2030, or any earlier date specified in the consent.

(2) A resource consent granted for the purposes of this subpart after 31 December 2030 must expire within 1 year after the date on which it is granted.

33 Intensive winter grazing within certain areas

(1) This clause does not apply until 1 January 2021.

Discretionary activity

(2) Intensive winter grazing is a discretionary activity if the total area in annual forage crop exceeds the highest total area in annual forage crop in any farm year between 2013/14 and 2018/19.

(3) Any resource consent granted for the discretionary activity must include at least the following conditions:

a) the applicant has a certified FW-FP; and

b) the FW-FP includes actions to avoid, remedy, or mitigate the adverse effects of the activity's contaminant discharges into freshwater, or into land in circumstances that may result in the contamination entering water; and

c) the nitrogen, phosphorus, sediment, or microbial pathogen discharges of the farm that will result from the increased land used will not exceed the average discharges of those contaminants from the farm during the farm year 2017/2018.

(4) An application for a resource consent for the discretionary activity must include a certified FW-FP for the farm to which the application relates.

34 Irrigated farming

Permitted activity

(1) An increase in the amount of land used on a farm for irrigated production (other than production from effluent irrigation) is a permitted activity if the increase since the commencement date is 10 ha or less.

Discretionary activity

(2) An increase in the amount of land used on a farm for irrigated production is a discretionary activity if the increase since the commencement date is more than 10 ha.

(3) Any resource consent granted for the discretionary activity must include at least the following conditions:

a) the applicant has a certified FW-FP; and
b) the FW-FP includes actions to avoid, remedy, or mitigate the adverse effects of the activity's contaminant discharges into freshwater, or into land in circumstances that may result in the contamination entering water; and
c) the nitrogen, phosphorus, sediment, or microbial pathogen discharges of the farm that will result from the increased land used will not exceed the average discharges of those contaminants from the farm during the farm year 2017/2018.

(4) An application for a resource consent for the discretionary activity must include a certified FW-FP for the farm to which the application relates.

35 High-risk land use changes

(1) This clause applies to any farm in which any of the following changes, from an **old use** to a **new use**, occur after the commencement date:

a) land that was used for arable, sheep, deer, or beef farming (old use) is changed to being used for dairy support (new use):
b) land that was used for arable, sheep, deer, beef, or dairy support farming (old use) is changed to being used for dairy farming (new use):
c) land that was used for wood vegetation or forestry (old use) changes to any form of pastoral farming (new use).

Permitted activity

(2) A change from an old use to a new use is a permitted activity if, since the commencement date, the total additional amount of land used on the farm over the farm year for a new use is less than 10 hectares.

Discretionary activity

(3) A change from an old use to a new use is a discretionary activity if, since the commencement date, the total additional amount of land used on the farm over the farm year for a new use is 10 hectares or more.

(4) Any resource consent granted for the discretionary activity must include at least the following conditions:

a) the applicant has a certified FW-FP:
b) the FW-FP includes actions to avoid, remedy, or mitigate the adverse effects of the activity's contaminant discharges into freshwater, or into land in circumstances that may result in the contamination entering water:
c) the nitrogen, phosphorus, sediment, or microbial pathogen discharges of the farm that will result from the increased land used will not exceed the average discharges of those contaminants from the farm during the farm year 2017/2018.

(5) An application for a resource consent for the discretionary activity must include a certified FW-FP for the farm to which the application relates.

36 Land use change to commercial vegetable production

Permitted activity

(1) Any change in land use to commercial vegetable growing by a farm since the commencement date is a permitted activity if, following the change, the total area of land in a freshwater management unit that is used by the farm for that purpose does not exceed the greatest total amount used for vegetable growing in that freshwater management unit by the farm in any one farm year between the 2013/14 and 2018/19 farm years.

Discretionary activity

(2) If the total amount of land in a freshwater management unit used by a farm for commercial vegetable production increases by more than the greatest total amount of land used in the freshwater management unit for vegetable growing by the farm in any one year between 2013 and 2018, the change is a discretionary activity.

(3) Any resource consent granted for the discretionary activity must be granted subject to the following conditions:

a) the applicant has a certified FW-FP:
b) the FW-FP includes actions to avoid, remedy, or mitigate the adverse effects of the activity's contaminant discharges into freshwater, or into land in circumstances that may result in the contamination entering water:
c) the nitrogen, phosphorus, sediment, or microbial pathogen discharges of the farm that will result from the increased land used will not exceed the average discharges of those contaminants from the farm over the period 2013 – 2018.

(4) An application for a resource consent for the discretionary must include a certified FW-FP for the farm to which the application relates.

Subpart 3 - Freshwater module of farm plans

37 Who must have FW-FP?

(1) Within 2 years after the commencement date, the following farms that do not already have a certified FW-FP must have a certified FW-FP:

a) farms used for commercial vegetable production:
b) farms in the catchments and subcatchments identified in Schedule 1:
c) farms in the Kaipara catchment that are on highly erodible land:
d) farms in the following 2 exemplar catchments:
    i)) Pelorus:
    ii) Manuherekia.

(2) By 31 December 2025, every other farm to which this Standard applies must have a certified FW-FP.

38 Content of FW-FP

(1) Every FW-FP must include at least the following:

a) the physical address of the farm:
b) the legal description of the land:
c) the farm identifier (if any):
d) the name, address, and contact details of the land owner:
e) the contact details of the person responsible for overseeing the implementation of the FW-FP:

f) reference to every relevant resource consent, along with the date it was granted and the date (if any) on which it expires:
g) mapping requirements that meet the requirements of subclause (2):
h) a risk assessment that meets the requirements of subclause (3):
i) action points that address the risks identified under subclause (3) and meet the requirements of subclause (4):
j) for farms in the catchments and subcatchments identified in Schedule 1, action points to reduce nitrogen discharges in accordance with subclause (5).

(2) The mapping required in an FW-FP must, whether using maps, aerial photography, or both, clearly show the following:

a) the boundaries of the property:
b) the boundaries of the main land management units within the property:
c) location of soil types:
d) location of permanent or intermittent rivers, streams, lakes, drainage ditches, ponds, overland flow paths, and wetlands:
e) the location of source protection zones for human drinking water:
f) the location of riparian vegetation and fences (including virtual fences) adjacent to waterbodies:
g) the location on all water bodies where stock access or crossing occurs:
h) the location of any critical source areas for nutrient loss, soil loss, or both.

(3) The risk assessment part of the FW-FP must identify and assess the risk of contaminant losses from the farm, with consequent impacts on freshwater ecosystem health, associated with any of the following activities carried out on the farm:

a) land management activities occurring on or near the locations referred to in subclause (2)(d) – (h):
b) previous or existing land uses that may be hazardous, such as-
   i. offal pits and farm dumps:
   ii. land on which an activity or industry described in the Hazardous Activities and Industries List is being, or has been, undertaken:
c) management of erosion-prone land:
d) management of soil loss resulting from land disturbance:
e) irrigation:
f) stock management, especially near waterbodies, drainage ditches, and riparian margins:
g) fertiliser and effluent management:
h) management of contaminant loss as a result of land disturbance:
i) management of activities required by this Standard to have a FW-FP.

(4) The action points in an FW-FP must identify the actions that the person implementing the FW-FP is undertaking, or will undertake, to avoid, remedy, or mitigate the loss of contaminants, along with timeframes for those actions.

(5) The action points in an FW-FP must identify the actions (with timeframes where relevant) that the person implementing the FW-FP is undertaking, or will undertake, to avoid, remedy, or mitigate the loss of nitrogen in accordance with:

a) any relevant plan rule; or
b) where there are no relevant plan rules, best practice options appropriate for the farm type, size and operation.

Information note

Activities and industries described in the Hazardous Activities and Industries List include those involving:

- agrichemicals
- fertiliser manufacture or bulk storage
- livestock dip or spray race operations
- persistent pesticide bulk storage or use
- pest control
- storage tanks or drums for fuel, chemicals, or liquid waste.

39 Obligation to provide FW-FP if required

The person who is responsible for an FW-FP must, on request by the relevant regional council, provide a copy of the FW-FP to the council as soon as practicable.

40 Certification of FW-FP

(1) An FW-FP may only be certified by a farm environment planner approved by the Minister for the Environment and the Minister of Agriculture.

(2) A person may not be approved as an approved farm environment planner unless he or she has at least the following qualifications and experience:

a) 3 years' experience in the management of pastoral, horticultural, or arable farm systems:
b) Successful completion of relevant training or qualification, and approved completion of requirements of the certification scheme approved by the Minister for the Environment and the Minister of Agriculture.

(3) An approved farm environment planner may certify an FW-FP only if satisfied that the FW-FP-

a) accurately identifies risks, as required by clause 38(3); and
b) sets out actions that can or will appropriately address those risks; and
c) is consistent with the Good Farming Principles as set out in the Good Farming Practice: Action Plan for Water Quality 2018; and
d) is consistent with relevant regional policy statements and plans and any relevant strategies and guidance issued by the regional council.

(4) As soon as practicable after certifying an FW-FP, the approved farm environment planner must notify the relevant regional council of the date on which the FW-FP was certified, using whatever method the council specifies to identify the farm to which the FW-FP relates.

41 Audit of compliance with FW-FP

(1) Every person responsible for implementing a certified FW-FP must arrange to have their compliance with the FW-FP audited by an approved auditor (who must not be the same person who certified the FW-FP).

(2) The approved auditor must be a suitably qualified and experienced person approved by the Minister for the Environment and the Minister of Agriculture.

(3) A person may not be approved as an approved auditor unless he or she has at least the following qualifications and experience:

a) 3 years' experience in the management of pastoral, horticultural, or arable farm systems:
b) Successful completion of relevant training or qualification, and approved completion of requirements of the certification scheme approved by the Minister for the Environment and the Minister of Agriculture:
c) is a member of an international standards organisation accredited audit programme or other audit scheme recognised by the Minister for the Environment and the Minister of Agriculture.

(4) An audit must be conducted within 24 months after the first certification of an FW-FP.

(5) Thereafter, an audit must be conducted every 2 years, unless the approved auditor is satisfied the environmental performance of the farm is at a level that means the next audit need not take place for 3 years.

(6) The audit must check and report on-

a) the accuracy of the information in the FW-FP; and
b) whether the proposed actions are likely to be effective in reducing contaminant loss: and
c) whether the person responsible for the FW-FP is doing the things outlined in the action points of the FW-FP; and
d) any remedial action to be carried out to meet the requirements of this Standard; and
e) any updates of the FW-FP required to reflect changing technologies and farm practices.

(7) On completion of an audit, the approved auditor must notify the relevant regional council that the audit has been completed and advise it of the results of the audit and when the next audit is due to be carried out.

Additional proposal for the management of nitrogen in Schedule 1 catchments

Information note
Subpart 4 below is an alternative proposal for managing nitrogen loss. If adopted, it would replace clauses 38(1)(j) and 38(5).

Subpart 4 - Nitrogen cap

42 Application of subpart 4

(1) This subpart applies only to farms in catchments that are identified in Schedule 1, but only until the National Policy Statement for Freshwater Management 2019 is fully implemented (as defined in clause 31(2)(b)) in the catchment.

(2) Clauses 46 and 47 apply on and from the commencement date, but-

a) clauses 44 and 45 do not apply until 19 months after the commencement date.
b) clause 48 does not apply until 18 months after the commencement date.

43 Definitions for subpart 4

In this subpart-

***baseline nitrogen loss figure** means the nitrogen loss figure calculated for the purposes of clause 47*

nitrogen loss figure *means the amount of nitrogen lost from the whole of a farm by leaching from farming activities, expressed in kilograms per hectare per year*

Overseer *means, at any time, the latest version of the proprietary software (OverseerFM) nutrient budget model used by applying the Best Practice Data Input Standards 2016*

Overseer modeller *means-*

a) *a nutrient manager certified under the Nutrient Manager Adviser Certification Programme; or*
b) *in respect of any farm, a suitably qualified person approved by the regional council in which the farm is located*

threshold value *means the value calculated by a regional council for the purposes of clause 47.*

44 Controlled activity

(1) Low-slope pastoral farming and all dairy farming is a controlled activity if, at any time, the nitrogen loss figure for the farm exceeds the threshold value for the catchment or subcatchment in which the farm is located.

(2) For the purpose of granting a resource consent for the controlled activity, the matter over which control is reserved is nitrogen loss.

(3) An application for a resource consent for the purposes of this clause will not be publicly or limited notified.

(4) A resource consent granted for the controlled activity must include at least the following conditions:

a) *the farm must have a certified FW-FP that includes actions that will, within 5 years, reduce the farm's nitrogen loss by the difference (expressed as a percentage) between-*
   i) *the farm's baseline nitrogen loss figure; and*
   ii) *the threshold value for the catchment in which the farm is located:*
b) *by 30 September in each year the farmer must provide the relevant local authority with-*
   i) *an Overseer output file for the previous farm year, certified by an Overseer modeller; and*
   ii) *documentation certified by an approved auditor that shows whether the farmer is complying with the FW-FP as it relates to reducing nitrogen loss:*
c) *within 3 years after the granting of the consent, the farmer must provide evidence to the relevant regional council to show that nitrogen loss from the farm has been reduced by at least 50% of the figure referred to in (a) above:*
d) *the consent expires on a specified date not later than 5 years after the date it is granted.*

45 Discretionary activity

(1) Low-slope pastoral farming and all dairy farming is a discretionary activity if, at any time,-

a) *the nitrogen loss figure for the farm exceeds the threshold value for the catchment in which the farm is located; and*
b) *the farm either does not have a certified FW-FP, or it has a certified FW-FP but it does not includes actions that will, within 5 years, reduce the farm's nitrogen loss by the difference (expressed as a percentage) between-*

i) the farm's baseline nitrogen loss figure; and
ii) the threshold value for the catchment in which the farm is located.

(2) Any resource consent granted for the discretionary activity must include at least the following conditions:

a) the farm must have a certified FW-FP that includes actions that will reduce the farm's nitrogen loss using best practicable options:
b) by 30 September in each year the farmer must provide the relevant local authority with-
i) an Overseer output file for the previous farm year, certified by an Overseer modeller; and
ii) documentation certified by an approved auditor that shows whether the farmer is complying with the FW-FP as it relates to reducing nitrogen loss:
c) within 3 years after the granting of the consent, the farmer must provide evidence to the relevant regional council to show that nitrogen loss from the farm has been reduced by at least 50% of the figure referred to in (a) above:
d) the consent expires on a specified date not later than 5 years after the date it is granted.

46 Requirement to provide baseline nitrogen loss figure

(1) Every farmer of a dairy farm or a low-slope pastoral farm (that is not a dairy farm) must provide the nitrogen loss figure for the farm to the relevant regional council-

a) in the form of an electronic Overseer output file certified as accurate by an Overseer modeller; and
b) within-
i) for dairy farms, 6 months after the commencement date; and
ii) for low-slope pastoral farms (other than dairy farms), 12 months after the commencement date.

(2) The nitrogen loss figure must be calculated over a farm year and must be-

a) the higher of the figures calculated in the 2017/18 farm year or the 2018/19 farm year; or
b) if those figures are not available, a figure representing nitrogen loss for the current year.

47 Regional council to calculate threshold values

(1) Every regional council with farms to which this subpart applies must calculate a threshold value for each catchment or subcatchment to which this subpart applies, as at 7 months after the commencement date, based on the nitrogen loss figures supplied under clause 46(1)(b)(i) by dairy farmers in each catchment.

(2) The threshold value for a catchment or subcatchment must be set as the highest nitrogen loss figure in the bottom [70 – 90%] of the nitrogen loss figures supplied under clause 46(1)(b)(i), when the nitrogen loss figures are ranked in ascending order.

48 Requirement to provide Overseer output files

Every farmer with a low-slope pastoral farm that is not required by clauses 44 or 45 to have a resource consent must provide annually to the relevant regional council an Overseer output file, certified by an Overseer modeller, of their farming activities for the previous farm year.

Schedule 1

Catchment name	Region
Taharua River	Hawke's Bay
Waipao Stream	Northland
Mataura River	Southland
Oreti River	Southland
Waimatuku Stream	Southland
Aparima River	Southland
Waihopai River	Southland
Waingongoro River	Taranaki
Motupipi River	Tasman Region
Piako River	Waikato Region
Waihou River	Waikato Region
Parkvale Stream	Wellington
Upper Rangitaiki and Otangimoana Rivers (upstream of their confluence only)	Bay of Plenty

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Draft NPSFM

Draft National Policy Statement for Freshwater Management

Version 16, for 22 August 2019

Authority

This national policy statement is issued by the Minister for the Environment under section 54 of the Resource Management Act 1991.

Contents

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Part 1: Preliminary provisions

1.1 Title

This is the National Policy Statement for Freshwater Management 2019.

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1.2 Commencement

This national policy statement comes into force on [*to come*].

1.3 Purpose of national policy statement

The purpose of this national policy statement is to set out objectives and policies in relation to freshwater management and to specify what local authorities must do to help achieve those objectives and policies.

1.4 Matter of national significance

The matter of national significance that this national policy statement is about is freshwater management.

1.5 Fundamental concept – Te Mana o te Wai

Te Mana o te Wai, the "the mana of the water", refers to the fundamental value of water and the importance of prioritising the health and wellbeing of water before providing for human needs and wants. It expresses New Zealanders' special connection with freshwater. When Te Mana o te Wai is upheld, the future wellbeing of people and our unique ecosystems is protected.

Upholding Te Mana o te Wai protects the mauri of the water and requires that Te Hauora o te Taiao (the health of the environment), Te Hauora o te Wai (the health of the waterbodies), and Te Hauora o te Tangata (the health of the people) are all provided for.

[Placeholder for reference to the Treaty of Waitangi, if it's not included in a preamble. For example: Te Mana o te Wai is cross-cultural in application. The Treaty of Waitangi /Te Tiriti o Waitangi is the underlying foundation of the Crown and Māori relationship, and is important to all New Zealanders. Te Tiriti upholds Te Mana o te Wai.]

As it applies to freshwater management, Te Mana o te Wai is a framework that has a number of features. These may be interpreted differently by different people in different contexts. It is relevant to the application of various regulatory and non-regulatory tools. The features of Te Mana o te Wai that are relevant to, and reflected in, this national policy statement, are:

- the principles of [Mana whakahaere/governance] kaitiakitanga/stewardship and manaakitanga/respect and care
- the **hierarchy of obligations** – to waterbodies first, then to the essential needs of people, and finally for other uses:

In the context of this national policy statement, giving effect to Te Mana o te Wai requires the following, and may include other things as determined locally:

a) adopting the priorities set out in the hierarchy of obligations:
b) providing for the involvement of iwi and hapū in freshwater management and identifying and reflecting tangata whenua values and interests:
c) engaging with tangata whenua and communities to identify matters that are important to them in respect of waterbodies and their catchments:
d) enabling the application of broader systems of values and knowledge, such as mātauranga Māori, to the health and wellbeing of waterbodies and freshwater ecosystems:

e) adopting an integrated approach, ki uta ki tai, to the management of waterbodies and freshwater ecosystems.

1.6 Definitions

(1) In this National Policy Statement-

Act means the Resource Management Act 1991

attribute means a measurable characteristic that can be used to assess a particular component of a value applied to water under the national objectives framework (*see* clauses 3.5 – 3.15)

commencement date means the date on which this National Policy Statement comes into force

compulsory value means any of the 3 [4] values of: Ecosystem Health, Human Contact, [Mahinga Kai or Tangata Whenua Value,] and Threatened Species, as described in Appendix 1A

ecosystem health has the meaning given in Appendix 1A

ecosystem services are the benefits obtained from ecosystems, which include-

a) supporting services (e.g. nutrient cycling, soil formation, habitat creation);
b) provisioning services (e.g. food, freshwater, wood, fibre, fuel);
c) regulating services (e.g. water purification, climate regulation, flood regulation, disease regulation); and
d) cultural services (e.g. aesthetic, spiritual, educational, recreational)

efficient allocation, in relation to water, includes economic, technical, and dynamic efficiency

environmental outcome means an environmental outcome for an FMU, or for individual water body or freshwater ecosystem that is described as required by clause 3.7

FMU, or **freshwater management unit**, means all or any part of a water body or waterbodies, and their related catchments, that a regional council determines under clause 3.6 is an appropriate unit for freshwater management and accounting purposes

inland wetland has the meaning in clause 3.15

ki uta ki tai ("from the mountains to the sea"), as used in the context of this National Policy Statement, refers to a holistic and integrated approach to freshwater management

limit refers to either a limit on resource use or a take limit

limit on resource use means a limit as defined in clause 3.10

national bottom line means an attribute state identified as such in Appendix 2A or 2B

natural wetland has the meaning in clause 3.15

outstanding water body means a water body identified in a regional policy statement or plan as having outstanding values (such as ecological, landscape, recreational, or spiritual values)

over-allocation, in relation to both the quantity and quality of water, is the situation where the water-

a) has been allocated to users beyond a limit on resource use or a take limit; or

b) is being used to a point where one or more target attribute states is not being met

primary contact site means a site identified by a regional council that it considers is regularly used, or would be regularly used, but for existing freshwater quality, for recreational activities such as swimming, paddling, boating, or watersports, and particularly for activities where there is a high likelihood of water or water vapour being ingested or inhaled

publish, in relation to an obligation on a local authority to publish material, means to make the material freely available to the public on the local authority's Internet site

stream has the same meaning as **river** in the Act, and is used interchangeably with that term, as consistent with common usage

take limit means a limit on the amount of water that can be taken from an FMU, as set under clause 3.12

Te Mana o te Wai has the meaning set out in clause 1.5

terrestrial environment means land above mean high water springs

threatened species are taxa that meet the criteria specified by Townsend et al. (2008) for the categories Nationally Critical, Nationally Endangered, and Nationally Vulnerable Species (*Andrew J. Townsend, Peter J. de Lange, Clinton A.J. Duffy, Colin M. Miskelly, Janice Molloy and David A. Norton (2008). The New Zealand Threat Classification System Manual*, available at:

https://www.doc.govt.nz/globalassets/documents/science-and-technical/sap244.pdf.

water body has the meaning in the Act, except that it does not include geothermal water.

(2) Terms defined in the Act and used in this National Policy Statement have the meanings in the Act, except as otherwise specified.

1.7 Application

Geographic application

(1) This national policy statement applies to freshwater in the terrestrial environment throughout New Zealand, except that any consideration of receiving environments includes consideration of environments in the coastal marine area.

Temporal application

(2) This national policy statement applies as from the date [*to come*], which means, for instance, that-

a) references to "current" or "existing" means existing as at that date; and
b) a requirement to "maintain" something is a requirement to maintain the thing as it was at that date.

(3) *See* Part 4 for provisions about the timing of the implementation of this national policy statement.

Information note

The coastal marine area is covered by the New Zealand Coastal Marine Policy.

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1.8 Application of section 55(2) of Act

(1) A requirement in this national policy statement to include a specific objective or policy (as, for instance, in clauses 3.2(1) and 3.15(2) is a requirement referred to in section 55(2)(a) of the Act.

(2) This means the specified objective or policy must be included in policy statements or plans (as required) without using the process in Schedule 1 of the Act.

Part 2: Objective and policies

2.1 Objective

The objective of this national policy statement is to ensure that resources are managed in a way that prioritises-

a) first, the health and wellbeing of waterbodies and freshwater ecosystems; and
b) second, the essential health needs of people; and
c) third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.

2.2 Policies

The policies that this national policy statement is intended to achieve are as follows:

Policy 1: Freshwater is managed in a way that gives effect to Te Mana o te Wai:

Policy 2: Freshwater is managed through a National Objectives Framework, in order to ensure that the health and wellbeing of waterbodies and freshwater ecosystems is maintained or improved:

Policy 3: The condition of waterbodies and freshwater ecosystems is systematically monitored over time, and action is taken to reverse deteriorating trends:

Policy 4: Freshwater is managed in an integrated way that considers the effects of the use and development of land on a whole-of-catchments basis, including the effects on sensitive receiving environments:

Policy 5: Iwi and hapū are involved in freshwater management, and tangata whenua values and interests are identified and reflected in the management of, and decisions relating to waterbodies and freshwater ecosystems:

Policy 6: The national target for water quality improvement (as set out in Appendix 3) is achieved:

Policy 7: Freshwater is allocated and used efficiently, all existing over-allocation is phased out, and future over-allocation is avoided:

Policy 8: There is no further loss or degradation of natural inland wetlands:

Policy 9: There is no further net loss of streams:

Policy 10: The significant values of outstanding waterbodies are protected:

Policy 11: The habitats of indigenous freshwater species are safeguarded:

Policy 12: Information about the state of waterbodies and freshwater ecosystems, and the challenges to their health and wellbeing, is regularly reported on and published:

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Policy 13: Communities are enabled to provide for their economic wellbeing while managing freshwater in a manner consistent with Te Mana o te Wai and as required by the national objectives framework and other requirements of this national policy statement.

Part 3: Implementing objective and policies

3.1 Overview of Part

This Part sets out what local authorities must do to implement or give effect to the objective and policies of this national policy statement as follows:

a) subpart 1 is about the manner in which local authorities must go about implementing this national policy statement:
b) subpart 2 sets out the national objectives framework for managing freshwater:
c) subpart 3 set out additional specific obligations on regional councils.
d) subpart 4 sets out exceptions applying to requirements on regional councils.

Subpart 1 Approaches to implementing objective and policies

3.2 Te Mana o te Wai

(1) Every regional council must include the following objective (or words to the same effect) in its regional policy statement:

"The management of freshwater in our region must be carried out in a manner that gives effect to Te Mana o te Wai, as it is described in the National Policy Statement for Freshwater Management 2019 and understood locally."

(2) Every regional council must give effect to Te Mana o te Wai in implementing this national policy statement.

(3) Te Mana o te Wai must inform the interpretation of-

a) the objective and policies of this national policy statement; and
b) the objectives and policies required by this national policy statement to be included in local authority policy statements and plans.

(4) As part of the requirement to give effect to Te Mana o te Wai, when implementing this national policy statement regional councils must specifically engage in discussion with communities and tangata whenua to determine local understandings of Te Mana o te Wai as applied to freshwater bodies in the region.

(5) In particular, every regional council must develop, and articulate in its regional policy statement, a long-term vision that gives effect to Te Mana o te Wai.

(6) The long-term vision must-

a) be developed through discussion with communities and tangata whenua about their long-term wishes for waterbodies in the region; and
b) be informed by an understanding of the history of, and current pressures on, waterbodies in the region; and
c) express what communities and tangata whenua want their waterbodies to be like in the future.

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(7) Every regional council must assess whether waterbodies in the region can both sustain current pressures on them and provide for the long-term vision articulated in its regional policy statement.

(8) The long-term vision and the discussions that led to it must inform and provide the context for all subsequent freshwater management and freshwater planning decisions in the region.

3.3 Tangata whenua roles and interests

(1) As part of the requirement to give effect to Te Mana o te Wai, regional councils must engage with tangata whenua in the management of waterbodies and freshwater ecosystems.

(2) Engagement with tangata whenua requires taking reasonable steps to-

a) involve tangata whenua in freshwater management and decisions-making regarding freshwater planning; and
b) identify tangata whenua values and interests in relation to waterbodies and freshwater ecosystems; and
c) reflect those values and interests in the management of, and decision-making regarding, the waterbodies and freshwater ecosystems in the region.

3.4 Integrated management

(1) Regional councils must, consistent with Te Mana o te Wai,-

a) recognise the interactions ki uta ki tai between freshwater, land, waterbodies, freshwater ecosystems, other ecosystems, and sensitive receiving environments, including the coastal environment; and
b) manage freshwater, and land use and development, in catchments in an integrated and sustainable way to avoid, remedy, or mitigate adverse effects, including cumulative effects.

(2) Regional councils must make or change their regional policy statements to the extent needed to provide for the integrated management of the effects of-

a) the use and development of land on freshwater; and
b) the use and development of land and freshwater on sensitive receiving environments.

(3) Giving effect to subclause (2) includes encouraging the co-ordination and sequencing of regional or urban growth, land use and development, and the provision of infrastructure.

(4) In order to give effect to this national policy statement, local authorities that share jurisdiction over a catchment should co-operate in the integrated management of the effects on freshwater of land use and development.

(5) Every regional council must insert the following method (or words to the same effect) into its regional policy statement:
"District plans must include objectives, policies, and methods to avoid, remedy, or mitigate the cumulative adverse effects of land use on freshwater bodies, freshwater ecosystems, and sensitive receiving environments resulting from urban development."

(6) Every territorial authority must include objectives, policies, and methods in its district plan at the next review of the plan to avoid, remedy, or mitigate the cumulative adverse effects of land use resulting from urban development on water bodies and sensitive receiving environments.

Information box:

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The following are examples of the kinds of methods territorial authorities could use to comply with clause 3.4(7):

- Regulating impervious surface cover and/or requiring on-site infiltration
- Requiring treatment of contaminants at source
- Using zoning/designations to avoid all, or certain types of development in areas where the effects on freshwater could not be adequately managed
- Provision of green infrastructure (especially for stormwater management)
- Use of best practice Water Sensitive Urban Design or Low Impact Design technique.

Subpart 2 National objectives framework

3.5 Overview of national objectives framework

(1) The national objectives framework requires that every regional council identifies values for each FMU in its region; sets target attribute states, and flows and levels, for waterbodies; develops interventions (limits specified in rules, or action plans) to achieve the target attribute states, flows, and levels; monitors waterbodies and freshwater ecosystems; and takes steps if deterioration is detected.

(2) At every stage of the process, regional councils must engage with communities and tangata whenua in order to give effect to Te Mana o te Wai, as required by clause 3.2.

3.6 Identify FMUs and monitoring sites

(1) Every regional council must identify FMUs for its region.

(2) Every water body in the region must be located within an FMU.

(3) Every regional council must also identify the following (if present) within each FMU:

a) sites to be used for monitoring attributes:
b) primary contact sites:
c) the location of habitats of threatened species:
d) outstanding waterbodies:
e) inland wetlands (*see* clause 3.15).

(4) Monitoring sites in an FMU must be located at sites that are either or both of the following:

a) representative of the FMU:
b) representative of one or more primary contact sites in the FMU.

3.7 Identifying values and environmental outcomes

(1) Every regional council must identify the values that apply to each FMU, as follows:

a) the compulsory values as set out in Appendix 1A:
b) any of the other values set out in Appendix 1B that the council considers applies:
c) any other value as the council considers, after consultation with its community and tangata whenua, applies.

(2) For each FMU, or for individual waterbodies or freshwater ecosystems within an FMU, the regional council must describe the environmental outcomes that it wants to achieve for-

a) the value Ecosystem Health, and each of its components; and
b) the value Human Contact, and each of its components; and

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c) the value[s] [Mahinga Kai or Tangata Whenua Value and] Threatened Species; and
d) any other values and components the council identifies.

(3) A regional council may identify additional components and attributes for any of the compulsory values, and components and attributes for any additional values identified.

(4) Any attributes developed by councils must be specific and, where possible, be able to be assessed in numeric terms.

(5) Regional councils must include the environmental outcomes identified or described under this clause as an objective in their regional plans.

3.8 Identifying current attribute states

(1) Every regional council must identify the current state of each attribute (noting that water quantity does not have attributes – *see* clause 3.11).

(2) The current state need not be a single measure but may take into account natural variability and sampling error.

(3) If a regional council does not have complete and scientifically robust data on which to establish the current state of an attribute, it must use its best efforts to identify a current state using the information that is available, including partial data, local knowledge, and information obtained from other sources.

3.9 Setting target attribute states

(1) In order to achieve the environmental outcomes described under clause 3.7, every regional council must set a target attribute state for every attribute, as at each relevant monitoring site.

(2) Every target attribute state must-
a) for attributes relating to the value Human Contact, be above the current state of that attribute as determined under clause 3.8; and
b) for all other attributes, be at or above the current state of that attribute as determined under clause 3.8.

(3) However, if the current attribute state is worse than the national bottom line for that attribute (as identified in Appendix 2A or 2B), the target attribute state must be set at, or better than, the national bottom line (*see* subpart 4 for exceptions to this).

(4) Every target attribute state must-
a) specify a timeframe for achieving the target attribute state; and
b) for attributes for compulsory values, be set in terms of the requirements of Appendix 2A or 2B, as appropriate; and
c) for any other attribute, be set in any way appropriate to the attribute.

(5) Timeframes for achieving target attribute states-
a) may be of any length or period; but
b) if timeframes are long-term, they must include interim targets (set for intervals of not more than 10 years) to be used to assess progress towards achieving the target attribute state in the long-term.

(6) When setting target attribute states, regional councils must-

a) have regard to the following:
   i) the foreseeable impacts of climate change:
   ii) the long-term vision set under clause 3.2:
   iii) the environmental outcomes set under clause 3.7(2):
   iv) the connections between waterbodies:
   v) the connection of waterbodies to coastal water; and
b) use the best information available at the time; and
c) not delay making decisions because of uncertainty about the quality or quantity of the information; and
d) take into account results or information from freshwater accounting systems; and
e) consider the requirements of all other national directions.

(7) If an attribute applies to more than one value, the most stringent target state that is required to achieve the environmental outcomes described under clause 3.7 must be applied wherever that attribute applies.

3.10 Identifying limits on resource use and preparing action plans

(1) In order to achieve the target attribute states for the attributes in Appendix 2A, every regional council-

a) must identify limits on resource use that will achieve the target attribute state; and
b) must include the limits on resource use as rules in its regional plan; and
c) may prepare and publish action plans; and
d) may impose conditions on resource consents.

(2) In order to achieve the target attribute states for the attributes in Appendix 2B, every regional council-

a) must prepare an action plan for achieving the target attribute state within the specified timeframe; and
b) must publish the action plan; and
c) may identify limits on resource use and include them as rules its regional plan; and
d) may impose conditions on resource consents.

(3) In order to achieve any other target attribute states, a regional council may do any or all of the following:

a) identify limits on resource use and include them as rules in its regional plan:
b) prepare and publish action plans:
c) impose conditions on resource consents.

(4) Limits on resource use may-

a) apply to any activity or land use practice; and
b) apply at any scale (such as to all or any part of an FMU, or to a specific water body or individual property); and
c) be expressed as an input control (such an amount of fertiliser that may be applied) or an output control (such as a volume or rate of discharge) and
d) describe the circumstances in which the limit applies.

(5) In setting limits on resource use, regional councils must-

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a) use the best information available at the time (which may be include measured, modelled, or estimated data); and
b) take into account results or information from freshwater accounting systems.

(6) Action plans may be published either by including them in a regional plan, or by being published separately.

3.11 Setting environmental flows and levels

(1) Every regional council must set environmental flows and levels for each FMU, and may set them for individual waterbodies or parts of waterbodies in an FMU.

(2) The environmental flows and levels must be developed on the basis of the environmental outcomes identified defined under clause 3.7.

(3) The environmental flows and levels must be expressed in terms of the water level, flow rate, and variability of flow (as appropriate to the water body) at which-

a) for flows and levels in rivers, the taking, damming, or diverting of water meets the environmental outcomes for the river and any connected water body; and
b) for levels of lakes, the taking, damming, or diverting of water meets the environmental outcomes for the lake and any connected water body; and
c) for levels of groundwater, the taking, damming, or diverting of meets the environmental outcomes for the groundwater and any connected surface water.

(4) Clause 3.9(6) applies when regional councils are setting environmental flows and levels.

3.12 Identifying take limits

(1) In order to meet environmental flows and levels, every regional council-

a) must identify take limits for each FMU; and
b) must include the take limits as rules in its regional plan; and
c) must state in its regional plan whether existing water permits will be reviewed to comply with environmental flows and levels; and
d) may prepare and publish action plans; and
e) may impose conditions on resource consents.

(2) Take limits must be expressed as a total volume or total rate at which water may be taken from each FMU, or from parts of an FMU, and must the circumstances in which the take may occur.

(3) Take limits must be identified at levels that-

a) provide for flow or level variability that meets the needs of the relevant water body and connected waterbodies, and their associated ecosystems; and
b) safeguard ecosystem health from the effects of the take limit on the frequency and duration of lowered flows or levels; and
c) provide for the lifecycle needs of aquatic life; and
d) provide for the essential health needs of people; and
e) take into account the environmental outcomes applying to the relevant waterbodies and any connected waterbodies (such as aquifers and downstream surface waterbodies), whether in the same or another region.

(4) Clause 3.10(5) and (6) applies when regional councils are identifying take limits.

3.13 Monitoring

(1) Every regional council must establish methods for monitoring progress towards achieving target attributes states and identified environmental outcomes for values and components.

(2) The methods must include-

a) measures of the health of indigenous flora and fauna; and
b) mātauranga Māori.

(3) Monitoring methods must recognise the importance of long-term trends in monitoring results, and the relationship between results and their contribution to evaluating the environmental outcomes set under clause 3.7(2).

3.14 What to do if deterioration detected

(1) If a regional council detects a trend indicating a deterioration in any attribute state, or a failure to achieve identified environmental outcomes for values or components, it must prepare an action plan for halting, and if possible reversing, the deterioration.

(2) The action plan must include actions to identify the causes of the deterioration, methods to address those causes, an evaluation of the effectiveness of the methods, and processes for regular review and adjustment.

(3) Where a target attribute state, environmental flow or level, or environmental outcome is not being met, the regional council may take any other steps, which may be regulatory (such as making rules or implementing methods), non-regulatory, or both, to assist the improvement of water quality, and avoid over-allocation, within defined timeframes.

Information notes

Action plans may include, for example-

a) describing the circumstances (ie, minimum flows) at which water takes will be restricted by way of a water shortage direction under section 329 of the Act:
b) points at which monitoring will be increased.

The following table identifies the values, components, and attributes of the compulsory values, and the minimum interventions that regional councils must use to achieve the target attribute states.

Table Number	Value	Component	Attribute	Minimum Intervention
3	Ecosystem health	Water quality	Total Nitrogen (lakes) (to be included in App 2A)	Limit
4	Ecosystem health	Water quality	Total Phosphorus (lakes) (to be included in App 2A)	Limit
5	Ecosystem health	Water quality	Dissolved Inorganic Nitrogen (rivers)	Limit

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Table Number	Value	Component	Attribute	Minimum Intervention
6	Ecosystem health	Water quality	Dissolved Reactive Phosphorus (rivers)	Limit
7	Ecosystem health	Water quality	Amonia toxicity (rivers)	Limit
8	Ecosystem health	Water quality	Nitrate toxicity (rivers)	Limit
9	Ecosystem health	Water quality	Dissolved oxygen (rivers)	Limit or Action Plan
10	Ecosystem health	Water quality	Suspended fine sediment (rivers)	Limit
19	Ecosystem health	Water quality	Dissolved oxygen (general)	Action Plan
20	Ecosystem health	Water quality	Dissolved oxygen (lakes) (bottom)	Action Plan
21	Ecosystem health	Water quality	Dissolved oxygen (lakes – seasonally stratifying) (Mid-hypolimnetic)	Action Plan
18	Ecosystem health	Physical habitat	Deposited sediment (rivers - wadeable)	Action Plan
1	Ecosystem health	Aquatic life	Phytoplankton (lakes) (to be included in App 2A)	Limit
2	Ecosystem health	Aquatic life	Periphyton (rivers) (to be included in App 2A)	Limit
13	Ecosystem health	Aquatic life	Macroinvertebrates (MCI*, QMCI) (rivers - wadeable)	Action Plan
14	Ecosystem health	Aquatic life	Macroinvertebrates (ASPM) (rivers - wadeable)	Action Plan
15	Ecosystem health	Aquatic life	Fish (IBI) (rivers)	Action Plan
16	Ecosystem health	Aquatic life	Lake submerged plants (native)	Action Plan
17	Ecosystem health	Aquatic life	Lake submerged plants (invasive species)	Action Plan

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Table Number	Value	Component	Attribute	Minimum Intervention
22	Ecosystem health	Ecosystem processes	Ecosystem metabolism (rivers)	Action Plan
11	Human contact	Human health	E.coli (lakes and rivers)	Limit or Action plan
12	Human contact	Human health	Cyanobacteria (lakes and lake-fed rivers)	Limit or Action plan
23	Human contact	Primary contact	E.coli	Action plan

Subpart 3 Specific requirements

3.15 Inland wetlands

(1) In this subpart-

coastal wetland means a natural wetland that is influenced by marine or coastal geomorphological processes to the seaward extent of freshwater influence, and includes-

a) saltmarshes (of which mangroves can be a structural component); and
b) seagrass meadows in intertidal and subtidal zones less than 2 m below mean low water spring tide

constructed wetland means a wetland constructed by artificial means that-

a) supports an ecosystem of plants that are suited to wet conditions; and
b) is constructed for a specific purpose in a place where a natural wetland does not already exist

effects management hierarchy means an approach to managing the adverse effects of subdivision, use, and development that requires that-

a) adverse effects are avoided where possible; and
b) adverse effects that cannot be demonstrably avoided are remedied where possible; and
c) adverse effects that cannot be demonstrably remedied are mitigated; and
d) in relation to adverse effects that cannot be avoided, remedied, or mitigated, offsetting is considered; and
e) if offsetting is not demonstrably achievable, compensation is considered

natural wetland means a wetland as defined in the Act (regardless of whether it is a dominated by indigenous or exotic vegetation), except that it does not include-

a) wet pasture or paddocks where water temporarily ponds after rain in places dominated by pasture, or that contain patches of exotic sedge or rush species; or
b) constructed wetlands; or
c) geothermal wetlands

inland wetland means any wetland that is not a coastal wetland, but not including geothermal wetlands

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net gain, in relation to a wetland or stream, means the point at which the measurable positive effects on the ecosystem health of the wetland or stream exceed the point of no net loss

net loss means the point at which measurable positive effects from targeted environmental management activities match the environmental losses due to the impacts of a specific development project, so that compared to a baseline there is no net reduction in environmental values over space and time

loss or degradation, in relation to a wetland, means the loss of extent, or a condition of deteriorated or depleted ecosystem health, ecosystem services, processes, or functioning.

(2) Every regional council must include in its regional policy statement the following policy (or words to the same effect):
"The loss or degradation of all or any part of a natural inland wetland is avoided."

(3) However, the policy required by subclause (2)-

a) must be read subject to any rules that give effect to the requirements of the National Environmental Standards: Freshwater, or to any more stringent rules that the council, as permitted by those Standards, includes in its regional plan.; and

does not apply to adverse effects from an activity that is for the purpose of restoring a wetland and those effects are temporary and reversible, or are consistent with achieving the long-term restoration aims for the wetland.(4) Every regional council must make or change its policy statement and plan to ensure that, when considering an application for a consent, adverse effects on any wetland are managed by applying the effects management hierarchy.

(5) Every regional council must, in respect of natural inland wetlands, and may in respect of constructed wetlands,-

a) identify and map wetlands in its region that are-
   i) 0.05 hectares or greater in size; or
   ii) known to contain threatened species; or
   iii) of a type that is naturally less than 0.05 ha in size (such as ephemeral wetlands or springs); and
b) establish and maintain an inventory of wetlands that includes, at a minimum, the following information about each mapped wetland:
   i) identifier and location:
   ii) area and GIS polygon:
   iii) classification of wetland type:
   iv) values (such as ecosystem services, habitat for indigenous biodiversity, amenity values):
   v) results of monitoring.

(6) In case of uncertainty or dispute about the existence or extent of a natural inland wetland, a regional authority must use the wetland delineation protocol available at: http://www.landcareresearch.co.nz/data/assets/pdf_file/0003/181353/1903-TSDC148-Wetland-deliniation-protocols.pdf, and the outcome of applying that protocol must be taken as definitive.

(7) Every regional council must include objectives, policies, or methods in its regional policy statement and plans that provide for and encourage the restoration of natural inland wetlands in its region. (8) Regional councils must permit the management of a constructed inland wetlands to prioritise activities and management practices that are necessary for, or consistent with, the purpose for which the wetland was constructed.

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(9) Every regional council must-

a) develop and undertake a monitoring plan to monitor the condition of its natural inland wetlands by reference to, at a minimum, their extent, vegetation, hydrology, and nutrients (in water, soil, or both); and

b) have methods to respond when degradation of wetland conditions is detected.

Information note:

Examples of constructed wetlands include areas of wetland habitat in or around bodies of water created for or in connection with any of the following purposes:

- nutrient attenuation:
- effluent treatment and disposal systems:
- stormwater management:
- reservoir for firefighting:
- hydroelectric power generation:
- irrigation:
- stock watering:
- domestic and community water supply:
- water storage ponds:
- landscaping:
- other artificial water storage facilities, including open drainage channels and engineered soil conservation structures:
- conservation or biodiversity offsetting:
- hunting.

The National Policy Statement on Indigenous Biodiversity 2020 contains additional relevant policies concerning the restoration and enhancement of wetlands.

The National Environmental Standard: Freshwater sets out regulations for the management of wetlands, river bed infilling, and fish passage.

3.16 Streams

(1) Every regional council must include the following policy (or words to the same effect) in its regional policy statement:

"The extent and ecosystem health of rivers and streams in the region, and their associated freshwater ecosystems, are at least maintained".

(2) However, the policy must be read subject to any rules that give effect to the requirements of the National Environmental Standards: Freshwater, or to any more stringent rules that the council, as permitted by those Standards, includes in its regional plan.

(3) Every regional council must make or change its policy statement and plan to ensure that, when considering an application for a consent, adverse effects on any stream are managed by applying the effects management hierarchy.

(4) Every regional council must make or change its regional policy statement and plans to ensure that the following do not result in a net loss in the extent or ecosystem health of the stream:

a) permanently diverting a stream:

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b) culverting a stream, where that is allowed and as far as practicable.

(5) Every regional council must make or change its regional policies and plans to ensure that the infilling of river or stream beds is avoided, unless there are no other practicable alternative methods of providing for the activity, and it is part of an activity-

a) designed to restore or enhance the natural values of the stream or of any adjacent or associated ecosystem; or
b) necessary to enable the development, operation, maintenance and upgrade of nationally significant infrastructure; or
c) required for the purposes of flood prevention or erosion control.

(6) However, subclause (5) is subject to any rules that give effect to the requirements of the National Environmental Standards: Freshwater, or to any more stringent rules that the council, as permitted by those Standards, includes in its regional plan.

3.17 Fish passage

(1) Every regional council must make or change its regional plan to include aquatic life objectives to achieve diversity and abundance of fish in all or specified streams.

(2) When preparing the objective, regional councils must-

a) identify the valued species, and their relevant life stages, for which instream structures must provide passage; and
b) identify undesirable species whose passage can or should be prevented; and
c) identify streams where fish passage for undesirable fish species is to be impeded in order to manage their adverse effects on fish populations upstream of any barrier; and
d) take into account any Freshwater Fisheries Management Plans and Sports Fish and Game Management Plans approved by the Minister of Conservation under the Conservation Act 1987; and
e) consult with the Department of Conservation to identify any threatened fish species that may benefit from natural or built barriers to exclude undesirable species.

(3) Regional councils must make or change their plans to require that regard is had to at least the following when considering an application for a consent relating to an instream structure:

a) the extent to which the structure provides, and will continue to provide for the foreseeable life of the structure, the council's aquatic life objective for fish:
b) the extent to which the structure does not cause a greater impediment to fish movements than in adjacent stream reaches:
c) the extent to which it provides efficient and safe passage for all fish (other than undesirable species) at all their life stages:
d) the extent to which it provides a diversity of physical and hydraulic conditions leading to a high diversity of passage opportunities for fish:
e) any proposed monitoring and maintenance plan for ensuring that the structure meets the council's aquatic life objective for fish now and in the future.

(4) Regional councils must establish and implement a work programme to improve the extent to which existing structures achieve the council's aquatic life objectives for fish.

(5) The work programme must include the following:

a) identifying existing instream structures within the region, and evaluating the risk they present as an undesirable barrier to fish migrations:

b) prioritising structures for remediation, applying the ecological criteria described in Table 5.1, of the New Zealand Fish Passage Guidelines:
c) documenting the structures or locations that have been prioritised, the remediation that is required to achieve the desired outcome, and how and when this will be achieved:
d) identification of structures that have been remediated since the commencement date:
e) how the ongoing performance of the remediated structure will be monitored and evaluated.

(6) Regional councils must collect, maintain, and publish records of new and (known) existing instream structures and assess their likely impact on fish passage and river connectivity.

Information note:
The following is a useful tool to help with managing fish passage:

Franklin, P., Gee, E., Baker, C., Bowie, S. 2018; New Zealand Fish Passage Guidelines for structures up to 4 metres: NIWA client report 2018019HN. Version 1.0. 229 p. NIWA Client Report No: 2018019HN, Report Date: April 2018, NIWA Project: END17201, Report Version No: 1.0

3.18 Primary contact sites

(1) Regional councils must manage primary contact sites for-
a) their risk to human health; and
b) their suitability for the activities that take place in them, in terms of, for example, the absence of slippery or unpleasant weed growth, and the visual clarity of the water.

(2) For every primary contact site in an FMU, regional councils must identify a sampling site or sites representative of the primary contact site or a number of primary contact sites.

(3) Between 1 November and 31 March each year every regional council must undertake weekly sampling for *E.coli*, unless-
a) a single sample from the sampling site is greater than 260 *E.coli* per 100 mL, in which case-
i) sampling frequency must be increased to daily, where practicable; and
ii) the regional council must take all reasonable steps to identify potential causes of microbial contamination; or
b) a single sample from the sampling site is greater than 540 *E.coli* per 100 mL, in which case the regional council must take all reasonable steps to notify the public, and keep them informed, that the site is unsuitable for primary contact until further sampling shows a result of 540 *E.coli* per 100 mL or less.

3.19 Water allocation

(1) Every regional council must make or change its regional plan to include criteria for-
a) deciding applications to approve transfers of water take permits; and
b) deciding how to improve and maximise the efficient allocation of water.

(2) Every regional council must identify in regional plans methods to encourage the efficient use of water.

(3) Regional councils must define a timeframe within which over-allocation is phased out, and methods to achieve that, so that the limits on resource use and take limits are reduced to levels that meet the objective and policies of this national policy statement.

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3.20 Accounting systems

(1) Every regional council must operate and maintain, for every FMU for which target attribute states and limits have been or are being set,-

a) a freshwater quality accounting system; and
b) a freshwater quantity accounting system.

(2) The purpose of the accounting systems is to provide the baseline information required-

a) for setting target attribute states, environmental flows and levels, and limits; and
b) to assess whether an FMU is over-allocated or not; and
c) to track over time the cumulative effects of activities (such as the granting of resource consents).

(3) The accounting systems must be maintained at a level of detail commensurate with the significance of the water quality or quantity issues applicable to each particular FMU.

(4) Every regional council must make information from those systems available to the public, regularly and in a suitable form, for every FMU for which target attribute states have been, or are being, set.

(5) The freshwater quality accounting system must (where possible), for each FMU, record, aggregate, and regularly update information on the measured, modelled, or estimated-

a) loads, concentrations, or both, of relevant contaminants; and
b) where a load or concentration has been set on the amount of a contaminant that is acceptable in a water body, the proportion of that amount recorded at monitoring sites for that contaminant; and
c) sources of relevant contaminants; and
d) the amount of each contaminant attributable to each source.

(6) The freshwater quantity accounting system must, for each FMU, record, aggregate, and regularly update information on the measured, modelled, or estimated-

a) amount of freshwater take; and
b) the proportion of freshwater taken by each major category of use; and
c) where a take limit has been set, the proportion of the allocation taken.

(7) In this section, **freshwater take** refers to all takes, whether metered or not, whether subject to a consent or not, and whether authorised or not.

Information note

The Resource Management (Measurement and Reporting of Water Takes) Regulations 2010 require water takes of more than 5 l per second to be measured and reported on.

3.21 Assessing and reporting

(1) Every regional council must produce a report annually on freshwater management in its region that sets out-

a) actual data, or a link to those data, about each component of the values Ecosystem Health and Human Contact, as obtained from monitoring sites for the attributes of the components; and if no data has been collected in relation to any attribute, this must be identified; and
b) actual data, or a link to those data, from any other monitoring done for the purpose of freshwater management; and

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c) a description of any uncertainties associated with the data.

(2) As part of the report required by section 35 of the Act (which is required at least every 5 years), every regional council must assess the freshwater management in its region and produce a synthesis report on it.

(3) The assessment required for the synthesis report must cover at least the following:

a) a comparison of the present state of attributes (and other things that are monitored) as at the time of the assessment as compared with any target attribute states for those things, including the extent to which the present state aligns with the environmental outcomes sought, in relation to each value, for each FMU; and
b) an assessment of the cumulative effect of changes across multiple sites within an FMU and multiple attributes during the period covered by the assessment:
c) if monitoring shows a deterioration from the current state or a downward trend, information on the known or likely causes:
d) an assessment of the actions taken since the last assessment, whether regulatory or non-regulatory and whether by local authorities or others, that contribute to the implementation of this NPS:
e) an assessment of whether the target attribute states and environmental outcomes for each FMU in the region are being achieved and, if not, whether and when they are likely to be:
f) the environmental pressures on each FMU (such as water takes, sources of contaminants, or water body modification) as indicated by information from the freshwater accounting systems referred to in clause 3.19:
g) any uncertainties in the data, evidence, or other information referred to or relied on in the assessment:
h) predictions of changes that are likely to affect waterbodies and freshwater ecosystems in the region:
i) an account of the extent to which, in the region,-
    i. the long-term visions for waterbodies, as identified under clause 3.2, are being achieved; and
    ii. the objective and policies of this National Policy Statement are being met.

(4) The synthesis report must set out the results of the assessments and also-

a) report on the state of each component of the value Ecosystem Health, and identify where any data or information is missing; and
b) provide a single ecosystem health score (by reference to the 5 components of Ecosystem Health) for each FMU in the region.

(5) The synthesis report must-

a) be written and presented in a way that members of the public are likely to understand easily; and
b) include specific data, or a link to where that data may be viewed; and
c) be freely available on the regional council's website.

Information note

A framework for assessing and communicating overall ecosystem health is described in Clapcott J, Young R, Sinner J, Wilcox M, Storey R, Quinn J, Daughney C, Canning A, 2018. *Freshwater biophysical ecosystem health framework*. Prepared for Ministry for the Environment. Cawthron Report No. 3194. 89 p. plus appendices. This is available from: https://www.mfe.govt.nz/publications/fresh-water/freshwater-biophysical-ecosystem-health-framework.

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Subpart 4 Exceptions

3.22 Exception for large hydro schemes

(1) This section applies to the following 6 hydro-electricity generation schemes (referred to as **Schemes**):

a) Waikato Hydro Scheme:
b) Tongariro Power Scheme:
c) Waikaremoana Power Scheme:
d) Waitaki Hydro Scheme:
e) Manapouri Power Scheme:
f) Clutha Hydro Scheme.

(2) When setting limits or developing action plans, and when making plan changes required by this national policy statement, regional councils must have regard to the importance of not adversely impacting the generation capacity and responsiveness of a Scheme.

(3) Regional councils may set target attribute states that are below national bottom lines in respect of waterbodies or freshwater ecosystems that are adversely impacted by structures that form part of any Schemes identified in subclause (1).

(4) Despite subclause (3), regional councils must still set target attributes states that, to the extent possible, improve any water body or freshwater ecosystem affected by any Scheme.

(5) Despite subclause (1), the only parts of the Schemes this subpart applies to are the structures that were first operational on or before 1 August 2014, whether or not they have been, or will be, subject to maintenance, repair or like for like replacement works after 1 August 2014.

3.23 Exception for naturally occurring processes

(1) If all or part of a water body is affected by naturally occurring processes that mean that the current state is worse than the national bottom line, and a target attribute state at or better than the national bottom line cannot be achieved, the regional council may set a target attribute state that is worse than the national bottom line, but must still set it to achieve an improved attribute state to the extent feasible given the natural processes.

(2) In any dispute about whether this exception should apply, the onus is on the relevant regional council to demonstrate that it is naturally occurring processes that prevents the national bottom line being achieved.

(3) For the purposes of this section, **naturally occurring processes** means processes that could have occurred in New Zealand before the arrival of humans.

3.24 Transitional exception

Regional councils may set target attribute states that are worse than national bottom lines in respect of freshwater ecosystems identified in Appendix 5, until the times, or for the periods, specified in that appendix.

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Part 4 Timing

4.1 Timing

(1) Every regional council must implement the objective and policies of this national policy statement as soon as reasonably practicable.

(2) The final decisions on changes to policy statements and plans that are necessary to give effect to this national policy statement must be publicly notified no later than 31 December 2025.

(3) To the extent that regional policy statements and plans already implement the objective and policies of this national policy statement, regional councils are not obliged to make changes to wording or terminology merely for consistency with it.

(4) However, in case of dispute, the onus is on the regional council to show that, despite the different wording or terminology used, their regional policy statement or plan does implement the objective and policies of this national policy statement.

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Appendices

Appendix 1A: Compulsory values

1 Ecosystem health

In relation to a water body in an FMU, ecosystem health refers to the extent to which the FMU supports an ecosystem appropriate to the type of water body (eg, river, lake, wetland, or aquifer).

There are 5 biophysical components that contribute to freshwater ecosystem health, and it is necessary that all of them are managed. They are:

Water quality – the physical and chemical measures of the water, such as temperature, dissolved oxygen, pH, suspended sediment, nutrients and toxicants.

Water quantity – the extent and variability in the level or flow of water.

Habitat - the physical form, structure and extent of the water body, its bed, banks and margins, riparian vegetation and connections to the floodplain.

Aquatic life – the abundance and diversity of biota including microbes, invertebrates, plants, fish and birds.

Ecological processes – the interactions among biota and their physical and chemical environment such as primary production, decomposition, nutrient cycling and trophic connectivity.

In a healthy freshwater ecosystem, water quality, quantity, habitat and processes are suitable to sustain appropriate indigenous aquatic life, as would be found in a minimally disturbed condition (before providing for other values).

2 Human contact

This refers to the extent to which waterbodies in an FMU supports people being able to connect with the water through a range of activities such as swimming, waka, boating, fishing, mahinga kai, and water skiing, in a range of different flows.

Matters to take into account for a healthy water body for human contact include pathogens, clarity, deposited sediment, plant growth (from macrophytes to periphyton to phytoplankton), cyanobacteria, and other toxicants.

3 Threatened species

This refers to the extent to which an FMU that supports a population of threatened species has the conditions necessary to support the continued presence and survival of the threatened species. The basic conditions relate to aquatic habitat, water quality, and flows or water levels, but may also include specialised habitat or conditions needed for only part of the life-cycle of the threatened species.

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4 [Placeholder for possible Mahinga Kai (described below) or Tangata Whenua Value]

Mahinga kai – Kai are safe to harvest and eat.

Mahinga kai generally refers to indigenous freshwater species that have traditionally been used as food, tools, or other resources. It also refers to the places those species are found and to the act of catching them. Mahinga kai provide food for the people of the rohe and these sites give an indication of the overall health of the water. For this value, kai would be safe to harvest and eat. Transfer of knowledge would occur about the preparation, storage and cooking of kai. In freshwater management units that are used for providing mahinga kai, the desired species are plentiful enough for long-term harvest and the range of desired species is present across all life stages.

Mahinga kai – Kei te ora te mauri (the mauri of the place is intact).

For this value, freshwater resources would be available and able to be used for customary use. In freshwater management units that are valued for providing mahinga kai, resources would be available for use, customary practices able to be exercised to the extent desired, and tikanga and preferred methods are able to be practised.

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Appendix 1B: Other values that must be considered

Contents

Descriptions of other values

Natural form and character – Where people value particular natural qualities of the freshwater management unit.

Matters contributing to the natural form and character of a freshwater management unit are its biological, visual and physical characteristics that are valued by the community, including:

i. its biophysical, ecological, geological, geomorphological and morphological aspects;

ii. the natural movement of water and sediment including hydrological and fluvial processes;

iii. the location of the water body relative to its natural course;

iv. the relative dominance of indigenous flora and fauna;

v. the presence of culturally significant species;

vi. the colour of the water; and

vii. the clarity of the water.

They may be freshwater management units with exceptional, natural, and iconic aesthetic features.

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[To be omitted if Mahinga kai is included as a compulsory value]

Mahinga kai – Kai are safe to harvest and eat.

Mahinga kai generally refers to indigenous freshwater species that have traditionally been used as food, tools, or other resources. It also refers to the places those species are found and to the act of catching them. Mahinga kai provide food for the people of the rohe and these sites give an indication of the overall health of the water.

For this value, kai would be safe to harvest and eat. Transfer of knowledge would occur about the preparation, storage and cooking of kai. In freshwater management units that are used for providing mahinga kai, the desired species are plentiful enough for long-term harvest and the range of desired species is present across all life stages.

[To be omitted if Mahinga kai is included as a compulsory value]

Mahinga kai – Kei te ora te mauri (the mauri of the place is intact).

For this value, freshwater resources would be available and able to be used for customary use. In freshwater management units that are valued for providing mahinga kai, resources would be available for use, customary practices able to be exercised to the extent desired, and tikanga and preferred methods are able to be practiced.

Fishing – The freshwater management unit supports fisheries of species allowed to be caught and eaten.

For freshwater management units valued for fishing, the numbers of fish would be sufficient and suitable for human consumption. In some areas, fish abundance and diversity would provide a range in species and size of fish, and algal growth, water clarity and safety would be satisfactory for fishers. Attributes will need to be specific to fish species such as salmon, trout, eels, lamprey, or whitebait.

Irrigation, cultivation and food production – The freshwater management unit meets irrigation needs for any purpose.

Water quality and quantity would be suitable for irrigation needs, including supporting the cultivation of food crops, the production of food from domesticated animals, non-food crops such as fibre and timber, pasture, sports fields and recreational areas. Attributes will need to be specific to irrigation and food production requirements.

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Animal drinking water – The freshwater management unit meets the needs of stock. Water quality and quantity would meet the needs of stock, including whether it is palatable and safe.
Wai tapu – Wai tapu represent the places where rituals and ceremonies are performed, or where there is special significance to iwi/hapū. Rituals and ceremonies include, but are not limited to, tohi (baptism), karakia (prayer), waerea (protective incantation), whakatapu (placing of raahui), whakanoa (removal of raahui), and tuku iho (gifting of knowledge and resources for future generations). In providing for this value, the wai tapu would be free from human and animal waste, contaminants and excess sediment, with valued features and unique properties of the wai protected. Other matters that may be important are that there is no artificial mixing of the wai tapu and identified taonga in the wai are protected.
Water supply – The freshwater management unit can meet people's potable water needs. Water quality and quantity would enable domestic water supply to be safe for drinking with, or in some areas without, treatment.
Commercial and industrial use – The freshwater management unit provides economic opportunities to people, businesses and industries. Water quality and quantity can provide for commercial and industrial activities. Attributes will need to be specific to commercial or industrial requirements.
Hydro-electric power generation – The freshwater management unit is suitable for hydro electric power generation. Water quality and quantity and the physical qualities of the freshwater management unit, including hydraulic gradient and flow rate, can provide for hydro-electric power generation.
Transport and tauranga waka – The freshwater management unit is navigable for identified means of transport. Transport and tauranga waka generally refers to places to launch waka and water craft, and appropriate places for waka to land (tauranga waka).

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Appendix 2A - Attributes requiring limits

Table 1 - Phytoplankton (Trophic state)

Value (and component)	Ecosystem Health (Aquatic Life)	
Freshwater Body Type	Lakes	
Attribute Unit	mg chl-a/ m^3 (milligrams chlorophyll-a per cubic metre)	
Attribute band and description	**Numeric attribute state**	
	Annual median	Annual Maximum
A Lake ecological communities are healthy and resilient, similar to natural reference conditions.	≤2	≤10
B Lake ecological communities are slightly impacted by additional algal and/or plant growth arising from nutrient levels that are elevated above natural reference conditions.	>2 and ≤5	>10 and ≤25
C Lake ecological communities are moderately impacted by additional algal and plant growth arising from nutrient levels that are elevated well above natural reference conditions. Reduced water clarity is likely to affect habitat available for native macrophytes.	>5 and ≤12	>25 and ≤60
National Bottom Line	**12**	**60**
D Lake ecological communities have undergone or are at high risk of a regime shift to a persistent, degraded state (without native macrophyte/ seagrass cover), due to impacts of elevated nutrients leading to excessive algal and/or plant growth, as well as from losing oxygen in bottom waters of deep lakes.	>12	>60
For lakes and lagoons that are intermittently open to the sea, monitoring data should be analysed separately for closed periods and open periods.		

Table 2 - Periphyton (Trophic state)

Value (and component)	Ecosystem health (Aquatic Life)	
Freshwater Body Type	Rivers	
Attribute Unit	mg chl-a/m^2 (milligrams chlorophyll-a per square metre)	
Attribute band and description	**Numeric Attribute State (default class)**	**Numeric Attribute State (productive class)**
	Exceeded no more than 8% of samples	**Exceeded no more than 17% of samples**
A Rare blooms reflecting negligible nutrient enrichment and/or alteration of the natural flow regime or habitat.	≤50	≤50
B Occasional blooms reflecting low nutrient enrichment and/ or alteration of the natural flow regime or habitat.	>50 and ≤120	>50 and ≤120
C Periodic blooms reflecting moderate nutrient enrichment and/ or moderate alteration of the natural flow regime or habitat.	>120 and ≤200	>120 and ≤200
National Bottom Line	**200**	**200**
D Regular and/or extended-duration nuisance blooms reflecting very high nutrient enrichment and/or very significant alteration of the natural flow regime or habitat.	>200	>200
Classes are streams and rivers defined according to types in the River Environment Classification system (REC). Numeric attribute states must be derived from the rolling median of monthly monitoring over five years.		

Note: To achieve a freshwater objective for periphyton within a freshwater management unit, regional councils must at least set appropriate instream concentrations and exceedance criteria for dissolved inorganic nitrogen (DIN) and dissolved reactive phosphorus (DRP). Where there are nutrient sensitive downstream receiving environments, criteria for nitrogen and phosphorus will also need to be set to achieve the outcomes sought for those environments. Regional councils must use the following process, in the following order, to determine instream nitrogen and phosphorus criteria in a freshwater management unit:

a) either –

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i) if the freshwater management unit supports, or could support, conspicuous periphyton, derive instream concentrations and exceedance criteria for DIN and DRP to achieve a periphyton objective for the freshwater management unit; or

ii) if the freshwater management unit does not support, and could not support, conspicuous periphyton, consider the nitrogen and phosphorus criteria (instream concentrations or instream loads) needed to achieve any other freshwater objectives:

b) if there are nutrient sensitive downstream environments, for example, a lake and/or estuary, derive relevant nitrogen and phosphorus criteria (instream concentrations or instream loads) needed to achieve the outcomes sought for those sensitive downstream environments:

c) compare all nitrogen and phosphorus criteria derived in steps (a) – (b) and adopt those necessary to achieve the freshwater objectives for the freshwater management unit and outcomes sought for the nutrient sensitive downstream environments.

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Table 3 – Total Nitrogen (Trophic state)

Value (and component)	Ecosystem Health (water quality)	
Freshwater Body Type	Lakes	
Attribute Unit	mg/m^3 (milligrams per cubic metre)	
Attribute band and description	**Numeric attribute state**	
	Annual Median	**Annual Median**
	Seasonally Stratified and Brackish	Polymictic
A Lake ecological communities are healthy and resilient, similar to natural reference conditions.	≤160	≤300
B Lake ecological communities are slightly impacted by additional algal and/ or plant growth arising from nutrient levels that are elevated above natural reference conditions.	>160 and ≤350	>300 and ≤500
C Lake ecological communities are moderately impacted by additional algal and plant growth arising from nutrient levels that are elevated well above natural reference conditions.	>350 and ≤750	>500 and ≤800
National Bottom Line	**750**	**800**
D Lake ecological communities have undergone or are at high risk of a regime shift to a persistent, degraded state, (without native macrophyte/seagrass cover) due to impacts of elevated nutrients leading to excessive algal and/or plant growth, as well as from losing oxygen in bottom waters of deep lakes.	>750	>800
For lakes and lagoons that are intermittently open to the sea, monitoring data should be analysed separately for closed periods and open periods.		

Table 4 – Total Phosphorus (Trophic state)

Value (and component)	Ecosystem Health (water quality)
Freshwater Body Type	Lakes
Attribute Unit	mg/m^3 (milligrams per cubic metre)
Attribute band and description	**Numeric attribute state**
	Annual Median
A Lake ecological communities are healthy and resilient, similar to natural reference conditions.	≤10
B Lake ecological communities are slightly impacted by additional algal and plant growth arising from nutrient levels that are elevated above natural reference conditions.	>10 and ≤20
C Lake ecological communities are moderately impacted by additional algal and plant growth arising from nutrient levels that are elevated well above natural reference conditions.	>20 and ≤50
National Bottom Line	**50**
D Lake ecological communities have undergone or are at high risk of a regime shift to a persistent, degraded state (without native macrophyte/seagrass cover), due to impacts of elevated nutrients leading to excessive algal and/or plant growth, as well as from losing oxygen in bottom waters of deep lakes.	>50
For lakes and lagoons that are intermittently open to the sea, monitoring data should be analysed separately for closed periods and open periods.	

Table 5 – Dissolved inorganic nitrogen

Value (and component)	Ecosystem health (water quality)	
Freshwater Body Type	Rivers	
Attribute Unit	DIN mg/L (milligrams per litre)	
Attribute band and description	**Numeric Attribute State**	
	Median	**95th percentile**
A Ecological communities and ecosystem processes are similar to those of natural reference conditions. No adverse effects attributable to DIN enrichment are expected.	≤ 0.24	≤ 0.56
B Ecological communities are slightly impacted by minor DIN elevation above natural reference conditions. If other conditions also favour eutrophication, sensitive ecosystems may experience additional algal and plant growth, loss of sensitive macroinvertebrate taxa, and higher respiration and decay rates.	> 0.24 and ≤0.50	> 0.56 and ≤01.10
C Ecological communities are impacted by moderate DIN elevation above natural reference conditions, but sensitive species are not experiencing nitrate toxicity. If other conditions also favour eutrophication, DIN enrichment may cause increased algal and plant growth, loss of sensitive macroinvertebrate & fish taxa, and high rates of respiration and decay.	> 0.5 and ≤ 1.0	> 1.10 and ≤ 2.05
National Bottom Line	**1.0**	**2.05**
D Ecological communities impacted by substantial DIN elevation above natural reference conditions. In combination with other conditions favouring eutrophication, DIN enrichment drives excessive primary production and significant changes in macroinvertebrate and fish communities, as taxa sensitive to hypoxia and nitrate toxicity are lost.	>1.0	>2.05
Groundwater concentrations also need to be managed to ensure resurgence via springs and seepage does not degrade rivers through DIN enrichment. Numeric attribute state must be derived from the rolling median of monthly monitoring over five years.		

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Table 6 – Dissolved reactive phosphorus

Value (and component)	Ecosystem health (water quality)	
Freshwater Body Type	Rivers	
Attribute Unit	DRP mg/L (milligrams per litre)	
Attribute band and description	**Numeric Attribute State[1]**	
	Median	**95th percentile**
A Ecological communities and ecosystem processes are similar to those of natural reference conditions. No adverse effects attributable to DRP enrichment are expected.	≤ 0.006	≤ 0.021
B Ecological communities are slightly impacted by minor DRP elevation above natural reference conditions. If other conditions also favour eutrophication, sensitive ecosystems may experience additional algal and plant growth, loss of sensitive macroinvertebrate taxa, and higher respiration and decay rates.	> 0.006 and ≤0.010	> 0.021 and ≤0.030
C Ecological communities are impacted by moderate DRP elevation above natural reference conditions. If other conditions also favour eutrophication, DRP enrichment may cause increased algal and plant growth, loss of sensitive macro-invertebrate & fish taxa, and high rates of respiration and decay.	> 0.010 and ≤ 0.018	> 0.030 and ≤ 0.054
National Bottom Line	**0.018**	**0.054**
D Ecological communities impacted by substantial DRP elevation above natural reference conditions. In combination with other conditions favouring eutrophication, DRP enrichment drives excessive primary production and significant changes in macroinvertebrate and fish communities, as taxa sensitive to hypoxia are lost.	>0.018	>0.054
Numeric attribute state must be derived from the rolling median of monthly monitoring over five years.		

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Table 7 – Ammonia Toxicity

Value (and component)	Ecosystem Health (Water Quality)	
Freshwater Body Type	Rivers	
Attribute Unit	mg NH4-N/L (milligrams ammoniacal-nitrogen per litre)	
Attribute band and description	**Numeric Attribute State**	
	Annual Median	**Annual Maximum**
A 99% species protection level: No observed effect on any species tested	≤0.03	≤0.05
B 95% species protection level: Starts impacting occasionally on the 5% most sensitive species	>0.03 and ≤0.24	>0.05 and ≤0.40
C 80% species protection level: Starts impacting regularly on the 20% most sensitive species (reduced survival of most sensitive species)	>0.24 and ≤1.30	>0.40 and ≤2.20
National Bottom Line	**1.30**	**2.20**
D Starts approaching acute impact level (ie risk of death) for sensitive species	>1.30	>2.20
Numeric attribute state is based on pH 8 and temperature of 20°C. Compliance with the numeric attribute states should be undertaken after pH adjustment.		

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Table 8 – Nitrate (Toxicity)

Value (and component)	Ecosystem Health (water quality)	
Freshwater Body Type	Rivers	
Attribute Unit	mg NO_3 - N/L (milligrams nitrate-nitrogen per litre)	
Attribute band and description	**Numeric Attribute State**	
	Annual Median	**Annual 95th Percentile**
A High conservation value system. Unlikely to be effects even on sensitive species.	≤1.0	≤1.5
B Some growth effect on up to 5% of species.	>1.0 and ≤2.4	>1.5 and ≤3.5
C Growth effects on up to 20% of species (mainly sensitive species such as fish). No acute effects.	>2.4 and ≤6.9	>3.5 and ≤9.8
National Bottom Line	**6.9**	**9.8**
D Impacts on growth of multiple species, and starts approaching acute impact level (ie risk of death) for sensitive species at higher concentrations (>20 mg/L).	>6.9	>9.8

Note: This attribute measures the toxic effects of nitrate, not the trophic state. Where other attributes measure trophic state, for example periphyton, freshwater objectives, limits and/or methods for those attributes will be more stringent.

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Table 9 – Dissolved Oxygen

Value (and component)	Ecosystem health (Water Quality)	
Freshwater Body Type	Rivers (below point sources only)	
Attribute Unit	mg/L (milligrams per litre)	
Attribute band and description	**Numeric Attribute State**	
	7-day mean minimum (Summer Period: 1 November to 30th April)	1-day mean minimum (Summer Period: 1 November to 30th April)
A No stress caused by low dissolved oxygen on any aquatic organisms that are present at matched reference (near-pristine) sites.	≥8.0	≥7.5
B Occasional minor stress on sensitive organisms caused by short periods (a few hours each day) of lower dissolved oxygen. Risk of reduced abundance of sensitive fish and macroinvertebrate species.	≥7.0 and <8.0	≥5.0 and <7.5
C Moderate stress on a number of aquatic organisms caused by dissolved oxygen levels exceeding preference levels for periods of several hours each day. Risk of sensitive fish and macroinvertebrate species being lost.	≥5.0 and <7.0	≥4.0 and <5.0
National Bottom Line	5.0	4.0
D Significant, persistent stress on a range of aquatic organisms caused by dissolved oxygen exceeding tolerance levels. Likelihood of local extinctions of keystone species and loss of ecological integrity.	<5.0	<4.0
The seven day mean minimum is the mean value of 7 consecutive daily minimum values. The one day mean minimum is the lowest daily minimum across the whole summer period.		

Table 10 – Suspended fine sediment

Value (and component)	Ecosystem Health (water quality											
Freshwater Body Type	Rivers and streams											
Attribute Unit	Turbidity (FNU)											
Attribute band and description	**Numeric attribute state by Suspended Sediment Class**[2]											
	1	2	3	4	5	6	7	8	9	10	11	12
A Minimal impact of suspended sediment on instream biota. Ecological communities are similar to those observed in natural reference conditions.	<2.0	<6.2	<1.3	<3.3	<7.5	<4.8	<2.3	<4.3	<1.2	<1.1	<1.1	<2.4
B Low to moderate impact of suspended sediment on instream biota. Abundance of sensitive fish species may be reduced.	<2.5	<7.9	<1.6	<3.9	<9.8	<6.3	<2.8	<5.2	<1.4	<1.3	<1.3	<2.7
C Moderate to high impact of suspended sediment on instream biota. Sensitive fish species may be lost.	<3.2	<10.5	<2.0	<4.8	<13.1	<8.3	<3.3	<6.4	<1.6	<1.5	<1.6	<3.1
National Bottom Line	3.2	10.5	2.0	4.8	13.1	8.3	3.3	6.4	1.6	1.5	1.6	3.1
D High impact of suspended sediment on instream biota. Ecological communities are significantly altered and sensitive fish and macroinvertebrate species are lost or at high risk of being lost.	>3.2	>10.5	>2.0	>4.8	>13.1	>8.3	>3.3	>6.4	>1.6	>1.5	>1.6	>3.1
The minimum record length for grading a site is two years of at least monthly samples (at least 24 samples). See Appendix 2C Tables 1 and 3 for the definition of each suspended sediment class and its River Environment Classification composition.												

Note: the attribute does not apply in the following rivers and streams due to naturally occurring processes

1. Naturally highly coloured brown-water streams;
2. Glacial flour affected streams and rivers;

Selected lake-fed REC classes (particularly warm climate classes) where high turbidity may reflect autochthonous phytoplankton production (as opposed to organic/inorganic sediment derived from the catchment)

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Table 11 – *Escherichia coli (E. coli)*

Value (and component)	Human contact (human health)			
Freshwater Body Type	Lakes and rivers			
Attribute	*Escherichia coli (E. coli)*			
Attribute Unit	*E. coli*/100 mL (number of *E. coli* per hundred millilitres)			
Attribute band and description	**Numeric Attribute State**			
Description of risk of Campylobacter infection (based on *E. coli* indicator)	% exceedances over 540 /100 mL	% exceedences over 260 /100 mL	Median concentration /100 mL)	95th percentile of *E. coli*/100 mL
A (Blue) For at least half the time, the estimated risk is <1 in 1000 (0.1% risk) The predicted average infection risk is 1%	<5%	<20%	≤130	≤540
B (Green) For at least half the time, the estimated risk is <1 in 1000 (0.1% risk) The predicted average infection risk is 2%	5-10%	20-30%	≤130	≤1000
C (Yellow) For at least half the time, the estimated risk is <1 in 1000 (0.1% risk) The predicted average infection risk is 3%	10-20%	20-34%	≤130	≤1200
D (Orange) 20-30% of the time the estimated risk is ≥50 in 1000 (>5% risk) The predicted average infection risk is >3%	20-30%	>34%	>130	>1200
E (Red) For more than 30% of the time the estimated risk is ≥50 in 1000 (>5% risk) The predicted average infection risk is >7%	>30%	>50%	>260	>1200

Attribute state should be determined by using a minimum of 60 samples over a maximum of 5 years, collected on a regular basis regardless of weather and flow conditions. However, where a sample has been missed due to adverse weather or error, attribute state may be determined using samples over a longer timeframe.

Attribute state must be determined by satisfying all numeric attribute states.

The predicted average infection risk is the overall average infection to swimmers based on a random exposure on a random day, ignoring any possibility of not swimming during high flows or when a surveillance advisory is in place (assuming that the *E. coli* concentration follows a lognormal distribution). Actual risk will generally be less if a person does not swim during high flows.

Table 12 – Cyanobacteria (Planktonic)

Value (and component)	Human contact (human health)
Freshwater Body Type	Lakes and lake fed rivers
Attribute Unit	Biovolume - mm3/L (cubic millimetres per litre)
Attribute band and description	**Numeric Attribute State**
	80th percentile
A (Blue) Risk exposure from cyanobacteria is no different to that in natural conditions (from any contact with freshwater).	≤0.5 mm3/L biovolume equivalent for the combined total of all cyanobacteria
B (Green) Low risk of health effects from exposure to cyanobacteria (from any contact with freshwater).	>0.5 and ≤1.0 mm3/L biovolume equivalent for the combined total of all cyanobacteria
C (Yellow) Moderate risk of health effects from exposure to cyanobacteria (from any contact with freshwater).	>1.0 and ≤1.8 mm3/L biovolume equivalent of potentially toxic cyanobacteria OR >1.0 and ≤10 mm3/L total biovolume of all cyanobacteria
National Bottom Line	1.8 mm3/L biovolume equivalent of potentially toxic cyanobacteria OR 10 mm3/L total biovolume of all cyanobacteria
D (Orange/Red) High health risks (eg, respiratory, irritation and allergy symptoms) exist from exposure to cyanobacteria (from any contact with freshwater).	>1.8 mm3/L biovolume equivalent of potentially toxic cyanobacteria OR >10 mm3/L total biovolume of all cyanobacteria
The 80th percentile must be calculated using a minimum of 12 samples collected over 3 years. 30 samples collected over 3 years is recommended.	

Appendix 2B – Attributes requiring action plans

Table 13 – Macroinvertebrates (1 of 2)

Value (and component)	Ecosystem health (aquatic life)	
Freshwater Body Type	Wadeable streams and rivers	
Attribute Unit	Macroinvertebrate Community Index (MCI) score; Quantitative Macroinvertebrate Community Index (QMCI) score	
Attribute band and description	**Numeric Attribute States**	
	QMCI	**MCI**
A Macroinvertebrate community, indicative of pristine conditions with almost no organic pollution or nutrient enrichment.	≥6.5	≥130
B Macroinvertebrate community indicative of mild organic pollution or nutrient enrichment. Largely composed of taxa sensitive to organic pollution/nutrient enrichment.	≥5.5 & <6.5	≥110 & <130
C Macroinvertebrate community indicative of moderate organic pollution or nutrient enrichment. There is a mix of taxa sensitive and insensitive to organic pollution/nutrient enrichment.	≥4.5 & <5.5	≥90 & <110
National Bottom Line	**4.5**	**90**
D Macroinvertebrate community indicative of severe organic pollution or nutrient enrichment. Communities are largely composed of taxa insensitive to inorganic pollution/nutrient enrichment.	<4.5	<90
MCI and QMCI scores to be determined using annual samples taken between December and March (inclusive) with either fixed counts with at least 200 individuals, or full counts, and with current state calculated as the five-year rolling average score. All sites in Deposited Sediment Classes 1, 5, and 11 per Table 18 are to use soft-sediment sensitivity scores and taxonomic resolution as defined in Table A1.1 in Clapcott et al. 2017 *Macroinvertebrate metrics for the National Policy Statement for Freshwater Management*. Cawthron: Nelson, New Zealand. MCI and QMCI to be assessed using the method defined in Stark JD, Maxted, JR 2007 A user guide for the Macroinvertebrate Community Index. Prepared for the Ministry for the Environment. Cawthron Report No. 1166.		

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58, except for sites in deposited sediment classes 1, 5 and 11 per Table 18, which require use of the soft-sediment sensitivity scores and taxonomic resolution defined in Table A1.1 in Clapcott et al. 2017.

Table 14 – Macroinvertebrates (2 of 2)

Value (and component)	Ecosystem health (aquatic life)
Freshwater Body Type	Wadeable streams and rivers
Attribute Unit	Macroinvertebrate Average Score Per Metric (ASPM)
Attribute band and description	**Numeric Attribute States ASPM score**[2]
A Macroinvertebrate communities have high ecological integrity, similar to that expected in reference conditions.	≥0.6
B Macroinvertebrate communities have mild-to-moderate loss of ecological integrity.	<0.6 & ≥0.4
C Macroinvertebrate communities have moderate-to-severe loss of ecological integrity.	<0.4 & ≥0.3
National Bottom Line	**0.3**
D Macroinvertebrate communities have severe loss of ecological integrity.	<0.3

ASPM scores to be determined using annual samples taken between December and March (inclusive) with either fixed counts with at least 200 individuals, or full counts, and with current state calculated as the five-year rolling average score. All sites in Deposited Sediment Classes 1, 5, and 11 per Table 18 are to use soft-sediment sensitivity scores and taxonomic resolution as defined in Table A1.1 in Clapcott et al. 2017 *Macroinvertebrate metrics for the National Policy Statement for Freshwater Management*. Cawthron: Nelson, New Zealand.

When normalising scores for the ASPM, use the following minimums and maximums: %EPT-abundance (0-100), EPT-richness (0-29), MCI (0-200). Collier, K. J. (2008). Average score per metric: an alternative metric aggregation method for assessing wadeable stream health. New Zealand Journal of Marine and Freshwater Research, 42(4), 367-378.

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Table 15 – Fish (rivers)

Value (and component)	Ecosystem health (aquatic life)
Freshwater Body Type	Wadeable
Attribute Unit	Fish Index of Biotic Integrity (F-IBI)
Attribute band and description	**Numeric Attribute State (Average)**
A High integrity of fish community. Habitat and migratory access have minimal degradation.	≥34
B Moderate integrity of fish community. Habitat and/or migratory access are reduced and show some signs of stress.	<34 and ≥28
C Low integrity of fish community. Habitat and/or migratory access is considerably impairing and stressing the community.	<28 and ≥18
National Bottom Line	**18**
D Severe loss of fish community integrity. There is substantial loss of habitat and/or migratory access, causing a high level of stress on the community.	<18
Sampling is to occur at least annually between December and March (inclusive) following the protocols for at least one of the backpack electrofishing method, spotlighting method, or trapping method in Joy M, David B, and Lake M. 2013. *New Zealand Freshwater Fish Sampling Protocols (Part 1): Wadeable rivers and streams.* Palmerston North, New Zealand: Massey University. The F-IBI score is to be calculated using the general method defined by Joy, M. K., & Death, R. G. (2004). Application of the Index of Biotic Integrity Methodology to New Zealand Freshwater Fish Communities. Environmental Management, 34(3), 415-428. but will exclude salmonids.	

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Table 16 – Submerged plants (natives)

Value (and component)	Ecosystem health (Aquatic life)
Freshwater Body Type	Lakes
Attribute Unit	Lake Submerged Plant Indicators: Native Condition Index
Attribute band and description	**Numeric Attribute State (% of maximum potential score)**
A Excellent ecological condition. Native submerged plant communities are almost completely intact	>75%
B High ecological condition. Native submerged plant communities are largely intact	>50 & ≤75%
C Moderate ecological condition. Native submerged plant communities are moderately impacted	≥20 & ≤50%
National Bottom Line	20%
D Poor ecological condition. Native submerged plant communities are largely degraded or absent	<20%
Monitoring to be conducted at least once every three years, following the method described in Clayton J, and Edwards T. 2006. LakeSPI: A method for monitoring ecological condition in New Zealand lakes. User Manual Version 2. Hamilton, New Zealand: National Institute of Water & Atmospheric Research Ltd p57 Scores are reported as a percentage of maximum potential score (%) of the Native Condition Index, and lakes in a devegetated state receive scores of 0.	

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Table 17 – Submerged plants (invasive species)

Value (and component)	Ecosystem health (aquatic life)
Freshwater Body Type	Lakes
Attribute Unit	Lake Submerged Plant (Invasive Impact Index)
Attribute band and description	**Numeric Attribute State (% of maximum potential score)**
A No invasive plants present in the lake. Native plant communities remain intact.	0%
B Invasive plants having only a minor impact on native vegetation. Invasive plants will be patchy in nature co-existing with native vegetation. Often major weed species not present or in early stages of invasion.	>1 & ≤25%
C Invasive plants having a moderate to high impact on native vegetation. Native plant communities likely displaced by invasive weed beds particularly in the 2 – 8 m depth range.	≥26 & ≤90%
National Bottom Line	90%
D Tall dense weed beds exclude native vegetation and dominate entire depth range of plant growth. Species concerned likely hornwort and Egeria.	>90%
Numeric attribute state to be calculated annually following the method described in Clayton J, and Edwards T. 2006. LakeSPI: A method for monitoring ecological condition in New Zealand lakes. User Manual Version 2. Hamilton, New Zealand: National Institute of Water & Atmospheric Research Ltd.	

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Table 18 – Deposited fine sediment

Value (and component)	Ecosystem Health (Physical Habitat)											
Freshwater Body Type	Wadeable Rivers and Streams											
Attribute Unit	% fine sediment cover[1,2]											
Attribute band and description	**Numeric attribute state by Deposited Sediment Class[3]**											
	1	2	3	4	5	6	7	8	9	10	11	12
A Minimal impact of deposited fine sediment on instream biota. Ecological communities are similar to those observed in natural reference conditions.	<84	<9	<42	<12	<80	<30	<41	<22	<48	<15	<76	<27
B Low to moderate impact of deposited fine sediment on instream biota. Abundance of sensitive macroinvertebrate species may be reduced.	<90	<15	<50	<17	<86	<38	<48	<33	<54	<22	<82	<36
C Moderate to high impact of deposited fine sediment on instream biota. Sensitive macroinvertebrate species may be lost.	≤97	≤21	≤60	≤23	≤92	≤46	≤56	≤45	≤61	≤29	≤89	≤45
National Bottom Line	**97**	**21**	**60**	**23**	**92**	**46**	**56**	**45**	**61**	**29**	**89**	**45**
D High impact of deposited fine sediment on instream biota. Ecological communities are significantly altered and sensitive fish and macroinvertebrate species are lost or at high risk of being lost.	>97	>21	>60	>23	>92	>46	>56	>45	>61	>29	>89	>45

The indicator score is percentage cover of the streambed in a run habitat determined by the instream visual method, SAM2, and the monitoring method is defined in p. 17-20 of Clapcott, J.E., Young, R.G., Harding, J.S., Matthaei, C.D., Quinn, J.M. and Death, R.G. (2011) Sediment Assessment Methods: Protocols and guidelines for assessing the effects of deposited fine sediment on in-stream values. Cawthron Institute, Nelson, New Zealand.

The minimum record length for grading a site is 24 samples taken over 2 years of monthly monitoring, or longer for sites where flow conditions only permit monthly monitoring seasonally.

See Appendix 2C Tables 2 and 3 for the definition of each class' River Environment Classification composition.

Table 19 – Dissolved Oxygen

Value (and component)	Ecosystem health (Water Quality)	
Freshwater Body Type	Rivers	
Attribute Unit	mg/L (milligrams per litre)	
Attribute description band and description	**Numeric Attribute State**	
	7-day mean minimum[1]	1-day mean minimum[1]
A No stress caused by low dissolved oxygen on any aquatic organisms that are present at matched reference (near-pristine) sites.	≥8.0	≥7.5
B Occasional minor stress on sensitive organisms caused by short periods (a few hours each day) of lower dissolved oxygen. Risk of reduced abundance of sensitive fish and macroinvertebrate species.	≥7.0 and <8.0	≥5.0 and <7.5
C Moderate stress on a number of aquatic organisms caused by dissolved oxygen levels exceeding preference levels for periods of several hours each day. Risk of sensitive fish and macroinvertebrate species being lost.	≥5.0 and <7.0	≥4.0 and <5.0
National Bottom Line	5.0	4.0
D Significant, persistent stress on a range of aquatic organisms caused by dissolved oxygen exceeding tolerance levels. Likelihood of local extinctions of keystone species and loss of ecological integrity.	<5.0	<4.0
Seven-day continuous dissolved oxygen monitoring to be collected at least once during summer (December to March inclusive). Objectives apply year-round.		

Table 20 – Lake-bottom dissolved Oxygen

Value (and component)	**Ecosystem Health (water quality)**
Freshwater body type	**Lakes**
Attribute Unit	mg/L (milligrams/litre) [1]
Attribute description **band and description**	**Numeric attribute state**
	Measured or estimated annual minimum[2]
A No risk from bottom DO of biogeochemical conditions causing nutrient release from sediments.	≥7.5
B Minimal risk from bottom DO of biogeochemical conditions causing nutrient release from sediments.	≥2.0 and < 7.5
C Risk from bottom DO of biogeochemical conditions causing nutrient release from sediments.	≥0.5 and < 2.0
National Bottom line	**0.5**
D Likelihood from bottom DO of biogeochemical conditions resulting in nutrient release from sediments.	<0.5
To be measured less than 1m above sediment surface at the deepest part of the lake using either continuous monitoring sensors or discrete DO profiles	

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Table 21 – Mid-hypolimnetic dissolved oxygen

Value (and component)	Ecosystem Health (water quality)
Freshwater body type	Seasonally stratifying lakes
Attribute Unit	mg/L (milligrams/litre)
Attribute description **band and description**	**Numeric attribute state**[1]
	Measured or estimated annual minimum
A No stress caused to any fish species by low dissolved oxygen	≥7.5
B Minor stress on sensitive fish seeking thermal refuge in the hypolimnion. Minor risk of reduced abundance of sensitive fish and macro-invertebrate species	≥ 5.0 & <7.5
C Moderate stress on sensitive fish seeking thermal refuge in the hypolimnion. Risk of sensitive fish species being lost	≥ 4.0 & <5 .0
National Bottom line	**4.0**
D Significant stress on a range of fish species seeking thermal refuge in the hypolimnion. Likelihood of local extinctions of fish species and loss of ecological integrity.	< 4.0
To be measured using either continuous monitoring sensors or discrete DO profiles.	

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Table 22 – Ecosystem metabolism

Value (and component)	Ecosystem health (ecosystem processes)
Freshwater Body Type	Rivers
Attribute	Ecosystem metabolism (Both Gross Primary Production and Ecosystem Respiration)
Attribute Unit	g O_2 m^{-2} d^{-1} (grams of dissolved oxygen per square metre per day)

Derived from at least seven days of continuous dissolved oxygen monitoring to be collected at least once during summer (December to March inclusive), using the method of Young RG, Clapcott JE, Simon K 2016. Ecosystem functions and stream health. Advances in New Zealand Freshwater Science. NZ Freshwater Sciences Society, NZ Hydrological Society.

Councils are to monitor, and develop an action plan to respond to deteriorating trends.

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Table 23 – *Escherichia coli (E. coli) (primary contact sites)*

Value (and component)	Human contact (recreation)
Freshwater Body Type	Primary contact sites in lakes and rivers (during the bathing season)
Attribute Unit	95th percentile of *E. coli*/100 ml (number of E. coli per hundred millilitres)
Attribute Band and description[1]	**Numeric Attribute State**
Excellent Estimated risk of Campylobacter infection has a < 0.1% occurrence, 95% of the time	≤ 130
Good Estimated risk of Campylobacter infection has a 0.1 – 1.0% occurrence, 95% of the time	131 - 260
Fair Estimated risk of Campylobacter infection has a 1 – 5% occurrence, 95% of the time	261 – 550
National bottom line	540
Poor Estimated risk of Campylobacter infection has a > 5% occurrence, at least 5% of the time	> 540
The narrative attribute state description assumes "% of time" equals "% of samples"	

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Appendix 2C Sediment Classification Tables

Table 1 - Suspended sediment attribute class REC composition

Suspended Sediment Class	Suspended Sediment REC Groups
1	WW_Low_VA; CW_Low_VA
2	WD_Low_Al
3	CD_Low_HS
4	CW_Low_SS
5	WW_Low_SS; WD_Low_SS
6	WW_Low_HS
7	CD_Low_Al; CW_Hill_VA
8	CD_Low_SS
9	CW_Hill_HS; CD_Hill_HS; CW_Low_Al
10	CW_Lake_Any
11	CW_Low_HS
12	CW_Mount_HS; CW_Hill_SS

Table 2 – Deposited sediment attribute class REC composition

Deposited Sediment Class	Deposited Sediment REC Groups
1	WD_Low_VA; WD_Low_Al
2	WW_Hill_HS; CW_Mount_VA
3	CW_Lake_Any; CW_Low_Al; CD_Hill_SS
4	CW_Mount_SS
5	WD_Low_SS
6	WW_Low_VA; WW_Low_HS; CD_Low_VA; CD_Hill_Al; CD_Low_HS
7	WW_Low_SS; CD_Low_SS; CD_Low_Al
8	WW_Lake_Any
9	WD_Low_HS
10	WW_Hill_VA; CW_Hill_HS; CW_Low_HS; CW_Mount_HS; CW_Hill_SS; CW_Hill_Al; CD_Mount_HS; CW_Mount_Al
11	WW_Low_Al
12	CW_Hill_VA; CW_Low_VA; CW_Low_SS; CD_Hill_HS

Table 3 – REC groups for both classification

REC Variable	REC Values	SSC abbreviation
Climate	Warm-Wet	Warm-Wet (WW)
	Warm-Extremely Wet	
	Warm-Dry	Warm-Dry (WD)
	Cold-Wet	Cold-Wet (CW)
	Cold-Extremely Wet	
	Cold-Dry	Cold-Dry (CD)
Topography (Source of flow)	Lowland	Lowland (Low)
	Lakefed	Lakefed (Lake)
	Hill	Hill (Hill)
	Mountain	Mountain (Mount)
	Glacial Mountain	
Geology	Soft Sedimentary	Soft Sedimentary (SS)
	Plutonic Volcanic	
	Miscellaneous	
	Hard Sedimentary	Hard Sedimentary (HS)
	Alluvium	Alluvium (Al)
	Volcanic Basic	Volcanic (VA)
	Volcanic Acidic	

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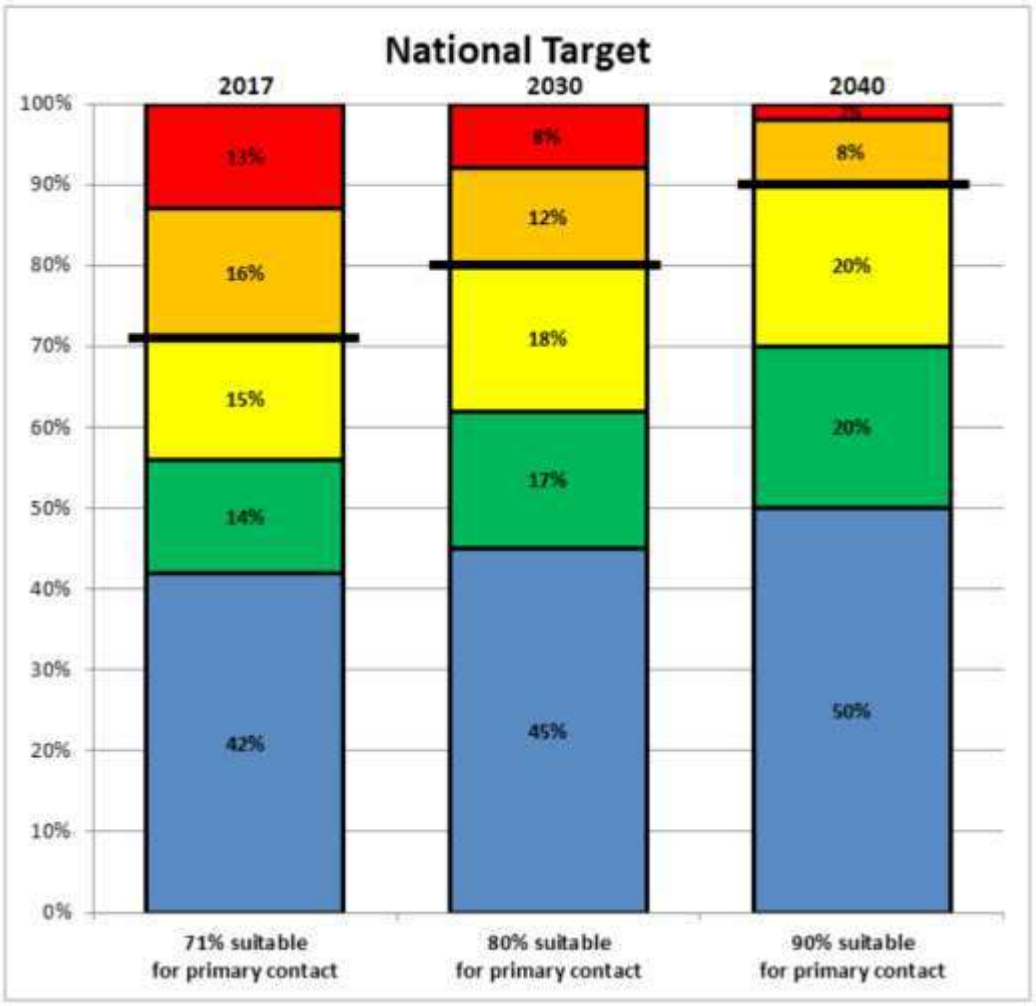
Appendix 3 – National target

The national target is to increase proportions of specified rivers and lakes that are suitable for primary contact (those that are in the **blue**, **green** and **yellow** categories) to at least 80% by 2030, and 90% no later than 2040, but also to improve water quality across all categories.



The categories above represent combined improvements in all regions. For each region, this means reducing the length of specified rivers and lakes in the **red** and **orange** categories, and increasing the length of specified rivers and lakes in the **yellow**, **green** and **blue** categories.

The categories are based on water quality in terms of the two human health attributes, *E. coli* and cyanobacteria – planktonic in Appendix 2 of this national policy statement.

For rivers and lakes, the target categories are same as the *E. coli* table attribute states. However, the categories do not include the 95th percentile of *E. coli*/100 mL numeric attribute state if there is insufficient monitoring data to establish the 95thpercentile.

For lakes, the categories are also based on the cyanobacteria – planktonic attribute states, however, to provide additional granularity for tracking improvements over time, the D band has been split into two categories (**orange** and **red**) as follows:

a. **orange** means the lake has between 1.8 and 3.0 mm3/L biovolume of cyanobacteria – planktonic, using an 80th percentile; and

b. **red** means the lake has more than 3.0 mm3/L biovolume of cyanobacteria – planktonic, using an 80th percentile.

For lakes, the lowest category for either *E. coli* or cyanobacteria – planktonic applies

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Appendix 5 – Temporary exception for specified freshwater management units

Freshwater management unit	Time until, or period, when exception in clause 3. 23 applies

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Stock exclusion regulations

Information notes

1. These regulations do not apply to rivers less than one metre wide.
2. On land that is not "low-slope", these regulations apply only to land with the stipulated stocking rates. [Alternatively, on land that is not "low-slope", these regulations apply only to land with a base carrying capacity of the stipulated stocking rates. The base carrying capacity is proxy for the stock the land would carry in an unimproved state. We are seeking feedback on whether the use of base carrying capacity is a better metric, or whether there is another approach that would be more effective in achieving the same outcome]

Stock exclusion (in a section 360 regulation)

The following general stock exclusion requirements apply:

a) Dairy and beef cattle, and pigs, are not permitted to cross water bodies except by a dedicated culverted or bridged cross point (unless that crossing is no more than twice per month).

b) Where an existing fence does not comply with setback requirements, it shall be allowed to remain in its current positions until 2025, unless the existing setback has a minimum 2 metre average width and is not less than 1 m setback, in which case the setback requirements do not apply until 2035.

c) Landowners may seek an exemption from stock exclusion requirements, or an extension of the phase-in timeframes.

d) The following definitions apply

   i. **dairy cattle**: means cattle farmed for milk production, and

      1. includes unweaned calves of dairy cows, and bulls on the farm whose purpose is mating with dairy cows; and
      2. includes dairy cattle not being milked (young animals or mixed-aged cows) that are grazed off the milking platform either temporarily or throughout the year; and
      3. does not include cattle farmed for beef production, or dairy support.

   ii. **dairy support** means dairy cattle that are not being milked (young animals or mixed-aged cows) that are grazed off the milking platform (ie, the area devoted to feeding dairy cows on a daily basis during the milking season) either temporarily or throughout the year.

   iii. **effective hectare** means the area of a farm on which animals are grazed

   iv. **low-slope land** is land that is classified as low-slope land on the NES mapping tool [available on-line]. The map shows land parcels where the average slope at the land parcel scale is less than or equal to 5 degrees [less than or equal to 7 degrees, less than or equal to 10 degrees]

   v. **non-low-slope land** is land that is not classified as lowland on the NES mapping tool [available on-line] and where the average slope at the land parcel scale is greater than 5 [7, 10]degrees.

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vi. **river**: as defined in the RMA and excludes ephemeral streams

vii. **setback**: means the distance from the edge of the bed [or edge of the wetted bed] to the exclusion mechanism (eg fence) as averaged across each river or lake on a property

viii. **stock units** are calculated from Table 1

ix. **wetlands**: For the purposes of this policy means a natural wetland [as described in the National Policy Statement for Freshwater Management] regardless of whether it is dominated by indigenous or exotic vegetation, except that it does not include

1. wet pasture, or paddocks where water temporarily ponds after rain in places dominated by pasture, or that contain patches of exotic sedge or rush species; or
2. constructed wetlands; or
3. geothermal wetlands

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Stock exclusion on "Low-slope" land

Waterbody	Stock	Setback	Timeframe
Wetland	Dairy and dairy support cattle, pigs, beef cattle and deer	5 metres on average across a property (with a minimum width of 1m)	1 July 2021 for wetlands identified in regional or district plans. 1 July 2023 for all other wetlands
Wetland	Any new pastoral system for all cattle, pigs or deer establishing after gazettal	5 metres on average across a property (with a minimum width of 1m)	Immediately
Rivers (> 1 m wide), and lakes	Dairy and dairy support cattle and pigs	5 metres on average across a property (with a minimum width of 1m)	1 July 2021
Rivers (> 1 m wide), and lakes	Beef cattle and deer	5 metres on average across a property (with a minimum width of 1m)	1 July 2023
Rivers (> 1 m wide), and lakes	Any new pastoral system for all cattle, pigs or deer establishing after gazettal	5 metres on average across a property (with a minimum width of 1m)	Immediately

Stock exclusion from waterways on Non-low-slope land

Waterbody	Stock	Setback	Timeframe
Wetland	Dairy and dairy support cattle, pigs, beef cattle and deer	5 metres on average across a property (with a minimum width of 1m)	1 July 2021 for wetlands identified in regional or district plans. 1 July 2023 for all other wetlands
Wetland	Any new pastoral system for all cattle, pigs or deer establishing after gazettal	5 metres on average across a property (with a minimum width of 1m)	Immediately
Rivers (> 1 m wide), and lakes	Dairy cattle and pigs (unless housed)	5 metres on average across a property (with a minimum width of 1m)	1 July 2021 Unless it is a new system, in which case, immediately
Rivers (> 1 m wide), and lakes	Beef cattle, dairy support cattle, and deer on land with a [stocking rate or base carrying capacity] • greater than 14SU/ha at the farm scale, or • greater than 18 SU/ha at a paddock scale if the [stocking rate or base carrying capacity] is less than 14SU/ha at the farm scale	5 metres on average across a property (with a minimum width of 1m)	1 July 2023 Unless it is a new system, in which case, immediately

Table 1. Calculating stock units

Source: Reynish, (editor) (2018). Farm Technical Manual. Volume 24. Published by the Faculty Agribusiness and of Commerce, Lincoln University. Table 1.74. Stock unit measurements for cattle and deer (including young stock).

Stock type (including young stock)			Stock unit measurements
Beef cow*	350kg, 68% calves weaned		3.7
	400kg, 83% calves weaned		4.4
	450kg, 88% calves weaned		5.3
	500kg, 90% calves weaned		6.3
Beef weaners*	135-270 kg		3.5
Beef*	200-400kg, slow growing		3.7
	200-465kg, rapid growing		4.6
	350-500 kg		4.7
Bull*	500kg		6.0
Jersey yearling 0-12 months			1.7
Friesian yearling 0-12 months			1.9
Jersey heifer			3.0
Friesian heifer			3.4
Red deer*	Weaning to 15 months	Males	1.4
		Females	1.2
	15 to 27 months	Males	1.8
		Females	1.8
	Adults	Males	2.1
		Females	1.9
Wapiti*	add 0.1 to red deer values		
Fallow deer	weaner buck		0.55
	Yearling buck		0.65
	Yearling doe		0.55
	Mature doe		0.9

Source: Table 1.73. Stock unit measurements for dairy cows, based on cow weight and milksolids

Cow liveweight	Milksolids yield						
	175 kg	210 kg	245 kg	280 kg	315 kg	350 kg	385 kg
250	4.6	5.1	5.5	6.0	6.4		
300	4.9	5.4	5.8	6.3	6.7	7.2	
350	5.2	5.6	6.1	6.5	7.0	7.4	
400	5.5	5.9	6.4	6.8	7.3	7.7	8.2
450	5.8	6.2	6.7	7.1	7.5	8.0	8.4
500		6.5	6.9	7.4	7.8	8.3	8.7
550			7.2	7.7	8.1	8.6	9.0

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Interim RIS

Interim Regulatory Impact Analysis for Consultation: *Essential Freshwater*

Part I: Summary and Overview

08 August 2019

Table of Contents

Section 1: General information

Purpose

This is a summary document of the interim regulatory impact analysis done to date for the Essential Freshwater package.

This analysis and advice has been produced for the purpose of:

- informing Cabinet decisions on policies to consult on
- supporting consultation on the proposals contained within the discussion document *Essential Freshwater*.

Part 1 contains a summary of the policies and options being considered. Further details on each option are available on the Ministry for the Environment's website.

The Ministry for the Environment and the Water Taskforce[1] are solely responsible for the analysis and advice set out in this Regulatory Impact Statement, except as otherwise explicitly indicated.

Overview

New Zealand has major issues with freshwater quality and ecosystem health. The focus of initiatives to date has been on addressing water quality issues. This package, however, takes a more inclusive approach to encompass the wider aspects of water that contribute to ecosystem health.

The Water Taskforce have identified polices that would stop further degradation and loss, and reverse the past damage to, our freshwater resources, waterways and ecosystems.

This regulatory impact analysis covers 20 different policy interventions which we consider that, if implemented, would make significant progress to addressing issues of freshwater quality and ecosystem health.

Key Limitations or Constraints on Analysis

This draft regulatory impact analysis accompanies the Government's *Essential Freshwater* discussion document. The purpose of this consultation is to gather your views on the proposals and enhance the overall understanding of the impacts of the *Essential Freshwater* policies. In addition to this, further impact analysis is underway to better understand not only the economic and environmental impacts but also the social and cultural costs and benefits of the package. All of this information will then be included in the final regulatory impact analysis that will accompany the Cabinet paper seeking final policy decisions.

The consultation document has a mix of firm proposals, and policy areas where we have not conclusively identified a preferred option. In these areas we have provided a range of options. The *Essential Freshwater* policy proposals are presented as a package because of the interrelatedness of the proposals in addressing declining fresh water ecosystem health and this allows New Zealanders to consider the package as a whole.

Understanding water quality and ecosystem health and why it varies from location to location and over time is challenging. Part of the difficulty arises because rivers, lakes, and groundwater are parts of an interconnected freshwater system that receives inputs from the surrounding land and the

[1] This taskforce is led by the Ministry for the Environment and the Ministry for Primary Industries, with members from the Treasury, Te Puni Kōkiri, Māori Crown Relations Unit, the Department of Internal Affairs, the Department of Conservation, the Ministry of Business, Innovation and Employment, and expertise from local government.

water ultimately flows into estuaries and coastal environments. A reduction in water quality in one part of the system can affect water quality elsewhere and make it difficult to determine the sources of pollution.[2]

Changing water flows can have significant effects on habitats, but information about the extent and scale of these impacts on our ecosystems is lacking. Other water issues like pollution also have an effect, but the cumulative impact of these changes on our social and economic values is difficult to determine.[3]

It is inherently difficult to accurately quantify environmental costs and benefits (and arguably it is not always necessary when the intrinsic value of the environment is acknowledged). It is often easier to quantify the economic cost of a policy intervention to an individual, yet harder to quantify the environmental benefit in the same terms. So, while best efforts have been made to quantify the impacts of the *Essential Freshwater* package, these should be understood within this context.

Furthermore, estimating the fiscal costs and benefits of direction in the Freshwater NPS is difficult because there is no easy way of predicting:

i. how councils may choose to exercise their discretion in several matters (such as the timeframes for achieving objectives to meet national bottom lines)

ii. what mitigation measures resource users might choose to put in place to meet limits and over what timeframe.

Responsible Manager

Martin Workman

Director, Water Taskforce
Ministry for the Environment

[2] Ministry for the Environment & Stats NZ (2019). New Zealand's Environmental Reporting Series: Environment Aotearoa 2019, p.47.

[3] Ibid., p.82.

Quality Assurance Statement

The Ministry for the Environment's Regulatory Impact Analysis Panel has reviewed the Regulatory Impact Analysis (RIA) developed by the Ministry for the Environment, and produced for the *Essential Freshwater* work programme (dated 8 August 2019).

Due to the size and complexity of the RIA, which contained 20 sections with separate analyses outlined in Appendices, the Panel has provided an assessment for each of the separate RIA. The Panel considers that all of the RIA meet the quality assessment criteria, except - Appendix 17: *Intensive winter grazing on forage crops*. This particular appendix partially meets the assessment criteria. How the issue can be a problem locally is described well. However, the RIA requires further analysis on the extent of the current situation nationally. We expect the consultation process will help to gather information to address the following issues:

- further detail of how the preferred option will work in practice; and
- whether the preferred option is the best solution to address the problem.

Overall the RIA are written clearly and concisely, and make the case for the recommended change, with the key elements of the proposal being clear and the most important impacts having been identified. The Panel considers that the RIA provides sufficiently robust analysis and information to support the proposed public consultation on the *Essential Freshwater* work programme.

Some of the individual RIA require further assessment of the impacts and costs on users and Local Government. However, we understand that this analysis is set to be undertaken during (but also informed by) planned public consultation. A final RIA will be developed following public consultation and when final policy decisions are being sought.

Though there is no overarching statement of the overall impacts of the package, we recommend that this be developed through and after consultation and included in the final RIA.

Section 2: Problem definition and objectives

The way we live and make a living is having a serious impact on our environment including our precious water resources. *Environment Aotearoa 2019*[4] identified nine priority issues that matter most to the current state of our environment. Four of these priority issues reflect the pressure we are putting on our rivers, lakes, wetlands, estuaries and groundwater:

- Changes to the vegetation on our land are degrading our soil and water
- Our waterways are polluted in farming areas
- Our environment is polluted in urban areas
- The taking of water changes flows which affects our freshwater ecosystems

These are not new issues; as outlined in the document *Essential Freshwater* the pressure on our freshwater is the result of more than 150 years of population growth and changes in the way we use our land.

Regulatory uncertainty also slows action to addressing water issues. The *Essential Freshwater* package aims to address this as improving regulatory certainty means that decisions may be taken more quickly and with confidence.

2.1 What is the context within which action is proposed?

Government reform

Essential Freshwater

In October 2018, the Government published the *Essential Freshwater: Healthy Water, Fairly Allocated*[5] work programme. The programme is the latest in a series of Government initiatives to address water use and the effects of land use on water quality and ecosystem health. Options to meet the objectives of that work programme[6] are assessed in this regulatory impact statement and will inform the Government's decisions on regulatory interventions.

There will be costs of action but the costs of inaction are not zero. The freshwater issues currently facing New Zealand have significant costs (e.g. the costs of ongoing funding to remediate degraded waterways). In addition to improving our environment, one of the major benefits of the *Essential Freshwater* package is the avoidance of even greater future costs – generally, environmental interventions are cheaper and more cost-effective the sooner they are implemented. As noted above, there are also overarching benefits to providing regulatory certainty (such as enhancing New Zealand's international reputation, and the trade benefits that would arise as a consequence).

There are many examples of individuals and businesses who are already doing their bit to protect and improve freshwater ecosystems. These examples of good practice can be built upon by others to improve freshwater outcomes throughout New Zealand.

Related Government work

Essential Freshwater is part of a broader programme of reform towards a sustainable, low emissions economy. This broader work programme includes Te Uru Rakau One Billion Trees programme, which will reduce erosion, improve freshwater quality and promote diversity of land use and biodiversity; three proposed national policy statements on urban development, highly productive land, and

[4] Available at https://www.mfe.govt.nz/environment-aotearoa-2019.

[5] Available at https://www.mfe.govt.nz/sites/default/files/media/Fresh%20water/essential-freshwater.pdf.

[6] The objectives of this work programme are outlined in section 2.4 below.

indigenous biodiversity; changes to the RMA to improve its operation and speed up freshwater planning; and a commitment to reduce our greenhouse gas emissions and transition to a low carbon, climate resilient New Zealand.

The other proposed national policy statements on highly productive land, urban development and indigenous biodiversity will also be consulted on between August and November 2019.

Water quality and ecosystem health

Environment Aotearoa 2019 provides the most recent assessment of the state of New Zealand's water quality using available indicators. It found that "there is clear evidence that waterways in our farming areas have markedly higher pollution by nutrients (nitrogen and phosphorus), microbial pathogens, and sediment[7] than waterways in native catchments. Although all these pollutants occur naturally in freshwater systems, excess concentrations can cause harm."

There are significant issues with ecosystem health in urban areas as well: "river water quality in urban areas was much worse than expected for natural conditions…even poorer than in pastoral areas".[8] While the Essential Freshwater Package does address issues with urban waterways, when considering the scale of the problems faced, it is important to consider that urban waterways make up less than one percent of New Zealand's rivers and lakes.[9]

Ecosystem health is an important metric that looks at a broader range of things than just water quality and quantity (i.e. habitat, aquatic life, and ecological processes). A recent report card produced by the Cawthron Institute provides an assessment of the country's freshwater ecosystem health. It highlights the relative lack of information we have on aspects of water health other than water quality. Overall, and in light of this lack of information, New Zealand river ecosystem health scored a B-.[10]

Environment Aotearoa 2019 assessed the state of freshwater against the Australian and New Zealand Guidelines for Fresh and Marine Water Quality.[11] These guidelines show what water quality indicators should look like under slight to moderate levels of human influence (default guideline values). Modelling in the report showed that "for most water quality variables, 50–90 percent of the total river length in the pastoral land-cover class exceeds the relevant default guideline value for 2013–17. In comparison, the models show that default guideline values are exceeded in less than 30 percent of the river length in the native land-cover class."[12] From 2013 to 2017, compared with rivers in the native land-cover class, the pastoral land-cover class had modelled median nitrate-nitrogen

[7] More detail on nutrients, pathogens and sediment will be provided in the breakdown of policy interventions below. For a general description of these items, see Environment Aotearoa 2019, p.47.

[8] see Environment Aotearoa 2019, p.65.

[9] In total, 3,344 kilometres of New Zealand's river length is in the urban land-cover class, compared with 188,024 kilometres in the pastoral landcover class, and 198,126 kilometres in the native landcover class. see Environment Aotearoa 2019, p.65.

[10] Clapcott J, Goodwin E, Williams E, Harding J, McArthur K, Schallenberg M, Young R, Death R, 2019, Technical Report on the Prototype New Zealand River Ecosystem Health Score, Cawthron Institute for MfE. In preparation.

[11] ANZECC & ARMCANZ 2000, Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand, Canberra.

[12] A total of 188,024 kilometres of New Zealand's river length is in the pastoral land-cover class, whereas a total of 198,126 kilometres is in the native land-cover class.

levels that were 9.7 times higher, dissolved reactive phosphorus levels 3.4 times higher, turbidity 2.2 times higher, and *E. coli* levels 14.6 times higher.[13]

While farming is not the only source for these pollutants, it is a major contributor. From 1994 to 2017, the number of dairy cattle in New Zealand increased by 70 percent (from 3.8 million to 6.5 million). During the same period, the number of sheep decreased by 44 percent from 49.5 million to 27.5 million, and the number of beef cattle decreased by 28 percent from 5 million to 3.6 million. The increase in dairy cattle has been most pronounced in the South Island, notably in Canterbury, Otago, and Southland. This shift from sheep and beef farming to dairy farming is associated with increased leaching of nitrogen from agricultural soils. Cattle excrete more nitrogen per animal than sheep (cows produce more urine and the urine has a higher nitrogen concentration), so nitrogen from cattle is more likely to leach through soil than nitrogen from sheep.[14]

In the 10 years from 2008 to 2017, some river water quality monitoring sites showed improving trends and some showed worsening trends. The pastoral and native land-cover classes had similar proportions of sites with improving and worsening trends. Understanding the causes of these trends is difficult due to the complex interconnections between water bodies, variable lag times, climate influences, and the mixture of land cover, land use, and land management that occurs in any given catchment.[15]

Water Usage

New Zealand lakes contain approximately 320 billion cubic metres, aquifers store around 711 billion cubic metres, and about 440 billion cubic metres flow in rivers and streams each year.[16] But New Zealand's water use is high. In 2014, New Zealand had the second highest volume of water take per person of OECD countries – 2,162 cubic metres compared with the OECD average of 815 cubic metres[17]. This usage has led to situations, depending on the area and time of year, where there is not enough water to meet demand, and results in some waterbodies being over-allocated (which in turn leads to issues with water quality and ecosystem health).[18]

Aside from hydroelectricity uses, there were 10,900 consents to take groundwater and 5,100 consents to take surface water in the 2013/14 water reporting year. The amount of surface water allocated was 74 percent of the total water allocated nationally, with the remainder from groundwater.[19]

The area of irrigated agricultural land almost doubled (a 94% increase) between 2002 and 2017 from 384,000 hectares to 747,000 hectares. Irrigated land area rose in every region during this time but the majority of this increase was due to the almost doubling of irrigated land in Canterbury (241,000

[13] Environment Aotearoa 2019, p.49-51.

[14] Ibid., p.58.

[15] Environment Aotearoa 2019, p.53.

[16] *Ministry for the Environment & Stats NZ (2017).New Zealand's Environmental Reporting Series: Our fresh water 2017. Retrieved from www.mfe.govt.nz and www.stats.govt.nz.*

[17] OECD. (2018). Water withdrawals (indicator). https://doi.org/10.1787/17729979-en

[18] *Environment Aotearoa*, 2019, p.75.

[19] Ibid. p.75.

to 478,000 hectares). In 2017, 64 percent of New Zealand's irrigated agricultural land was in Canterbury.

Waitangi Tribunal Claims and the Treaty of Waitangi

In February 2012 the New Zealand Māori Council (NZMC) lodged Wai 2358 with the Waitangi Tribunal. This claim concerned the Crown's resource management reforms, which the NZMC argued were proceeding without having first established a regime to recognise and provide for Māori rights and interests in freshwater.

One of the Waitangi Tribunal's freshwater inquiry's (Wai 2358) focus was on whether the current law concerning freshwater and the Crown's freshwater reforms (both completed and proposed) were consistent with the principles of the Treaty. The NZMC argued that the answer on both accounts was 'no'. Although it supported the recent provision for Mana Whakahono-ā-Rohe agreements in the Resource Management Act 1991 and the strengthening of Te Mana o te Wai in the National Policy Statement for Freshwater Management 2014 (amended 2017), the NZMC submitted that these changes had come too late and did not go far enough.

We are expecting the Tribunal to report back late in 2019. We hope to consider the report of the Tribunal alongside submissions as part of public consultation.

Public perceptions of freshwater

In the 2018 New Zealand General Social Survey[20] 80.2 percent of New Zealanders stated that there was a problem with the state of New Zealand's rivers, lakes, streams, wetlands, and aquatic life. Of these people, half of them (49.3 percent) thought farming activities were the main cause of the issue. The second-most commonly stated cause was sewage and stormwater discharges (at 16.6 percent).

2.2 What regulatory system, or systems, are already in place?

Existing legislation/regulations

Instrument	Description
Resource Management Act 1991	The RMA is New Zealand's main piece of legislation that sets out how to manage our environment. The RMA is based on the principle of sustainable management which involves considering effects of activities on the environment now and in the future before making resource management decisions. As well as managing air, soil, freshwater and coastal marine areas, the RMA regulates land use and the provision of infrastructure which are integral components of New Zealand's planning system.

[20] Available at https://www.stats.govt.nz/information-releases/wellbeing-statistics-2018.

Instrument	Description
Section 360 regulations	Regulations made under Section 360 of the RMA take immediate effect from commencement date. Section 360 (1) lists the matters regulations can be made for. The matters are generally administrative, but have been expanded to include exemptions related to: • discharges (removing the need for specific discharges to be authorised by consent, rule or NES), • requirements for holders of water permits, • discharge permits, • coastal permits, • land use consents to keep records, and • measures to exclude stock from water bodies. Current section 360 regulations relevant to freshwater include requirements to measure and report water takes (Resource Management (Measurement and Reporting of Water Takes) Regulations 2010). The powers to create regulations for excluding stock from waterbodies have yet to be used.
National Policy Statement for Freshwater Management 2014 (amended 2017)	National policy statements are instruments made under sections 45-55 of the Resource Management Act 1991. They state objectives and policies for matters of national significance. The Freshwater NPS provides direction on how local authorities should carry out their responsibilities under the RMA for managing fresh water. Local authorities must give effect to national policy statements in their regional and district plans.
National Environmental Standards (NES)	National environmental standards (NES) are regulations made under section 43 of the Resource Management Act and can apply to any specified part of the country or nationally (although all current national environmental standards apply nationally). NES are regulations that prescribe standards for environmental matters. The government sets standards where appropriate to ensure a consistent standard for an activity or resource use. They can prescribe technical and non-technical standards, methods or other requirements for land use and subdivision, use of the coastal marine area and beds of lakes and rivers, water take and use, discharges, or noise. Each regional, city or district council must enforce the same standard. In some circumstances where specified in the NES, councils can impose stricter or more lenient standards. An example is the NES for Sources of Human Drinking Water (2008). It sets requirements on regional councils for protecting sources used for water supply from becoming contaminated. Currently, there is no NES for freshwater management more generally.
Regional Policy Statements	Regional councils are required to prepare a regional policy statement for their region. RPSs provide an overview of the resource management issues of the region and policies and methods to achieve integrated management of the natural and physical resources of the region. Local authorities in the region must give effect to the RPS in their regional and district plans.

Instrument	Description
Regional Plans	Regional plans give effect to national policy statements, national planning standards and regional policy statements. They must also not be inconsistent with water conservation orders. In terms of freshwater, regional plans can cover issues within the functions of the regional council, including soil conservation, land uses that affect water quality and quantity, aquatic ecosystems, biodiversity, discharge of contaminants, taking, damming and diverting water, and allocation of natural resources.
District plans	A territorial authority (city or district council) must prepare a district plan for its district to achieve sustainable management. It must give effect to national policy statements and regional policy statements and must not be inconsistent with regional plans and any applicable water conservation orders. District plans cover issues related to the functions of territorial authorities, including the effects of land use and the control of impacts from activities on biodiversity, rivers and lakes.

The Resource Management Act 1991 (the RMA) regulates the use and development of natural and physical resources of New Zealand. The purpose of the RMA, given in section 5, is to promote the sustainable management of natural and physical resources. The management of freshwater resources is largely the responsibility of regional councils, and is achieved through objectives, policies, rules and other methods adopted in regional plans. The Governor-General can make regulations (both national environmental standards and section 360 regulations), which prevail over regional rules (except where the regional rules are more stringent and the regulations allow stringency), and can approve national policy statements prepared by the Minister for the Environment. National policy statements state objectives and policies for matters of national significance that are relevant to achieving the purpose of the RMA.

National direction on freshwater management is primarily provided through the National Policy Statement for Freshwater Management 2014 (the Freshwater NPS), a national policy statement prepared under the Resource Management Act 1991. The Freshwater NPS came into effect in 2011. It was amended and replaced in 2014, and amended in 2017. It sets out objectives and policies that regional councils must give effect to in their regional policy statements and plans. It requires councils to fully implement the objectives and policies of the Freshwater NPS by 2025, or 2030 if they cannot complete the process to sufficient quality by 2025.

The Freshwater NPS requires regional plans to have objectives, policies and methods, including rules, that:

- Safeguard the life-supporting capacity, ecosystem processes and indigenous species of fresh water, including their associated ecosystems.
- Establish systems to account for all freshwater taken and contaminants entering freshwater bodies in the region.
- Maintain or improve the overall quality of fresh water within the region.
- Identify the values the community holds for all freshwater bodies in the region, and set freshwater objectives and limits to provide for those values.
- Establish systems to monitor the progress towards achieving freshwater objectives.

- Avoid over-allocation of freshwater resources, and phase out existing over-allocation. Where there is over-allocation, councils must set targets in the regional plan, including defined timeframes, to transition to sustainable allocation.
- Improve the integrated management of fresh water, land and the coastal environment.
- Reflect tāngata whenua values in freshwater management and take reasonable steps to include iwi and hapū in freshwater management.

The Government's policy intention of how councils should do this is given in the Preamble of the Freshwater NPS as follows: "Setting enforceable quality and quantity limits is a key purpose of the national policy statement. This is a fundamental step to achieving environmental outcomes and creating the necessary incentives to use freshwater efficiently, while providing certainty for investment. Water quality must reflect local and national values. The process for setting limits should be informed by the best available information and scientific and socio-economic knowledge."

Settlement Obligations

The Ministry has obligations under the Te Awa Tupua (Whanganui River Claims Settlement) Act 2017. This includes an obligation to recognise: Te Awa Tupua's status as a legal person and as "an indivisible and living whole, comprising the Whanganui River from the mountains to the sea, incorporating all its physical and metaphysical elements"; and Tupua te Kawa, which are intrinsic values representing the essence of Te Awa Tupua (ss12 to 15 of the legislation). The effect of any regulatory proposals on Te Awa Tupua has not yet been assessed. If any regulations affecting Te Awa Tupua are progressed, the impact of those regulations on Te Awa Tupua will be assessed following public consultation.

2.3 What is the policy problem or opportunity?

Problem Definition

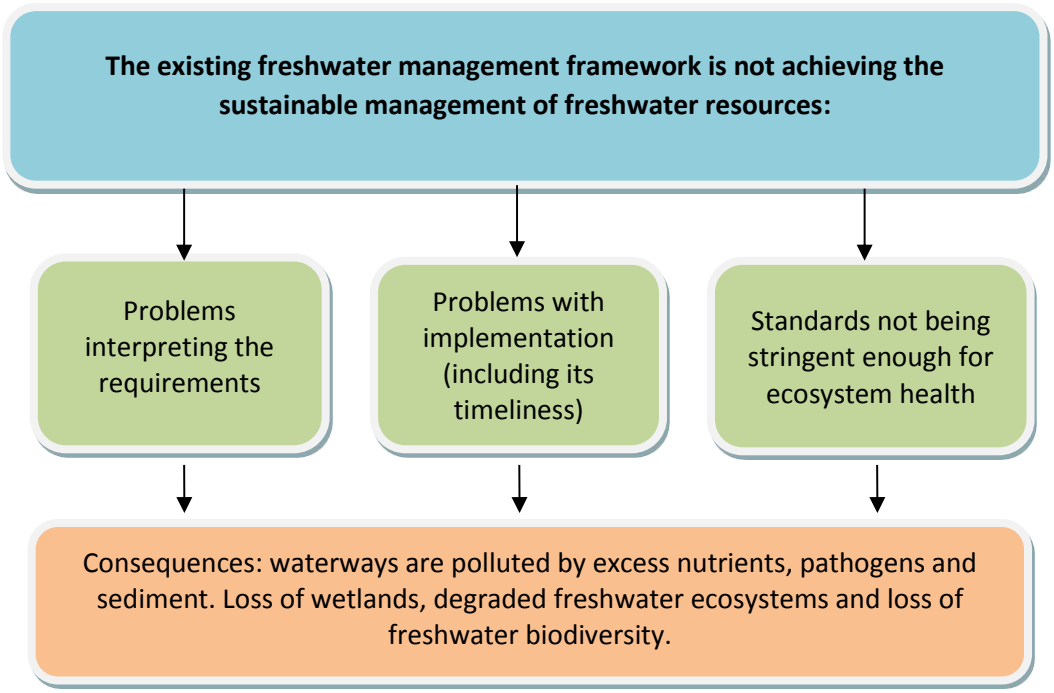


Figure 1: Overarching issues and their consequences

Figure 1 above sets out the overarching issue – the existing freshwater management framework is not achieving the sustainable management of freshwater resources.

Although the RMA provides a framework for good water management practice, there have been issues with implementation. The existing policy framework is currently incomplete (i.e. it currently focuses on water quality and quantity, but leaves out broader measures of ecosystem health). Furthermore, some of the existing standards are not achieving ecosystem health. With increased pressure on water resources, councils are struggling to apply tougher rules on water users, in particular on the primary sector in which land use has so far been relatively unregulated.

The process for giving effect to Freshwater NPS is long and complex (though this is largely inevitable when dealing with such a significant issue). There is a lack of regulatory certainty which can make it difficult for councils to implement the Freshwater NPS. Implementing the Freshwater NPS requires input from multiple disciplines including freshwater ecology, economics and te ao Māori, and a reconciliation of the community's environmental, economic, social and cultural values.

Problems with interpretation and implementation – Insufficient Integrated Management

Regional councils have as one of their functions the control of land use for the purposes of managing water quality and quantity (section 30 of the RMA). Yet despite the causes of freshwater degradation having moved from being dominated by direct discharges to water, to now being dominated by land use effects, there are few controls on agricultural land use designed to improve water quality.

Councils have expressed difficulty with the interpretation and implementation of parts of the existing policy framework. This compounds issues they already have with implementation like some of their decisions being subject to legal challenge.

Problems with interpretation and implementation – Variable Iwi/hapū involvement

The RMA provides mechanisms for Treaty partnership with Māori in freshwater governance, but these have not been well or widely utilised. Direction in the Freshwater NPS for councils to engage with Iwi and hapū has been poorly implemented in some regions.[21]

Standards not stringent enough – Degraded water quality

Water quality in many parts of New Zealand is declining across a number of indicators. The slow adoption of quantitative enforceable water quality limits in the majority of regional plans, and the slow application of these limits to resource users has meant that water quality is continuing to degrade in places.

Status Quo

Many councils are making progress on new policy and plan initiatives which will improve the management of our fresh water (particularly for water quantity). However, other regions are further behind and making much slower progress in managing the increase in demand.[22] In addition to the Freshwater NPS, other actions by central government will also have an effect on water quality.

Costs of not acting

Furthermore, it is important to understand that the costs of not acting are not zero. The environmental issues currently facing New Zealand have immediate significant costs (e.g. the costs of ongoing funding to remediate degraded waterways and the cost of not supporting access to natural environments) as well as future costs (eg, decreased productivity due to soil erosion). In addition to improving our environment, one of the major benefits of the Essential Freshwater package is avoiding greater future costs – generally, environmental interventions are cheaper and more cost-effective the sooner they are implemented.

2.4 Objectives

The Government set the following objectives for improving freshwater management in its document *Essential Freshwater: healthy water, fairly allocated*[23]

> *Stopping further degradation and loss* – taking a series of actions now to stop the state of our freshwater resources, waterways and ecosystems getting worse, and to start making immediate improvements so that water quality is materially improving within five years.
>
> *Reversing past damage* – promoting restoration activity to bring our freshwater resources, waterways and ecosystems to a healthy state within a generation.

The Government also set out a vision for freshwater. They affirmed that:

- freshwater is a precious and limited resource and a taonga of huge significance, and at the heart of what it is to be a New Zealander

[21] Ministry for the Environment. 2017. National Policy Statement for Freshwater Management Implementation Review: National Themes Report. Wellington: Ministry for the Environment.

[22] Ibid.

[23] A third objective: *Addressing water allocation issues – working to achieve efficient and fair allocation of freshwater and nutrient discharges, having regard to all interests including Māori, and existing and potential new users* is being considered separately. There will be a concurrent consultation on allocation issues as part of the broader *Essential Freshwater* that goes out for consultation.

- access to safe drinking water is a basic right, and drinking water sources must be safeguarded
- the life-supporting capacity of water is critical for the habitat of indigenous freshwater species, trout and salmon
- New Zealanders consider they have a birth right to swim safely in New Zealand's rivers and lakes and at beaches, and that waterways should be fishable and safe for food gathering
- Mauri must be restored to waterways subjected to pollution and practices that have compromised the relationship that Māori have traditionally had with these taonga
- if each of New Zealand's local rivers is clean enough to swim in safely and life supporting for freshwater species, then all New Zealand rivers will be.

2.5 Are there any constraints on the scope for decision making?

Allocation issues

Options to change freshwater allocation issues (both quality and quantity) are not considered as part of this regulatory impact analysis. Nitrogen discharge allocation will be consulted on as part of the *Essential Freshwater* policy package; however not at the same time as the rest of the package. Therefore, no decisions are sought in this area at this stage.

The purpose of the upcoming consultation process on Nitrogen discharge allocation is to begin a national conversation on this important issue.

Some other tools such as taxes on farm inputs (eg, fertiliser) have been ruled out by the Government in this term and are not considered in this analysis.

2.6 Stakeholder Engagement

The Water Taskforce within the Ministry for the Environment has undertaken work alongside four advisory groups to develop policy options. These groups are: Kāhui Wai Māori (KWM: a Māori freshwater forum established to allow for collaborative freshwater policy development between the Crown and Māori), a Science and Technical Advisory Group (STAG: to advise on scientific evidence for freshwater policy development), the Freshwater Leaders Group (FLG: a group to co-design policy solutions and provide a sounding board Water Taskforce ideas, input ideas, challenge analysis, and lead discussion in various sectors), the Regional Sector Water Sub-Group. Individual policy leads also worked with representatives from the hydro-electric generation industry and a Sediment Working Group (consisting of policy and technical experts from regional councils).

Public consultation is currently planned for late August 2019.

The views of advisory groups on the various policies of the Essential Freshwater Package will be discussed in the relevant sections below. In addition to this, the advisory groups have produced their own reports on the *Essential Freshwater* package, these will be available to the public during the consultation period.

Section 3: Overall options identification

3.1 What options are available to address the problem?

Of the regulatory tools listed in section 2.2 above, we have identified three regulatory tools that can be used to address the problem. These are:

1. changes to the Freshwater NPS (which has an existing implementation date of 2025);

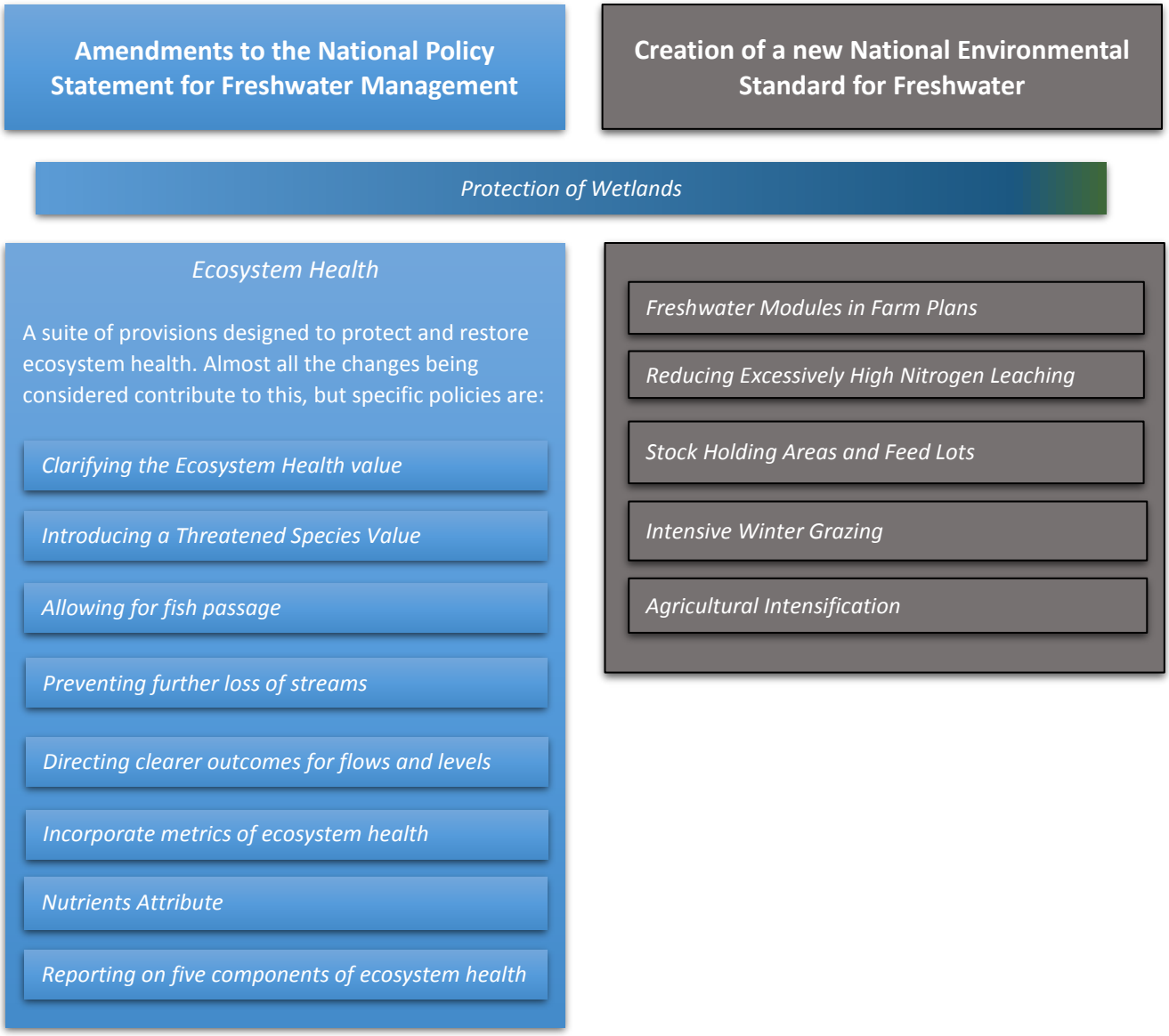
2. the creation of a new National Environmental Standard (which would impose regulations quickly to limit potential further decline); and
3. the creation of new section 360 regulations (which can take immediate effect from their commencement date and are a more appropriate vehicle for some interventions).

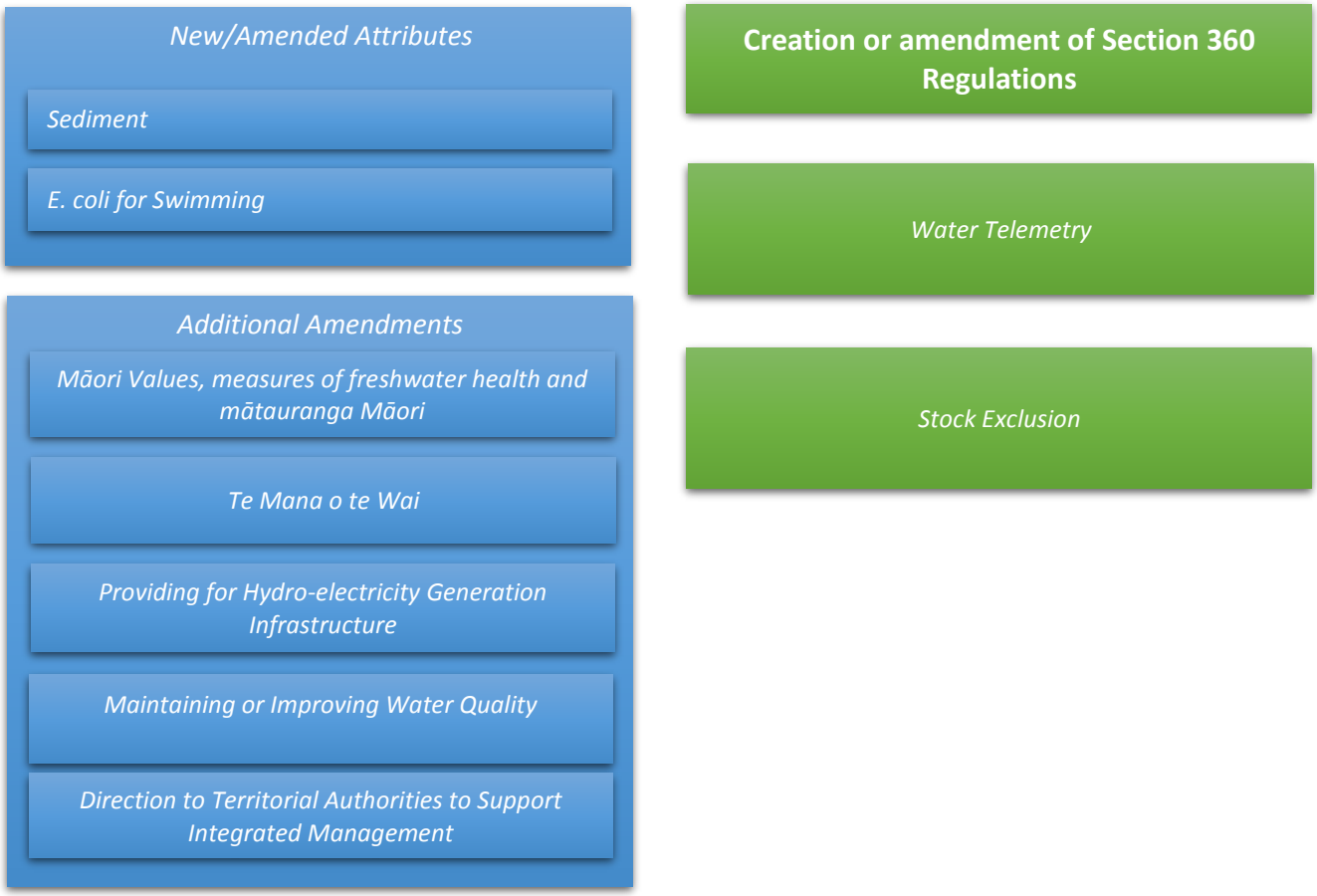
Together these tools are looking to improve policy direction; set thresholds or bottom lines; require adoption of good practice; improve monitoring and reporting on freshwater; and support people in implementing these changes.

We consider that these are the best policy tools for the kind of intervention required by this problem. They provide sufficient flexibility in balancing the need for strong national direction while ensuring that councils have sufficient flexibility to adapt to local circumstances.

Figure 2 shows what tool the analysis recommends for each policy area.

Figure 2: Essential freshwater policy areas by recommended instrument





The recommended options for each of the policy areas are summarised separately below. A full analysis of each of these options is available in Part II of this regulatory impact analysis.

3.1 Options not considered

RMA Reform

The Essential Freshwater work programme has focussed on utilising existing tools available under the RMA rather than changing the RMA itself. However, there is currently a bill to introduce a new planning process for freshwater which councils must use. This will require plans to be operative by 2025. This new planning process will support the changes included in the *Essential Freshwater* programme by enabling these to come into effect in a timely way.

3.2 Criteria

Each of the policy options considered have been assessed using the following general criteria. For certain sub-options some criteria were deemed not to be relevant or additional criteria were used. The criteria used to assess each option along with the list of options considered can be found within the full regulatory impact analysis in the chapter associated with the specific policy area.

Effectiveness: *The option provides a solution to the problem. The problem has been completely addressed.*

Timeliness: *The option prevents further degradation of fresh water in New Zealand in a timely fashion.*

Fairness: *The option treats all stakeholders (rural, urban, future and current generations) equitably. The costs fall on those that contribute to the problem and not other parties (ie, on central or local Government).*

Efficiency: *The option is cost-effective. The option achieves maximum benefits with minimum wasted effort or expense. This criterion should consider impacts, either negative or positive, on the wellbeing of people (individuals and communities).*

Principles of the Treaty of Waitangi: *The option appropriately provides for the principles of the Treaty of Waitangi. The option promotes partnership and protects Māori rights/interests and relationships with their taonga.*[24]

Te Mana o te Wai: *The option puts the well-being of the water first, and promotes values-based (based on the needs of the community), holistic management to sustain the wellbeing of the people. The option acknowledges mātauranga Māori.*

[24] *You can read about the principles of the Treaty here: https://www.waitangitribunal.govt.nz/treaty-of-waitangi/principles-of-the-treaty/*

Section 4: Summary of Preferred Options

Our current preferred options (which will be reviewed following consultation to incorporate views expressed in submissions) contain:

- proposals to set policy direction (taking a holistic view of managing land and water resources and enable regional councils to move more quickly)
- proposals to raise the bar on ecosystem health (strengthen focus on ecosystem health, set more stringent bottom lines, and stop further loss of wetlands and streams)
- a proposal to improve monitoring of water use
- proposals to improve farm practices (require farmers and growers to meet new standards and improve practices for high-risk activities

In this section, summaries of the impacts of the proposals are discussed. More detail is available on specific proposals in Part II.

4.1 Recognising all components of ecosystem health

Recommendation

We recommend a suite of complementary options aimed at managing biophysical freshwater ecosystems holistically, by better recognising and providing for all aspects of ecosystem health in council planning. These options would be delivered by amending the National Policy Statement for Freshwater Management, and making new regulation in a National Environmental Standard. The recommended options are as follows:

- Amend the description of the compulsory value for Ecosystem Health to clarify that aquatic life, water quality, water quantity, habitat, and ecological processes must all be managed.
- Require regional councils to implement practices described in the New Zealand Fish Passage Guidelines for any consent for a structure in the beds of rivers, accounting for any operative Fisheries Management Plans.
- Require regional councils to collect and maintain records of potential fish passage barriers, and implement a rehabilitation strategy to achieve fish ecology objectives.
- Require councils to set objectives to manage threatened species, by including a new Threatened Species compulsory value in Appendix 1.
- Amend the requirements for setting objectives, so that there is a clear distinction between desired environmental outcomes for values as a whole, and those associated objectives with attributes that are specific measurable aspects of the value.
- Add new attributes for ecosystem health (fish, macroinvertebrates, dissolved oxygen in rivers, ecosystem metabolism in rivers, dissolved oxygen in lakes and aquatic plants in lakes), with requirements for monitoring and triggers for action.

Additional detailed options to address other particular aspects of ecosystem health (flows and levels, preventing stream loss, preventing loss of wetlands, managing nutrients, sediment, dissolved oxygen, and reporting on ecosystem health) are analysed separately.

Problem being addressed

Freshwater ecosystems are not being adequately recognised and safeguarded. To date, national direction and local authority freshwater management effort has tended to be focussed on water quality and quantity. But ecosystem health has three more components – physical habitat, the presence (or absence) of aquatic life, and the interaction between all these components (ecosystem processes). All five components are necessary for a healthy functioning ecosystem.

Reasons for recommendation being preferred

The recommended options bring additional recognition and focus to managing all aspects of ecosystem health. By recognising all aspects of ecosystem health, councils and communities will be able to make more informed decisions which should encourage effective safeguarding of freshwater ecosystems.

Impact on affected parties

Regional councils will need to review and amend their regional plans to give effect to the new direction on how to manage ecosystem health. They may need to fill technical gaps in their competency or management programmes, and undertake additional monitoring. Government investment has been made in some tools to assist, such as MBIE Envirolink Grants aimed at managing fish passage, collecting data on fish barriers, and national environmental monitoring standards (NEMS) for dissolved oxygen.

The above recommendation requires regional councils to manage fish passage in a way informed by the New Zealand Fish Passage Guidelines. An increase in consenting or design costs is expected for new structures, but it is more cost effective to provide for fish passage at the design and construction stage, than to remediate once built. Councils are free to decide how they prioritise remediation of existing fish barriers, and to whom the cost falls.

Additional monitoring requirements will result in one-off capital costs to councils for monitoring equipment, and ongoing monitoring costs which they may recoup via consents from resource users. Landowners and businesses may incur costs to adapt their practices to the proposed policies on ecosystem health and fish passage, or actions that councils choose to put in place to achieve community objectives for freshwater ecosystem health.

Our wellbeing is underpinned by healthy freshwater ecosystems. Examples of on-going cultural, social and economic benefits include supporting our heritage and a sense of identity, mahinga kai, clean drinking water, recreation, positive branding for tourism and exporters, and the social licence to operate for those sectors that rely on exploiting freshwater resources.

4.2 Preventing further loss of streams

Recommendation

We propose that the Freshwater NPS will require councils to maintain the extent and ecosystem health of rivers and streams, and to monitor and report on losses and gains in river and stream habitat. The policy will direct councils to avoid reclamation of the bed of a river or stream unless certain exemptions apply relating to nationally significant infrastructure, flood prevention or erosion control, restoration, or where no other practicable alternative exists. Councils will be required to ensure that piping and permanently diverting streams or rivers do not result in a net loss of extent or ecosystem health.

Regional councils will be directed to ensure adverse effects of development on streams and rivers are offset where they can't be avoided.

Problem being addressed

Habitat loss in streams and rivers happens because the cumulative effect of multiple instances of piping or reclaiming stream or river beds is not adequately accounted for in development. The ecology of rivers and streams (particularly small contributing waters) is under-valued when compared to the economic value from developments and transporting runoff from rainfall as quickly as possible. Effects of piping or infilling a stream are often not adequately offset or compensated for by common approaches, such as riparian planting, in another location.

Reasons for option being preferred

These options will ensure that a minimum standard is applied, providing fair and consistent outcomes across the country. They will clarify the requirements for resource consent applications and minimise the time spent negotiating mitigation requirements, a process that can be costly and impose delays.

The recommended options encourage a more holistic view of streams and rivers rather than focusing on water quality and quantity, consistent with direction in the Essential Freshwater package to consider all the components of ecosystem health.

Impact on affected parties

While this would apply to streams in both urban and rural areas, we anticipate the biggest impact of the proposals would be on greenfield urban development.

Preventing the loss of an urban stream within a new development can reduce the amount of land available and result in less land being available for purchase (by land area). This could result in higher costs per property being passed on to purchasers, or a reduced return for the development as a whole, impacting decisions about the feasibility of the project.

The design of new development can mitigate these higher costs and reduced return. Incorporating stream corridors into green open space networks and reserves, providing more compact development using smaller lot sizes and higher density, and providing green alternatives to piped stormwater infrastructure can make urban development more cost-effective. These types of design approaches are consistent with the urban development outcomes the National Policy Statement for Urban Development (NPS-UD) is seeking to encourage.

Design-based solutions for development would be unlikely to mitigate the full cost impacts, and overall this policy would be likely to increase property prices in new greenfield developments were there are streams. Where housing yield cannot be maintained in a development (eg, through design

or increased density) the reduction in land available could also mean that more land is required to accommodate the same number of dwellings.

Reduced return to developers could be mitigated in part by the premium that properties close to urban streams would be likely to attract due to the amenity provided by the stream; however this would further add to the cost passed on to property purchasers.

The costs would be mainly borne by developers and passed on to property purchasers, while benefits would mainly be enjoyed by the wider community and environment. They are likely to include amenity, shared space for recreation and active transport, resilience to natural hazard risk, reduced pressure on stormwater infrastructure outside of the development, improved water quality in downstream receiving environments, benefits for biodiversity and ecosystem health, and opportunities for people to be better connected to the natural environment, and for tangata whenua to express kaitiakitanga. These benefits can be difficult to quantify in financial terms, and can be highly site-specific.

4.3 Directing clearer ecological outcomes for river flows and water levels

Recommendation

We recommend amending the Freshwater NPS to:

- require freshwater quantity objectives for ecosystem health to set out the intended environmental outcome for flow variability in the Freshwater Management Unit,
- require that minimum flows and water allocation limits allow for flow variability to meet the needs of the ecosystem, manage the effects of the allocation limit on the frequency and duration of lowered flows, and provide for the life-cycle needs of aquatic life,
- require groundwater levels and allocation limits to achieve freshwater objectives for the groundwater body and for any connected surface waterbody, and
- encourage councils to review existing water permits to comply with rules about water quantity, and for plans to set out how and when new rules would affect permit holders.

We also recommend preparing guidance on appropriate methodologies for setting ecological flows, and other technical matters.

Problem being addressed

- Regional plans often have no clear connection between the flow or water level where takes or diversions are restricted or must stop (minimum flows), and the ecological or environmental outcome those restrictions are intending to achieve. This means councils have no transparent way to assess the effectiveness of their minimum flows. This problem becomes critical in areas where the total amount of water allowed to be taken is over-allocated, and in areas where the effects of climate change are increasing pressure on increasingly scarcer water resources.
- Some minimum flow regimes do not adequately recognise connections between water bodies, including between surface water and groundwater, meaning that surface water ecosystems become stressed.
- Few regional councils require existing water permits to be reviewed to comply with new regional rules, meaning abstractions can continue at the rate allowed by the permit, potentially causing environmental effects that would not be allowed by the new rule.

Reasons for recommendation being preferred

With most councils already managing flows and levels in rivers and aquifers, the amendments will provide a clearer basis for councils to use when reviewing the effectiveness of their existing rules in terms of safeguarding ecosystem health. The benefits of these amendments will accrue over the next five-ten years. Having clearer environmental outcomes will help direct community choices about appropriate minimum flows and allocation limits. Encouraging councils to require existing water permits to comply with updated rules about minimum flows and allocation limits will mean the sustainable limits set in regional plans are achieved.

Nationally set minimum flow methodologies were not adopted because setting flows and levels regionally makes better use of locally specific information about the aquatic ecosystems and the needs of the communities.

Impact on affected parties

Affected parties will have greater certainty about the intended effects of minimum flows and water levels proposed in regional plans, and will be able to make more informed decisions to meet the needs of indigenous fauna in their waterbodies.

4.4 Nutrient attributes for managing ecosystem health

Recommendation

The Ministry's preferred option is to consult on new attribute tables for dissolved inorganic nitrogen (DIN) and dissolved reactive phosphorus (DRP), noting that further analysis is needed to understand their implications and achievability.

Problem being addressed

Between 1998 and 2017, concentrations of nitrate-nitrogen worsened at 54.7 per cent of river monitoring sites, and concentrations of DRP concentrations worsened at 30.2 per cent of sites[25].

The existing periphyton attribute in the Freshwater NPS protects the ecosystem health of hard-bottomed rivers and those with a lake or estuary downstream. The existing national bottom lines for ammonia and nitrate toxicity are not sufficient for protecting ecosystem health, and there is a risk that they could be applied as such in some soft-bottomed rivers. There are concerns that the periphyton attribute could be inappropriately applied by setting incorrect instream nutrient concentrations.

Reasons for recommendation being preferred

Nutrient enrichment of fresh and marine waters can impose economic costs by affecting ecosystems, recreational and amenity benefits, spiritual values, and recreational and commercial fisheries[26]. It is more cost effective to prevent degradation of waterways than to restore them after degradation has occurred, particularly in systems that have passed ecological "tipping points" due to ongoing degradation[27]. For example, remedying the effects of ongoing degradation on lakes, estuaries and groundwater can be difficult, expensive and can take generations.

The Ministry considers that there is justification for introducing a more stringent bottom line or threshold for nitrate compared to the current nitrate toxicity bottom line to provide for ecosystem health, especially based on the new definition of ecosystem health and the consideration of Te Mana o te Wai. The proposed DIN and DRP attributes would have effect in soft-bottomed rivers that do not have an estuary or lake downstream. Currently, objectives in these waterways can be set using the nitrate toxicity attribute that does not provide for ecosystem health. For hard-bottomed (stony) rivers and those with an estuary or lake downstream, the existing periphyton and lake water quality attributes will be stricter than the proposed N and P attributes. Where there is more than one applicable nutrient attribute, the more stringent attribute will apply.

Reducing DIN and DRP will contribute to improvements in ecosystem health by potentially reducing the prevalence of excessive macrophytes and periphyton. It will help maintain fish and invertebrate communities, the structure and function of ecosystems, and their resilience to negative impacts.

Impact on affected parties

Government only received finalised advice on science informing this proposal on 24 June. Up until then there had been considerable discussion amongst the scientists. More work is required to

[25] Ministry for the Environment & Stats NZ (2019). New Zealand's Environmental Reporting Series: Environment Aotearoa 2019. Available from www.mfe.govt.nz and www.stats.govt.nz.

[26] OECD. Publishing, & Organisation for Economic Co-operation and Development Staff. (2012). Water Quality and Agriculture: Meeting the Policy Challenge. OECD publishing.

[27] Rohr, J. R., E. Bernhardt, M. W. Cadotte, and W. Clements. (2018). The ecology and economics of restoration: when, what, where, and how to restore ecosystems. Ecology and Society 23(2):15.

quantify the benefits and costs of the proposed options but below we summarise what we know to date on the impacts of this proposal.

The proposed DIN and DRP attributes will mean that for some soft-bottomed streams and rivers (where the nitrate toxicity bottom line would set the minimum requirements) the bottom line will change from DIN of 6.9 mg L^{-1} to 1.0 mg L^{-1}. Approximately 27 per cent of the length of streams and rivers in New Zealand are soft-bottomed and unlikely to support periphyton (for example the Piako River across the Hauraki Plains) meaning the new attribute would change the bottom line for these streams.

The phosphorus attribute will apply to approximately 0.1 per cent of rivers, because rivers that are naturally high in phosphorus would be exempt. However, this figure assumes that regional councils will set their phosphorus objectives at levels low enough to manage periphyton as per the existing requirements in the Freshwater NPS. Incorporation of a DRP attribute ensures there will be an upper limit in place to guide where councils set their phosphorus objectives.

Where there is more than one relevant attribute for managing the effects of nutrients, the more stringent one would apply. In hard-bottomed rivers (for example the Manuherikia River in Otago) managing nutrients to prevent excessive periphyton growth under the current Freshwater NPS provisions would likely require tighter restrictions on nutrient run-off than the proposed new bottom lines.

The proposed DIN and DRP attributes will introduce stricter objectives in soft-bottomed rivers in some lowland agriculturally-dominated areas. While there would be a small impact when viewed as a national average, it would require over 50 per cent additional nitrogen load reductions in some catchments, compared to what is already required under the Freshwater NPS. This will likely require change from dairying to less intensive land uses in some catchments.

4.5 Reporting on the five components of ecosystem health

Recommendation

We recommend amending the National Policy Statement for Freshwater Management to include requirements for councils to report on the five defined components of ecosystem health - water quality, quantity, physical habitat, aquatic life, and ecosystem processes (the interaction between the other four components). It is recommended Councils are directed to:

- Report collected data on an annual basis, explicitly under the five mandatory components of ecosystem health. Where there is no data collected for a component or indicator, this must be shown.
- Produce a synthesis report card integrating the five components of ecosystem health as a single ecosystem health score. This will be produced, at a minimum, every five years.
- Report in a way that is publicly accessible and understandable.

Problem being addressed

Current reporting on ecosystem health is inadequate to inform communities and planning decisions because it focusses disproportionately on water quality at the expense of the other critical components of ecosystem health (ie, aquatic life, physical habitat, water quantity, and ecological processes). Systematic under-reporting of ecosystem health, and inability to communicate effectively where improvements or declines on overall ecosystem health have occurred, limit public understanding of problems and the management interventions required to halt declines.

Reasons for recommendation being preferred

Reporting on the five components of ecosystem health will mean that:

- decisions about resourcing interventions are supported by meaningful evidence-based knowledge
- effectiveness of policies to improve ecosystem health can be assessed
- the public better understands the extent that the information represents the freshwater ecosystem, and where information gaps exist.

Impact on affected parties

Regional councils will be required to either amend their existing reporting, or undertake new reporting to include the five components of ecosystem health. This may require updates to database templates, re-configuration of summary statistical outputs, re-configuration of graphical displays to convey the information into websites (e.g. LAWA) and development of report cards. Additional narrative will also be required to provide the context of information presentation and website linkages.

Greater understanding of the information will allow more informed decisions which can then be targeted towards specific areas of concern for each community.

4.6 Sediment

Recommendation

We recommend the inclusion of a suspended fine sediment attribute with a requirement to set resource use limits in the Freshwater NPS. The proposed attribute bottom lines and bands reflect the negative effect of elevated suspended sediment levels on freshwater macroinvertebrates and fish. The attribute bottom lines and bands differ between waterways to account for the high natural variability of in-stream sediment and ecological responses to it throughout New Zealand.

We also recommend the inclusion of a deposited sediment attribute with an action plan requirement in the Freshwater NPS. This requirement includes direction for councils to develop methods to respond to specific indicator thresholds or degrading trends, similar to the current macroinvertebrate monitoring requirement. Again, thresholds differ between waterways.

Problem being addressed

Levels of suspended and deposited fine sediment in rivers and streams have reached ecological tipping points in many parts of New Zealand. While some of the problem is due to historical practices and management approaches, current management does not sufficiently reduce ecosystem health degradation due to sediment. Councils do not require maintenance of specific, region-wide in-stream sediment thresholds to provide for overall ecosystem health, which is a policy gap. To address this policy gap, we have developed in-stream sediment thresholds for the protection of ecosystem health.

Reasons for recommendation being preferred

Inclusion of a suspended sediment attribute will require regional councils to take proactive planning measures to improve water quality above identified ecological thresholds across the country. Setting the thresholds through the Freshwater NPS provides national clarity on required outcomes. A deposited sediment attribute will ensure councils collect the information needed to assess the interventions available to improve that component of ecosystem health.

Impact on affected parties

Across the majority of the country, some parts of rivers currently would not meet the proposed suspended sediment bottom lines. To improve water quality above bottom lines, we must reduce erosion across the landscape. We have modelled potential interventions – including afforestation or erosion and sediment controls on farms in highly erodible areas – to achieve bottom lines at the catchment scale. Where it is feasible using modelled scenarios, interventions are required on at least 600,000ha.

Estimated monetary benefits of the interventions outweigh costs over a 50-year period in all scenarios. The estimated monetary benefits to costs vary between approximately $31.2 billion : $7.1 billion (ratio of about 4.5 : 1) and approximately $5.4 billion : $5.3 (ratio of about 1.02 : 1) depending on the discount rate and carbon value used.

The interventions, and resultant reduction in erosion, will have many benefits aside from protection of ecosystem health. For instance, they will reduce landslide and flood damage to property and critical infrastructure, sequester carbon, reduce nutrient discharges, protect aquaculture and fisheries' productivity, improve the availability of mahinga kai, and improve individuals' and communities' ability to connect to waterbodies. The values of many of these benefits could not be monetised, but they are certainly significant.

Many groups of people – farmers, housing and infrastructure developers, foresters, infrastructure operators, and others – will ultimately have to change current practices or otherwise implement mitigations. Where and when changes in practice or specific interventions are required depends on councils' limit-setting processes. High-risk erosion areas, particularly in the hill country, and high-risk sediment generation activities, such as earthworks or land clearance, will likely be the focus of new controls as well as local and central government support programmes like the Hill Country Erosion Fund and 1 Billion Trees programme.

4.7 *E. coli* for Swimming

Recommendation

We recommend amending the Freshwater NPS to add a new attribute table for *E. coli* with attribute states in line with the 2003 Microbiological water quality guidelines for marine and freshwater recreational areas. Councils would be required to set target states for *E. coli* above a national bottom line of 550 *E. coli* per 100 ml for primary contact sites during the swimming season, and set actions to achieve these in an action plan.

Problem being addressed

The high levels of *E. coli* in rivers and lakes indicate an unacceptable risk of infection or illness to people who are in contact with the water, particularly where there is a high incidence of ingestion or inhalation of water and water vapour. This situation is getting worse in some rivers and current direction in regional plans and the Freshwater NPS is not driving sufficient improvements.

Reasons for recommendation being preferred

Requiring reductions in *E. coli* concentrations in places where people swim will reduce their risk of infection and illness. The improvements would be targeted at sites with the most human contact and therefore the greatest health risk. This approach will have a greater overall public health benefit than targeting all water bodies, where the exposure is lower (the existing *E. coli* table and the direction to improve the quality in terms of human health would still apply for the remaining water bodies). The monitoring results, which councils report on Land, Air, Water Aotearoa (LAWA), show that many of these bathing sites present a health risk under current management approaches.

Impact on affected parties

Regional councils regularly monitor 292 bathing sites (see LAWA), 109 of which are likely to not meet the recommended national bottom line. Of these, 26 sites have a wastewater treatment plant upstream which discharges (either always or sometimes) to freshwater. Pastoral land uses (with stock) comprise more than half the land upstream of the sites exceeding the national bottom line.

The total cost of illnesses associated with contact with recreational water (coastal and fresh water) could be $25M - $175M annually (based on the economic impacts of disease). With nearly half New Zealand's population living within 20 km of a river or lake currently identified as a recreational site, the benefits of reducing the risk of infection at those sites could have a benefit of $10M – $80M.

The total costs of meeting the national bottom line depends on the actions regional councils choose to take. Reducing *E. coli* at bathing sites may be achieved by stopping runoff from cattle laneways and yards, and/or by excluding stock from rivers upstream of bathing sites. Fencing costs to exclude all stock (including sheep – unlike the Stock Exclusion proposal) from all upstream rivers with pastoral land uses is estimated at $654M. In practice, there is substantial fencing already done, or required in regional plans, and councils will take more targeted interventions, such as focussing on areas identified using faecal-source tracking, so a more realistic estimate is $300 million. Improving wastewater treatment to reduce pathogens could deliver significant improvements to *E. coli* levels in 26 catchments and is a very small component of wastewater treatment plant upgrade costs.

The cost of the mitigation measures would largely be imposed on the communities who will also benefit from safer use of rivers and lakes for outdoor activities (swimming, kayaking etc, but also picnicking and tramping). Rivers and lakes with high water quality help New Zealand's tourism reputation, particularly for international trout fishers. Mitigation measures to meet *E. coli* targets have substantial co-benefits in reducing nutrients and sediment (see Stock Exclusion).

4.8 Providing for Māori values and attributes of freshwater health

Recommendation

We recommend consulting on two options to amend the Freshwater NPS to place stronger requirements on regional councils to incorporate Māori values and attributes into regional freshwater planning. These options are:

- creating a 'mahinga kai' compulsory value for the National Objectives Framework, equivalent to ecosystem health and human health for recreation,
- creating a new value category for 'tangata whenua' values in the National Objectives Framework.

We also recommend non-regulatory measures, such as guidance and funding to support regional council and hapū/iwi capacity and capability to implement the Freshwater NPS.

Problem being addressed

At a national scale, Māori values and attributes of health are not being adequately identified, reflected or incorporated by regional councils into regional freshwater planning instruments and processes. This suggests that there are barriers in place that prevent meaningful Māori participation in these processes. It also suggest that the Freshwater NPS has failed to provide strong direction to regional councils requiring them to prioritise and incorporate Māori freshwater values and attributes more effectively into freshwater planning processes. The major causes of this problem are a lack of strong regulatory direction requiring regional councils to incorporate Māori values into regional freshwater planning, and a lack of resourcing (capacity, capacity, financial) faced by regional councils and hapū/iwi.

Reasons for recommendation being preferred

The intent of this policy is to provide a clear avenue for Māori values and attributes to be expressed, and to place strong requirements on regional councils to incorporate Māori values into freshwater planning. This will improve Māori involvement in freshwater management and freshwater planning processes, and assist regional councils with implementing Part D of the Freshwater NPS and delivering on Part 2 of the RMA.

Improving Māori involvement in freshwater planning will have greater outcomes for freshwater and upholding Te Mana o te Wai, as traditional Māori practices have an inherently integrated and holistic approach to resource management. Integrating Māori knowledge into freshwater management allows for us to understand more about freshwater systems in New Zealand, improving the information available to regional councils. Consulting on two options allows us to test the impacts of this approach, and to understand what the best policy intervention might be in a complex policy area.

Impact on affected parties

We anticipate there will be implementation costs for regional councils due to strengthened requirements that are applicable in every Freshwater Management Unit in New Zealand, and increased engagement expectations. Māori values are inherently integrated and holistic and would add to upholding Te Mana o te Wai, which will benefit the entire community. There will be positive benefits associated with improving connection with waterbodies, intergenerational knowledge transfer, greater understanding of different cultural perspectives in the community. Furthermore, involving Māori in freshwater management will improve mātauranga-Māori based freshwater data, which is difficult to source due to ad-hoc approaches to data collection based on available funding/opportunity.

4.9 Te Mana o te Wai in the Freshwater NPS

Recommendation

We recommend reframing Te Mana o te Wai in the current Freshwater NPS by clarifying current provisions, further embedding the concept, and requiring an approach that prioritises the essential value, health, and wellbeing of freshwater bodies.

Our proposals are:

1. Clarify the description of Te Mana o te Wai so that it more clearly underpins the whole framework of the regulation. Since expanding the description of the concept in 2017, we've been working further to understand better how the concept fits within the overall Freshwater NPS.
2. Clarify how new and existing components of the Freshwater NPS relate to Te Mana o te Wai.
3. In addition to managing freshwater in a way that is consistent with Te Mana o te Wai, regional councils will be required to, in discussions with communities and tangata whenua:
    a) Determine local understanding of Te Mana o te Wai for local waterbodies.
    b) Establish a long-term vision and trajectory (ie, multi-generational) for the waterbody to be articulated in regional policy statements. This step would involve:
        1. Understanding what communities and tangata whenua want their waterbodies to look like in the future.
        2. Understanding of the history of and current pressures on local waterbodies.
        3. Assessing whether the waterbodies can sustain current pressures and meet the aspirations communities and tangata whenua hold for the water.
    c) Report on whether freshwater management (including freshwater objectives and limits) move towards the long-term trajectory established by communities and tangata whenua.

Problem being addressed

Regional councils are uncertain regarding what is expected for Te Mana o te Wai in freshwater management. Some councils have raised the concern that the role of Te Mana o te Wai and how it relates to, or adds to, other requirements in the Freshwater NPS is unclear. There is an opportunity to strengthen and clarify the role of Te Mana o te Wai in the Freshwater NPS and require an approach that prioritises the health and wellbeing of the water.

Reasons for recommendation being preferred

This option provides clearer and more specific direction to regional councils regarding Te Mana o te Wai in the Freshwater NPS by promoting an approach that prioritises freshwater bodies and provides a long-term trajectory.

Impact on affected parties

We have not conducted an in-depth impact assessment of these options due to time constraints. We will conduct further impact assessment on these options, including social and cultural impacts, before the Government makes final policy decisions. However, we anticipate this option will result in long-term cultural, environmental and social benefits, including civic engagement and subjective wellbeing. It will make community aspirations clearer and highlight where freshwater management decisions are inconsistent with these aspirations. We anticipate this option may impose additional costs on regional councils as a result of perceived greater expectations for engagement as well as on regulated parties if more environmentally protective freshwater management approaches are required.

4.10 Providing for Hydro-electricity Generation Infrastructure

Recommendation

We recommend allowing Regional Councils to set objectives below national bottom lines in the National Objectives Framework for waterways impacted by significant hydro-electricity generation infrastructure. We intend to do this by listing New Zealand's six largest hydro-electricity schemes by generating capacity in Appendix 3. The six largest hydro-electricity schemes in New Zealand are the:

- Waitaki Scheme (including infrastructure operated by both Meridian Energy and Genesis), in the Canterbury Region;
- Waikato Scheme in the Waikato Region;
- Manapouri Scheme in the Southland Region;
- Clutha Scheme in the Canterbury Region;
- Tongariro Scheme in the Manawatu/Whanganui, and Waikato Regions; and
- Waikaremoana Scheme in the Hawkes Bay Region.

We also recommend clarifying the relationship between the National Policy Statement for Renewable Electricity Generation and the Freshwater NPS.

Problem being addressed

The maintenance of New Zealand's hydropower baseload will be very important in meeting New Zealand's renewable electricity generation goals as it will operate in conjunction with increased wind electricity generation – hydro is of particular strategic importance as it can complement wind generation which is unable to store its potential energy.

Some regional councils will not be able to achieve certain national bottom lines without potentially reducing the amount of renewable electricity produced by a hydroelectric scheme.

Exceptions are allowed for waterways affected by infrastructure listed in Appendix 3. Appendix 3 is currently empty. Therefore no regional council is able to set a freshwater objective below a national bottom line in a water body affected by infrastructure, even if it is in the national interest for a regional council to do this.

Reasons for recommendation being preferred

The six largest schemes account for approximately 89% of New Zealand's hydroelectricity. This option strikes a balance between the interests of freshwater quality and ecosystem health, security of electricity supply, affordable electricity, and New Zealand's international obligations to reduce our carbon emissions.

Impact on affected parties

This option will provide greater certainty to the generators who own the six largest schemes. It will also provide certainty to regional councils and resource users of the expectations for water quality in areas not covered. The option will however leave the 11% of generators who will not be listed in Appendix 3 facing a different regulatory environment and risk. There is a risk that this may create a competitive advantage in favour of the larger generators.

This exemption will not affect the requirement to maintain or improve water quality. It means that councils will not be required to set objectives better than national bottom lines (if a waterway is already below national bottom lines) for aspects of ecosystem health in waters affected by the six largest hydro-electricity schemes. Not having to improve to meet bottom lines may also reduce the impacts on the catchment community that they would otherwise have felt from the requirement to meet bottom lines.

4.11 Maintaining or improving water quality

Recommendation

We recommend the following changes to the Freshwater NPS to maintain freshwater quality and ecosystem health:

(a) Requiring regional plans to set specific, measurable and time-bound freshwater objectives to maintain water quality at its current state (rather than within attribute bands).
(b) Defining "existing freshwater quality" as the quality of fresh water on the date the amended Freshwater NPS is proposed, unless councils have already set freshwater objectives to implement the Freshwater NPS.
(c) Setting clearer reporting requirements that specify what information should be used to assess whether water quality has been maintained. This includes accounting of takes and sources of contaminants, implementation progress, predicted changes in quality, climate influences, and information needed to assess the overall state values like ecosystem health. We recognise that this is complex and will involve interpretation and the exercise of judgment by regional councils.
(d) Delete the word "overall" from Objective A2, to avoid situations where this is interpreted to mean something other than (a)-(c) above.

Problem being addressed

Currently objective A2 of the Freshwater NPS directs that the "overall quality of fresh water within a freshwater management unit is maintained or improved…" while protecting or improving other specified matters. Policy CA2(e)(iia) provides further direction when setting freshwater objectives to maintain, requiring that they be set within the same band as existing freshwater quality. "Existing freshwater quality" is further defined as the quality of water at the time freshwater objectives are set, including future planning processes.

This means regional plans can permit freshwater quality to decline by: setting freshwater objectives that allow for declines within band ranges (which are currently defined for all compulsory attributes); and allowing water quality to decline prior to setting freshwater objectives in their regional plan. Any declines prior to setting freshwater objectives can be locked in by maintaining change from a future state that is more degraded.

Under the Freshwater NPS it is also unclear how regional councils are expected to demonstrate whether water quality has been maintained over time. This may cause debate and litigation when they review their plans.

Reasons for recommendation being preferred

These changes will mean that regional plans cannot allow water quality to decline, and will provide regional councils with clearer direction about how they should assess whether water quality has been maintained.

Impact on affected parties

The costs of the recommended changes are small – they build on existing requirements to maintain or improve water quality. There are opportunity costs associated where changes will prevent additional resource use or require mitigations that were not previously necessary. There are also costs for regional councils to comply with additional reporting requirements.

4.12 Direction to Territorial Authorities to Support Integrated Management

Recommendation

We recommend adding content to the Freshwater NPS that directs territorial authorities (TAs – city and district councils) to manage the effects of land use for urban development on fresh water in their district plans. This would widen the scope of the Freshwater NPS to direct both regional councils and TAs, whereas up until now it has only directed regional councils. It would create an obligation for TAs to use district plans (eg, through objectives, policies, rules, consent conditions, or other methods) to manage the effects of urban development on fresh water.

Problem being addressed

There is a lack of integration between decision-making by regional councils (who have primary responsibility for environmental management of water) and territorial authorities (who a have primary responsibility for managing the environmental effects of urban development). An outcome of this lack of integration is that city and district councils view their role in freshwater management as limited to complying with water and discharge permits, leaving the bulk of the responsibility to plan for, and manage effects on urban water with regional councils.

City and district councils are, however, uniquely placed to promote better integrated management, particularly in urban areas, due to their role in managing infrastructure and land use activities.

Reasons for recommendation being preferred

This option would likely drive more integrated management of the effects of urban land use on fresh water than exists under the status quo. It would help to fill a current gap where insufficient action is being taken by TAs.

Adopting the preferred option would mean that decisions about managing urban water would be made in the context of wider decisions on urban development (eg, decisions about urban form and subdivision design), which means there would be opportunities for TAs to look at the most effective ways of achieving multiple objectives (eg, amenity, recreation, and water management).

Impact on affected parties

The direct costs would be due to increased analysis requirements for TAs (eg, through section 32 analysis) and potential for plan provisions to be appealed to the Environment Court. Also, where capacity and capability does not currently exist within TAs (eg, in terms of knowledge of freshwater management) this would need to be developed.

The proposal would not add greater requirements than what the Freshwater NPS already anticipates; freshwater is already required to be managed in urban areas to meet freshwater objectives and limits that are set for freshwater bodies. This policy is intended to make it more likely that these requirements would be met, by ensuring that when urban growth occurs it is accompanied by decisions about how to manage the effects of that growth. The indirect costs and benefits of the proposed option would depend on the types of planning provisions TAs chose to use to give effect to the policy. The costs associated with the types of interventions that could be expected (eg, Water Sensitive Design) can be difficult to quantify and can vary significantly depending on the circumstances; some elements can be cheaper than traditional infrastructure, while others may add to development costs but provide a range of environmental and social benefits. Decisions about which interventions to adopt would be made by individual TAs, informed by the same cost/benefit evaluation processes they use for other planning decisions to ensure they are the most appropriate for the situation.

4.13 Wetlands

Recommendation

The Ministry recommends amendments to the Freshwater NPS and new rules within the proposed Freshwater NES to prevent further loss and degradation of our remaining natural wetlands. Strengthened Freshwater NPS direction includes:

- avoid loss and degradation of inland wetlands
- require the identification, mapping and maintenance of a register of inland wetlands
- provide for activities necessary for the construction of wetlands
- monitor inland wetland condition
- encourage inland wetland restoration.

Freshwater NES rules include restricting specific activities in and around inland and coastal wetlands relating to:

- new drainage
- alterations of wetland water levels through draining, damming, diversion, and water takes
- earthworks (ie, reclamation or disturbance of the wetland bed)
- clearance of indigenous vegetation.

More enabling provisions will be given where these activities are required for wetland restoration, consented hydro-generation and flood control schemes, and nationally significant infrastructure. The avoid, remedy, mitigate, offset effects cascade would apply for nationally significant infrastructure with the expectation of a 'net-gain' approach for any offsetting.

Problem being addressed

Historically the value of wetlands was not recognised, and extensive drainage of wetlands to create 'productive land' was incentivised. We are still experiencing a high rate of wetland loss in some regions. Current national policies are inadequate for inland wetlands, and consequently the strength of regional plans varies considerably between local councils. Also, lack of data and resources can make implementation of rules difficult.

Reasons for recommendation being preferred

This option is preferred because it provides the most immediate and nationally consistent action to protect our remaining natural wetlands. The new regulations are restrictive and represent a 'no loss' approach to preserving natural wetlands regardless of ecological state because: critically few remain; it is difficult to re-create the function and value of lost wetlands; and wetlands that appear degraded often retain some level of value and provision of ecosystem services. This aligns with the stated objective of stopping further degradation and loss of our freshwater resources.

Impact on affected parties

The proposals will provide significant benefits to the public by protecting the values of ecosystem services that wetlands provide such as natural hazard resilience, nutrient cycling, and biodiversity and amenity values. The proposals will impose costs on councils and resource users: resource users will be required to avoid wetland loss and degradation by limiting some activities, and councils will have to implement regulations and undertake wetland mapping and monitoring. The regulations will have minimal impact on the potential to convert further wetlands to other land uses such as farming or urban development because nationally less than 1% of non-protected natural inland wetlands occur on land classes most likely to be affected. Few coastal wetlands are privately owned and therefore proposals are unlikely to affect many landowners.

4.14 Freshwater modules in farm plans

Recommendation

Freshwater modules in farm plans (FW-FPs) will be required through the NES-FM for farms over 20 hectares (with a lower 5 hectare threshold for horticulture). The first tranche of FW-FPs will be required by 2022 and all farms will be required to have one by 2025 or 2030. FW-FPs will have to meet minimum requirements relating to content, including addressing local ecosystem health issues and planning requirements; mapping of water and risks to its quality (eg, critical source areas); a risk assessment of on-farm activities like irrigation and effluent application; and a schedule of actions to mitigate risks. A suitably qualified and experienced practitioner will need to certify the FW-FP meets all requirements. An independent audit of implementation will also be required. Regional councils will enforce compliance with the NES, including any FW-FP prepared in accordance with the NES. The above requirement will be accompanied by financial support from government to promote effective implementation.

Problem being addressed

Mandatory FW-FPs are intended to promote the up-take of tailored actions to manage risks to ecosystem health. Mitigating the adverse environmental effects of farming often requires location-specific responses that are tailored to farm type and location. FW-FPs are intended to be enduring tools that promote a foundation for continuous improvement in environmental performance.

Reasons for recommendation being preferred

If well-resourced, mandatory FW-FPs could help deliver significant improvement in ecosystem health and promote continuous improvement in farming practice and help farmers become more resilient. Making FW-FPs mandatory is likely to help drive the development of institutional capacity (eg, adequate numbers of suitably qualified and experienced practitioners) to deliver high quality FW-FPs. FW-FPs could also be integrated with modules for greenhouse gas mitigation, biodiversity enhancement and water-use efficiency.

We are also consulting on a voluntary approach to FW-FPs, with plans required only where necessary to meet specific regulatory requirements like those relating to defined high-risk land use activities. Such an approach is less likely to help deliver a significant improvement in ecosystem health or help build the institutional capacity that may enable a more devolved model for improving farming practices to be considered in the future.

An alternative approach of prescribing good practice standards to cover a comprehensive range of day to day farming activities is likely to be cumbersome; may preclude more cost effective solutions; and is unlikely to help farmers be more resilient and focussed on desired outcomes.

Impact on affected parties

The requirement for FW-FPs will impact on all farms (above minimum size thresholds) through costs of preparing FW-FPs, implementing the actions in FW-FPs, and auditing of FW-FPs. There will also be impacts on regional councils and central government associated with administering a mandatory FW-FP regime and building the supporting institutional capacity. At the same time, there will be significant positive impacts. These will primarily be associated with improving water quality and ecosystem health outcomes, as well as strong potential to help the primary sector to become more resilient and sustainable. These impacts are summarised below.

Financial costs to farms of preparing an FW-FP will vary depending on the complexity of the farm system and will essentially be a one-off cost, with an average estimated cost of around $3500. If we assume 28,000 more farms need FEPs, the cost would be approximately $100M. The costs of

implementing actions in an FW-FP also vary depending on what is required. Irrigation schemes in Canterbury suggest farmers budget $10-$30 K per annum for FW-FP implementation (excluding one-off infrastructure investments like an effluent treatment system upgrade ($100K) that may be required irrespective of the FEP Policy). An average cost for a FEP audit is estimated to be $1500.

There is the potential for negative effects on farmer wellbeing if the financial costs of preparing and implementing FW-FPs will, or are perceived to, affect farm viability and/or if farmers are concerned they do not have the necessary skills to prepare and implement FW-FPs and/or do not believe the requirements are relevant or correct.

If FW-FP delivery is well-resourced, the policy has potential to provide significant benefits not only in contributing to improved ecosystem health, but also building a more sustainable and resilient primary sector. Capability and capacity building of farmers and rural professionals is particularly important and a tailored 1-1 approach of farm planning with follow up/auditing, has been shown to be critical for helping to drive capability building and continuous improvement.

Modelling has shown that good management practice, such as what FW-FPs would entail, could lead to a 5-20% reduction of nitrogen leaching and a 47-70% reduction in sediment loss. A tailored FW-FP process provides the framework to engage farmers and promote implementation of management practices that can identify and address key risks to freshwater outcomes.

The impact on tangata whenua and the wider public of improved water quality and ecosystem health will be significant. This will include enhanced mahinga kai; recreational values; and public health benefits. Also significant is the potential contribution to Brand NZ, such as tourism, market access and/or market premium benefits. There is also general pride and contribution to New Zealanders' cultural identity and values associated with a high quality natural environment.

For farmers, the process of developing a FW-FP (especially with tailored one-on-one support) may promote some farmers' wellbeing through helping them feel more equipped and resilient in facing the environmental challenges ahead and confident in their role as environmental stewards. In some cases the FW-FP process may identify farm system changes that may improve profitability and provide environmental benefits (eg, soil testing could suggest less fertiliser is needed). The FW-FP framework has potential to be used for other priority environmental themes (eg, GHG, biodiversity) promoting co-benefits (integrated farm planning).

Costs to regional councils to administer the FW-FP regime will be significant, and include compliance monitoring and enforcement costs. Monitoring costs can be recovered where consents are used. However, other monitoring costs will fall on ratepayers. There are also significant costs associated with administration, data management, farmer extension, education, reporting; and primary industry and central government liaison. FEPs should help deliver on council RMA obligations and contribute to better environmental outcomes in region and enhance ecosystems' ability to provide for cultural and recreational values of citizens.

4.15 Reducing excessively high nitrogen leaching (nitrogen cap)

Recommendation

We recommend two options for a short-term (2020 to 2025) policy to address excessive nitrogen losses while councils set long-term objectives and limits under the Freshwater NPS: per-hectare nitrogen leaching thresholds (option 1) and a national fertiliser cap (option 2). The preferred option may be one option or a combination of the two.

Under option 1, all low-slope pastoral farms[28] in identified high nitrogen-impacted catchments would need to provide an audited OverseerFM budget to the regional council. The regional council would use the Overseer results to determine the threshold at the percentile specified in the NES [to be determined, but between the 70thand 90th]. All those above the threshold would be required to reduce their nitrogen leaching to below the threshold within 12 months, or apply for a time-limited consent. A freshwater module in a farm plan (FW-FP) would specify and schedule the actions that will reduce the Overseer N loss estimate to the threshold within a defined period. Those farms under the threshold would need only a FW-FP.

Under option 2, Central Government would set thresholds for the maximum rate of N fertiliser use per hectare. There would be one threshold for the pastoral sector, and a higher rate for some crops. It would be prohibited to exceed the application rate. Councils would need to monitor fertiliser rates, and FW-FPs would need to record fertiliser use.

The Government is proposing consulting on an alternative option: setting requirements to reduce nitrogen leaching in highly N-impacted catchments through freshwater modules in farm plans (FW-FPs). This option will allow greater flexibility to farmers to reduce nitrogen. A similar option is assessed as Option Five in Appendix 15 of Part II.

Problem being addressed

Not all farmers are managing nitrogen efficiently, resulting in higher nitrogen leaching losses compared with the levels that could be achieved following good practice. Farms that are at the upper end of the spectrum have an unnecessarily high impact on water quality. Longer term, this policy gap will be addressed in regional plans, but until regional rules are in place that give full effect to the Freshwater NPS, degradation of freshwater quality may continue unabated.

Reasons for recommendation being preferred

The preferred option should:

- be able to be implemented quickly, which is critical for a short-term policy
- be targeted at catchments where high nitrogen losses from farming sources matter most
- provide a clear set of actions for each farm that will reduce nitrogen losses
- provide data for councils to assist with limit setting, and/or for future nutrient allocation
- prepare farmers and growers for longer term policies that will reduce nitrogen leaching.

[28] See section 4.20 Stock Exclusion for definition of low slope. High-leaching horticultural and arable land uses are excluded from this proposed requirement, because of the difficulty of defining an appropriate threshold for diverse crops and rotations.

Impact on affected parties

The reduction in nitrogen discharges will improve the ecological health of receiving waters and benefit recreational water users[29].

The modelling to date of the economic impacts on farms has been very limited, so the following data is illustrative only:

- Reducing discharges to the 75th percentile was modelled to change annual profit by +$106 to -$541 per hectare on 10 case-study dairy farms in the Waikato, with an average of -$143[30].
- Modelling of the impacts of a 9 percent drop in nitrogen losses from a single case-study Canterbury dairy-support farm, indicated an 8 percent fall in earnings before interest and tax (EBIT), and an 84 percent fall in disposable surplus (earnings after depreciation, interest, and tax)[31]. This reduction in disposable surplus is partly driven by the significant debt levels on the case study farm. Management changes included reduced fertiliser and stocking rate, and changes in crop types grown.
- Modelling of the impacts on a single case-study Waikato dairy farm currently leaching 76 kg N/ha, costed the impacts of reducing discharges to 60, 50 and 40 kg/ha resulted in reductions in EBIT of +14%, -13% and -26% respectively[32]. Management changes included discontinuing part of an expensive and high-leaching pasture renewal method, reducing fertiliser and stock numbers, and increasing purchases of supplementary feed.

Farmers in the specified catchments will also face increased costs of preparing and implementing an FW-FP and Overseer budget, and for those over the threshold, a consent application.

Option 2 has not been fully evaluated. It is likely that some farmers would substitute bought-in feed for nitrogen fertiliser to maintain feed supplies on pastoral farms.

[29] This outcome will be achieved so long as the reductions in nitrogen losses from farms above the threshold are not eroded by increasing nitrogen losses from those farms below the threshold. This is achieved in part by the Intensification and FW-FP proposals (sections 4.14A and 4.18).

[30] Ledgard et al; 2017. Understanding nutrient losses on Waikato case study farms and effectiveness of selected mitigation options. AgResearch report for Fonterra and Dairy NZ, cited in Allen, J; 2019. Statement of evidence of James Kenneth Allen for Fonterra Cooperative Group Ltd (at the hearing of submissions on proposed Plan Change 1 and variation 1 to the Waikato Regional Plan (Healthy Rivers).

[31] MRB, 2019. Impact of possible environmental policy interventions on case study farms. Report for MfE.

[32] Journeaux, P; 2019. Modelling of Mitigation Strategies on Farm Profitability. Report for MfE.

4.16 Stock Holding Areas and Feed Lots

Recommendation

We recommend introducing a National Environmental Standard (NES) with permitted activity standards for land use, and where required consent requirements are supported by the adoption of Freshwater Modules in Farm Plans. This option involves confirming definitions, minimum standards and consent requirements, for all existing and future feedlots and intensive stock holding areas at a national scale.

Problem being addressed

At a regional level, significant variation exists in defining and regulating stock holding areas and feedlots. Stock holding areas are a commonly used farming practice in the dairy and red meat sectors that can economically benefit farms by improving productivity, but they present a high risk to water quality degradation if inappropriately designed and/or managed. Feedlots are much less common but involve increased risks due to holding stock for longer periods of time and at higher stocking rates approximately five are estimated.

- **Stock holding areas** can be covered or uncovered and includes management practices such as feed pads, wintering pads, standoff pads, loafing pads and sacrifice paddocks but excludes stock yards, milking sheds, shearing sheds and woolsheds.
- **Feedlots** are farming system where stock are held in covered and uncovered areas for an extensive period of time and fed almost exclusively on feedlots.

When risks are managed appropriately, stock holding areas can be a useful tool for reducing farm-scale contaminant discharges to water. There are a number of measures that can be implemented by the operators of stock holding areas and feedlots to reduce the risks of water quality degradation. Industry groups have developed guidance for farmers to help them implement such measures voluntarily. However as the cost to water quality is external to the operator, there may be little incentive for operators to invest in these measures.

Some regional councils have regulated the use of land for, or the contaminant discharge from, these activities under the Resource Management Act 1991. However there are significant gaps. Only two of the 16 regional councils directly regulate the use of land for stock holding areas and or feedlots. There is also a lack of consistency in definitions and approaches, and significant gaps exist in ensuring that nationally, these activities are operated in a way that reduces the risk for further water quality degradation.

Reasons for recommendation being preferred

A NES can set standards, rules, activity status and other requirements for land use. The NES could specify definitions for these activities, establish permitted activity standards, resource consent requirements, classes and conditions for the activity. A NES can establish consent requirements that enable site specific constraints and opportunities to be addressed in conditions of the consent, whilst still enabling the activity for the benefit of farmers.

An NES can also be applied nationally, be more equitable and has an immediate effect on resource management decisions, allowing the water quality impacts to be addressed in a timely manner. This builds on the existing good work of councils and industry in developing minimum standards. This means that where good practice is already adopted, there will not be an undue burden to the farmer.

The high level of risk associated with these activities means both monitoring and compliance of stock holding areas and feedlots is enabled by clear and specific permitted activity standards or consent requirement rather than relying on voluntary adoption of mitigation measures, or through a less prescriptive approach.

The consent requirement for stock holding areas and feedlots could impose restrictions on the use of land. Addressing land use would allow for up-front reductions in contaminant discharges, without the cost and complexity of having to develop national standards for contaminant discharges. Design and management measures for land use are available and relatively easy to implement, and consent conditions could be designed to ensure that these measures are implemented.

The NES would be prescriptive in setting activity classes and consent conditions. This would provide clarity to regional councils and farmers as it does not rely on council interpretation. The prescribed minimum standards and consent conditions should codify proven good design/management practices to reduce the risk of undertaking these activities, so that risks are mitigated as a matter of course.

The proposal for Freshwater Modules in Farm Plans[33] could be used in conjunction with this approach, to better support implementation and compliance. Freshwater Modules in Farm Plans can provide a useful tool for farmers to align their activity to the proposed regulatory limits, and consent requirements for stock holding areas and feedlots, and to help farmers plan for improvement.

Impact on affected parties

The regulations will primarily affect farmers and regional councils. Discharges to water from stock holding areas would be reduced with positive impacts on the environment. Good quality stock holding areas may also improve productivity. The regulations will impose costs on farmers if they are required to build or amend infrastructure to meet minimum standards and or undertake a consent process. Infrastructure costs are estimated at $72 per cow,[34] and costs for consents are approximately $3000 per application. There are currently estimated five feedlots in New Zealand, all of which will require resource consent. Estimating the number of consents required for stock holding areas will done before regulations are finalised.

Regional councils will have increased workloads and costs to monitor compliance with the regulations, although these costs may be recovered from landowners carrying out the activity. The NES would specify that regional councils could recover costs for compliance, monitoring and enforcement of permitted activities.

Benefits could be realised by industries that support farmers to meet minimum standards in particular the building of infrastructure. With increased work opportunities there would also be an increased demand for a higher skilled larger rural professional workforce to support farmers to meet minimum standards and consent requirements.

[33] Refer to Freshwater Modules in Farm Plans detailed analysis in Part II.

[34] Design of a low cost winter stand-off pad for reducing nutrient losses to water from winter forage crops grazed by dairy cows, Chrystal et al. 2016.

4.17 Intensive Winter Grazing on Forage Crops

Recommendation

We recommend that good management practices for winter forage crop grazing wherever it occurs are specified in a National Environmental Standard. The proposed regulation will permit intensive winter grazing on forage crops subject to technical standards that are based on industry minimum standards and level of risk. If the standards cannot be meet a consent may be required to be applied for or the activity may be subject to enforcement action by councils.

The new controls on intensification also relate to this proposal as they require that there is no increase in winter forage crop grazing in addition to areas that were in crop from 2013 – 2018.

The Government is also proposing to consult on a variation of Option Four. This option has a regulatory framework with technical standards for slope to graze crop on, pugging depth and set back from water. Supplemented by industry minimum standards for size of area to be cropped, management of critical source areas, grazing management (strip grazing) and timing for resewing bare ground, all managed through FW-FPs. Components of this option are addressed within Option Four (and parts of Option Two) within Appendix 17 of Part II.

Problem being addressed

The activity addressed in this regulation is characterised by intensive winter grazing of annual forage crops at high stocking densities under closely controlled grazing systems (compared to extensive grazing on pasture or similar perennial crops). While it only covers a small percentage of farmed pastoral land, it is a high profile[35] activity with concern[36] being widely expressed about the environmental consequences of contaminant losses[37] impacts on animal health and the extent to which good management practices meet industry minimum standards to reduce contaminant loss is being adopted. The scale of forage cropping is set out in the table below which shows hectares of forage crops grown per region in 2018.

Table One Forage brassicas[38] (Hectares during the year ended 30 June 2018)

Region	Forage brassicas (Hectares during the year ended 30 June 2018)	Region	Forage brassicas (Hectares during the year ended 30 June 2018)
Northland Region	2225	Wellington Region	6357
Auckland Region	724	West Coast Region	3480
Waikato Region	15368	**Canterbury Region**	**77133**
Bay of Plenty Region	2850	**Otago Region**	**52860**
Gisborne Region	1458	**Southland Region**	**43658**
Hawke's Bay Region	10716	Tasman Region	1379
Taranaki Region	3923	Nelson Region	3
Manawatu-Wanganui Region	16168	Marlborough Region	1574
Total New Zealand			**239,875**

[35] For example; https://www.nzherald.co.nz/the-country/news/article.cfm?c_id=16&objectid=12180124

[36] For example; https://www.odt.co.nz/rural-life/dairy/vets-open-pan-industry-initiative-grazing

[37] Belliss et al. 2019 Manaaki Whenua Land care: Identification of high-risk agricultural activities: national mapping of the location, scale and extent of winter forage cropping and intensive grazing on hill country land" paragraphs 9 -16.

[38] Data from Agricultural Production Survey June 2018 (Statistics NZ 2019)

As set out in Table one this activity is most common in Otago, Southland and Canterbury where about 80% of the winter grazing in 2018 occurred. In addition the inadequate management of sediment has resulted in the death of over 90% of macroinvertebrates in some streams in Southland.

Grazing of forage crops during winter is an activity identified as having a high risk of contaminant loss associated with it. The risk of contaminant loss is coupled with; an increase in the prevalence of this activity, rapidly changing farm systems, especially farm grazing systems, not all councils having developed a regulatory response that manage contamination effects from this activity and lags in the development of regional plan provisions. Regional plans try to address these problem but they can sometimes follow a lengthy process.

Reasons

We consider this option provides the most practical, enforceable and timely way to prevent further degradation to surface and ground water bodies from intensive winter grazing of forage crops. The proposal enables winter forage crop grazing to be specified in a consistent and timely way irrespective of where the activity is carried out.

This proposal also contributes to reducing risks of litigation in regional plan processes.

The national regulation can be gazetted and take effect rapidly –and could apply as soon as winter grazing in 2020. However, as planning for winter (including seed purchase and contracting services) commences well in advance of the winter season, it is recommended that farmers be given a year to become familiar with the new regulations to enable them to plan ahead to meet them in 2021.

Impact on affected parties

Landowners grazing winter forage crops will be required to adopt several, low cost, industry good practice grazing management measures to halt water degradation from effluent and sediment loss. However, new restrictions on the scale and location of intensive winter forage crop grazing and a restriction on the extent of severe treading (pugging) damage may result in consent costs or changes to a farm grazing system being necessary.

There will be a financial impact on any landowners who will require a resource consent. If current practices do not change, the intensive winter grazing requirements may trigger in the order of 1500 resource consents, on top of those already required by existing regional plan rules (at about $3,000 per consent). Additional costs may result from consent requirements to reduce contaminant loss, including wider buffer areas from water bodies and requirements for monitoring and reporting.

Councils are able to be more stringent then the NES or develop additional discharge activity rules that might be more stringent. This approach means Councils will be able to recover costs of monitoring the activity. (A national environmental standard may empower local authorities to charge for monitoring any specified permitted activities in the standard). Compliance will be by regional councils and enforcement action may be taken or consents required.

There is a relationship between this regulation and other parts of the proposed NES. In order to avoid adverse effects from forage crop grazing, stock holding infrastructure may be required and the setback requirements for stock exclusion will overlap if the intensive winter grazing on forage crops is near water.

4.18 Agricultural intensification

Recommendation

We recommend interim regulations in an NES that require resource consent for high-risk intensification activities:

1. that increase the area of land in irrigated pastoral, arable or horticultural production (above a minimum land-area threshold)
2. that increase the area of forage cropping/intensive winter grazing (aligned to intensive winter grazing regulations – see section 4.17)
3. where land use changes to higher-risk land use (above a minimum land-area threshold): arable, deer, sheep, beef to dairy support; arable, deer, dairy support, sheep, or beef to dairy; woody vegetation and forestry to any pastoral use.
4. where land use changes to commercial vegetable growing, if the activity would increase the applicant's net area in commercial vegetable growing in the sub-catchment (above their highest extent in the past year).

The interim regulations would only apply to regions/catchments that do not have fully operative regional plan provisions (objectives, limits/targets and rules) giving full effect to Part CA of the current Freshwater NPS. Once plan provisions are in place, these regulations will no longer apply.

All regulations would require applicants to have a freshwater module in a farm plan (FW-FP) and demonstrate no increase in nitrogen, phosphorus, sediment or pathogen discharges. The activities listed would be prohibited if they increase discharges. Consents will be time-limited to 2030. For 4 above, we are also considering a second option for consent requirements, requiring applicants to have a FW-FP and be operating above good management practice.

Problem being addressed

New Zealand has seen significant agricultural intensification[39] in recent years. This has contributed to water quality degradation and ecosystem loss. Councils are still developing objectives, limits and rules to give effect to the Freshwater NPS, which will ultimately address the risk of further intensification. However, further intensification may take place in the interim.

Reasons for recommendation being preferred

The recommended approach ensures rules are in place while councils carry out the limit and objective setting process. We consider this the most practical, timely and enforceable way to prevent further degradation of waterways caused by intensification. Other options will either take too long to implement (due to the need to collect baseline data) or would be too uncertain in delivering the desired outcome.

Impact on affected parties

Restrictions on intensification will prevent additional pressure on freshwater ecosystems caused by increased contaminant discharges. Costs will fall primarily on farms and regional councils, with benefits for all water users.

Quantifying the total expected cost for farms is difficult as it relies on predicting the number of farms that will intensify over the next five years. These decisions are influenced by a range of factors, including commodity prices, technology, and other Government policies.

[39] Defined as increases in agricultural inputs (eg, stock, fertiliser, crop area) per hectare of land either through changing to a higher intensity land use or through intensifying an existing land use.

With the regulations in place, farms that wish to intensify will incur costs for resource consents (about $3,000 per consent) and environmental assessments to inform the consent (tens of thousands of dollars). There will also be an opportunity cost for farms that either wish to intensify during the interim period but cannot without increasing contaminant discharges.

Regional councils will have increased costs to monitor compliance with the regulations. Recreational water users will benefit by 'costs avoided' from water quality degradation that may have taken place had the regulations not been introduced. There will be benefits for land-owners with under-developed land, as headroom will be maintained until councils have ways to manage nutrient limits.

Modelling in the Ruamāhanga catchment (Wellington region)[40] shows that some land use change can still go ahead without increasing contaminant discharges. The table below shows the opportunity cost (in net revenue) and associated water quality benefits for different intensification scenarios.

Scenario	**Impact of regulations in Ruamāhanga catchment on:**			
	Net revenue	**Nitrogen loss**	**Phosphorus loss**	**Sediment loss**
All sheep and beef farms on LUC1-4 land convert to dairy	$20 million (9%) lower with controls in place, but still about 10 percent higher than current net revenue	~7 percent lower	~2 percent lower	minimal difference
All dairy support convert to dairy	$14 million (7%) lower with controls in place, but about the same as current revenue	~6 percent lower	~2 percent lower	minimal difference
All forestry convert to dairy	$15 million (8%) lower with controls in place (can't convert)	~6 percent lower	~3 percent lower	~20 percent lower
All forestry convert to sheep and beef	No change - higher revenue from not converting	~3 percent lower	~4 percent lower	~20 percent lower

The opportunity cost to an individual farm depends on whether it is intending to intensify, and the production potential of the farm. Modelling for a single sheep and beef farm in the Waikato converting to dairy[41] showed that with the regulations in place:

- Earnings before interest and tax (EBIT) would be about $250/ha lower (~$74,000 for the entire farm) (due to lower milk solid production and additional mitigation costs) but still much higher than if it had stayed in sheep and beef (~$2,000/ha vs. ~$600/ha)
- The net present value (NPV) of the farm after 20 years would be ~$1million lower (~$500,000 compared to ~$1.5 million)
- The internal rate of return (IRR) would still be attractive at 6.8% (compared to 8.3%).

While intensification regulations will reduce flexibility for farms in the short term, and increase compliance costs for councils, this approach is likely to be less costly than no regulation. New Zealand is transitioning to a low-emissions sustainable economy. This will include regional water quality limits, and land use change over the medium-long term to meet those limits. Restricting intensification now will prevent lost investment in unsustainable intensification that has to be reversed/abandoned, and will halt water quality degradation to make the transition to tougher water quality limits less complex/costly.

[40] Although this is a highly rural catchment, we cannot assume that it is representative of all catchments across New Zealand.

[41] These results indicate how the regulations could affect a single farm. Farm systems vary depending on a range of factors (eg, location, size etc.). We cannot assume that a single farm is representative of all farms.

4.19 Updating the Resource Management (Measurement and Reporting of Water Takes) Regulations 2010 to require real-time reporting of water use

Recommendation

We recommend mandatory daily electronic transmission of data for all water take consents captured by the current Regulations (ie, consented water takes over 5 litres per second). This would require amending the Regulations to mandate that

- measurements occur every fifteen minutes (or daily via written council approval); that
- water take records are kept in a form suitable for electronic transmission and storage; that
- consent holders provide daily electronic records to the council that granted the consent; and
- that these daily electronic records are provided to the council no later than one day after the end of the day in which the water was taken.

These requirements would be staggered, being first applied to consents of 20 litres per second (l/s) or more who must meet this requirement within two years of the Regulations come into force; applied to consents of 10 l/s up to 20 l/s within four years of the Regulations come into force; and applied to consents of 5 l/s up to 10 l/s within six years of the Regulations come into force. Transmission may occur via a third-party provider who handles the data on behalf of the consent holder and regional council.

Problem being addressed

The current Regulations are relatively permissive as they only require data to be reported to councils once a year at minimum and allow a wide range of reporting methods. In practice, this reporting method varies from hand-written records being posted to the council to real-time time data being sent electronically directly to councils. This has raised fundamental issues of data quality and timeliness for regional councils as they end up with missing water-use records, suspicious looking totals (eg, exactly the same amount of water being taken every day) and tardy reporting by some users. As a result councils are often not able to use this data effectively for compliance, monitoring and enforcement work and for the management of minimum flows in rivers and groundwater levels. Data currently collected is not of sufficient quality to provide robust national estimates of water use.

Reasons for recommendation being preferred

The recommended option will deliver data on water use which is consistent and timely, and meet the original policy objectives of the Regulations as intended in 2010. The staggered approach will provide time for regional councils, water users and industry providers to adapt and solve implementation issues that will arise, manages the demand for the installation of telemetry units and is likely to make electronic transmission cheaper for those with smaller water takes as result of higher demand and market competition for telemetry units.

Impact on affected parties

This option strikes a balance between costs on users (new telemetry units) and regional councils, and the provision of good quality, timely information (which will also save users time preparing and sending data to councils). Stakeholders consulted to date have unanimously supported changing the Regulations to mandate telemetry. Adopting this recommendation would significantly enhance the government's ability to promote greater water-use efficiency, enforce regulations and low flow restrictions, improve reliability of access to data for users, and achieve Te Mana o te Wai. Associated costs are estimated at $14.3M annually.

4.20 Stock Exclusion

Recommendation

We recommend section 360 regulations and NES regulations requiring farmers to exclude all cattle, pigs and deer from rivers, lakes, wetlands and drains across low-slope New Zealand (generally the more intensively farmed parts of the country). Outside of low-slope areas, cattle, pigs and deer will be excluded where the type and intensity of farming poses a similar risk to that of low-slope farming. Wherever stock exclusion is required, there must be a five metre setback from the river or lake bed (no setback would be required from drains).

Stock exclusion must be achieved within five years of gazettal, phased according to farm type and stream size. Applications can be made to regional councils for exemptions. Existing fences that do not provide a five metre setback may remain in their existing positions until 2035.

The Government is also proposing an alternative option, that for drains and streams that are less than 1m wide, there would be a mandatory requirement for FW-FPs to determine what fencing and setbacks are required. If this option was progressed, we would aim to develop standards to direct FW-FP development, and ensure stock are being excluded wherever it is appropriate. The FW-FP option provides more flexibility to take account of individual farm conditions and the best value investment to improve the health of waterways, but less certainty about what stock exclusion and set backs will be put in place. This option is analysed as Option One of Appendix 20 of Part II.

Problem being addressed

Cattle, pigs and deer physically damage the beds and banks of streams, adversely affecting habitat for fish spawning and other aspects of ecological health. Bank erosion and de-vegetation allows contaminants to be more easily washed into the water leading to sedimentation of river and lake beds and reductions in water clarity. Disease-causing organisms in dung present health risks to people in contact with the water. Nutrients in dung and urine promote weed growth.

Bankside erosion in Waikato tributaries was estimated as contributing approximately 60% of the instream sediment. On average across catchments in Hawke's Bay, Waikato, Northland, and Manawatu-Whanganui, streambank erosion contributes 18% of total suspended sediment loads.

Soil compaction near streams caused by stock grazing and trampling leads to reduced infiltration, followed by erosion of the bank surface by overland flow, rilling and/or gullying. Vehicle and animal stream-access tracks can create breaks or gaps in otherwise continuous stream bank systems where overland flows concentrate and thereby create points of weakness.

Although regional councils are restricting stock access to some rivers and lakes in their regional plans, there is little uniformity in their approaches, and the lengthy plan making process makes getting effective and consistent rules in place across the country costly and difficult.

Reasons for recommendation being preferred

The recommended approach provides national consistency for cattle, pig and deer access to waterways on "low-slope" land (less than five degrees). Clear and consistent regulations will provide certainty to farmers. The regulations build on the work the dairy industry has achieved in excluding dairy cattle from 97.5 % of "Accord waterways" (greater than one metre width, and 30cm depth), and extend good practices to other stock farmers on low-slope land within achievable timeframes.

Excluding stock on non-low-slope land only where stocking rates are high recognises that fencing on these farms is difficult and costly, and that the benefit of exclusion is lower if there are fewer stock.

Smaller streams and drains are included because they cumulatively contribute a significant proportion of contaminants. Setbacks from streams are important for ecological health and to future-proof streams for the riparian plants often critical for stream shading.

Impact on affected parties

This proposal will reduce health risks to people in contact with the water (see *E. coli* for swimming for more information), and improve ecosystem health for aquatic life by reducing nutrients and sediment in the water.

The highest cost would fall on owners of low-slope farms with no fencing (likely to be beef farms), with additional costs for lost pasture in the setbacks. Other costs may include providing culverted or bridged stock crossing points and controlling weeds within setbacks. These costs will be highly variable across the country depending on the length of rivers and lakes within farms, the extent of existing fencing and compliant stock crossing points, and the existing regional rules that would apply regardless of this national intervention. Phasing in the requirements will help manage the impact of these costs.

Some indicative costs to farmers based on modelled farms with stock not currently excluded from streams and a five-year implementation timeframe are (opportunity costs are based on EBITD per hectare over ten years, fencing costs include alternative water):

- A 125 ha Waikato/Bay of Plenty dairy farm would incur fencing costs of $19,229 and $67,414 opportunity cost in lost land from a 5m setback (or $16,853 for a 3m setback)
- A North Island 281 ha intensive (lowland) beef farm and stocking rate of 9.6 SU/ha would incur fencing costs of $75,131 and $14,018 opportunity cost in lost land from a 5m setback (or $3,505 for a 3m setback)
- A 571 ha central North Island hill country sheep and beef farm and stock rate of 8.7SU/ha would incur fencing costs (based on 10% of the farm triggering exclusion) of $15,252 and $1,899 opportunity cost in lost land from a 5m setback (or $475 for a 3m setback)

Nationally, the total estimated costs for farmers based on the kilometres of streams to fence and excluding the streams on dairy farms already fenced is $400M (this differs from the cost estimate for reducing *E. coli* for swimming because it does not assume that all streams in the non-low slope land are fenced, and it does not include sheep). This comprises $128M for low-slope land (or $116.5M for a 3m setback), and $272.8M for non-low-slope land (or 270.8M for a 3m setback). These costs are likely to be an over-estimate because the calculation of stream lengths included all rivers flowing through low-slope (less than or equal to 5 degrees) and non-low-slope (more than 5 degrees) land parcels with grassland and annual cropland and includes the regions where regional rules require stock exclusion. Including the ongoing lost costs over the next ten years ($170M for low slope land and $29M for non-low slope, brings this to $600 million.

Putting these costs in perspective, the Survey of Rural Decision-makers reported that 75% of farmers found no change in profit after excluding stock from waterways, 8% reported increased profits and 17% had lower profits. This goes against their expectations for stock exclusion where 51% believed they would have lower profits.[42] In addition, farm performance and environmental performance were both higher than expected after excluding stock from waterways on their farms (52% and 65% respectively compared with their expectations of 20% and 41%).

[42] www.landcareresearch.co.nz/science/portfolios/enhancing-policy-effectiveness/srdm/srdm2017/farm-plans-and-land-management/management-stock-exclusion-from-waterways

Furthermore, against these costs are the significant benefits to improved ecosystem health, in particular, reducing sediment input to streams (and the co-benefits reduced nutrients and pathogens) by reducing streambank erosion and surface erosion near the stream. See "*E. coli* for swimming" for more information on the benefits to human health from improving water quality by reducing contamination from stock dung.

Section 5: Impact analysis of the package

5.1 What option, or combination of options, is likely best to address the problem, meet the policy objectives and deliver the highest net benefits?

The Water Taskforce recommend a combination of:

- amendments to the Freshwater NPS
- a new Freshwater NES
- amendments to existing section 360 regulations
- new section 360 regulations.

This combination of interventions is required to address the complex and multi-faceted issues with freshwater management in New Zealand.

Sections 4.1-4.20 above provide recommendations for individual policy areas. Specific analysis for each policy area are provided in appendices 1-20.

In general, we recommend amendments to the Freshwater NPS where variation between regions is greater. A nuanced solution that takes into account community values and local circumstances is required. These issues are best resolved over the medium-term through regional freshwater planning processes, which the Freshwater NPS can direct and guide.

We recommend new or amended regulations where an issue is more uniform across the country, a single consistent solution is preferred or where immediate action is required. These issues are best resolved through more prescriptive direction that does not need to be translated into regional plan content.

The choice between making regulations through a National Environmental Standard (NES) or section 360 of the RMA largely depends on the topic being considered.

NES regulations cannot prevail over existing consent conditions (but they can trigger a review of a regional resource consent). However, they have the advantage of being able to address a wider range of environmental issues, and therefore can be delivered without needing an RMA amendment.

Regulations under section 360 have the advantage of prevailing over existing consent conditions. However, they are limited to very specific topics listed in section 360(1) of the RMA. Adding new topics to the list requires an amendment to the RMA. Where section 360(1) allows regulations on a specific issue considered in this policy package, we have opted for this option.

5.2 Summary of costs and benefits of the preferred approach

Table 1 Summary of work to date on costs and benefits of the preferred options.

Changes to the Freshwater NPS	
Proposal	**Benefits/Costs**
Sediment	**Benefit:** Estimated monetary benefits of the interventions to meet the proposed bottom lines at the catchment level over a 50-year period vary between approximately $31.2 billion and approximately $5.4 billion depending on the discount rate and carbon value used. This does not include a range of other anticipated benefits that could not be monetised in the analysis. The benefit and cost ranges provided here are indicative because they represent only one potential implementation pathway and ultimate benefits and costs will depend on how the proposals are actually implemented. **Costs:** These will be borne by resource users, local and central government, proportionally, according to future policy choices (especially funding of works). Estimated monetary costs of the interventions to meet the proposed bottom lines at the catchment level over a 50-year period vary between approximately $7.1 billion and $5.3 billion depending on the discount rate used.
Wetlands	**Benefits**: Non-protected inland wetlands on fertile land provide $1.4b a year of ecosystem services. These are the wetlands that are likely to be drained under the status quo. **Costs:** Less than 28,933 ha impacted, most in Canterbury, West Coast, Otago, Southland and Waikato. There will be a lost opportunity for development in and around these sites (e.g. conversion to pasture, or urban development).
E.coli for swimming	**Benefits**: A benefit of avoiding disease (could be between $10M and $80M annually based on the costs of people getting sick). Improved water quality at the non-compliant swimming spots (153 sites, approximately half of tested sites) **Costs**: Fencing will be required. Costs will ultimately depend on the actions regional councils choose to take, and the timeframes over which they want improvements made. Some fencing is already in place and will be required for stock exclusion regulations. Cost of improved infrastructure at wastewater treatment plants. 60% of all wastewater treatment plants nationally are currently going through, or will go through, a resource consenting process in the next 10 years. But the biggest proportion of these costs will be for improving nutrients and oxygen demand. Disinfection is usually by UV treatment and is not a significant proportion of wastewater treatment costs.[43]
Attributes for nitrogen and phosphorus to provide for ecosystem health	**Benefits:** Reducing nitrogen and phosphorus will contribute to improvements in ecosystem health by potentially reducing the prevalence of nuisance aquatic plants and slime. It will help ensure that river ecosystems more closely resemble those in unimpacted systems. These improvements will also benefit people's use of waterways for food gathering, recreation and amenity. Reducing nutrient inputs at their source is more cost effective than restoring freshwater and marine ecosystems after degradation has occurred. **Costs:** This proposal will have the most effect on soft-bottomed rivers in some lowland agriculturally-dominated areas. Achieving the proposed nutrient reductions will be achievable in some areas using best management practice, in these cases a reduction in nutrient loss can result in an economic benefit.

[43] Department of Internal Affairs, 2018. Three Waters Review – cost estimates for upgrading wastewater treatment plants to meet objectives in the Freshwater NPS.

Changes to the Freshwater NPS	
Proposal	**Benefits/Costs**
	However in some catchments, changes in land use will be required to reduce losses of nutrients from the land. Councils can determine the appropriate timeframes for achieving target attribute states. This means councils have the ability to mitigate cost impacts by spreading costs over time.
Providing for hydro-electricity generation infrastructure	**Benefits**: The benefits are largely avoided costs and regulatory uncertainty from the status quo. The avoided costs are higher operational and investment costs to meet expected electricity demand over the forecast period. These were assessed in a 2015 report looking at the impact of reduced flows on hydro generation in seven separate reduced flow scenarios in different catchments, as well as a further scenario which combined the effects of the seven separate scenarios. In this 2015 modelling the impact was most visible in the combined scenario which significantly increased minimum flows across several catchments, and resulted in an average annual increase in short-run marginal cost of $15 to $31 per MWh. [44] This modelling however was based on MBIEs 2013 mixed renewables scenario and included thermal generation that has since retired and at least 600 MW of new thermal generation by 2025. New generation investment is now more likely to be wind and geothermal, with the latter increasing the reliance on hydro generation to cover when intermittent wind is unavailable. Consequently, $15 to $31 per MWh is likely to be an underestimate of the potential cost of reduced hydro flexibility, and the risk to security of supply may be greater from reduced inflows.
Recognising all components of ecosystem health	**Benefits**: Improved fish passage. Greater protection of freshwater ecosystems. **Costs**: One-off capital costs of $2M for councils for monitoring equipment, and ongoing monitoring costs which they may recoup via consents from resource users. Approximately $20M to mitigate the lack of fish passage through existing structures.
Clearer ecological outcomes for river flows and water levels	**Benefits**: The major benefit is that all fauna in an ecosystem will be considered when setting minimum flow thresholds and allocation limits. It will also provide improved clarity of process. **Costs**: Costs include council assessments of the needs of the ecosystem for flows. The impacts that this clarification would have on users having reduced access to water has not been estimated.
Reporting on the five components of ecosystem health	**Benefits**: Better recognition and understanding of freshwater ecosystems. Increased understanding of freshwater ecosystems leading to improved decision-making. **Costs**: Impacts limited to additional council resource for the additional monitoring burden.
Maintaining or improving water quality	**Benefits**: This policy will prevent regional councils from reducing water quality, this will help to protect the ecosystem services provided by waterways. **Costs**: Low implementation costs
Te Mana o te Wai in the Freshwater NPS	**Benefits**: Clarifying and strengthening framework so councils are clear about expectations of Te Mana o te Wai. Clearly defined aspirations for freshwater ecosystem health should lead to council decisions that set higher objectives for fresh water.

[44] Halliburton. March 2015. Assessment of the Impact of Flow Alterations on Electricity Generation.

Changes to the Freshwater NPS	
Proposal	**Benefits/Costs**
	Costs: Costs to councils due to increased community engagement and increased costs for communities who choose higher environmental standards.
Preventing further loss of streams	**Benefits**: Will encourage more efficient use of land and infrastructure, and strategic consideration of locations for housing intensification. Benefits to ecosystem health of maintaining habitat and connectivity. Social and cultural benefits to general public including increased public awareness of urban stream ecosystems, corridors for cycling, walking, and traffic-free routes. **Costs**: Developers may pass lost profits onto house purchasers. This will depend on development design, topography of land, amount of streams present, and the ecological values that need to be offset. Will increase consenting, monitoring and compliance costs for some councils. Using the cost of restoring a piped stream as a proxy for the ecosystem services provided, a Greater Wellington Regional Council study concluded a 31% probability that social benefits to the community would outweigh the lost income of the developer.[45] The *Stream Retention Through Subdivision Design Alternatives* report concluded that "the retention of streams within urban developments will not unduly hinder the provision of additional housing capacity within the Wellington region".[46]
Direction to territorial authorities to support integrated management	**Costs**: The cost is minimal and limited to staff resources at territorial authorities.
Improving Māori involvement in freshwater management: Better incorporation of Māori values and measures of freshwater health	*Consulting on 2 options.* **Benefits**: Improved outcomes for freshwater, connection with waterbodies, intergenerational knowledge transfer, and greater understanding of different cultural perspectives within the community. This would also improve mātauranga Māori based freshwater data (subject to adequate intellectual property protections). **Costs**: Higher costs for regional councils due to strengthened implementation requirements and engagement expectations.

[45] Greater Wellington Regional Council's Proposed Natural Resources Plan (notified in 2015).

[46] Stream Retention Through Subdivision Design Alternatives. Prepared for Greater Wellington Regional Council by Morphum Environmental Ltd, McIndoe Urban and Wraight + Associates July 2018.

Improving farm practices	
Proposal	**Benefits/Costs**
Freshwater Modules in Farm Plans[47] (FW-FP)	**Benefits**: Tools to help farmers manage environmental risks. Tracking action towards addressing risks in a coordinated way. In some cases the FW-FP process may identify farm system changes that may improve profitability and provide environmental benefits (eg, soil testing could suggest that less fertiliser is needed). **Costs**: About 28,000 more farms will need a FW-FP by 2030, councils will need to monitor compliance. Estimate $3,500 per farm plan - $100M total. $38m to audit FW-FPs.
Reducing nitrogen	**Benefits**: Reductions in excess nitrogen entering water ways (may also be cost savings to farmers depending on source of nitrogen). **Costs**: In addition to the cost of a FW-FP above, additional auditing costs of $1,500 per year per applicable farm (additional audit required for applicable farmers in high N-impacted catchments).
Addressing high risk land use activities: stock holding areas and feedlots	**Benefits**: Will reduce discharges to water from stock holding areas. Good quality stock holding areas may improve productivity. **Costs**: Builds on existing work by councils and industry in developing minimum standards. This means that, where good practice is already adopted, there will not be an undue burden to the farmer. Approximately $3,000 per consent, and an estimated $72 per cow to meet infrastructure costs[48].
Intensive winter grazing of forage crops	**Benefits**: no further degradation of freshwater and soils from these activities. **Costs**: Intervention will be focussed so as to maximise the benefits at a minimal cost. We estimate that about 2,000 additional consents will be required costing approximately $3,000 per consent.
Agricultural intensification	**Benefits**: Benefits include restricting a rise in contaminants entering waterbodies and the avoidance of increased costs of future mitigations. Halting further damage to waterways resulting from this intensification. The opportunity to develop 'under-developed land' in future is maintained. **Costs**: Costs are mostly opportunity costs (ie, revenue foregone from intensification if a farmer is unable to obtain a consent). $3000 per consent plus cost for expert opinion/evidence to support a consent application to intensify.
Stock exclusion	**Benefits**: 77% of the nutrients in water ways were contributed by streams less than 1m wide[49], inclusion of those streams will result in a larger beneficial environmental impact.

[47] Analysis from Landcare Catchment Case Study for the Ruamahanga, Macfarlane Rural Business (MRB) Farm Case Studies, and AgFirst Farm Case Studies.

[48] Landcare Catchment Case Study for the Ruamahanga

[49] McDowell, R.W, Cox, N and Snelder T.H. 2017. Assessing the Yield and Load of Contaminants with Stream Order: Would Policy Requiring Livestock to be Fenced Out of High-Order Streams Decrease Catchment Contaminant Loads.

Improving farm practices	
Proposal	**Benefits/Costs**
	Estimated benefits of $983m for excluding stock from flat and rolling land.[50] This analysis didn't include streams <1m wide so the benefits of this proposal would be greater. **Costs**: Estimated cost of $400m for fencing and lost opportunity cost of retiring land within fences. This assumes none of this is currently fenced (and unlike the *E. coli* mitigation costs, is not targeting sheep farming).[51] Potential to become weed/pest plant colonised. This impact can be managed by supporting regional councils to further develop riparian management programmes. See *E.coli* for swimming below for estimates of fencing costs (which is one method of stock exclusion).

Improved information for managing freshwater	
Proposal	**Benefits/Costs**
Updating the Resource Management (Measurement and Reporting of Water Takes) regulations 2010 to require real-time reporting of water use	**Benefits**: • water use efficiency • setting allocation and low flow restriction policies and operational practices. • efficient use of council resources, particularly regarding compliance, monitoring and enforcement. • greater ability for integrated surface and groundwater management. **Costs**: Cost estimated at $14.3m annually (upper bound), this includes cost to regulators, wider government and those with water consents for more than 5 L/sec. The cost of purchase and installation of a telemetry unit will be $600 - $1,800.
Social impacts of the *Essential Freshwater* Package	
Social impacts of the *Essential Freshwater* Package	**Benefits**: The positive social impacts associated with improved water quality, ecosystem health and providing for Te Mana o te Wai are likely to include: • reduced risk to human health (through improved drinking water quality) • improved environmental amenity • increased opportunities for cultural purposes and recreation. Proposals would likely contribute to improved physical and mental wellbeing, particularly at the local scale, and contribute to New Zealanders' cultural identity associated with a high quality natural environment. These positive impacts are likely to be felt by New Zealanders at large, including Māori and local farming communities.[52]

[50] MfE and MPI. 2016. National Stock Exclusion Study - July 2016.

[51] Journeaux, P. 2019. Modelling of Mitigation Strategies on Farm Profitability: Testing Ag Package Regulations On-farm.

[52] Austin, 2019. Social impact analysis of Essential Freshwater.

	Costs: Negative social impacts include reprioritising of council resources away from providing other projects. The number of proposed regulations facing the agricultural sector, is likely to have an immediate negative impact on farmers' wellbeing (anxiety/mental health).

5.3 Summary of social and cultural impacts

Social impact

To date social impacts have only been assessed against a selection of the proposals (Sediment, Mandatory Freshwater Modules in Farm Plans, Reducing Nitrogen Surpluses, Intensification, and Stock Exclusion). Analysis of the social impacts of the other proposals is expected to be expanded over the coming months.

The positive social impacts associated with improved water quality and providing for Te Mana o te Wai are likely to include:

- reduced risk to human health (through improved drinking water quality)
- improved environmental amenity
- increased opportunities for cultural purposes and recreation.

This will likely contribute to improved physical and mental wellbeing, particularly at the local scale, and contribute to New Zealanders' cultural identity associated with the high quality natural environment. These positive impacts are likely to be felt by New Zealanders at large, including Māori and local farming communities.

The number of proposed regulations facing the agricultural sector, including areas other than freshwater quality (eg, climate change), is likely to have immediate negative impacts on farmers' wellbeing (anxiety/mental health). Alternatively by contributing to the improvement of freshwater quality across the country this may improve the public's perception of the farming community as stewards of the land (and building a social licence to operate). This may have a positive impact on the social cohesion of local communities, farmers' mental health (and as a result physical health), and overall satisfaction of life. Additionally, farming within environmental limits may also have positive impacts on our New Zealand brand overseas (eg, opportunities for higher added value farm products and eco-tourism), and protect New Zealand natural capital on which future generations depend upon.

Many of the proposed policies are likely to increase demand for a higher-skilled and larger rural professional workforce. Building rural professional capacity and capability will likely require investment from government and industry alike, higher demand is likely to result in more job opportunities.

The *Essential Freshwater* package will also impact on councils, through increased workload. Councils may need to de-prioritise other projects/programmes to resource the implementation of the package resulting in some dissatisfaction for council staff. Inversely, if councils are not able to de-prioritise enough other programmes, this may result in overworked staff with associated impact on their physical and mental health. Councils may increase rates in order to resource the extra workload, with potential negative impacts for wider communities.

Impact for Māori

While we have not specifically modelled the impacts on Māori at a local level (whānau, marae, hapū, Māori owned businesses), we have done a high-level indicative cultural impact assessment of some of the proposals. An in-depth impact assessment will be conducted in the coming months.

It is important to consider the unique characteristics, governance and collective ownership of Māori land, cultural values, and rights under the Treaty of Waitangi in addressing water issues.

Māori identity is intrinsically linked to the environment including freshwater bodies, hence why Māori hold a responsibility of katiakitanga or stewardship of the environment. This relationship is described in different whakatauki and pepeha such as the one commonly used by Whanganui River Māori – *Ko au te Awa, ko te Awa ko au* (I am the river and the river is me).

We anticipate that our efforts to halt further degradation and reverse past damage will have a positive impact on the mauri and wairua of our waterways. Halting degradation would also help restore the wellbeing and mana of Māori and the wider communities, and support Māori in strengthening their identity and connection to the water while still exercising their role as kaitiaki.

Strengthening the role of Te Mana o te Wai and the ability of tangata whenua to express their values and knowledge of freshwater management will help ensure Te Ao Māori is further recognised. Furthermore, ensuring that a holistic and integrated approach is adopted that puts the essential value of the water as the first priority. In addition, it will further help ensure that tangata whenua are able to practice tikanga over the management of freshwater values, such as mahinga kai. These changes will influence local decisions, ensuring these values are managed and incorporated in freshwater planning, and for tangible actions to occur on the ground to protect these values.

We also acknowledge that some policies of the Essential Freshwater work programme may not meet the possible higher expectations of water quality that Māori hold in relation to their freshwater bodies or that are inconsistent with Te Ao Māori. These particular proposals aim are '*maintain or improve water quality*' and '*providing for hydro-electiricty generation infrastructure*'. Additionally, while reduced timeframes (regional councils to give effect to the Freshwater NPS by 2025) would ensure more rapid action to halt degradation, this may also impact on engagement timeframes with iwi and hapū and their capability and capacity to participate in the process. This risk will be mitigated by a new process introduced through a new resource management bill.

It is important to note that our efforts to stop further degradation and loss and reverse past damage will also affect Māori enterprises, particularly in the agriculture industries and where land may be underdeveloped.

Consistency with Treaty of Waitangi settlements

We are intending on undertaking broad consultation with iwi as part of the Essential Freshwater consultation. We will ensure that where there are existing legislative or settlement requirements, we engage with the related iwi directly, on whether the proposals are consistent with these, eg, the Whanganui River Iwi with respect to Te Awa Tupua (Whanganui River Claims Settlement) Act 2017.

We will procure legal advice as to whether the *Essential Freshwater* package is consistent with existing historical Treaty of Waitangi settlements, or broader Crown obligations.

Risks with rights and interests issues not addressed

There is a risk that through the public consultation, iwi and Māori will continue to raise certain rights and interests issues (such as governance and allocation) which are outside of the current proposals.

5.4 What other impacts is this approach likely to have?

The policy proposals in this analysis are part of a wider Government approach to transitioning to a sustainable, low-carbon and resilient New Zealand. This transition includes policy proposals for biodiversity, climate change, and highly productive land. At this stage we are not able to provide detailed information on the co-benefits, impacts and costs across these policies and the cumulative effect of policy change on the primary sector and other sectors. This work is planned to be completed by the end of 2019.

To help mitigate these impacts, the proposed regulatory interventions will be accompanied by non-regulatory support. This will include whole-of-government place-based investment in targeted at-risk catchments, and government support to assist councils and the primary sector to implement these changes. For more information see Section 6 below.

Section 6: Implementation and Operation

6.1 How will the new arrangements work in practice?

A new, revised Freshwater NPS, a new Freshwater NES, amended section 360 regulations and new section 360 regulations will be gazetted in early-mid 2020.

Regional councils will need to begin implementing the directions in the revised Freshwater NPS, and are required to be fully compliant by 2025.[53]

Overall, the new changes will not substantially alter existing freshwater planning processes. In many cases, new directions will simply clarify existing requirements (such as the clarification around the treatment of hydroelectric infrastructure). However, other changes will require regional councils to modify their existing approaches (such as the new sediment attribute).

While the Freshwater NES and section 360 regulations will take immediate effect, individuals will need to comply with the requirements of the regulations at different times for different policy areas. In many cases, the requirements will be phased (eg, the three-tranche approach to freshwater modules in farm plans and phased introduction of stock exclusion requirements).

[53] Note that currently the Freshwater NPS allows for Regional Councils to extend the implementation deadline to 2030 if an attempt to meet 2025 would result in lower quality planning or if it would be impractical. This will be changed to 2025. This is part of a broader RMA change proceeding through a separate process – that change will have its own regulatory impact analysis and the change to the timeframe will be analysed as part of that package.

Figure 3 below shows how the *Essential Freshwater* policy package will be rolled out over time.

Figure 3: implementation of Essential Freshwater policy package.

	2020	2021	2022	2023	2024	2025	2030+
NPS	Amended NPS gazetted	Regional councils give effect to NPS requirements (set objectives and limits)				Councils give full effect to NPS	
NES	Regulations come in to force, councils must begin processing resource consents		First tranche of freshwater modules in farms plans complete			Second tranche of freshwater modules in farms plans compete Interim regulations no longer apply	Third (final) tranche of Freshwater Modules in Farms Plans complete by 2030
S360 regulations	Regulations come in to force, councils must begin processing resource consents	First tranche of stock excluded		Second tranche of stock excluded		Third tranche of stock excluded	Existing fences moved to comply with 5m setback by 2035

- Where the regulations require resource consent (eg, the agricultural intensification and intensive winter grazing regulations) regional councils will need to process the consent when an individual applies.
- Where the new NES requires resource consent and the activity was permitted under the regional plan, the individual will have up to 6 months to obtain consent for the activity. An individual with consent to carry out an activity that now has more stringent requirements set by the NES will be able to continue as originally consented (an NES cannot prevail over an existing consent).
- Where the section 360 regulations require specific actions, these actions will prevail over any existing consented activity where the section 360 regulations are more stringent.

6.2 What are the implementation risks?

A key risk to the policy package is that regional councils will not have the resources required to:

- hold meaningful engagement with tangata whenua
- carry out thorough consultation processes to set objectives and limits
- amend regional plans and policy statements by 2025 (or in exceptional cases 2030) given the imposition of new attributes and new requirements for ecosystem health

- monitor compliance with the new Freshwater NES and section 360 regulations
- process resource consents where these are required by the Freshwater NES or section 360 regulations, and
- administer new functions, such as freshwater modules in farm plans.

Another risk is a lack of industry capability and capacity to implement the proposed changes within the specified timelines. For example:

- Implementation of freshwater modules in farm plans relies on there being a sufficiently-sized pool of suitability qualified persons to prepare and audit the plans. This pool of qualified persons will need to be built up over time.
- Wide-spread fencing of waterways may increase demand for fencing materials and labour, leading to shortages in some parts of the country.

These risks will be mitigated through guidance and non-regulatory support.

Section 7: Monitoring, Evaluation and Review

7.1 How will the impact of the new arrangements be monitored?

The Environmental Reporting Act 2015 requires the Ministry for the Environment and Statistics New Zealand to provide six-monthly reports on the state of New Zealand's environment over a three-year cycle. The reports are a valuable source for monitoring the environmental impact of policies from across environmental domains.

The three-year cycle includes five 'domain reports': air, atmosphere and climate, freshwater, land, and marine, and a synthesis report covering all five domains (two reports a year, over three years). The next report will be published in April 2022.

The last freshwater domain report *Our fresh water 2017* was published in April 2017. The next report is due in April 2020 (the time the policy package will come into force) then in April 2023.

Both the 2022 synthesis report and 2023 freshwater domain report will give some indication of the overall trends in water quality since these policy proposals come into force. However, trends in freshwater quality and ecosystem health take a long time to change. In some areas, water quality and ecosystem health may decline before it improves, and improvements may not be evident in other areas for decades (due to the lag of nutrient loads working their way through soils into freshwater systems).

In addition, the website Land Air Water Aotearoa (www.lawa.org.nz) compiles environmental information from across the 11 Regional Councils and five Unitary Authorities. These organisations regularly publish their water quality data in a consistent format on this website. The website is designed for a public audience to be able to interpret scientific information correctly. Over the long term this will be a useful resource for allowing people to monitor the effectiveness of the interventions contained within the Essential Freshwater package.

7.2 When and how will the new arrangements be reviewed?

The Freshwater NPS itself requires a review of its implementation and effectiveness. The date of this review is currently 1 July 2020. Due to the close proximity to these amendments, it is proposed to extend the date of this review to a date within the next five years. That will allow for a better picture as to how the proposed interventions are functioning.

Furthermore, a comprehensive implementation support programme will allow us to monitor how councils are going with implementation and if further changes or refining is needed.