DairyNZ

# RMA National Direction – Freshwater

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## Regarding: Updating RMA National Direction

DairyNZ welcomes the opportunity to provide feedback on updating RMA National Direction for Freshwater, the Primary Sector, and Infrastructure and Development (the "consultation").

**Scope and focus of this submission**

DairyNZ recognise this is the first of two submission stages, with detailed drafting feedback to come later in 2025. While this submission focuses on freshwater issues, DairyNZ is interested in all aspects of the resource management system because it impacts the entire dairy sector. We will carefully consider relevant national direction drafting in the next phase.

**We support an improved freshwater policy that leads to improved environmental outcomes**

DairyNZ supports freshwater policy that is effective, enduring, science-based, and aimed at delivering ecosystem and human health outcomes valued by communities and mana whenua.

The current approach is not working. It is divisive, inefficient, and ineffective at delivering these outcomes. A better approach requires greater focus on positive, pragmatic, on-the-ground actions within catchments that we know will deliver better outcomes. Actions such as riparian planting, critical source area management, and habitat and wetland restoration, enabled through improved use of Freshwater Farm Plans and catchment-scale planning, can better move us in the right direction to improve freshwater outcomes.

The dairy and wider primary sectors have demonstrated strong leadership and commitment through voluntary initiatives implemented by farmers who take ownership of both the issues and solutions specific to their farms and catchments. With the right regulatory support, the sector is well-positioned to continue improving freshwater outcomes while sustaining resilient rural communities and a productive economy.

This will require significant change to the current regulatory settings.

**DairyNZ recommendations:**

- **Update the NPS-FM objective** to deliver on national values while enabling sustainable uses like farming, and more pragmatism regarding when and where improvements are required.
- **Add practical considerations** including cost, feasibility, and socio-economic impact to decision-making, so that plans are realistic and tailored to each area.

- **Clarify and reframe the National Objectives Framework** by prioritising outcome attributes linked to national values and community aspirations, and managing key driver attributes (both contaminant and non-contaminant) through targeted, on-the-ground actions.
- **Back sustainable farming** by encouraging catchment and landowner-led solutions, recognising good practices and supporting positive actions, such as enhancing biodiversity and aquatic habitat through riparian and wetland restoration.

**Who is DairyNZ**

DairyNZ is the industry-good organisation representing all New Zealand dairy farmers. We help farmers build profitable, sustainable, and resilient farm businesses through extension, advocacy, science, and research. Our purpose is to progress a positive future for New Zealand dairy farming.

Funded by a levy on milksolids paid by all dairy farmers under the Commodity Levies Act 1990, a significant portion of our work supports research and development to deliver water quality outcomes.

**Next steps**

Our submission aims to provide constructive, actionable feedback. We welcome further opportunities to discuss how our recommendations can be incorporated into the next drafting phase of the national direction, including the translation of scientific principles into effective policy and legislative frameworks that work for the industry, the environment, and New Zealand as a whole.

Nāku iti noa, nā

| | |
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| **Campbell Parker** | **Dr David Burger** |
| Chief Executive | General Manager, Farms Solutions & Policy |

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# Section 1: Summary of submissions

DairyNZ welcomes the opportunity to work with officials prior to the next phase of consultation, and on the broader RMA reform programme.

DairyNZ is committed to working collaboratively with the government, and other stakeholders, to achieve workable, enduring regulations that will deliver the environmental improvements sought by communities. We urge policymakers to adopt a balanced, evidence-based approach that recognises the progress already made and the need for practical, workable solutions.

A summary of our key submissions is below. These are supported by more detailed responses in the body of the submission.

**Table 1. Summary of key submissions**

| Topic | DairyNZ position and recommendation |
|---|---|
| **Relationship to RMA reform** | Proceed with national policy consultation but consider deferral for those aspects heavily reliant on spatial planning until Phase 3 RMA reform. |
| **Objective of the NPS-FM** | **Support replacing the current objective with a single objective** that:<br>• Maintains water quality for four compulsory values (human health, ecosystem health, threatened species, mahinga kai).<br>• Enables sustainable use and development (e.g. food production, economic/cultural needs).<br>• Allows improvement *where practicable* when bottom lines or community outcomes aren't met.<br><br>Policies should support this by:<br>• Embedding cost, feasibility and socio-economic implications into decisions.<br>• Enabling non-regulatory solutions and regional discretion.<br>• Requiring *reasonable* progress.<br>• Setting achievable targets that account for how much the landscape has been modified.<br>• Good outcomes need more than just contaminant limits – non-contaminant management factors and on the ground actions are essential.<br>• Ensuring land use change is only required where a fair pathway exists. |
| **Te Mana o te Wai** | • Retain Te Mana o te Wai within the NPS-FM as a preamble, rather than within the objective.<br>• Remove reference to a hierarchy.<br>• Within the preamble, include reference to:<br>  ○ The need to ensure that the mana, importance and intrinsic value of freshwater (Te Hauora o te Wai, Te Hauora o te Taiao, Te Hauora o te Tangata) is recognised and provided for while enabling sustainable resource use.<br>  ○ The particular rights and interests that Māori have in freshwater and the need to involve iwi and hāpu to meet obligations under the Te Tiriti o Waitangi. |

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| **The National Objectives Framework (NOF)** | **Establish a new framework for the NOF** which:<br>• Places a focus on outcomes<br>• Retains four compulsory national values of ecosystem health, human health for recreation, threatened species, and mahinga kai.<br>• Reduces the number of national bottom lines from greater than 20 to 8:<br>  ○ Dissolved oxygen (rivers and lakes)<br>  ○ Phytoplankton (lakes)<br>  ○ Macroalgae (estuaries, new bottom line)<br>  ○ Periphyton (rivers – hard bottom)<br>  ○ Macroinvertebrate Community Index (MCI)<br>  ○ Fish Index of Biotic Integrity (F-IBI)<br>  ○ *E. coli* (primary and secondary contact – rivers, lakes, estuaries)<br>  ○ Planktonic cyanobacteria (lakes and lake-fed rivers)<br>• Utilises 5 supporting/driver attributes to be applied if considered a driver of degradation in a catchment, to be determined by the regional council:<br>  ○ Nitrate and ammonia toxicity (with modified species protection level from 95% to 90% that aligns the target to the narrative for heavily modified states), and as based on current science<br>  ○ TN /TP trophic state (lakes)<br>  ○ Suspended sediment using a single class attribute (and NBL) as proposed in Appendix B<br>  ○ Potential TN (estuaries) – this is a new driver attribute to support the proposed macroalgae outcome attribute for estuaries<br>• We believe these changes will ensure improved environmental management through a system that identifies and directs the right interventions for specific water quality issues. |
| **Freshwater Action Plans (new tool)** | **Introduce Freshwater Action Plans** in the NPS-FM as spatially defined, community-led tools at the catchment or sub-catchment level that:<br>• Guide coordinated, operational actions to deliver freshwater quality outcomes aligned with regional plan objectives.<br>• Support and inform regulatory approaches by integrating local initiatives, enabling adaptive, place-based delivery.<br>• Reflect how change occurs on the ground, with regional and central government playing a supporting role through funding, facilitation, and technical input.<br>• Provide a mechanism to reduce reliance on regulation where effective community-led action is occurring, while still enabling regulatory escalation where necessary. |
| **Enabling Commercial Vegetable growing** | We advocate for improving the NPS-FM more generally to better recognise the importance of food production and existing land uses, with consideration for implications of increasing footprint on other land uses. |

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| **Water security & storage** | We **support enabling off-stream water storage**:<br>• Support national standards for off-stream storage.<br>• We ask officials to engage with Irrigation NZ when drafting specific standards in the national directions.<br>Seek longer duration consent timeframes for water allocation and water storage infrastructure to provide investment confidence. |
| **Wetlands** | We support:<br>• The avoidance of further loss of the extent of wetlands.<br>• Encouraging the remediation, restoration, and construction of wetlands.<br><br>We **seek more practical rules, and a broader approach focused on enabling positive actions** through:<br>• A permitted activity pathway for constructed wetlands.<br>• Refocusing regulation on mapping and managing significant wetlands and habitats of threatened species.<br>• Clarifying definitions, removing unintended capture of low-value or pastoral areas in the definition of 'natural inland wetlands'.<br>• Streamlining farming rules around wetlands with risk-based permitted activity provisions.<br>• Maintaining regional mapping of significant wetlands and threatened species habitats to support effective implementation.<br>• Incentivising protection through a range of supporting actions. |
| **Fish passage** | • **Reduce regulatory requirements** under the NES-F.<br>• Enable councils to continue using risk-based, permissive rules for low-risk culverts.<br>• Promote practical tools like FPAT and BART to support farmers and raise awareness of best practice.<br>• Simplify reporting with further detail requested only if needed. |
| **Farmer facing regulations (N cap)** | • **Retain the 190kg/ha/yr limit but improve implementation standards**.<br>• Apply as an average across the effective farmed area as opposed to a cap for every hectare.<br>• Remove the requirement to provide receipts annually and amend the reporting timeframes to align with the farming calendar.<br>• Shift from regulation to management in a farm plan over time. |
| **Drinking water source mapping** | • Identify source water sites (not three SWRMA zones) during regional planning processes.<br>• Enable regional councils and communities to determine the need for protection zones based on catchment and specific risks.<br>• Use the 'greater than 500' population threshold as a starting point for required mapping. |

# Section 2: Introduction

## Principles informing our proposed replacement to the NPS-FM

DairyNZ supports a national freshwater framework that is enduring, practical, and improves freshwater outcomes through locally driven, science-informed actions. The following principles underpin our recommended approach:

**A clear and enduring, outcomes-based framework**

- Focus on achievable and enduring freshwater outcomes rather than prescriptive regulatory inputs which may not necessarily achieve desired outcomes.
- Provide for long-term certainty to enable sustained investment in freshwater and ecosystem health improvements.
- Ensure national consistency through an improved National Objectives Framework (NOF), delivering to the retained set of compulsory values, namely human health for contact recreation, ecosystem health, threatened species and mahinga kai.
- Retain and build on proven components of the existing NPS-FM that support long-term progress, including:
    - Ki uta ki tai - Integrated management from the mountains to the sea
    - Maintain or improve freshwater outcomes within FMUs
    - Long-term visions and achievable freshwater outcomes
    - Community and tangata whenua participation in freshwater planning

**Locally-led and pragmatic implementation**

- Enable landowners, communities, tangata whenua, and councils to co-develop catchment-based solutions that reflect local conditions and values.
- Direct regional councils to adopt freshwater approaches tailored to local environmental, cultural, economic, and social context.
- Support the use of robust on-farm and catchment level tools and methods, such as Freshwater Farm Plans, and catchment scale Freshwater Action Plans as core delivery mechanisms for improving freshwater outcomes.
- Allow for phased implementation with clear, realistic timeframes and practical transition pathways.
- Recognise the role of existing community and sector-led initiatives in delivering change.

**Science-informed decision making and adaptive management**

- Base freshwater policy and planning on fit-for-purpose scientific evidence, supported by mātauranga Māori.
- Apply adaptive management to enable continuous learning, implementation, monitoring, and iterative improvement in freshwater outcomes.
- Set freshwater targets that are achievable (based on current knowledge and considering catchment development), reflect natural variability (e.g. climate externalities), and economic/social feasibility.

**Balancing the four wellbeings (environment, economic, social and cultural), fair transition and sustainable use of resources**

- Better balancing of environmental, cultural, social, and economic wellbeing in freshwater decision-making.
- Support fair timeframes for change by recognising local capacity, challenges, and the need for practical support on the ground.

- Enable responsible and environmentally sustainable use of freshwater to support human health, food production, and the sustainability of communities.
- Provide scope for land use flexibility to enable sustainable growth while maintaining or improving freshwater outcomes, avoiding unnecessary disruption to regional and local economies or food systems.
- Provide clear policy signals that promote investment certainty and long-term confidence in land and water management and sustainable practices.

**Taking a partnership, solutions-focused approach**

- Central and regional government works in partnership with farmers and tangata whenua and local communities to co-design and deliver catchment scale solutions.
- Focus on identifying pragmatic actions that are most likely to address key drivers/limitations that are specific to that catchment and therefore deliver the greatest environmental benefit (i.e. improvement of freshwater outcomes).
- Provide the necessary time and assistance for farmers to understand and adopt the most effective (prioritised) interventions and mitigations (i.e. actions).
- Future regulations and, importantly, responses to those regulations, need to recognise that existing dairy land use met the regulatory standards of the time.
- Ensure central and regional government co-invest in on-farm/catchment initiatives, mitigation tools, and innovation to share costs and ensure maximum impact.
- Commit to transparency and accountability through joint monitoring and reporting over time in the right places.

**Shared responsibility and collective action**

- Improve freshwater outcomes through coordinated effort and shared responsibility across all land uses, sectors, and communities.
- Acknowledge that while dairy has a part to play in contributing to freshwater outcomes, it comprises only around 2.2 million hectares (8%), and hence there are broader challenges that stem from multiple land uses and sources.
- Support implementation of catchment-scale solutions actions that address priority contaminant and non-contaminant drivers specific to each catchment/FMU.
- Reinforce the dairy sector's commitment to Good Farming Practice (GFP) and targeted action implemented through Freshwater Farm Plans (FWFPs), while recognising that delivering on freshwater outcomes depends on collective contributions from all sectors.

# Economic context for freshwater policy – A dairy sector perspective

**The Dairy sector's economic contribution**

The dairy sector remains one of New Zealand's most important economic contributors. In the 2024/25 season, dairy exports are projected to reach $27 billion,[1] reflecting dairy's critical role in the nation's prosperity. Dairy farming supports more than 54,000 jobs with over 38,000 on farm and over 16,000 in dairy processing[2]. Beyond direct employment, the sector's economic multiplier effect stimulates broader activity, sustaining rural infrastructure, community services, and employment across the supply chain.

Dairy sector employment underpins regional economies, particularly in rural areas where alternative economic opportunities are limited. For instance, in Waimate, one in three jobs are dairy-related, and dairy wages

[1] Ministry for Primary Industries. (2025). Situation and Outlook for Primary Industries: June 2025.
[2] Solid foundations: Dairy's economic contribution to New Zealand Solid foundations Dairy's economic contribution to New Zealand *Microsoft Word - Solid foundations - Final - 04 September 2023.docx*

constitute 52% of total wages paid. The sector also has a high employment share in other districts including South Taranaki (1 in 4 jobs), Westland (1 in 4.5 jobs), Southland (1 in 5 jobs), and Matamata-Piako (1 in 6.5 jobs). [3]

**Affordable, efficient regulation that supports sustainable resource use**

The dairy sector is committed to freshwater outcomes while continuing to underpin the New Zealand economy. Three fundamental requirements to this ongoing improvement are time, regulatory certainty and financial investment. To ensure economic benefits remain, it is important to ensure that the marginal costs of developing and implementing environmental mitigations are considered when setting regulations. This requires careful design of regulations that balance both costs and benefits. Freshwater reform must avoid imposing costs that are disproportionate to the estimated environmental gains, including the cumulative costs of meeting multiple regulations and market drivers. These costs not only affect individual farms but also have broader implications for rural communities, supply chains, and New Zealand's economic stability.

## The dairy sector is up for the challenge

Farmers are committed to continuous improvement, and the sector has shown leadership and investment in addressing environmental challenges, including:

- 2003 Dairying and Clean Streams Accord: Voluntary commitment to exclude stock from waterways, improve effluent compliance, and manage nutrients across dairy farms.
- 2013 Sustainable Dairying Water Accord: Sector-led, independently audited programme to improve on-farm environmental performance and protect freshwater resources.
- 2013 Dairy Environment Leaders & Climate Change Ambassadors (ongoing): Farmer-led networks championing environmental stewardship and supporting change.
- 2013 Forages for Reduced Nitrate Leaching: Science programme demonstrating that forage management can reduce nitrate leaching by over 20%, supporting water quality improvement.
- 2017 Dairy Tomorrow Strategy: Long-term sustainability strategy committing the sector to environmental protection, innovation, and intergenerational responsibility.
- 2018 Sustainable Catchment Projects: Catchment-scale initiatives in Tararua, Selwyn-Hinds, and Aparima to improve water quality while maintaining farm resilience.
- 2019 Step Change: Farm-level programme providing tools and support to help farmers meet environmental goals while improving profitability.
- 2023 Dairy Tomorrow – Environmental Commitment: Updated sector-wide plan guiding coordinated, future-focused environmental action based on the sector strategy.

These voluntary efforts show that the sector is not only ready but committed to long-term environmental improvement. With regulatory settings that enable practical, outcomes-based approaches, dairy farmers are well-placed to continue improving water quality while maintaining resilient rural communities and a productive economy.

## Outcomes of the Sustainable Dairying: Water Accord (2013–2018)

The Sustainable Dairying: Water Accord was a voluntary, industry-led initiative developed by DairyNZ and the Dairy Companies Association of New Zealand (DCANZ). It aimed to lift environmental performance across all dairy farms, particularly in relation to freshwater quality. The Accord has now concluded, but it delivered substantial improvements in on-farm practices and laid the foundation for the sector's readiness to lead on future environmental management.

[3] Ibid.

Key achievements of the Accord include:

- Waterway protection: By the end of the Accord, more than 98% of significant waterways on dairy farms had been fenced to exclude cattle, amounting to over 24,000 km of fencing. In addition, approximately 99% of regular stock crossings (over 44,000) were either bridged or culverted, significantly reducing direct contamination of waterways.
- Effluent management: Regular auditing and monitoring led to significant improvements in effluent compliance. By 2017, the non-compliance rate had dropped to just 5.2%.
- Nutrient management: By 2018, 94% of dairy farms (over 10,000) had developed nutrient budgets to support improved nutrient use efficiency and environmental outcomes. Approximately 83% of farms were also submitting annual nitrogen use data, laying the groundwork for current nitrogen reporting requirements.
- Riparian management: Over 50% of farms with waterways had developed riparian management plans to guide planting and erosion control. The sector also produced regional riparian guides to assist consistent and effective implementation.
- Water use efficiency: Water measurement and infrastructure upgrades were promoted under the Accord, with over 54% of farms installing water meters by 2018. This contributed to improved irrigation and shed water use efficiency.
- Transparency and accountability: The Accord required annual public reporting and independent auditing. This transparency increased public confidence and provided a mechanism for continuous improvement within the sector.

These achievements demonstrate that the dairy sector is capable of significant environmental progress through a combination of voluntary action, industry leadership, and science-informed practice change. The Accord also created the baseline infrastructure and behaviours that underpin the sector's current preparedness to implement regulated Freshwater Farm Plans and nitrogen caps. A summary of key mitigations involving DairyNZ is in Appendix A.

## Dairy Tomorrow partnership environmental commitments

Following the Water Accord, the dairy sector launched the Dairy Tomorrow strategy with a commitment to protect and nurture the environment for future generations. This commitment had a focus on continuous improvement on-farm, through the wide-scale adoption of Farm Environment Plans and good farming practices targeted at the water quality and climate change problems we are working to solve. On the ground, several catchment scale projects, as well as tools and guidance, will support farmers to reduce their environmental footprint.

More than 84% of dairy farms now operate under Industry Farm Environment Plans with adoption to rise once regulatory FWFPs are implemented. Industry-led initiatives like the Sustainable Dairying: Water Accord and research into freshwater science and on-farm and catchment scale mitigations now provide an evidence base demonstrating the sector's commitment to continual improvement.[4]

## Levy payer feedback received as part of developing this submission

DairyNZ undertook consultation with levy payers in the preparation of this submission. Some key themes emerged:

- Certainty and stability
    - Levy payers expressed a need for clear, consistent, and enduring regulations to give confidence for long-term planning and investment.

[4] Dairy Tomorrow Report, sustainable-dairying-annual-report-protecting-our-environment-2022-v141.pdf

    - Ongoing regulatory change and complexity undermine trust and create uncertainty, making it harder to commit to good practices.
- Practical and science-based regulation
    - Regulations must be practical, achievable, and grounded in robust, catchment-relevant science.
    - To deliver better freshwater quality we need to identify and target the actual causes of water quality issues.
- Removing barriers to positive action
    - Current rules often hinder sensible environmental actions, especially around wetlands (e.g. fencing, planting, maintenance).
    - Farmers want flexible, outcome-focused rules that enable practical improvements on the ground.
    - There is a strong desire for recognition of the significant progress already made through voluntary actions and investment.
- Empowering catchment-based solutions and ownership
    - Farmer and community-led catchment groups are seen as highly effective in delivering meaningful freshwater outcomes.
    - Levy payers support a mix of regulatory and voluntary approaches that empower local leadership and collective action.
    - Farmers want a collaborative approach, with central and regional government and communities working together to achieve shared outcomes.
- Protecting sector credibility
    - Concern exists about public and market perception if regulatory changes appear to weaken environmental standards.
    - Farmers want to constantly improve the environment – they do not want to 'go backwards'.
    - Farmers want balanced policies that maintain momentum, support transparency and accountability, and uphold the credibility of the dairy sector.
- Support good dairy farming
    - We all benefit when dairy farmers are proud of their efforts to improve the environment while supporting the economy.
    - Leading dairy farmers are proud of their commitment to and investment in improving their environments and embrace the opportunity to demonstrate this.

## Targeted engagement with Mana Whenua and Māori levy payers

DairyNZ undertook targeted consultation with Mana Whenua and Māori levy payers in developing this submission and we thank them for their perspectives that come from a rich depth of cultural insight into freshwater. Through our discussions there was broad consensus that review of the NPS-FM is needed to make it workable for Mana Whenua, Māori landowners and farmers. This included support for a regulatory framework that is practical and workable, that is based on an enduring set of principles, includes consideration of the governance for decision-making and management of freshwater, and integrates knowledge and practices.

While there was agreement that review was needed, those consulted also laid down the challenge that any changes need to ensure the ongoing protection of freshwater as critical to the health of the environment and communities.

# Section 3: Why an Outcomes Approach is better for the Environment

DairyNZ believes it is a priority to move to an outcomes-based approach to freshwater management, focused on achieving tangible environmental improvements rather than relying solely on input or activity-based rules. This approach prioritises setting clear, measurable goals for ecosystem health and community values, enabling flexibility in how those outcomes are achieved, and delivering on outcomes in the most efficient way. It allows for innovation, recognises regional differences, and supports continuous improvement while ensuring environmental efforts are practical, science-based, and aligned with productive land use.

This requires a move away from the comfort of relying on setting numerical resource use limits base on the 'big four' contaminants (nitrogen, phosphorus, sediment and *E.coli*). But change is needed if our focus is on delivering outcomes, as contaminants are generally poor proxies for stream health, explaining little of the variability in outcome attributes (i.e. ecological responses). [5-6-7-8-9] While E.coli is a reasonable indicator of pathogen risk, management of this contaminant (as a limit) to provide for the human – contact recreation value is problematic for several reasons .[10] DairyNZ believe that the regulatory process needs to be a lot more honest with communities about the 'science uncertainty' of contaminant limits and acknowledge we cannot set regulatory contaminant targets and limits and expect these to provide for the outcomes sought by communities and tangata whenua.

This 'science limitation' was recognised by the Ministry for Environment when defining Appendix 2B "Action Plan" attributes as part of the 2020 NPS-FM. A Ministry factsheet[11] explains the need for action plans for these attributes where limit setting is not as appropriate. It goes on to add (bold text is DairyNZ emphasis):

> *"While limit setting is necessary to meet many target attribute states,* ***some attributes that measure important parts of the ecosystem health (eg, macroinvertebrates) are more difficult to link to resource use*** *but still need to be managed to protect ecosystem health.* ***The new requirements to prepare action plans for these attributes***

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[5] M. Pingram, K. Collier, M. Hamer, B. David, A. Caitlin, J. Smith. (2019). Improving region-wide ecological condition of wadeable streams: Risk analyses highlight key stressors for policy and management. *Environmental Science and Policy* 92 (2019), 170-181.

[6] K. Collier, A. Cooper, R. Davies-Colley, J. Rutherford, C. Smith, R. Williamson, (1995). Managing Riparian Zones: A contribution to protecting New Zealand's rivers and streams. Volume 1: Concepts. Prepared by NIWA for Department of Conservation (1995), 45 p. https://www.doc.govt.nz/documents/science-and-technical/riparianzones1.pdf

[7] T. Snelder, A. Canning (2019). Comparison of MCI – nutrient relationship analysis of Canning and Snelder. STAG document 16 (23 June 2019) 11 p. 16-STAG-additional-meeting-docs-Comparison-of-MCI-vs-nutrient-relationship-23-June-2019.pdf

[8] T. Snelder (2022). Investigation of relationships between invertebrates and dissolved nutrient concentrations in NZ rivers. WRC Technical Report TR2022/44. 33 p. https://www.waikatoregion.govt.nz/services/publications/tr202244/

[9] E. Graham, M. Greenwood (2023). Drivers of macroinvertebrate communities in Northland streams. NIWA Report 202384HN prepared for NRC. 114 p. https://www.nrc.govt.nz/media/k5bcl5bb/drivers-of-macroinvertebrate-communities-in-northland-streams.pdf

[10] The limit-setting management approach to *E.coli* is still problematic for the following reasons: 1) Primary contact standards are applied to all waterways which fails to assess the suitability of waterways for other important secondary contact recreational values; 2) current attributes require management for primary contact recreation under storm/flood conditions where people are recommended not to swim due to drowning/safety risks (we should be managing for primary contact recreation under non-storm conditions); 3) under baseflow conditions, avian sources are often a significant contributor to *E.coli* levels which are a non-manageable source for pastoral land users; 4) contribution and risk associated with 'naturalised E.coli'; 5) combination of stormflows and other sources results in many 'native-dominated' catchments not meeting NBLs for primary contact recreation – any NBL that cannot be met in an unmodified catchment is, by definition, an inappropriate NBL to apply to modified catchments. 5) The complex nature of *E.coli* management is reflected in the current primary contact sites E.coli attribute (Table 22 in 2020 NPS-FM) is in Appendix 2B as an action plan attribute – that is, an attribute where limit setting is considered less appropriate.

[11] MfE (2020). Limit setting and action plans factsheet. https://environment.govt.nz/assets/Publications/Files/FS22-Limit-setting-and-action-plans-factsheet-final.pdf

***will ensure councils, in consultation with communities, set out how chosen actions will contribute to achieving target states*** *and undertake a review within five years."*[17]

This raises an important question: if contaminant-based target concentrations (and loads) cannot deliver these broader ecological outcomes (i.e., the things that communities want), then what are they achieving?

A sole focus on contaminants would make sense if these contaminant drivers were good proxy measures of the ecological outcomes we are managing for. This, however, is not the case, with several studies showing that contaminants, for example nutrients, are poorly related to (i.e. a weak predictor of) complex ecological health measures, including macroinvertebrates and fish community indices. Poor relationships between contaminants (i.e. water quality) and ecological outcomes should not come as a surprise as the 2020 NPS-FM emphasises the importance of managing for the 5 biophysical components that contribute to freshwater ecosystem health – namely: water quality, water quantity, habitat, aquatic life, and ecological processes. How can freshwater ecosystem health be measured if the focus is almost exclusively on water quality contaminants, which, in many riverine environments, will not be the limiting driver?

The reason that the regulatory system has fixated on contaminants is not because these are the best approach to provide for community outcomes, but rather that contaminants are more closely linked to land use. So regardless of whether contaminants are driving impoverished ecological outcomes, the only direct 'lever' available to regulators is a contaminant one. If outcomes not being met, then regulation can only go after land use to constrain the loss of contaminants associated with that land use. However, if regulation does not shift to include other (arguably more important), non-contaminant drivers (e.g. habitat and water quality), then top-down regulation is likely to continue its course of delivering ineffectual, adversarial, time-consuming and resource-draining processes that prevent maintaining, let alone, enhancing, economic growth.

Freshwater management needs regular review and an adaptive approach because many key ecosystem health measures are influenced by more than just contaminants.

What DairyNZ is proposing is a framework that incorporates this important aspect of the 2020 NPS-FM, that is, the requirement to develop freshwater action plans to provide for important measures of ecosystem health (and human health – recreation). Unlike the problematic attribute hierarchy introduced in the 2020 NPS-FM (a confusing mix of limits setting and action plan attributes) which prioritised contaminant limits, our proposed hierarchical framework prioritises measures of ecological responses (outcomes) which are supported by driver attributes (contaminants and non-contaminants). Having identified the most effective (highest priority) driver attributes, plans to support and implement 'chosen actions' to improve driver attribute states (and in doing so improve outcomes) would be developed.

# Section 4: Responses to Specific Consultation Questions

# Relationship to resource management reform

*Q. What resource management changes should be made in the current system under the RMA (to have immediate impact now) or in the future system (to have impact longer term)? From the topics in this discussion document, which elements should lead to changes in the current system or the future system, and why?*

DairyNZ recognises there are arguments both for and against progressing amendments to national direction ahead of Phase 3 of Resource Management Act (RMA) reform, particularly given the short timeframes involved and the need to ensure consistency with the eventual replacement legislation.

On balance, DairyNZ supports amending the national direction through this process prior to Phase 3. While this approach introduces some uncertainty and potential inefficiency, it is our preferred option for the following reasons:

**There is greater clarity in the current process compared to broader reform**

While the RMA Expert Advisory Group Report, Minority Report, and Cabinet response provide high level guidance around the replacement to the RMA, there remains limited detail around several core elements of the proposed new system. In contrast, the matters addressed in this national direction consultation are comparatively clearer and more actionable in the near term.

**This consultation can constructively inform broader reform**

The conversations and insights arising from this process can help shape the design and implementation of the future framework, including the proposed Planning Act and Natural Environment Act. This consultation provides an opportunity to test and advance thinking around key systemic proposals, including:

- Environmental limits: Approaches to setting limits, recognition of the limitations and constraints to tools for this purpose, the appropriate spatial scale, division of responsibilities between central and local government and practical mechanisms for implementation.
- Strategic drivers: The implications, intended or unintended, of enabling urban growth and infrastructure development on rural land use and primary production.
- Further thinking on new mechanisms: The feasibility and implications of proposed tools like resource use charges or market-based allocation systems.
- Provide certainty and maintain momentum: While Phase 3 reforms will bring big changes, it's important to give some clarity now so farmers, catchment groups, and councils can keep implementing positive on the ground action and be confident this will be recognised and enabled.

**The relationship between national and regional planning**

While this consultation is focused on national policy direction it remains imperative to consider the short-term impacts on regional processes, including:

- The implications if an updated NPS-FM is not in place by the end of 2025. There is a need for clarity that no new regional freshwater plans can be commenced prior to new national direction being in place. This could be achieved through either an extension to the existing moratorium or the implementation of new national direction.
- Implementation of new national direction provides an opportunity to influence resource consents under existing national and regional plans under s 104(1)(b) of the RMA, which requires a consent

authority to consider any relevant provisions of an NES or NPS when processing a consent. This is an important 'circuit breaker' between existing national direction and any intended changes, at the resource consent level.

There are some matters that may be worth deferring. In particular, any proposals that are strongly reliant on spatial planning as proposed under the replacement legislation should be considered for deferral.

**Relief sought**

**Proceed with national policy consultation. Consider deferral for those aspects heavily reliant on spatial planning.**

# Rebalancing freshwater management through multiple objectives

## DairyNZ position

DairyNZ supports recrafting the NPS-FM objective as it is currently too rigid.

A recrafted objective would not remove the requirement for councils to have conversations with their communities to understand the environmental outcomes those communities want to achieve. Rather it would give the council flexibility to have and deliver on those conversations instead of having them limited by the NPS-FM objective.

Nor would a rebalanced objective remove the requirement to maintain or enhance (where degraded) the environment and improve the stock of wetlands, if the appropriate policies were in place. We agree that a NPSFM should not enable water and aquatic ecosystem health outcomes to 'go backwards'. However, we also consider that the extent and pace of improvement needs to be informed by an understanding of impacts on social, cultural and economic well-being and community willingness and ability to pay the cost.

DairyNZ considers the 2017 NPS-FM suffered from too many objectives that were formulaic rather than value-adding, and which provided more confusion than clarity. There is an opportunity to direct councils and communities with a single, balanced objective that seeks to reconcile potential conflicts, rather than confusing councils and communities with too many (and potentially conflicting) objectives.

DairyNZ believes the new objective should seek to:

- Maintain water quality, including:
    - Life-supporting capacity, ecosystem processes, and indigenous species (ecosystem health).
    - Human health, as affected by contact with freshwater.
    - Habitat quality and extent for threatened freshwater species.
    - Opportunities to exercise cultural practices in relation to mahinga kai.
- Subject to at least maintaining these outcomes, provide for use and development of freshwater, including:
    - Food production.
    - Other strategic uses and activities.
    - Economic, social, and cultural needs of people and communities.
- Improving freshwater outcomes as far as practicable where current conditions do not meet national bottom lines or community-set outcomes.
- Refine the National Objectives Framework to focus on the key drivers in each catchment, supporting chosen actions most likely to improve freshwater outcomes.

### Questions

*Q. Would a rebalanced objective on freshwater management give councils more flexibility to provide for various outcomes that are important to the community? How can the NPS-FM ensure freshwater management objectives match community aspirations?*

As above, a single, recrafted objective would give councils more scope for conversations with communities around what should be achieved, and when.

*Q. What do you think would be useful in clarifying the timeframes for achieving freshwater outcomes?*

Clause 3.3 (2) of the NPS-FM 2020 directs the process for setting of long-term visions and requires a council to set goals that are 'ambitious but reasonable' over timeframes that are "both ambitious and reasonable".

> *(2) Long-term visions:*
>
> *…*
>
> *(b) must set goals that are ambitious but reasonable (that is, difficult to achieve but not impossible); and*
>
> *(c) identify a timeframe to achieve those goals that is both ambitious and reasonable (for example, 30 years after the commencement date).*

In our experience, the strong direction of the NPS-FM 2020 means councils couldn't start community discussions with a 'blank slate'. Instead, they proposed 'ambitious' changes within 'ambitious' (short) timeframes. This discouraged farmers and rural communities from fully engaging, as the starting point for the discussion on freshwater goals felt unrealistic or punitive and threatened the viability of their farms and communities, with an endpoint that was not achievable or realistic in heavily modified landscapes.

Timeframes should be adaptable and flexible to the specific conditions, rather than randomly set and universally applicable, and guide more than just the setting of long term visions. For example, we believe conversations around timeframes should guide:

- Whether improvements in freshwater outcomes can be achieved within the specified timeframes through non-regulatory means (like freshwater farm plans and freshwater action plans) before imposing rules that restrict farming activities.
- Whether those timeframes recognise and reflect the scale of change required—including changes to land use or practices—and the social and economic impacts of making those changes.

We are seeking a policy that will guide the setting of realistic and practical targets for freshwater outcomes, with flexibility for long-term or hard-to-achieve goals, but a clear expectation of steady progress, for example:

- Targets must be achieved as soon as reasonably practicable.
- If achievement of those targets will take longer than the life of the regional plan, interim targets must be set for the plan's duration.
- When deciding what is "reasonably practicable", councils must consider factors such as:
    - Existing and future contaminant sources
    - Habitat and physical limitations
    - Natural and human-made constraints
    - Availability and feasibility of technical, economic or market solutions
- We consider it reasonable there is provision for councils not to have to set a timeframe if achieving the target is clearly not attainable in the foreseeable future, but freshwater plans must still include driver state targets that show progress toward improvement over time.
- Targets and end points must be achievable in the context of existing catchment land use.

*Q. Should there be more emphasis on considering the costs involved, when determining what freshwater outcomes councils and communities want to set?*

The costs involved for determining freshwater outcomes, and whether those outcomes are economically, culturally and socially achievable, should be a core component of the discussion between councils and their communities, and be taken into consideration in any limit setting conversations.

**How these values should be considered**

Provision for the consideration of the economic, social and cultural costs to communities should be central to any new NPS-FM, in terms of the objective, the processes for discussing the targets to be achieved, and by

when, and assessments around whether or not any targets would result in marginal costs, or drive significant land use change. In summary this should be achieved by introducing flexibility and economic realism into by:

- Embedding cost considerations into freshwater decision making.
- Allowing regional discretion based on feasibility.
- Encouraging non-regulatory solutions as an efficient alternative.
- Requiring only reasonable progress when full compliance is not economically viable.
- National Bottom Lines or objectives that can only be achieved through land use change should only be set if there's a clear and fair pathway to achieve them.

**Relief sought**

**DairyNZ supports replacing the existing NPS-FM objective with a single, updated objective which removes the existing hierarchy and instead seeks to:**

- **Maintain water quality to deliver on four compulsory values of human health for contact recreation, ecosystem health, threatened species, and mahinga kai.**
- **Subject to at least maintaining these outcomes, provide for use and development of freshwater, including:**
    - **Food production**
    - **Other strategic uses and activities**
    - **Economic, social, and cultural needs of people and communities**
- **Improve freshwater outcomes as far as practicable where current conditions do not meet national bottom lines or community-set outcomes.**

**The NPS-FM policies should be amended to deliver on this updated objective by:**

- **Embedding cost, feasibility and socio-economic implications into decisions.**
- **Enabling non-regulatory solutions and regional discretion.**
- **Requiring reasonable progress.**
- **Setting achievable targets that account for how much the landscape has been modified.**
- **Good outcomes need more than just contaminant limits – non-contaminant management factors and on the ground actions are essential.**
- **Ensuring land use change is only required where a fair pathway exists.**

# Rebalancing Te Mana o te Wai

## DairyNZ position

**Issues with the current translation of Te Mana o te Wai**

The concept of Te Mana o te Wai has been included in the NPS-FM since 2014, as a matter of national significance and an integral part of the framework that "*forms the platform for community discussions about the desired state of fresh water relative to the current state"*. The concept was then expanded upon in 2017.

It is DairyNZ's view that the concept did not become problematic until the NPS-FM 2020:

- Made Te Mana o te Wai the fundamental concept of the NPS-FM, *"relevant to all freshwater management and not just to the specific aspects of freshwater management* referred to in the NPS-FM.
- Attempted to translate the concept into a hierarchy of obligations that prioritised

  *(a) first, the health and well-being of water bodies and freshwater ecosystems*

  *(b) second, the health needs of people (such as drinking water)*

  *(c) third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.*

- Made this hierarchy the sole objective of the NPS-FM 2020

The unfortunate implications of this attempt to provide greater weighting to, and translate, Te Mana o te Wai has become a lightning rod for concerns about the obligations with the NPS-FM 2020 as a whole, in particular that the national direction does not provide for a balanced consideration of economic, social and cultural impacts at the regional and FMU levels when considering how to manage freshwater resources.

These concerns have been exacerbated by regional councils translating Te Mana o te Wai as an obligation to consult with mana whenua in specific resource consent processes, rather than waiting to translate Te Mana o te Wai into a planning framework. The practical implications were more expensive consenting costs, significant demand on already stretched mana whenua resourcing, and a negative perception of Te Mana o te Wai.

In considering the inclusion and interpretation of Te Mana o te Wai in national and regional freshwater policy, DairyNZ has recognised the practical reality that the concept has taken on a different meaning to the interpretations of Te Mana o te Wai in 2014 and 2017, given broad perception it could, and has been interpreted as, devaluing the economic and social implications of freshwater management decisions.

**Discussion on the solutions put forward in the consultation**

The consultation document puts forward three options in relation to Te Mana o te Wai. In summary these are:

- Option 1: Remove hierarchy of obligations and clarify how Te Mana o te Wai applies
- Option 2: Reinstate Te Mana o te Wai provisions from 2017
- Option 3: Remove Te Mana o te Wai provisions

DairyNZ does not support Option 3. Despite negative perception of Te Mana o te Wai as a result of the NPS-FM 2020, we believe it is an important intrinsic value in relation to freshwater management and plays a role in the need to actively involve iwi and hāpu in the overall management of freshwater under Te Tiriti o Waitangi.

We believe it is important to recognise the intrinsic value of freshwater and recognise and provide for Te Hauora o te Wai, Te Hauora o te Taiao, Te Hauora o te Tangata while also enabling current and future New Zealanders to sustainably use land and water for economic, social and cultural well-being.

In relation to Option 1, we consider it is an absolute necessity to remove the hierarchy of obligations. The interpretation of the hierarchy in the NPS-FM 2020 has negatively affected discussions about the freshwater outcomes to be achieved, their timing, and implementation. It has also influenced how Te Mana o te Wai is perceived across the dairy sector. However, we do not support Option 1 as retaining the 2020 version; removing the hierarchy, and clarifying its application would not be sufficient to address the concerns arising from the current interpretation.

In relation to Option 3, while this would result in an improvement to how the concept is applied at the national level, we believe the implications of the NPS-FM 2020 version are such that more significant change is required.

**Inclusion of Te Mana o te Wai**

DairyNZ considers an amendment to the NPS-FM should take a step back and return to what is considered to be the foundation principles of Te Mana o te Wai; integrated and holistic well-being, while providing for sustainable use.

This should:

- Retain Te Mana o te Wai within the NPS-FM.
- Including it as a preamble or to provide context to the NPS-FM without including it in the objective, guiding implementation of Te Mana o te Wai but in a way that attempts to enable a local discussion rather than impose an answer.
- Including reference to:
    - The need to ensure that the mana, importance and intrinsic value of freshwater (Te Hauora o te Wai, Te Hauora o te Taiao, Te Hauora o te Tangata) is recognised and provided for while enabling current and future New Zealanders to sustainably use land and water for economic, social and cultural well-being.
    - The particular rights and interests that Māori have in freshwater and the need to involve iwi and hāpu in the overall management of freshwater as being important to meeting obligations under the Te Tiriti o Waitangi.

## Questions

| Q. What will a change in NPS-FM objectives mean for your region and regional plan process? |
|---|

Changing the existing NPS-FM objective, especially by removing the hierarchy of obligations, would create a more balanced and practical foundation for regional planning. The current interpretation has caused tension between values, constrained local conversations about trade-offs, and led to inconsistent, costly implementation.

| Q. Do you think that Te Mana o te Wai should sit within the NPS-FMs objectives, separate from the NPS-FMs objectives, or outside the NPS-FM altogether and why? |
|---|

DairyNZ's view is that Te Mana o te Wai should remain within the NPS-FM, but not as a sole or overriding objective. Instead, it should be repositioned as a preface, outside the objectives section, and as a preamble or context-setting section of the NPS-FM. This would allow Te Mana o te Wai to guide the overall intent of the policy statement in a meaningful way, without creating the rigidity and interpretation risks that have resulted from the NPS-FM 2020 translation.

Maintaining it within the NPS-FM acknowledges Te Mana o te Wai as an intrinsic value and the need to actively involve iwi and hāpu in the overall management of freshwater under Te Tiriti o Waitangi.

Q. How will the proposed rebalancing of Te Mana o te Wai affect the variability with which it has been interpreted to date? Will it ensure consistent implementation?

An NPS-FM that is less prescriptive in how Te Mana o te Wai is to be applied will naturally result in more variability. The interactions between Te Mana o te Wai as a concept, the objective/s of the NPS-FM, where Te Mana o te Wai sits, and how councils work with mana whenua to ensure Te Mana o te Wai is implemented at the regional and FMU scales are all interacting components of this discussion.

Since 2020, Te Mana o te Wai has in some instances been interpreted by regional councils as a binding legal obligation (including in resource consent processes) rather than as a strategic direction to guide freshwater planning. It is easy to see why given the literal translation of the concept in the NPS-FM 2020.

DairyNZ believes that repositioning it as a guiding concept, rather than a rule-based hierarchy, enables a more consistent understanding that respects the intent without overreaching. Clearer national level direction on how it should inform freshwater plan processes and implementation will help align council approaches while allowing for regional context and values.

**Relief sought**

**Retain Te Mana o te Wai within the NPS-FM as a preamble, rather than within the objective, to provide important context to guide implementation in a way that attempts to enable a local discussion rather than impose an answer. Include reference to:**

- **The need to ensure that the mana, importance and intrinsic value of freshwater (Te Hauora o te Wai, Te Hauora o te Taiao, Te Hauora o te Tangata) is recognised and provided for while enabling sustainable resource use.**
- **The particular rights and interests that Māori have in freshwater and the need to involve iwi and hāpu in the overall management of freshwater as being important to meeting obligations under the Te Tiriti o Waitangi.**

# Providing flexibility in the National Objectives Framework

## DairyNZ position

DairyNZ considers simplification and improvements to the National Objectives Framework (NOF) a priority. We ask that the NOF is amended to support more flexible and effective delivery for maintaining and improving freshwater outcomes:

- Retain the four compulsory national values of Ecosystem Health, Human Health for Recreation, Threatened Species, and Mahinga Kai.
- Refine the NOF - Introduce an attribute hierarchy that distinguishes compulsory **outcome attributes** linked to national values with National Bottom Lines (NBLs) from supporting **driver attributes** (contaminant and non-contaminant) that councils can prioritise management of (via implementation of chosen actions and working with landowners) to improve outcomes.
- Amend *E. coli* attributes to reflect that the compulsory value supports both primary and secondary contact uses and ensure the NOF reports on the suitability of waterways for a broader range of recreational activities other than just primary contact.
- Update the management approach to ensure chosen regulatory and non-regulatory actions are guided by prioritised **driver attributes** which are in turn guided by relevant **outcome attribute** targets.
- Clarify the intended purpose of assessing contaminant driver states (relative to band thresholds), which is to evaluate the likely risk to achieving outcome targets (and hence level of prioritisation to manage), not to default to using trigger numeric targets or limit-setting. This supports a move away from fixed contaminant thresholds being interpreted as enforceable instream or load based targets.
- Clarify that the primary purpose of existing numeric thresholds for contaminant **driver attributes** is to assess the indicative risk that current state driver concentrations pose to achieving **outcome attribute** targets. This assessment helps prioritise where action is needed (regulatory or non-regulatory), rather than using the thresholds as default numeric targets. This supports moving away from treating fixed thresholds as enforceable limits.
- Build on the existing requirement in the 2020 NPS-FM to set action plans for Appendix 2B attributes, providing a logical and integrated framework for identifying contaminant and non-contaminant **drivers** to identify practical actions, support and track implementation of chosen actions, and monitor improvements toward freshwater outcomes.
- National bottom lines would apply to nitrogen toxicants, with the NBL adjusted to reflect a 90% species protection level (chronic effects). These NBLs would be used to assess indicative risk:
    - If the current state exceeds the NBL, then it would be mandatory for reductions in this contaminant to be prioritised).
    - The numeric NBL (or higher numeric thresholds) would not be used to set numeric concentration- or load-based targets.
- While we acknowledge the importance of other contaminant drivers (which need to be managed), we do not consider the science is sufficiently well developed in defining NBLs that represent meaningful thresholds that are critical for management at the national level. We have proposed new suspended and deposited sediment attributes (Appendix B) as these are widely acknowledged to be problematic.
- Recommend including stream temperature (summer) as a new contaminant **driver attribute** – recognising its importance in providing for aquatic life and ecosystem health values.
- Improve implementation through the development of Freshwater Action Plans - spatially defined, community-led delivery mechanisms for improving the state of priority driver.
- Ensure flexibility for councils to tailor interventions based on catchment context, while attributes via the implementation of chosen actions maintaining accountability for achieving freshwater outcomes.

**The core outcome of the NOF should be to provide for the values that communities want from their waterways.** We expand upon these points in the section below.

## Developing an improved National Objectives Framework

With respect to National compulsory values, we support retaining the four compulsory values in the 2020 NPS-FM, namely:

- Ecosystem Health
- Human Health for Recreation
- Threatened Species
- Mahinga Kai

These values reflect what we understand tangata whenua and communities care about. To deliver on them, the NOF must establish a hierarchical order (i.e. framework) to provide for better 'intervention logic' which guides more efficient, pragmatic and prioritised plans that provide for improved freshwater outcomes. The proposed attribute hierarchy distinguishes between:

- **Outcome Attributes**: Indicators/measures that are closely related to the compulsory values sought by communities. For example, for the value Ecosystem Health, the proposed Outcome Attributes are measures of ecological responses to a multitude of contaminant and non-contaminant 'factors' (referred to hereafter as **driver attributes**).
- **Driver Attributes**: Manageable factors (both contaminant and non-contaminant) that influence the state of Outcome Attributes.

Where the compulsory values are not being met, this should be indicated, first and foremost, through assessment of measures that are most closely linked to delivering these values – namely **outcome attributes**. To improve the state of an instream **outcome attribute**, the NOF must direct regulators to consider what are the key **drivers** (including non-contaminants) that are influencing the current state of the outcome attribute.

If the process only considers **contaminant drivers** (as it currently does) and ignores **non-contaminant drivers**, which are often the key factors limiting improvement of outcome state (**(**e.g. riparian planting that provides critical habitat and shading in pastoral catchments), then the contaminant-based regulatory framework will fail to achieve the outcomes sought by the community.

If a regulatory framework fails to direct attention and resourcing to addressing the **drivers** most likely to improve/achieve freshwater outcomes (i.e. **outcome attributes**) for the community, then it is not providing the required intervention logic and is fundamentally flawed The proposed amendments outlined in the consultation document do not address these important limitations, whereas DairyNZ believe their proposal does, and that it aligns with the 2020 NPS-FM requirement to co-develop **action plans** to improve important ecosystem health outcomes.[12]

For example, if improved fish metrics are required (i.e. measured as Fish IBI or some other measure) in a pastoral catchment, but key limitations on fish presence/extent (penetration) are habitat and stream temperature, then the correct intervention logic to improve this ecosystem health outcome is to provide habitat and shade more of the stream network. No amount of setting contaminant based-limits on resource use will directly address the state of these **non-contaminant drivers**.

[12] "*While limit setting is necessary to meet many target attribute states, some attributes that measure important parts of the ecosystem health (eg, macroinvertebrates) are more difficult to link to resource use but still need to be managed to protect ecosystem health. The new requirements to prepare action plans for these attributes will ensure councils, in consultation with communities, set out how chosen actions will contribute to achieving target states"* MfE Factsheet (FS22) (2020). 5 p. FS22-Limit-setting-and-action-plans-factsheet-final.pdf

**National Compulsory Values and their Outcome Attributes**

Outcome Attributes are closely linked to compulsory values and should have numeric attribute states, including National Bottom Lines[13], because these thresholds define a meaningful response/risk endpoint that is independent of catchment context (i.e. place). Refer to Appendix B for tables.

**Ecosystem Health**

- Dissolved oxygen (rivers and lakes)
- Phytoplankton (lakes)
- Macroalgae (estuaries)[14]
- Periphyton (rivers – hard bottom)
- Macroinvertebrate Community Index (MCI)[15]
- Fish Index of Biotic Integrity (F-IBI)

**Human Health for Recreation**

- *E. coli* (primary and secondary contact – rivers, lakes, estuaries)
- Planktonic cyanobacteria (lakes and lake-fed rivers)

**Mahinga Kai**

- No outcome attributes, but could be assessed via measures of access, species presence, and mauri

**Threatened Species**

- No outcome attributes, but could be assessed via measures of presence/abundance (via standard or emerging methods such as environment DNA (eDNA)

**Driver Attributes**

Driver attributes influence the outcomes but the extent to which they do is catchment specific. Councils should have discretion over how and when these are used, depending on the specific outcomes being targeted. **Driver attributes**, or the levers that can be pulled to achieve outcomes, must include both **contaminant** and **non-contaminant drivers** (refer to Appendix B for proposed attribute tables)

This is an effective approach given the intent of regulation is to identify the problems (re: current freshwater outcomes) and then 'regulate' to address (improve) these. The NOF should not be limited to an almost exclusive focus on contaminant drivers when there is a significant amount of scientific evidence which shows that **non-contaminant drivers** are just as, or arguably of greater, importance.

With respect to managing contaminant drivers, DairyNZ recognise the importance of reducing the loss of contaminants to water from farming activities to the extent practicable.[16] It is important to emphasise that the hierarchical attribute framework is not intended to dilute the importance of managing contaminant loss from pastoral land, but rather to identify when we need to make additional efforts to prioritise contaminant loss in catchments where these drivers are the key limitation for improving freshwater outcomes. The rigour/importance of managing for contaminant drivers is reflected in the following proposal related to contaminant drivers:

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[13] Notwithstanding the need for some flexibility around NBLs where they are considered unachievable.

[14] Noting that the NPS-FM current must consider estuarine receiving environments and therefore we consider it sensible to make this explicit via incorporating a trophic state indicator as a compulsory Outcome Attribute in the NOF.

[15] Recognising that there are river environments (place-specific and river continuum) that do not provide for the habitat requirements of intolerant macroinvertebrate species. Accordingly, like with the application of the periphyton attribute, there should be some flexibility in the application of the macroinvertebrate attribute where there is technical evidence to support placing greater emphasis of fish community health measures – given native fish are at the top of aquatic food webs and feed on macroinvertebrate (aquatic and terrestrial).

[16] Recognising that a catchment dominated by pastoral landcover, is likely to have, on average, around 10-times higher concentrations of sediment, nutrients and pathogen contaminants.

- Regardless of the state of a relevant outcome attribute, the default requirement is for the baseline state[17,18] concentrations to be at least maintained.[19]
- For contaminant **driver attributes** with established effects-based thresholds that are nationally relevant and critical to managing for outcomes[20], we propose retaining NBLs for these contaminant drivers. However, the NBL numeric values would be used to compare against current state to provide a categorical indication of the level of 'risk' of the contaminant driver with respect to improving relevant **outcome attribute** states. The risk category would define the level of prioritisation applied (e.g. through chosen interventions) to improve the state of that driver to reduce risk (and contribute to improving outcome states). DairyNZ believe this approach is a more efficient way to identify catchment priority interventions necessary to drive improvements, without the need to using the thresholds to generate contaminant-based limits on resource use.
- Acknowledging the importance of providing intervention logic (i.e. managing drivers to provide for outcomes), where **outcome attributes** targets are being met, if relevant contaminant **driver attributes** exceed the NBL, then the risk would still be assessed as "high", but the level of prioritisation (and hence intervention) would need to acknowledge the **attribute hierarchy** (i.e. that the outcome is being met) and consider what additional outcome benefits (relative to costs) will be delivered through additional interventions.

<u>Contaminant Drivers</u>

- Nitrate-nitrogen (toxicity)
- Ammonia-nitrogen (toxicity)
- Total nitrogen and phosphorus (lakes)
- Total nitrogen (macroalgal susceptible estuaries)
- Nitrogen and phosphorus (rivers– trophic state)
- Suspended and deposited fine sediment
- Temperature (rivers)[21,22]

We have suggested changes to some of these contaminant attributes (Appendix B), namely suspended sediment, deposited sediment, nitrate-toxicity and ammonium-toxicity.

To make it clearer regarding the supporting role of driver attributes, we propose replacing the letter designation of the contaminant driver bands (i.e., A, B, C or D) with a qualitative **indicative risk** statement to guide/inform the prioritisation assessment of contaminant drivers. This is because driver attributes are managed to achieve an outcome attribute state – hence narrative states for driver attributes should

[17] Baseline state being defined as the better of current state or state determined in the period ending 2017, noting that these states should take into account for natural variation caused by factors external to land management (i.e. climate). In other words, baseline state should be defined as a range (Suren et al. 2024)

[18] A. Suren, J. Dare, P. Scholes, E. Fox, R. Carter. (2024). Estimates of baseline state and natural variability of NPS-FM attributes. BOPRC Environment Publication 2024/06. 77 p.

[19] We believe in many instances, the continued implementation of GFP and the afforestation of pastoral land that there will likely be some improvements. The only caveat here is where changes in external, non-manageable factors (i.e. climate change) cause increased losses of contaminants to waterways (e.g. sediment), independent of land use.

[20] We contend that the contaminant **driver attributes** that meet this criterion include nitrogen toxicants and lake TN / TP trophic state. While we acknowledge the importance of sediment (suspended and deposited), DairyNZ do not believe these thresholds have the necessary robustness to apply as NBLs. Note that we have proposed alternative sediment attributes (refer to Appendix B), with the suspended sediment attribute based on macroinvertebrate extirpation (Franklin et al 2019; Appendix H p. 197 https://environment.govt.nz/assets/Publications/Files/deriving-potential-fine-sediment-attribute-thresholds-for-the-national-objectives-framework.pdf

[21] Unshaded small streams can routinely be 10-12°C warmer than forested/shaded streams reaching maximum summer temperatures of close to 30°C – which is beyond the thermal tolerance/preference for a lot of native aquatic life. As with point source discharges, temperature can be considered a contaminant. We have recommended a temperature attribute based on the original NOF temperature recommendations by NIWA (2013).

[22] NIWA (2013). Rob Davies-Colley, Paul Franklin, Bob Wilcock, Susan Clearwater and Chris Hickey (2013). National Objective Framework – Temperature, Dissolved Oxygen & pH: Proposed thresholds for discussion. NIWA Client Report HAM2013-056. Prepared for Ministry for the Environment. 83 p.

convey/direct whether this is a contaminant of concern or not – they should not be used to define/infer an environmental outcome state as science has (repeatedly) shown contaminants to be poorly related to outcomes (particularly in riverine receiving environments). An example is shown in Table 1.

**TABLE 1.** EXAMPLE OF CHANGE FROM QUALITY BANDS (I.E. A-D) TO QUALITATIVE DESCRIPTIONS OF INDICATIVE RISK (I.E. 'LOW' TO 'HIGH') OF THE CONTAMINANT DRIVER ATTRIBUTE TO IMPROVING A RELEVANT OUTCOME ATTRIBUTE STATE (I.E. IS THIS CONTAMINANT DRIVER A PRIORITY FOR INTERVENTIONS TO REDUCE RISK AND CONTRIBUTE TO IMPROVED OUTCOMES?)

| **Value (and component)** | Ecosystem health (Water quality) | |
|---|---|---|
| **Freshwater body type** | Lakes | |
| **Attribute unit** | mg/m$^3$ (milligrams per cubic metre) | |
| **Indicative risk to relevant outcome attribute** | **Numeric attribute state** | |
| | **Annual median** | **Annual median** |
| | Seasonally stratified and brackish | Polymictic/non stratified |
| **A (low)** Indicative nitrogen concentrations that provides for an Outcome Attribute phytoplankton A-band | ≤160 | ≤300 |
| **B (moderate)** Indicative nitrogen concentration range (median) that provides for an Outcome Attribute phytoplankton B-band | >160 and ≤350 | >300 and ≤500 |
| **C (moderate-high)** Indicative nitrogen concentration range that provides for an Outcome Attribute phytoplankton C-band. | >350 and ≤750 | >500 and ≤800 |
| **National bottom line** | **750** | **800** |
| **D (high)** Indicative nitrogen concentrations that may result in Outcome Attribute phytoplankton D-band. | >750 | >800 |



Non-Contaminant Drivers (examples, not intended as an exhaustive list)

- Stream shading / riparian habitat[23]
- Stream flow and variability
- Channel morphology / hydrological modification
- Fish passage (barriers)
- Invasive plants and pest fish
- Habitat connectivity

[23] DairyNZ believe this is a key (priority) driver attribute to support improved ecosystem health outcome attributes states. There is a large body of scientific evidence about the importance of riparian planted margins for shading and habitat provision. For example, Department of Conservation's "Managing Riparian Zones: A contribution to protecting New Zealand's rivers and streams (DOC 1995)

- volume 1: https://www.doc.govt.nz/documents/science-and-technical/riparianzones1.pdf
- volume 2: https://www.doc.govt.nz/documents/science-and-technical/riparianzones2.pdf

**Key rules and flexibility in application**

- Target States must be set for outcome attributes[24] and must be no worse than the 2017 baseline or current state (whichever is the better).[17]
- Driver attributes with numeric thresholds (i.e. the contaminant driver) must be included in the assessment to determine priority contaminants. We propose that the outcome of this assessment is to define a categorical risk (i.e. prioritisation) class. Using Total Nitrogen (trophic state-Lake) as an example (refer to **Error! Reference source not found.**) if the Phytoplankton target outcome attribute state (e.g. C-band) is not being met, then if current state TN concentration is >800 mg/$m^3$, TN would be assessed as a priority contaminant driver, and actions/methods targeting N-reductions would be a focus of catchment/farm plans/regulations. We do not see additional benefits in setting the 800 mg/m3 threshold as a numeric target.
- Where a relevant **outcome attribute** target is already met, councils must not set stricter targets for contaminant **driver attributes** than the current or 2017 baseline state.[17]
- Unachievable outcome attribute targets (due to natural conditions, limitations imposed by historic catchment development and essential infrastructure) should be avoided. Regardless of the achievability, there should be an ongoing focus on continual improvement, particularly regarding the state of prioritised non-contaminant drivers such as habitat and shading. Catchment-scale implementation of restorative actions can 'offset' some of the impacts from contaminant drivers, while not compromising the viability of productive, pastoral catchments.
- Regional plans must include methods and pragmatic actions that improve the state of priority **driver attributes**, and in doing so, progress towards achievement of target **outcome attribute** states. This process will be an iterative process and reflects the need for long-term adaptive management. These should include as a priority:
    - Freshwater Farm Plans
    - Catchment-scale Freshwater Action Plans (discussed further below)
    - Regional rules or standards (rules are optional but must be deemed effective under s32 if used)

[24] Target Outcome Attribute States (or TAOS), equivalent to Target Attribute States (TAS) in the current NPS-FM/NOF.

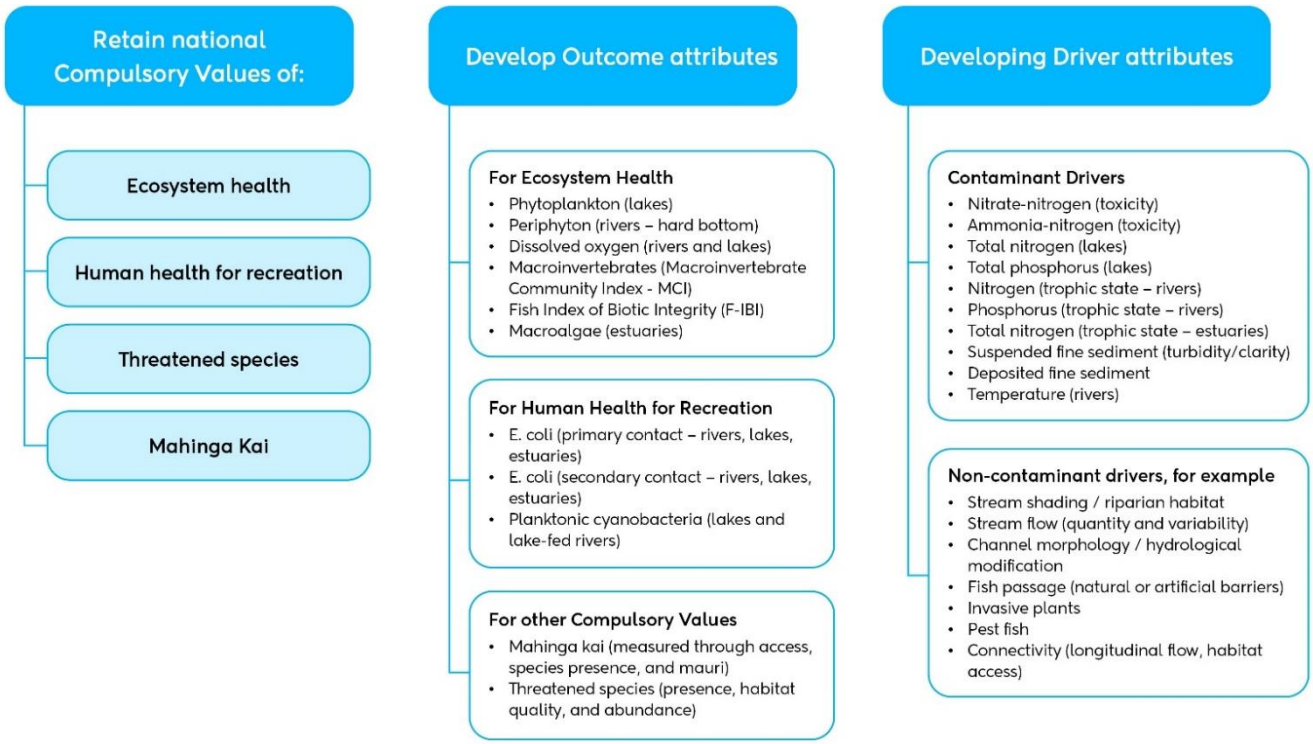


FIGURE 1: PROPOSED COMPULSORY VALUES, OUTCOME ATTRIBUTES AND DRIVER ATTRIBUTES

**Managing *E.coli* for primary and secondary contact**

DairyNZ supports a return to managing *E. coli* levels for primary contact recreation at specific recreational (swimming) sites and secondary contact recreation elsewhere.

DairyNZ strongly advocates for a differentiated approach to *E. coli* standards in freshwater management, recognising that a blanket application of primary contact thresholds (e.g., ≤540 *E. coli* /100 mL) across all rivers, lakes, and estuaries is unnecessary and would place an unjustified economic burden on farmers, in those locations where those water bodies are not used for primary contact activities.

We agree it is important to have more stringent *E. coli* levels in those locations of freshwater management areas where there are primary contact activities such as swimming, diving, or water skiing are occurring. This is because these activities involve a high probability of water ingestion, increasing the risk of illness from pathogens indicated by *E. coli,* a key faecal contamination indicator.

Other freshwater bodies (or locations within those waterbodies) are instead used for secondary contact purposes like boating, fishing or wading where the health risks are lower. Imposing universal standards requiring primary contact standards to be met everywhere would require significant and costly mitigation efforts, such as advanced effluent treatment systems and complete stock exclusion, which may not be proportionate to the actual public health or environmental risks in those contexts.

It is also important that implementation of regulations relating to *E. coli* levels at primary contact sites are practical. There is little value in placing huge weight to monitoring outside of the times of the year when swimming occurs or monitoring and reporting levels during floods.

Primary contact sites can be identified through engagement with the community and tangata whenua – where we swim and when – as part of the consultation process for defining community values.

**Distinguishing between quality and quantity**

- Water quantity must be managed through quantified limits applied at the farm scale.

- Water quality should be addressed through improved practices and planning, not mandatory numeric limits.

This approach supports adaptive, practical, and community-focused freshwater management, targeting what matters most, using the most appropriate tools, and allowing for flexibility while ensuring accountability.

## Questions

| Q. Which values, if any, should be compulsory? If so, which ones and why? |
|---|

DairyNZ believes key, outcome focused values should remain compulsory at a national level to ensure a consistent baseline for freshwater management across New Zealand. The following should be included as compulsory values:

- Ecosystem Health: This value is critical as it ensures the life-supporting capacity, ecological processes, and diversity of indigenous species in freshwater bodies are maintained. It is a foundational value for environmental sustainability and applicable across all regions.
- Human Health for Recreation: This value safeguards the health of people engaging in activities like swimming, ensuring primary contact sites meet safety standards. It reflects a national priority for recreational use of freshwater and human wellbeing.
- Threatened Species: Protecting habitats of threatened freshwater species is essential for biodiversity conservation, a national concern.
- Mahinga Kai: This value recognises cultural significance of sites for mahinga kai gathering, particularly for Māori, ensuring that traditional food resources are safe and plentiful, and that cultural practices can continue.

Including these as compulsory national values provides a consistent framework while allowing regions to identify and deliver on additional values in consultation with their communities.

| Q. What would be the practical effect of removing compulsory national values? Do you think this will make regional processes easier or harder? |
|---|

DairyNZ believes the compulsory values of Ecosystem Health, Human Health for Recreation, Threatened Species and Mahinga Kai should be retained, but the methods for achieving these should be improved by differentiating attributes into outcome attributes and driver attributes as above.

| Q. Which attributes, if any, should be compulsory to manage? And which should be optional to manage? |
|---|

Outcome Attributes directly linked to the four national Compulsory Values should be <u>compulsory</u> to manage. These include:

- Ecosystem Health: Phytoplankton (lakes), Periphyton (rivers – hard bottom), Dissolved oxygen (rivers and lakes), Macroinvertebrate Community Index (MCI), Fish Index of Biotic Integrity, Macroalgae (estuarine trophic state)[25].
- Human Health for Recreation: *E. coli* (primary and secondary contact – rivers, lakes, estuaries), Planktonic cyanobacteria (lakes and lake-fed rivers).
- Mahinga Kai: quantitative/qualitative measures relating access, species presence, and mauri.
- Threatened Species: measures of presence/absence, abundance and habitat quality.

[25] DairyNZ proposed new outcome attribute to manage for trophic state outcomes in estuaries.

Drivers (contaminant and non-contaminant) or driver attributes, are supporting factors that need to be considered, and where they are identified as important, managed to provide for the relevant outcome attribute/s.

However, we don't consider that these drivers attributes should be characterised as **optional** to manage. While we envisage different subsets of **driver attributes** being identified for priority management in catchments/FMUs, this prioritisation assessment will only be robust if it considers a comprehensive suite of potential drivers (i.e. contaminants and non-contaminants) which will necessitate some degree of monitoring if regulators are to track improvement of these drivers when identified as a priority for progressing towards a target outcome attribute state.

| Q. Which attributes, if any, should have national bottom lines? If so, which ones and why? |
|---|

Outcome attributes (listed above) should have National Bottom Lines to ensure these key measures are providing for at least a minimum acceptable standard for communities, with respect to the compulsory values of ecosystem health and human contact. Within our proposed attribute hierarchy, contaminant attributes have been moved to a supporting role for improving outcome attributes. We do not consider contaminant drivers to be attributes in their own right (i.e. a contaminant concentration in itself is not a tangible freshwater outcome that is closely linked to community values). That said, contaminants are still important drivers (negative) of **outcome attributes**, and our approach requires assessment of current-state concentrations against established thresholds to identify whether the contaminant **driver attribute** is a priority for management intervention. As part of a robust assessment to characterise the indicative risk (i.e. low vs high), driver attributes should have NBLs where there is acknowledgment that these thresholds meet the criterion of being critical for management of **outcome attributes** at the national scale.

DairyNZ consider the following contaminant **driver attributes** have workable NBLs for the purposing of categorising their indicative risk in regard to improving **outcome attribute** states:

1. Nitrate (modified species protection level)
2. Ammonia (modified species protection level)
3. TN /TP trophic state (lakes)
4. Suspended sediment using a single class attribute (and NBL) as proposed in Appendix B[26]
5. Potential TN (estuaries) – this is a new driver attribute to support the proposed macroalgae **outcome attribute** for estuaries

**Nitrogen toxicity - recommendation to change the species protection level**

DairyNZ believe that for nitrate-N and ammonia-N toxicity attributes, NBL threshold should correspond to a 90% species protection level. Prior to the 2020 NPS-FM, the species protection level (chronic) was 80%, (6.9 mg/L) and despite several submissions recommending a shift to a 90% species protection (chronic) level (3.8 mg/L), a recommendation from a sub-group of the science technical advisory group (STAG) resulted in the NBL shift from 80 to a 95% species protection level (2.4 mg/L).[27]

We note the justification for this recommendation had little scientific basis and was more about finding a compromise that was closer to the then-proposed NBL of 1 mg/L for DIN supported by other STAG members.

[26] DairyNZ acknowledge the importance of sediment, however we do not believe the science has developed workable thresholds for either sediment attribute. Based on previous work, we have proposed new suspended sediment attribute (Appendix B), and we believe this NBL (corresponding to 8-9 NTU) would be suitable for assigning indicative risk categories which a key component of the changes to enable greater pragmatism, workability and flexibility in the NOF.

[27] Appendix 7 in Freshwater Science Technical Advisory Group (STAG) Supplementary report to the Minister for the Environment (2020). https://environment.govt.nz/assets/Publications/Files/freshwater-science-and-technical-advisory-group-supplementary-report.pdf

The subgroup of STAG made the following explanation for their recommendation (bold text is DairyNZ emphasis):

> *"Increasing the level of protection from toxicity by making the current bottom of the 'B band' the national bottom line for ammonia and nitrate The current national bottom line provides for 80% species protection from chronic toxicity and the* ***sub-group's recommendation is to raise this to 95% species protection from chronic toxicity which is more consistent with other ecosystem health protection measures recommended by the STAG"*** (Appendix 7 – STAG Supplementary Report).[Error! Bookmark not defined.]

We believe the STAG subgroup were wrong in their assessment, as a 95% protection level (chronic toxicity) is appropriate for **slightly to moderately** disturbed systems.[28] The Australian and New Zealand guidelines for freshwater and marine water quality describe the attributes of slightly to moderately disturbed systems as:

> *"Ecosystems in which aquatic biological diversity may have been adversely affected to a relatively small but measurable degree by human activity. The biological communities remain in a healthy condition and ecosystem integrity is largely retained.* ***Freshwater systems would typically have slightly to moderately cleared catchments or reasonably intact riparian vegetation****."*

We do not consider that this description adequately describes the level of catchment and riparian disturbance in many of New Zealand's intensively farmed, pastoral-dominated catchments. For example, across 748 pastoral catchments (upstream of LAWA monitored sites), grouped by proportion of Dairy, on average, the amount of native landcover in these catchments ranged from 17% to as little as 3% (Figure 3). As such, the level of disturbance in NZ pastoral catchments is often considerably more than just "slightly to moderately cleared catchments or reasonably intact riparian vegetation". This high level of disturbance is why 'riparian management' (provision of shade and habitat) is considered one of the most important drivers of ecosystem health in pastoral catchments (ref NIWA).

For these reasons, the current use of a 95% species protection level (chronic toxicity effects) should be changed to 90% protection level so that it is more consistent with defining a national minimum acceptable standard for assessing the priority of reducing nitrate (and/or ammonia) to improve the state of outcome attributes.

An amendment to a 90% protection rate corresponds to a median nitrate concentration of 3.8 g/m3. This will provide for even the most sensitive native fish and invertebrates, including early life stages of sensitive fish, invertebrates, and amphibians.[29][30] The 3.8 mg/L threshold reflects best available science and a precautionary, ecologically relevant basis for managing nitrate in support of national freshwater goals.

This is a perspective DairyNZ put forward in our submissions to the Essential Freshwater package in October 2019, where we argued for a reduction in what was then the existing nitrate toxicity standard of 6.9 g/m$^3$ to 3.8 g/m$^3$, providing for even the most sensitive native fish and invertebrates at a 90% protection rate. We note that this was the position/recommendation submitted by NIWA (2019).[31] We do consider the NBLs for either sediment attribute in the current NPS-FM represent a nationally applicable minimum acceptable standard which is critical for managing for ecosystem health. We have proposed alternative, simplified suspended sediment and deposited sediment attribute tables (Appendix B).

We consider that NBL are probably good enough for TN and TP (lakes) and possibly "potential TN" concentrations for estuarine trophic state. We do not consider that nutrient thresholds in any of the multiple versions of the 'nutrient look-up tables' met the criteria of an NBL.

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[28] https://www.waterquality.gov.au/anz-guidelines/resources/key-concepts/level-of-protection#highly-disturbed-systems
[29] Hickey, C. W. (2013). *Updating nitrate toxicity effects on freshwater aquatic species*. NIWA, Envirolink Report 1207-ESRC255.
[30] NIWA (2014). *Nitrate toxicity guidelines for National Objectives Framework*. NIWA Freshwater Update.
[31] Scott Larned (2019). NIWA Submission on the Essential Freshwater package, refer to para 90. 30 p. (31 October 2019).

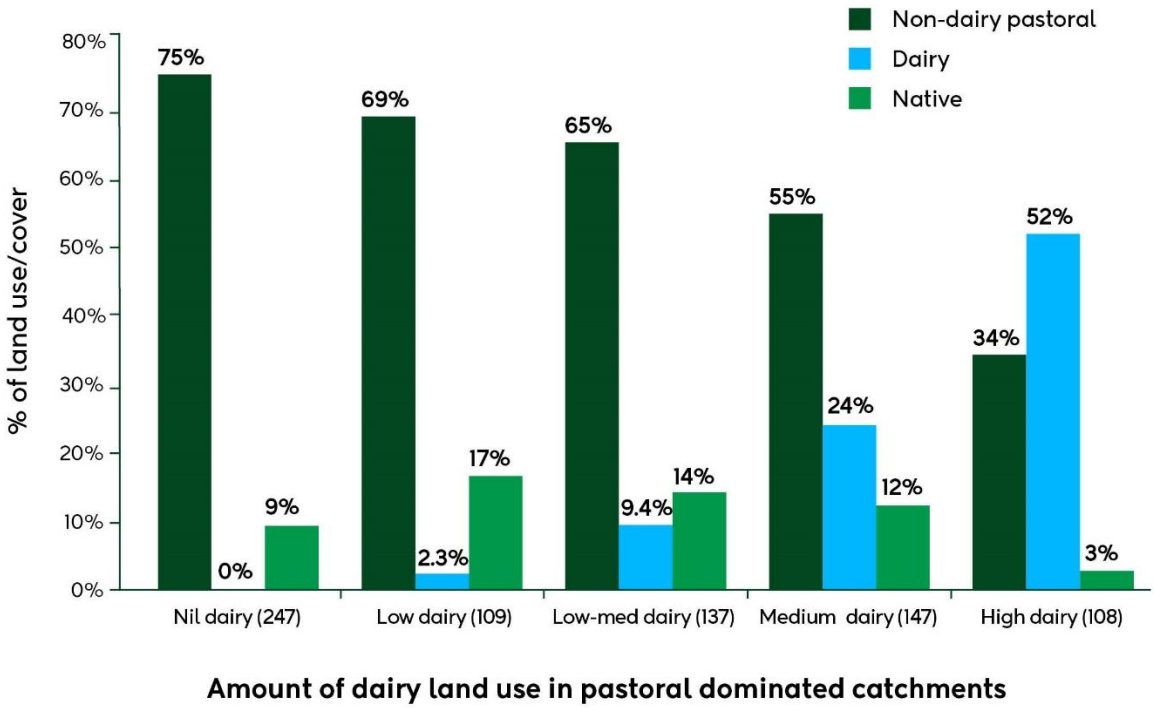


FIGURE 3: AMOUNT OF NATIVE LANDCOVER IN IN PASTORAL DOMINATED CATCHMENTS WITH DIFFERENT PROPORTIONS OF DAIRY LAND USE

| Q. To what extent should action plans be relied upon, including to achieve targets for attributes? |
|---|

Action plans are an important and positive aspect of the NPS-FM 2020. They need to be heavily relied upon if a top-down regulatory framework is going to 'connect' meaningfully with both the contaminant and non-contaminant drivers and translate these into actions that landowners need to be implementing on farm.

Freshwater Action Plans (FWAPs) should be developed at the catchment or sub-catchment level, led and owned by local communities, in collaboration with regional councils, mana whenua, and other stakeholders. While the regional freshwater plan sets the environmental outcomes to be achieved, and assesses and identifies the priority driver attributes, the FWAP is a core operational tool for identifying the actions needed to improve driver state, and how these 'chosen actions' will be delivered on the ground. FWAPs focus on coordinated, community-driven actions that are relevant to the catchment context, and support implementation via the regulatory FWFP instrument.

As discussed in section 3, we believe that a strength of NPS-FM 2020 was the incorporation of attributes that are important measures of ecosystem health (and human contact),

and the acknowledgement that we need to manage for these, but that this is going to require action plans as opposed to contaminant-based limit setting. This provided a much-needed dose of realism into the NOF (about the limitations of managing for community values with a solely contaminant focus), acknowledging that the solution requires adaptive management to make iterative improvements in the state of key drivers (via implementing chosen actions) of outcome attributes.

Regional councils play a critical enabling role in the success of FWAPs. This includes providing technical support, data and modelling, facilitation, funding, and alignment with regional policy and planning processes. Councils are expected to actively support communities and catchment groups in developing and implementing FWAPs, but not to enforce or police the commitments within them. Instead, councils participate as core partners in the development of the plan and help ensure it is integrated with other regional initiatives.

While FWAPs themselves are non-regulatory, they complement the regulatory framework. Regional Freshwater Plans should include regulatory measures set at a reasonable level, but when doing so, councils must consider the role that FWAPs may play in achieving desired outcomes through non-regulatory means at farm and catchment scales. If a FWAP demonstrates successful progress toward freshwater outcomes, it may reduce the need for further regulation. Conversely, if a FWAP fails to deliver, this should be reflected in future regulatory responses, which are the responsibility of the council.

Key Features of Freshwater Action Plans:

- Spatially defined: Set at the catchment or sub-catchment level within FMUs, reflecting existing communities of interest and catchment group-led initiatives.
- Operationally focused: Identify and support delivery of the actions agreed upon by landowners and communities within a specific catchment.
- Integrated with planning: Regional Freshwater Plans should be informed by, and account for, Freshwater Action Plans.
- Inclusion of catchment issues: FAPs should address relevant Outcome and Driver Attributes, tailored to local conditions and priorities at catchment and sub-catchment scales.
- Adaptive: Designed to evolve based on new information, community and tangata whenua input, and support from local or central government.
- Catchment context aligned: CCCV (Catchment Context, Constraints, and Values) information from the Freshwater Farm Plan Regulations could be incorporated to ensure Freshwater Farm Plan actions align with catchment-scale objectives. This may include accounting for FWAP related actions through voluntary actions in the FWAP.

**Relief sought**

**Introduce Freshwater Action Plans in the NPS-FM as spatially defined, community-led tools at the catchment or sub-catchment level that:**

- **Guide coordinated, operational actions to deliver freshwater outcomes aligned with regional plan objectives.**
- **Support and inform regulatory approaches by integrating local initiatives, enabling adaptive, place-based delivery.**
- **Reflect how change occurs on the ground, with regional and central government playing a supporting role through funding, facilitation, and technical input.**
- **Provide a mechanism to reduce reliance on regulation where effective community-led action is occurring, while still enabling regulatory escalation where necessary.**

| Q. Should councils have flexibility to deviate from the default national thresholds (including bottom lines) and methods? Are there any other purposes which should be included? |
|---|

We believe there should be some flexibility as outlined elsewhere in this submission.

The priority should be to ensure the NPS-FM allows councils to focus on fewer, more meaningful outcome attributes as direct measures if a value is being achieved, subject to national bottom lines, and distinguish these from driver attributes, which are not compulsory but are factors that influence whether outcomes are achieved.

This approach focuses regional freshwater plans on the outcomes that matter, while providing flexibility to choose the appropriate levers to pull (driver attributes) to achieve these outcomes.

We are also seeking further policies within the NPS-FM to recognise existing land use and provide for flexibility in achieving outcomes.

**Relief sought**

**Amend the NOF to support more flexible and effective delivery of freshwater outcomes:**

- **Retain the four compulsory national values of Ecosystem Health, Human Health for Recreation, Threatened Species, and Mahinga Kai.**
- **Refine the NOF - Introduce an attribute hierarchy that distinguishes compulsory outcome attributes linked to national values (with National Bottom Lines) from supporting driver attributes (contaminant and non-contaminant) that councils can prioritise management of (via implementation of chosen actions and working with landowners) to improve outcomes.**
- **Amend *E. coli* attributes to reflect that the compulsory value supports both primary and secondary contact uses and ensure the NOF reports on the suitability of waterways for a broader range of recreational activities other than just primary contact.**
- **Update the management approach to ensure chosen regulatory and non-regulatory actions are guided by prioritised driver attributes, which are in turn guided by relevant outcome attribute targets.**
- **Clarify the intended purpose of assessing contaminant driver states (relative to band thresholds), which is to evaluate the likely risk to achieving outcome targets (and hence level of prioritisation to manage), not to default to using trigger numeric targets or limit-setting. This supports a move away from fixed contaminant thresholds being interpreted as enforceable instream or load based targets.**
- **Clarify that the primary purpose of existing numeric thresholds for contaminant driver attributes is to assess the indicative risk that current state driver concentrations pose to achieving outcome attribute targets. This assessment helps prioritise where action is needed (regulatory or non-regulatory), rather than using the thresholds as default numeric targets. This supports moving away from treating fixed thresholds as enforceable limits.**
- **Build on the existing requirement in the 2020 NPS-FM to set action plans for Appendix 2B attributes, providing a logical and integrated framework for identifying contaminant and non-contaminant drivers to identify practical actions, support and track implementation of chosen actions, and monitor improvements toward freshwater outcomes.**
- **Refine the framework for contaminant driver attributes by retaining National Bottom Lines where those threshold values are 'critical at the national level'. Importantly, these driver NBLs would be used to assess risk (i.e. if current state exceeds NBL, then mandatory for this to be prioritise), the numeric NBL would not be used to set numeric concentration - or load-based targets. With respect to contaminant drivers where NBL meets criteria of being critical at the national level, we believe this applies to:**
    - **Toxicants (nitrate-N and Ammoniacal-N) corresponding to a 90% species protection level (chronic toxicity). As per current phosphorus attribute, these thresholds are not suitable to be used as an NBL. We acknowledge that it is important to manage for sediment effects, but current NBLs for both deposited and suspended sediment driver attributes are problematic and not suitable as basis for NBL.**
    - **We have derived alternative sediment attributes where we believe the NBL for suspended sediment would meet the criteria of being 'critical at the national level'.**
- **Improve implementation through the development of Freshwater Action Plans; spatially defined, community-led delivery mechanisms for improving the state of priority driver. Ensure flexibility for councils to tailor interventions based on catchment context, while attributes via the implementation of chosen actions maintaining accountability for achieving freshwater outcomes.**

# Enabling commercial vegetable growing

## DairyNZ position

DairyNZ recognises the reliance New Zealand has on domestic vegetable production, the role that regulations can play in influencing the price of food production, and the importance of ensuring domestically produced food is available at a reasonable price for domestic consumption. More enabling and permissive regulations that allow for and recognise the specific challenges of specific activities play a large role in reducing these costs.

As noted in the consultation document, commercial vegetable growing (CVP) is concentrated in some areas of the country, such as Pukekohe and Horowhenua, and can disproportionately contribute to nutrient loads in those catchments.

DairyNZ's approach to freshwater management is focused on outcomes. From a high level, economic perspective we consider it is more efficient for every land use to identify, develop and adopt mitigations at low marginal cost rather than requiring a fewer number of land uses to address the issues.

Our primary question in considering more permissive regulations for CVP is whether or not the ecosystem and human health outcomes in those catchments or FMUs where CVP is prevalent are being met. If not, the question is what role CVP should play in meeting those outcomes.

If the answer is to provide more permissive regulation for commercial vegetable production (CVP), then from DairyNZ's outcomes-based perspective, two key questions arise:

- What expectations will be placed on other land uses within those catchments to maintain or improve water quality outcomes, in line with what tangata whenua and communities want to achieve?
- Or are tangata whenua and community expectations for freshwater outcomes being deferred specifically for commercial vegetable production?

DairyNZ's proposed replacement to the NPS-FM includes provisions to consider the FMU or catchment specific nature of existing land uses when setting desired outcomes. These processes, in addition to an NPS-FM objective that provides for food production and policies that better recognise the economic and social impacts of regulations on communities, provide improved avenues for considering the impacts of regulations.

In addition, Freshwater Farm Plans provide an important and farm specific option for managing specific land uses in a way that recognises the challenges of that land use activity, farm, and the outcomes to be achieved within specific catchments. These also provide an avenue for regulations targeted for CVP. DairyNZ believes robust Freshwater Farm Plans targeted to farm and catchment risk should be a priority for all primary producers.

### Questions

| |
|---|
| Q. What are the pros and cons of making commercial vegetable production a permitted activity? |

Making CVP a permitted activity will reduce the regulatory costs to CVP and presumably these reduced costs will flow through to the prices paid by domestic consumers. However, it could also mean either increased obligations on other landowners (including other food producers) or an acceptance of lower ecosystem and human health outcomes (or both).

DairyNZ's position is that an updated, outcomes focused NPS-FM that recognises food production more broadly and better recognises the economic, social and cultural impacts of regulation provides avenues for councils to discuss which land uses to provide for in specific areas and the impacts of those decisions.

**Relief sought**

**Improve the NPS-FM more generally to better recognise the importance of food production and existing land uses.**

# Addressing water security and water storage

## DairyNZ position

DairyNZ agrees that water security is becoming increasingly important, and that having more water when and where it is needed is critical to community wellbeing and food production. Off-stream water storage has both relatively fewer environmental impacts, and greater water availability at key times offers environmental benefits, taking pressure off in-stream flows and offering mitigation opportunities like flow augmentation and managed aquifer recharge.

We support the proposal to develop new national standards that permit the construction of off-stream water storage. Addressing those matters listed as 'in scope' through national standards would ideally ensure these are robust, consistent across regions and efficient, including:

- Earthworks
- Vegetation clearance
- Damming and diversion
- Construction, use/operation, maintenance of
- Dam/storage structure
- Taking of water (from the water storage structure only)

We support Irrigation NZ's submissions in relation to these standards.

For those matters listed as out of scope, we highlight the role that consenting duration and certainty plays. Consent duration and certainty is important for investment certainty in both freshwater allocation and to enable confidence to invest in infrastructure for storage, use, and allocation.

### Questions

| Q. Should rules for water security and water storage be set nationally or regionally? |
|---|

They should be set nationally, where the environmental impacts will be similar in effect, as this will provide certainty and clarity.

| Q. Are there any other options we should consider? What are they and why? |
|---|

The consent timeframes for the allocation of water quantity, and in relation to water storage and allocation infrastructure, should be robust with a reasonable duration (over 15 years, as a minimum) to provide investment confidence.

| Q. What are your views on the draft standards for off-stream water storage set out in attachment 2? Should other standards be included? Should some standards be excluded? |
|---|

We support Irrigation NZ's submission on the standards.

| Q. Should both small-scale and large-scale (eg, community schemes) water storage be enabled through new standards? |
|---|

Yes, although the standards and methods for assessing potential effects should reflect the scale of storage.

**Relief sought**

**DairyNZ supports the proposal for national standards for off-stream storage. We ask officials to engage with Irrigation NZ when drafting specific standards in the national directions.**

# Simplifying the wetlands provisions

## DairyNZ position

DairyNZ recognises the important functions of wetlands, and we support the aim to avoid further loss of the extent of wetlands. Enabling the protection, restoration and construction of wetlands is a key way of delivering these outcomes.

**We seek the following key changes to achieve wetland enhancement and clarify farming activities around wetlands:**

Clarity and integration:

- Wetland rules are currently spread across several Acts and national directions, causing confusion, legal disputes, and weaker implementation. DairyNZ supports clear, simple, and affordable rules that help farmers protect, restore, and build wetlands. Some of the proposed changes will help, but a full review is needed to remove overlaps and consider all the positive functions wetlands play. This could include considering whether all wetland rules are addressed through one national direction.

Regulatory prioritisation:

- The regulatory focus should be (in the following priority):
    - Mapping and protecting existing wetlands of significance and habitats of threatened species.
    - Incentivising enhancement of existing wetlands.
    - Encouraging and acknowledging the restoration of existing wetland areas.
    - Supporting construction of new wetlands.

Improve current rules by:

- Including clearer definition of natural inland wetlands.
- Clearer permitted activities in proximity to wetlands.
- A permitted activity pathway for constructed wetlands in the NES-F and clear policy direction providing for constructed wetlands in the NPS-FM.

Improving support and removing barriers:

- Funding, including rates relief and a dedicated national fund to support landowners.
- Scope for councils to develop permitted activity pathways for low risk enhancements.
- Support from councils to apply for consents or provide exemptions for the enhancement of wetlands.
- Ensuring access to expert advice and guidance for wetland improvements and management.
- Recognising wetlands as mitigations in regulations, including FWFP and catchment scale planning (Freshwater Action Plans).

**Re-defining 'natural inland wetland' under national regulations**

The current regulatory approach is not effectively protecting wetlands or encouraging new ones to be built. Some regions are interpreting the rules in ways that increase costs for farmers, without improving wetland protection.

The current approach captures all possible wetland areas regardless of wetland condition, indigenous dominance and ecological significance. This approach is spreading effort too wide and better gains can be made by protecting and enhancing wetlands of significance through investment in protection, fencing, planting or enhancement of areas with native wetland species dominance that contribute ecosystem services.

For those reasons, DairyNZ would like to see the following changes to the definition of a natural inland wetland:

- We support removing the pasture exclusion part of the definition.
- We propose the following areas are specifically excluded from the RMA definition:
    - Constructed wetlands (refer to our proposed definition)
    - Induced wetlands (as per proposal in the discussion document)
    - Geothermal wetlands
    - Rivers and streams or other waterbodies, should not be captured as a natural inland wetland, but could be part of a regionally significant wetland if mapped and included in a regional plan.

**Pathways for enabling constructed wetlands**

DairyNZ supports regulations to enable construction of wetlands using a permitted activity pathway enabled through national directions. We see two options to achieve this:

- Insert directions in the NPS-FM which require regional councils to provide for and promote the construction of wetlands as a permitted activity by inserting objectives, policies and methods in their regional plans, or,
- Insert policy direction in the NPS-FM, and a permitted activity pathway for the construction of wetlands as a regulation in the NES-F.

We believe that it is more efficient to develop a national level permitted activity pathway because a regulation in the NES-F can be applied directly without the need for a regional council to amend their plans. The proposed definition in the consultation document is:

> *Wetland construction is when an area is artificially engineered to mimic the functions of a natural inland wetland, where one did not previously exist.*

Constructed wetlands are often built in already wet areas, like boggy parts of a paddock that may have once been natural wetlands. Building wetlands in these areas should be provided for. Environment Canterbury has developed a definition which we would like to put forward as an alternative:

> *Constructed wetland: means a wetland that has been created by human action, excluding any artificial wetlands used for wastewater or stormwater treatment.*

**National direction provisions for constructed wetlands**

Below is an example of policy wording that could be used to develop direction in the NPS-FM:

> *Wetlands and riparian margins*[32]
>
> *Recognise the benefits of constructed wetlands on water quality, indigenous biodiversity, and amenity values, by enabling the construction, use, and maintenance of constructed wetlands provided that the activity does not result in:*
>
> *(a) adverse effects on the health and well-being of any water body or indigenous ecosystem, except for temporary or minor adverse effects; or*
>
> *(b) significant adverse effects on sites and values of importance to tangata whenua; or*
>
> *(c) the constructed wetland being used as a water storage facility; or*

[32] This is copied from a proposed permitted activity pathway for constructed wetlands developed by Environment Canterbury as an example of a policy that could be used to incentivise wetland construction.

*(d) any risk to lawfully established infrastructure or the health and safety of people or communities.*

**Permitted activity pathways for constructed wetlands**

DairyNZ supports the development of a specific permitted activity pathway for constructed wetlands to inform national standards or regional implementation.

A permitted activity pathway will need to address the following areas:

- The use of land
- The planting or removal of vegetation in the bed of a lake or river
- The associated taking, use, damming or diversion of water
- The incidental use or disturbance of the bed of the lake or river
- The incidental discharge of water or contaminants to land or to water, excluding the discharge of construction-phase stormwater, stormwater or wastewater
- The incidental discharge of sediment-laden water to land or water

A regulation should as a minimum include the following areas as standards:

- Permit planting with native plants
- Require water to be diverted back to the same stream or river it was taken from, providing sufficient residual water remains
- Permit enough soil/earthworks to be removed and enough water to be diverted to allow for good functioning of the wetland
- Include a requirement to give notice to the regional council ahead of construction commencing

DairyNZ would welcome the opportunity to work with officials on the drafting of a permitted activity to address these matters.

## Questions

| |
|---|
| Q. What else is needed to support farmers and others to do things that benefit the environment or improve water quality? |

*Issue*

DairyNZ has led catchment projects with communities in multiple regions to develop and implement different mitigations and nature enhancing activities such as constructed wetlands. Through this work, several barriers have been identified, the main ones being:

- Cost and time constraints of farmers (or the fear of high cost and time available) of carrying out work in compliance with current regulations and consenting requirements.
- The regulatory settings are too complex to comply with.
- There remain several knowledge and extension gaps related to wetland protection, enhancement and construction.
- The impact of future regulations on current actions is unknown, and too uncertain.
- Farmers risk losing production capacity by taking land out of production for wetland construction/restoration.
- Catchment scale versus farm scale protection, construction, and management causes issues.

These experiences are supported by a previous report prepared by NIWA for DairyNZ addressing regional regulatory barriers to the adoption of different edge of field mitigations, including constructed wetlands[33]. The report supports our view that wetland protection, restoration, and construction need to be incentivised in several different ways, in addition to a simplified regulatory approach, to support enhancement of wetlands.

Incentives and support should be put in place to recognise that wetlands provide an ecosystem service to the community and are not only for the benefit of a single landowner. Incentives should ideally be targeted, depending on purpose of the wetland.

As a first priority, regulatory and non-regulatory systems should incentivise farmers to protect existing wetlands. DairyNZ propose incentives to encourage protection of existing wetlands, restoration, and construction of new wetlands.

- Incentivisation of environmental enhancements, including constructed wetlands, through permitted activity pathways where adverse effects are temporary or minor.
- Guidance for different edge-of-field mitigations developed or updated to assist with applications and assessment of resource consents in cases where consents are needed for environmental enhancements.
- Rates relief for land used for wetland construction, restoration and protection.
- Recognition of wetland co-benefits and mitigations through environmental regulation, including Freshwater Action Plans and Freshwater Farm Plans.
- Establishment of a national environmental enhancement fund, to support landowners to restore, protect, and enhance wetlands, biodiversity and other areas providing ecosystem benefits beyond the farm scale.

| Q. What should a farming activities pathway include? Is a farming activity pathway likely to be more efficient and/or effective at enabling activities in and around wetlands? |
|---|

*Issue*

The proposed change to the definition of removing pasture exclusion means all areas that met the RMA definition of a wetland on farmland will be captured by the regulations. While this will streamline the interpretation of the definition, this simplification should be balanced with pragmatic restrictions in those areas. We propose that farming activities should have permitted activity pathways so it is clear what is and isn't restricted. The regulations should be risk based and tailored to the distance from the wetland.

***Relief sought***

**A new Regulation is included in the NES-F, (similar to Regulation 50 - Arable and horticultural land use) to provide permitted activities for pastoral land use (meaning *the use of land for the grazing of livestock* under s.217B of the Act).**

[33] NIWA, 2020. Regulatory barriers to uptake of farm-scale diffuse pollution mitigation measures. An assessment of Regional Plan requirements and regional council incentives. A report prepared for DairyNZ and MBIE. Microsoft Word - 2019131HN Final.docx

TABLE 2: PROPOSED PERMITTED ACTIVITIES AND SETBACKS FROM WETLANDS

| Permitted within and 0 – 10m of a wetland | Permitted outside, and within 10 – 100m of a wetland | Not permitted within, or within 10 – 100m of a wetland |
|---|---|---|
| Grazing (except for significant wetlands or wetlands with threatened species) [34] | Fencing (as long as sediment disruption is minimal) | Drainage (except for maintenance of existing tile drains) |
| Irrigation (excluding compounds (effluent, fertiliser)) | Cultivation | Construction/earthworks |
| | Grazing | |
| | Irrigation (excluding compounds (effluent, fertiliser) | |
| | Tile drains | |

Q. What will be the impact of removing the requirement to map wetlands by 2030?

On one hand, removing the mapping requirements will reduce the costs to councils and thereby ratepayers. On the other hand, mapping of wetland areas is critical to the management of those areas, and a failure to map may create uncertainty for farmers who may unknowingly breach regulations.

There should, as a minimum, be a requirement in national direction for regional councils to map or update existing maps of regionally significant wetlands, including a requirement to map habitats of threatened species.

If the requirement to map is removed or focused only on those regionally significant wetlands and habitats of threatened species, it should be made clear that wetland rules in the NPS-FM and NES-F, apart from permitted activity pathways, only apply to wetlands that are mapped in a regional plan.

Q. Could the current permitted activity conditions in the NES-F be made clearer or more workable?

Please see our proposed improvements above.

Q. Do you think the cost of excluding stock from all natural wetlands in extensive farming systems can be disproportionate to environmental benefits and if so, why?

There are benefits to excluding stock from wetlands, in many instances dependent on the type and number of animals. This view is supported by previous research on grazing effects in wetlands.[35] There are also significant costs, particularly in relation to fencing.

[34] Grazing is further covered by the question related to stock exclusion.
[35] Effects of livestock grazing on wetlands: literature review. NIWA (2004) Microsoft Word - final grazing.doc

DairyNZ considers the priority for stock exclusion from wetlands should be focused on significant wetlands, and/or where stock access would pose a threat to threatened species. The impact of stock exclusion from other wetlands will be contingent on what is or is not considered extensive farming.

Freshwater Farm Plans can play a role in managing risks beyond these wetland areas. However, the regulation making powers under s360(1)(hn) of the RMA appear to limit the ability to delegate decisions around stock exclusion to FWFP certifiers or regional councils. This prevents FWFPs from being used as a flexible alternative to national stock exclusion rules. This issue would need to be addressed.

The RIS does not consider other regulatory options, like introducing a consent pathway, that could achieve the same policy goals. We believe a broader review of options should have been done before settling on the current approach. The policy problem also needs to be considered in light of the wider changes proposed to the NPS-FM 2020 and NES-F wetland regulations in this consultation.

Regulation 17 of the stock exclusion regulations requires excluding stock from natural wetlands that support threatened species. However, we interpret that this regulation cannot be implemented until councils have set limits under the NPS-FM 2020. Upcoming changes to the NPS-FM may provide an option for addressing these matters.

A consent pathway could be introduced in the national direction. One option could be to remove the requirement under regulation 17 and instead include "grazing" in clause 3.22(1) of the NPS-FM. This would allow a consent process (through the NES-F or regional plans) and more flexibility in managing grazing in wetlands.

While this could create a short-term gap before new regional plans are notified, it could be addressed using the NES-F and the proposed farming activity pathway currently under consultation. A priority in these matters is ensuring the definition of a wetland is sufficiently robust not to capture low value areas, where the benefits of excluding stock would be marginal relative to the costs.

**Relief sought**

**DairyNZ supports the aim of avoiding further loss of the extent of wetlands and encouraging the restoration and construction of wetlands.**

**We seek more practical rules and a broader approach focused on enabling positive actions, by:**

- **Refocusing regulation on mapping and managing *significant wetlands* and habitats of threatened species first, to prioritise effort and investment.**
- **Clarifying definitions, removing unintended capture of low-value or pastoral areas in the definition of 'natural inland wetlands'.**
- **Enabling wetland construction through a nationally consistent *permitted activity pathway* to enable water quality and biodiversity benefits.**
- **Streamlining farming rules around wetlands with risk-based permitted activity provisions.**
- **Incentivising protection and enhancement through rates relief, national funding, and recognition of ecosystem services through catchment planning (Freshwater Action Plans) and other support.**

# Simplifying the fish passage regulations

## DairyNZ position

DairyNZ supports the aim of improving fish passage through the NPS-FM and NES-F. We support a simple, practical approach that helps farmers take action. As farmers develop their freshwater farm plans, they'll identify ways to improve fish habitat and passage, mainly by removing barriers like old culverts and fords.

One key issue is that current reporting requirements are too complex and technical for most farmers and rural contractors. A risk-based approach would make it easier for them to take positive action.

Any changes must consider the real impact on farms. Many farms have dozens or even hundreds of structures like culverts and crossings. Freshwater farm plans can help identify and support these actions. Tools like the Fish Passage Assessment Tool (FPAT) and the Barrier Assessment and Reporting Tool (BART) are useful and should be promoted to farmers and contractors, including in the development and implementation of FWFP.

DairyNZ supports

- Option 1 – reducing and simplifying information requirements
- Option 2 – simplify the permitted activity conditions for culverts in regulation 70(2)

**DairyNZ does not hold a position on temporary structures or culverts**.

### Questions

| Q. What information requirements are necessary for fish passage? What would the difference in cost be relative to current information requirements? |
|---|

Farmers and catchment groups are becoming increasingly aware of the opportunities to build on ecosystem health and improve outcomes for fish. Many of the information requirements under regulation 62 and accompanying specific activities may be useful for councils reporting, however many have little to no impact on the outcome of fish passage.

Specifically for a farmer, the concerns around compliance, reporting, and risk of non-compliance create barriers to undertake activities of environmental benefit. This is not supporting the intent of the NPS-FM. As a result of the regulatory requirements, farmers face the option of not undertaking the positive action on one hand, or acting and facing the need to invest in an expert to provide the information connected with their culvert or structure installation.

DairyNZ seeks that MFE aims to reduce as many conditions as possible and continue to promote resources such as FPAT and BART raising awareness of best practice.

| Q. How can regulations for temporary and permanent culverts in the NES-F be made simpler? |
|---|

The conditions under regulation 70 for culverts do not provide a risk-based assessment to recognise the scale of such works. For a farm that is replacing a small culvert collecting from a small catchment area, the requirements to establish the design seem to outweigh the outcomes desired. Many councils have adopted a risk-based approach for this reason through a series of rules that are more enabling.

DairyNZ recommends providing councils with flexibility to create more permissive rules for low-risk culverts operating in low-risk areas to further enable landowners to adopt actions to improve fish passage on farm. This aligns with the options consulted on for temporary culverts.

DairyNZ does not have a position on temporary culverts.

**Relief sought:**

- **Reduce regulatory requirements under the NES-F to make it easier for farmers to act.**
- **Enable councils to continue using risk-based, more permissive rules for low-risk culverts and small catchments.**
- **Promote practical tools like FPAT and BART to support farmers and raise awareness of best practice.**

# Addressing remaining issues with farmer-facing regulations

## DairyNZ position

Fertiliser use is a critical part of a dairy system, with farmers seeking optimum response rates from both nitrogen and other nutrients applied to pasture. Farmers are economically incentivised to get the most out of any fertiliser application. DairyNZ, through sector commitments such as Good Farming Practices (GFP), provides guidance on efficient fertiliser use which includes:

- Farm systems applying fertiliser in alignment with the Code of Practice for Fertiliser Nutrient Management.
- Nutrient Management Plans prepared, managed and adapted as practice on farm changes.
- Feed budgets/wedges are used to strategically time synthetic N use.
- Purchase N surplus is recorded and at or below the target for the farm.

Dairy farmers have been improving their reporting of the N-cap as tools and awareness improve from industry and councils. Most New Zealand Dairy farmers seek to operate as a permitted activity under regulation 33. For those exceeding the thresholds there is a non-complying activity pathway regulation 34. Given the N-cap has been in place for several seasons, regional councils have managed to gain a better understanding of the small proportion of farmers nationally who may be exceeding such thresholds.

DairyNZ is not opposed to retaining the N-cap as a catch-all, but we are in support of the options to reduce reporting and compliance costs for farmers through much needed changes to the existing regulations.

What is also important to recognise is the existing and potential future plan changes operating within the regions, providing catchment specific management of diffuse discharges. DairyNZ has completed a stocktake of existing regional regulations and it appears many dairy farmers are already operating under as stringent or more stringent regional rules for either synthetic fertiliser or a mixture of synthetic, organic and farm animal effluent combined.

### Questions

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| Q. To what extent will it be more efficient to require dairy farmers to report on fertiliser use at the same time of year they report on other matters? |

Issue

The current N-cap reporting deadline (12 months ending 30 June) does not align with other farm reporting timeframes and creates unnecessary complexity for farmers. If the N-cap or its reporting requirements remain, this misalignment must be fixed to reduce paperwork and time away from farming.

Additionally, the requirement to provide fertiliser receipts is unnecessary and inefficient. These receipts often don't reflect actual on-farm application due to timing, land ownership structures, or multiple land parcels. Councils will have other tools—such as FWFPs and monitoring—to check compliance. Removing the receipt requirement would reduce unnecessary burden without affecting environmental oversight.

| |
|---|
| Q. Has the requirement for dairy farms to report their use of fertiliser already served its purpose, in terms of having signalled a level of unacceptable use that should be avoided -no more than 190 kilograms per hectare per year and if so, is this requirement still necessary? |

Issue

DairyNZ has reviewed the consultation options alongside feedback from levy payers and stakeholders. While we question the evidence base for a national synthetic nitrogen N cap, we believe the 190kg/ha cap could remain as a temporary backstop if improvements are made to reporting requirements and the evidence base. This would allow time for FWFP and new regional plans under the future NPS-FM to take effect.

We note both benefits and drawbacks to retaining the cap:

- The current cap focuses only on synthetic nitrogen, which is just one part of nitrogen management and may lead to unintended shifts (e.g. increased supplement use or stocking changes) that aren't more efficient.
- Some farms could produce feed more efficiently without the cap, reducing reliance on imported supplements.
- In regions with stricter or evolving rules, the national cap may add little value. Farmers have raised fairness concerns when being compared across regions with differing fertiliser use patterns.

**Relief sought**

- **DairyNZ recommends retaining the 190kg/ha/yr limit acting as a national catchall for synthetic nitrogen fertiliser use.**
- **This should be applied as an average across the effective farmed area as opposed to a cap for every hectare.**
- **Remove the requirement to provide receipts annually and amend the reporting timeframes to align with the farming calendar.**
- **Insert a sunset clause so that synthetic fertiliser is managed through over time.**

# Including mapping requirements for drinking water sources

## DairyNZ position

DairyNZ provided joint feedback on the consultation process that occurred in mid-2024. We are yet to see the results from this consultation. This makes it difficult to grasp the role and implications of supporting SWRMA's within this consultation.

The NES has been consulted on in 2018 and 2022, and neither iteration was successful. Ongoing discussions have been had since in the attempt to seek a resolution. DairyNZ, alongside Federated Farmers of New Zealand and Beef + Lamb NZ, more recently provided joint feedback raising concerns on some of these core issues.

DairyNZ supports managing risks to drinking water but questions the value of the proposed three tier SWRMA framework. We oppose blanket national restrictions that don't reflect catchment-specific risks, especially where regional plans already manage downstream risks effectively through controls on discharges, spills, and other environmental releases. Some examples are:

- Waikato regional plan has an accidental spill or discharge section from agricultural spills or discharges into water. The discharger must notify affected downstream users and council immediately. Many consents hold notification clauses as well when works are being undertaken.
- The Bay of Plenty Regional Natural Resources plan provides clear policy direction that encourages avoiding those adverse impacts but where unavoidable, requires engagement or notification.
- Many regional plans hold notification requirements beyond drinking water source users, including tangata whenua, recreational groups, and irrigation schemes.

Our submission specifically on the NES-DW provides more details on our position on the three SWRMAs. We would however be in support of mapping and recognition of drinking water sites for populations over 500 people through regional councils, which can then be managed based on the risk and need of that specific take. This mapping should be integrated into the regional planning process involving appropriate community consultation.

**If greater protection is needed for a specific drinking water source (e.g. a large city bore in a catchment with high risk activities present), councils can use the regional planning process to justify and implement tailored protections. This ensures decisions are based on local evidence and catchment-specific risks, rather than applying one-size-fits-all national restrictions.**

### Questions

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| Q. Do you think that requiring regional councils to map SWRMAs for applicable drinking water supplies in their regions will improve drinking water safety? Should councils be required to publish SWRMAs? |

Given the existing district and regional regulations and obligations placed on both landowners and national requirements on drinking water providers, we question whether mapping of SWRMA 1, 2 and 3 would improve drinking water safety.

If they are not published on regional councils' websites this would raise further doubt on the value of undertaking such process where activity users cannot utilise such resource.

DairyNZ recommends identification of the sites supplying greater than 500 people to align with the suppliers responsible with meeting drinking water standards under this threshold. These sites should be published for activity users to have as a tool for identifying levels of risk.

Q. Do you think that three zones should be required for each SWRMA or is one zone sufficient?

DairyNZ, alongside Federated Farmers and Beef + Lamb NZ, has provided joint feedback opposing the proposed three-tier SWRMA approach. We support identifying source water takes through a single defined zone, which aligns with the goal of protecting drinking water without adding unnecessary complexity.

**Relief sought:**

**DairyNZ's relief seeks the identification of a site rather than SWRMA's being undertaken during the upcoming regional planning processes through regional councils. This stage should focus on identification of sites for mapping, then on allowing the community to identify when a specific need is required to identify an area of protection based on current risks to that take.**

Q. Should there be a population threshold to require regional councils to map SWRMAs for only some applicable supplies?

We recommend focusing on the sites supplying greater than 500 as the initial threshold to align with the more stringent requirements under the Taumata Arowa Quality Assurance program. Councils will be able to identify where other priority sites and areas of protection are required through community engagement and consultation during regional planning processes.

**Relief sought:**

- **Identify source water sites (not three SWRMA zones) during regional planning processes.**
- **Enable regional councils and communities, through an appropriate consultation process, to determine the need for protection zones based on catchment and specific risks.**
- **Use the 'greater than 500' population threshold as a starting point for required mapping.**

# Appendix A: Example Mitigations

## Investment In Mitigations

The Dairy sector is committed to lowering its environmental footprint, particularly by mitigating nitrogen, phosphorus, and sediment losses to improve freshwater quality.

DairyNZ is committed to working with our partners to ensure innovative, research-based initiatives underpin the industry's dedication to meeting stringent environmental regulations while sustaining economic viability. The following provide examples of this sustained commitment.

Plantain is being promoted as a proven tool to reduce nitrate leaching in New Zealand dairy systems, supported by the $22 million, seven-year *Plantain Potency and Practice Programme*—a partnership between DairyNZ, PGG Wrightson Seeds, Fonterra, and the Ministry for Primary Industries. Trials at Lincoln and Massey Universities have shown that incorporating 20–30% plantain into pastures can reduce nitrate leaching by 23–26%, without reducing milk production.[36] In the Tararua District, 88 farms had adopted plantain by 2023, covering over 3,189 hectares of mixed pasture and 104 hectares of dedicated crop.[37] The Tararua Plantain Project—a five-year, farmer-led initiative launched in 2018 by DairyNZ, Horizons Regional Council, and others—is applying these findings at a catchment scale with six demonstration farms, aiming to reduce nitrogen losses by 60% to meet local regulatory targets.[38]

To mitigate the loss of contaminant, DairyNZ and alongside other stakeholders promote the implementation of good farming practice (GFP) on-farm. Management practices and nutrient losses from dairy farms were evaluated nationally between 2013 to 2022. Over this 10-year period, the number of monitored dairy farms increased from 137 to 378. National median nitrogen (N) and phosphorus (P) loss rates remained relatively stable (38–40 kg N/ha/year and 1.1–1.2 kg P/ha/year).

Regional analysis found that farms which exhibited decreasing N and P loss trends showed increased adoption of effluent and forage establishment method GFPs, for example, the use of low-rate effluent application, direct drill, and minimum tillage, and increased effluent storage.[39] Furthermore, over a 20-year period in five dairy-dominated catchments, the uptake of GFP has been linked to surface water quality improvement. Two-thirds of in-stream water quality trends were improving; however, some were degrading, especially nitrate-nitrogen [9].

The Dairy Clean Streams Accord (2003) and Dairy Water Accord (2013) have driven widespread fencing of waterways, with 98% of dairy farm waterways fenced by 2017, significantly reducing sediment and phosphorus inputs from stock access (DairyNZ, 2024). DairyNZ and partners invest in, and promote, actions to reduce phosphorous[40] and sediment[41] loss.

Further improvements are possible given sufficient time and appropriate regulatory settings to support uptake of GFP. A desktop analysis indicates that full implementation of established GFP could reduce phosphorus losses by up to 26% and sediment by up to 66% by 2035 compared to 2015 levels, particularly in wet or

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[36] Review confirms plantain is a useful tool to reduce nitrate leaching | DairyNZ
[37] DairyNZ-led Tararua Plantain Project scoops collaboration award | DairyNZ
[38] Tararua Plantain Project - DairyNZ | DairyNZ
[39] Macintosh et al. (2025). A 10-year evaluation of management practices and nutrient losses from dairy farms in New Zealand – Trends and drivers. A 10-year evaluation of management practices and nutrient losses from dairy farms in New Zealand – Trends and drivers - ScienceDirect
[9] McDowell, R. W., K. A. Macintosh and C. Depree. (2023). Linking the uptake of best management practices on dairy farms to catchment water quality improvement over a 20-year period. Science of the Total Environment 895, 164963. https://doi.org/10.1016/j.scitotenv.2023.164963
[40] Reducing phosphorus loss - DairyNZ | DairyNZ
[41] Reduce sediment loss | DairyNZ

irrigated dairy regions like Canterbury.[42] Complementary efforts further highlight the sector's commitment. The Low N Systems programme at Lincoln University, launched in 2023, employs "stacked" mitigations, combining reduced nitrogen fertiliser (below 190 kg/ha/year), diverse pastures with plantain and Italian ryegrass, and wintering on baleage to achieve 40–60% nitrogen loss reductions with minimal profit impact.

Catch crops like oats, when sown immediately after winter grazing, can reduce nitrogen leaching by up to 50% while also producing valuable livestock feed. In Canterbury and Southland, they could collectively reduce nitrogen losses by 6,000 tonnes if used on half the forage crop area.[43]

The above body of evidence highlights both the enduring commitment of the sector to reducing its environmental footprint, and the opportunities for further continual improvement if the regulatory settings are enabling positive, on the ground actions focused on improving the environment while retaining the economic benefits the dairy sector has to offer to Aotearoa, New Zealand.

[42] McDowell, R. W., et al. (2020). Quantifying contaminant losses to water from pastoral land uses in New Zealand III. What could be achieved by 2035? New Zealand Journal of Agricultural Research. https://doi.org/10.1080/00288233.2020.1844763

[43] Reducing nitrogen through catch crops · Plant & Food Research

# Appendix B: Outcome and Driver Attribute Tables

## Outcome Attributes (Ecosystem Health)

Phytoplankton (trophic state -lakes)

| **Value (and component)** | Ecosystem health (Aquatic Life) | |
|---|---|---|
| **Freshwater body type** | Lakes | |
| **Attribute unit** | mg chl-*a*/ $m^3$ (milligrams chlorophyll-*a* per cubic meter) | |
| **Attribute band and description** | **Numeric attribute state** | |
| | **Annual median** | **Annual maximum** |
| **A**<br>Lake ecological communities are healthy and resilient, similar to natural reference conditions. | ≤2 | ≤10 |
| **B**<br>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**<br>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**<br>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.

## Periphyton (trophic state – hard bottomed rivers)

| **Value (and component)** | Ecosystem health (Aquatic Life) | |
|---|---|---|
| **Freshwater body type** | Rivers | |
| **Attribute unit** | mg chl-*a*/m$^2$ (milligrams chlorophyll-*a* per square meter) | |
| **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**<br>Rare blooms reflecting negligible nutrient enrichment and/or alteration of the natural flow regime or habitat. | ≤50 | ≤50 |
| **B**<br>Occasional blooms reflecting low nutrient enrichment and/or alteration of the natural flow regime or habitat. | >50 and ≤120 | >50 and ≤120 |
| **C**<br>Periodic short-duration nuisance 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**<br>Regular and/or extended-duration nuisance blooms reflecting high nutrient enrichment and/or significant alteration of the natural flow regime or habitat. | >200 | >200 |

Hard bottom rivers are defined as those where bed substrate is comprised of <50% fine (<2mm) sediment. This attribute does not apply to soft-bottom streams.

At low risk sites monitoring may be conducted using visual estimates of periphyton cover. Should monitoring based on visual cover estimates indicate that a site is approaching the relevant periphyton abundance threshold, monitoring should then be upgraded to include measurement of chlorophyll-*a*.

Classes are streams and rivers defined according to types in the River Environment Classification (REC). The Productive periphyton class is defined by the combination of REC "Dry" Climate categories (that is, Warm-Dry (WD) and Cool-Dry (CD)) and REC Geology categories that have naturally high levels of nutrient enrichment due to their catchment geology (that is, Soft-Sedimentary (SS), Volcanic Acidic (VA) and Volcanic Basic (VB)). Therefore the productive category is defined by the following REC defined types: WD/SS, WD/VB, WD/VA, CD/SS, CD/VB, CD/VA. The Default class includes all REC types not in the Productive class.

Based on a monthly monitoring regime. The minimum record length for grading a site based on periphyton (chlorophyll-*a*) is 3 years.

Macroalgal Ecological Quality Rating (trophic state - estuaries)

| **Value (and component)** | Ecosystem Health | |
|---|---|---|
| **Freshwater body type** | Estuaries[1] | |
| **Attribute unit** | Ecological quality rating score (unitless) | |
| **Macroalgae susceptibility band** | **Eutrophication level** | **Ecological Quality Rating (EQR) score** |
| **A**<br>Ecological communities are healthy and resilient. Algal cover <5% and low biomass of opportunistic macroalgal blooms. | Minimal | 1.0> EQR≥0.8 |
| **B**<br>Ecological communities are slightly impacted by additional macroalgal growth arising from nutrients levels that are elevated. Limited macroalgal cover (5–20%) and low biomass of opportunistic macroalgal blooms | Low-Moderate | 0.8>EQR≥0.6 |
| **C**<br>Ecological communities are moderately to strongly impacted by macroalgae. Persistent, macroalgal cover (25–50%) and/or biomass. | Moderate-High | 0.6>EQR≥0.4 |
| **National bottom line** | | **EQR 0.4** |
| **D**<br>Ecological communities are strongly impacted by macroalgae. Persistent very high macroalgal cover (>75%) and/or biomass. | High-very high | EQR<0.4 |

[1] macroalgal susceptible estuaries, namely '*shallow intertidal dominated estuaries'* (SIDES) and to lesser extent '*shallow, short, residence time tidal river*' (SSRTRE) estuaries (Plew et al. 2020)[2]

[2] Plew, D.R., Zeldis, J.R., Dudley, B.D., Whitehead, A.L., Stevens, L.M., Robertson, B.M., Robertson, B.P. (2020) Assessing the eutrophic susceptibility of New Zealand Estuaries. *Estuaries and Coasts* 43: 2015-2033.

## Macroinvertebrates (MCI)

| **Value** | Ecosystem Health | |
|---|---|---|
| **Freshwater body type** | Rivers (wadeable)* | |
| **Attribute** | Macroinvertebrate Community Index (MCI)[1] | |
| **Attribute unit** | Dimensionless index units (up to theoretical 200) | |
| **Attribute State** | **Numeric Attribute State[2]** | **Narrative Attribute State[2]** |
| | **5-year median** | |
| A | >120 | High quality environment where species composition is near natural state most of the time |
| B | 100 - 120 | Good quality environment where human activities and/or natural disturbances cause some loss of sensitive species. |
| C | 80 - 100 | Fair quality environment where moderately-highly tolerant species dominate. |
| **National bottom line** | **80** | |
| D | <80 | Poor quality environment where highly tolerant species dominate most of the time. |

* potential for presence-absence sampling using eDNA method for this attribute to be extended to non-wadeable rivers (at the discretion of regional councils)

[1] Councils may use the quantitative MCI metric (QMCI) (in place of MCI) with band thresholds for A/B, B/C and C/D (NBL) of 6.0, 5.0 and 4.0, respectively – although QMCI is not recommended for SoE monitoring (Stark and Maxted 2 refer to Section 3.2)

[2] Collier K, Clapcott J, Neale M 2014. A macroinvertebrate attribute to assess ecosystem health for New Zealand waterways for the national objectives framework - issues and options. Environmental Research Institute Report 36, University of Waikato, Hamilton.

MCI and QMCI scores to be determined using annual samples taken between 1 November and 30 April with either fixed counts with at least 200 individuals, or full counts, and with current state calculated as the five-year median score. MCI scores are to be calculated using the tolerance values in Table 1 of Stark and Maxted (2007).[3] Depending on the nature of the stream bed, macroinvertebrate samples are to be collected according to the methods (C1-C4) in Stark et al (2001).[4] The suitability of hard or soft bottom protocols (and use of hard or soft bottom tolerance values) are to be determined by the Regional Council – but must be specified.

[3]Stark JD, and Maxted, JR (2007) *A user guide for the Macroinvertebrate Community Index*. Cawthron Institute: Nelson, New Zealand (See Clause 1.8)

[4]Stark, J. D.; Boothroyd, I. K. G; Harding, J. S.; Maxted, J. R.; Scarsbrook, M. R. 2001: Protocols for sampling macroinvertebrates in wadeable streams. New Zealand Macroinvertebrate Working Group Report No. 1. Prepared for the Ministry for the Environment. Sustainable Management Fund Project No. 5103. 57p.

## Fish (rivers)

| **Value (and component)** | Ecosystem health (Aquatic life) |
|---|---|
| **Freshwater body type** | Rivers (wadeable)* |
| **Attribute unit** | Fish Index of Biotic Integrity (F-IBI) |
| **Attribute band and description** | **Numeric attribute state (average)** |
| **A**<br>High integrity of fish community. Habitat and migratory access have minimal degradation. | ≥34 |
| **B**<br>Moderate integrity of fish community. Habitat and/or migratory access are reduced and show some signs of stress. | <34 and ≥28 |
| **C**<br>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**<br>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 |

* potential for presence-absence sampling using eDNA method for this attribute to be extended to non-wadeable rivers (at the discretion of regional councils)

Sampling is to occur at least annually between December and April (inclusive) following the protocols for at least one of the backpack electrofishing method, spotlighting method, trapping method (Joy et al. 2013) or via suitable environmental DNA (eDNA) method (Melchior and Baker 2023).

Joy M, David B, Lake M (2013). *New Zealand Freshwater Fish Sampling Protocols (Part 1): Wadeable rivers and streams*. Massey University: Palmerston North, New Zealand. (*see* clause 1.8)

Melchior M. and Baker C. (2023). eDNA Guideline and field protocols for lotic systems. NIWA Client Report 2023279HN.

The F-IBI score is to be calculated using the general method defined by Joy, MK, and Death RG. 2004. Application of the Index of Biotic Integrity Methodology to New Zealand Freshwater Fish Communities. *Environmental Management*, 34(3), 415-428. (*see* clause 1.8)

## Dissolved oxygen (rivers and lakes)

| **Value (and component)** | Ecosystem health (Water quality) | |
|---|---|---|
| **Freshwater body type** | Rivers and lakes (seasonally stratified) | |
| **Attribute unit** | mg/L (milligrams per litre) | |
| **Attribute description band and description** | **Numeric attribute state (1-day minimum)[1]** | |
| | **Rivers[2]** | **Lakes[3,4] - seasonally stratified (mid-hypolimnion)** |
| **A**<br>No stress caused by low dissolved oxygen on any aquatic organisms that are present at matched reference (near- pristine) sites. | ≥7.5 | ≥7.5 |
| **B**<br>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. | ≥5.0 and <7.5 | ≥5.0 and <7.5 |
| **C**<br>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. | ≥4.0 and <5.0 | ≥4.0 and <5.0 |
| **National bottom line** | **4.0** | **4.0** |
| **D**<br>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. | <4.0 | <4.0 |

[1] median of at least five annual 1-day minimum DO values. For example, if minimum DO values for years 1-5 were 3.5, 5.2, 6, 4, 5.5, then the 5-year median (DO minimum) value would be 5.2 (B band)

[2] The 1-day minimum is the lowest daily minimum across the summer period (1 November to 30 April) determined when DO pressure Is highest (i.e. warmest temperatures, base flow conditions, high plant biomass). Ideally the annual DO minimum should be determined from a minimum (total) monitoring duration of 2 weeks (preferably 4 weeks.

[3] To be measured using either continuous monitoring sensors or discrete dissolved oxygen profiles.

[4] bottom water dissolved oxygen for lakes is included as a driver (Appendix 4) as it relates to release of nutrients from bed sediments

# Outcome Attributes (Human Health – contact recreation)

*Escherichia coli (E.coli)*

| **Value (and component)** | | Human health | | |
|---|---|---|---|---|
| **Freshwater body type** | | Lakes and rivers (Primary and Secondary contact) | | |
| **Attribute unit** | | *E.coli*/100 mL (number of *E.coli* per hundred millilitres) | | |
| Attribute State | Attribute numeric state | Recreation type | Sampling statistic[1] | Narrative attribute state |
| A | <130 | Secondary contact | median | People are exposed to a negligible risk of infection (<0.1% risk) when undertaking activities with occasional immersion of water (such as wading and boating). |
| | | Primary contact | 95th percentile | People are exposed to a very low risk of infection (<0.1% risk) when undertaking activities likely to involve full immersion. |
| B | ≤260 | Secondary contact | median | People are exposed to a very low risk of infection (<0.1% risk) when undertaking activities with occasional immersion of water (such as wading and boating). |
| | | Primary contact | 95th percentile | People are exposed to a low risk of infection (up to1% risk) when undertaking activities likely to involve full immersion. |
| C | >260 and <540 | Secondary contact | median | People are exposed to a low risk of infection (less than 1% risk) from contact with water during activities with occasional immersion and some ingestion of water (such as wading and boating). |
| | | Primary contact | 95th percentile | People are exposed to a moderate risk of infection (less than1% risk) when undertaking activities likely to involve full immersion. 540/100ml is the minimum acceptable state for activities likely to involve full immersion. |
| National bottom line | 540 | Primary contact | 95th percentile | |
| D | >540 and ≤1,000 | Secondary contact | median | People are exposed to a moderate risk of infection (less than 5% risk) from contact with water during activities with occasional immersion and some ingestion of water (such as wading or boating). People are exposed to a high risk of infection (greater than 5% risk) from contact with water during activities likely to involve immersion. |
| National bottom line | 1,000 | Secondary contact | median | |
| E | >1,000 | All | median | People are exposed to a high risk of infection (greater than 5% risk) from contact with water during activities with occasional immersion and some ingestion of water (such as wading or boating). |

[1] median is calculated from 5 years of monthly SoE data; 95th percentiles calculated from 5 years of summer surveillance monitoring at recreational sites.

## Cyanobacteria (planktonic)

| **Value** | Human contact |
|---|---|
| **Freshwater body type** | Lakes and lake fed rivers |

| **Attribute unit** | Biovolume $mm^3/L$ (cubic millimetres per litre) |
|---|---|
| **Attribute band and description** | **Numeric attribute state** |
| | 80th percentile |
| **A (Blue)**<br>Risk exposure from cyanobacteria is no different to that in natural conditions (from any contact with freshwater). | ≤0.5 $mm^3/L$ biovolume equivalent for the combined total of all cyanobacteria |
| **B (Green)**<br>Low risk of health effects from exposure to cyanobacteria (from any contact with freshwater). | >0.5 and ≤1.0 $mm^3/L$ biovolume equivalent for the combined total of all cyanobacteria |
| **C (Yellow)**<br>Moderate risk of health effects from exposure to cyanobacteria (from any contact with freshwater). | >1.0 and ≤1.8 $mm^3/L$ biovolume equivalent of potentially toxic cyanobacteria OR<br>>1.0 and ≤10 $mm^3/L$ total biovolume of all cyanobacteria |
| **National bottom line** | **1.8 $mm^3/L$ biovolume equivalent of potentially toxic cyanobacteria**<br>**OR**<br>**10 $mm^3/L$ total biovolume of all cyanobacteria** |
| **D (Orange/Red)**<br>High health risks (for example, respiratory, irritation and allergy symptoms) exist from exposure to cyanobacteria (from any contact with freshwater). | >1.8 $mm^3/L$ biovolume equivalent of potentially toxic cyanobacteria<br>OR<br>>10 $mm^3/L$ total biovolume of all cyanobacteria |
| The 80th percentile must be determined using a minimum of 12 samples collected over 3 years. Thirty samples collected over 3 years is recommended. | |

# Driver Attributes - Contaminants

## Ammonia-nitrogen toxicity

| **Value (and component)** | Ecosystem health (Water quality) | |
|---|---|---|
| **Freshwater body type** | Rivers and lakes | |
| **Attribute unit** | mg $NH_4$-N/L (milligrams ammoniacal-nitrogen per litre) | |
| **Indicative risk to relevant outcome attribute/s** | **Numeric attribute state** | |
| | Median[1] | 95th percentile[1] |
| **A (low)**<br>99% species protection level: No observed effect on any species tested. | ≤0.03 | ≤0.05 |
| **B (moderate)**<br>95% species protection level: Starts impacting occasionally on the 5% most sensitive species. | >0.03 and ≤0.24 | >0.05 and ≤0.40 |
| **C (moderate high)**<br>90% species protection level: Starts impacting regularly on the 10% most sensitive species (reduced survival of most sensitive species). | >0.24 and ≤0.54 | >0.40 and ≤0.92 |
| **National bottom line** | **0.54** | **0.92** |
| **D (high)**<br>Starts approaching acute impact level (that is, risk of death) for sensitive species. | >0.54 | >0.92 |

[1] median and 95th percentile statistics calculated from 5 years of monthly data.

Grading should place greater emphasis on median values, as these are more representative of chronic-long-term exposure.

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 (see Table below) – if no pH data is available then a value of 7 is used.

**Conversion ratios for pH adjustment of ammonia concentrations**

$$Conc_{pH\ 8} = \frac{Conc_{pH\ sample}}{Ratio} \qquad \text{Equation (1)}$$

| Sample pH | Ratio | Sample pH | Ratio | Sample pH | Ratio |
|---|---|---|---|---|---|
| 6 | 2.86 | 7 | 2.42 | 8.1 | 0.87 |
| 6.1 | 2.84 | 7.1 | 2.32 | 8.2 | 0.73 |
| 6.2 | 2.82 | 7.2 | 2.21 | 8.3 | 0.62 |
| 6.3 | 2.80 | 7.3 | 2.09 | 8.4 | 0.53 |
| 6.4 | 2.77 | 7.4 | 1.94 | 8.5 | 0.44 |
| 6.5 | 2.73 | 7.5 | 1.79 | 8.6 | 0.38 |
| 6.6 | 2.70 | 7.6 | 1.63 | 8.7 | 0.32 |
| 6.7 | 2.64 | 7.7 | 1.47 | 8.8 | 0.27 |
| 6.8 | 2.59 | 7.8 | 1.31 | 8.9 | 0.23 |
| 6.9 | 2.51 | 7.9 | 1.14 | 9 | 0.20 |
| | | 8 | 1.00 | >9 | 0.20 |

## Nitrate-nitrogen (toxicity)

| **Value (and component)** | Ecosystem health (Water quality) | |
|---|---|---|
| **Freshwater body type** | Rivers | |
| **Attribute unit** | mg $NO_3$ – N/L (milligrams nitrate-nitrogen per litre) | |
| **Indicative risk to relevant outcome attribute/s** | **Numeric attribute state** | |
| | Median[1] | 95th percentile[1] |
| **A (low)**<br>High conservation value system. Unlikely to be chronic effects even on sensitive species (99% species protection). | ≤1.0 | ≤1.5 |
| **B (moderate)**<br>Slightly to moderately disturbed systems. Some chronic growth effects on up to 5% of species (95% species protection). | >1.0 and ≤2.4 | >1.5 and ≤3.5 |
| **C (moderate-high)**<br>Highly disturbed systems. Some chronic growth effects on up to 10% of species (90% species protection). | >2.4 and ≤3.8 | >3.5 and ≤5.6 |
| **National bottom line** | 3.8 | 5.6 |
| **D (high)**<br>Growth effects on >10% of species (mainly sensitive species such as fish). No acute effects. | >3.8 | >5.6 |

[1] median and 95th percentile statistics calculated from 5 years of monthly data.

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 may be more stringent.

## Suspended fine sediment

| **Value (and component)** | Ecosystem health (Water quality) | |
|---|---|---|
| **Freshwater body type** | Rivers | |
| **Attribute unit** | Visual clarity (m) and turbidity (NTU) | |
| **Indicative risk to relevant outcome attribute/s** | **Numeric attribute state by suspended sediment class** | |
| | **Visual clarity (median)** | **Turbidity (median)** |
| **A (low)** | ≥1.25 | ≤5.4 |
| **B (moderate)** | <1.25 and ≥0.84 | >5.4 and ≤7.2 |
| **C (moderate-high)** | <0.84 and ≥0.7 | >7.2 and ≤8.2 |
| **possible National bottom line** | 0.7 | 8.2 |
| **D (high)** | <0.7 | >8.2 |

Table H-2 and H-4, Appendix H – Franklin et al. 2019
Regional councils to determine whether attribute assessment by visual clarity OR turbidity

Based on a monthly monitoring regime where sites are visited on a regular basis regardless of weather and flow conditions. Record length for grading a site based on 5 years.
Councils may monitor turbidity and convert the measures to visual clarity.

*See* Appendix 2C Tables 23 and 26 for the definition of suspended sediment classes and their composition. The following are examples of **naturally occurring processes** relevant for suspended sediment:

- naturally highly coloured brown-water streams
- glacial flour affected streams and rivers
- selected lake-fed REC classes (particularly warm climate classes) where low visual clarity may reflect autochthonous phytoplankton production.

## Total nitrogen (trophic state - lakes)

| **Value (and component)** | Ecosystem health (Water quality) | |
|---|---|---|
| **Freshwater body type** | Lakes | |
| **Attribute unit** | mg/m$^3$ (milligrams per cubic metre) | |
| **Indicative risk to relevant outcome attribute** | **Numeric attribute state** | |
| | **Annual median** | **Annual median** |
| | Seasonally stratified and brackish | Polymictic/non stratified |
| **A (low)**<br>Indicative nitrogen concentrations that provides for an Outcome Attribute phytoplankton A-band | ≤160 | ≤300 |
| **B (moderate)**<br>Indicative nitrogen concentration range (median) that provides for an Outcome Attribute phytoplankton B-band | >160 and ≤350 | >300 and ≤500 |
| **C (moderate-high)**<br>Indicative nitrogen concentration range that provides for an Outcome Attribute phytoplankton C-band. | >350 and ≤750 | >500 and ≤800 |
| **National bottom line** | **750** | **800** |
| **D (high)**<br>Indicative nitrogen concentrations that may result in Outcome Attribute phytoplankton D-band. | >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.

## Total phosphorus (trophic state - lakes)

| **Value (and component)** | Ecosystem health (Water quality) |
|---|---|
| **Freshwater body type** | Lakes |
| **Attribute unit** | mg/$m^3$ (milligrams per cubic metre) |
| **Indicative risk to relevant outcome attribute** | **Numeric attribute state** |
| | Annual median |
| **A (low)**<br>Indicative phosphorus concentration range that provides for an Outcome Attribute phytoplankton A-band | ≤10 |
| **B (moderate)**<br>Indicative phosphorus concentration range that provides for an Outcome Attribute phytoplankton B-band | >10 and ≤20 |
| **C (moderate-high)**<br>Indicative phosphorus concentration range that provides for an Outcome Attribute phytoplankton C-band. | >20 and ≤50 |
| **D (high)**<br>Indicative phosphorus concentrations that may result in Outcome Attribute phytoplankton D-band. | >50 |

For lakes and lagoons that are intermittently open to the sea, monitoring data should be analysed separately for closed periods and open periods.

## Total Nitrogen* (trophic state - estuaries)

(* refers to potential TN concentration calculated from the mixing of riverine and oceanic sources)[a]

| **Value (and component)** | Ecosystem health (Water quality) |
|---|---|
| **Freshwater body type** | Estuary (intertidal, macroalgal dominated) |
| **Attribute unit** | mg/m$^3$ (milligrams per cubic metre) |
| **Indicative risk to relevant outcome attribute** | **Numeric attribute state** |
| | 5-year median |
| **A (low)**<br>Indicative potential TN concentrations that provides for an Outcome Attribute macrolagal EQR[b] A-band | ≤250 |
| **B (moderate)**<br>Indicative phosphorus concentration range that provides for an Outcome Attribute phytoplankton B-band | >250 and ≤450 |
| **C (moderate-high)**<br>Indicative phosphorus concentration range (median) that provides for an Outcome Attribute phytoplankton C-band. | >450 and ≤650 |
| **possible National bottom line** | **650** |
| **D (high)**<br>Indicative phosphorus concentrations (median) that may result in Outcome Attribute phytoplankton D-band. | >650 |

[a] Potential nitrogen concentrations are defined as the concentration that would occur in the absence of uptake by algae, or losses or gains due to non-conservative processes such as denitrification (Plew et al. 2018)[b]. A dilution factor D was derived for each estuary, which allowed the potential concentration in the estuary C to be calculated from the concentration in the inflow $C_R$ and ocean $C_O$.

$$C = \frac{C_R + C_O(D-1)}{D}$$

[b] Plew, D., B. Dudley, U. Shankar, and J. Zeldis. 2018a. Assessment of the eutrophication susceptibility of New Zealand Estuaries. NIWA Client Report, Prepared for Ministry for the Environment. https://www.mfe.govt.nz/publications/fresh-water/assessment-of-eutrophication-susceptibility-of-new-zealand's-estuaries

[c] EQR = ecological quality rating score -outcome attribute for assessing trophic state in relevant estuaries (refer to Table 3)

## Water temperature (summer)

| **Value (and component)** | Ecosystem health (Water quality) |
|---|---|
| **Freshwater body type** | rivers |
| **Attribute unit** | Degrees Celsius (°C) |
| **Indicative risk to relevant outcome attribute/s** | **Numeric attribute state[a]** |
| | 95th percentile[b] |
| **A (very low)**<br>No thermal stress on any aquatic organisms that are present at matched reference (near-pristine) sites. | ≤19 |
| **B (low)**<br>Minor thermal stress on occasion (clear days in summer) on particularly sensitive organisms such as certain insects and fish. | >19 and ≤22 |
| **C (moderate)**<br>Some thermal stress on occasion, with elimination of certain sensitive insects and absence of certain sensitive fish. | >22 and ≤25 |
| **possible National bottom line** | **25** |
| **D (high)**<br>Significant thermal stress on a range of aquatic organisms. Risk of local elimination of keystone species with loss of ecological integrity. | >25 |

[a] indicative thresholds based on Davies-Colley et al. (2013) – Easten Dry region. B/C band threshold was amended from 21 to 22 to provide B and C band 'widths' of 3°C. Although temperatures were recommended as Cox-Rutherford Index (CRI, the average between the daily mean and maximum), Davie-Colley et al. (2013) also recommended use of 95th percentile values, which has wider acceptance regarding summary statistics for NPS-FM attributes.

Davie-Colley et al. (2013). *National Objectives Framework - Temperature, Dissolved Oxygen & pH Proposed thresholds for discussion*. NIWA Client report HAM2013-056 prepared for Ministry for the Environment, 83 p. https://environment.govt.nz/assets/Publications/Files/national-objective-framework-temperature-dissolved-oxygen-ph.pdf

[b] 95th percentile of continuous summer monitoring data (1st Dec to 31st March) based on at least 5-years of data. If data is not collected continuously over the summer period (or for different durations), then state should be determine as the mean of the annual 95th percentile values.

## Deposited sediment

| **Value (and component)** | Ecosystem health (Water quality) | |
|---|---|---|
| **Freshwater body type** | Streams – hard bottom[a] | |
| **Attribute unit** | % fine sediment (<2mm) cover | |
| **Indicative risk to relevant outcome attribute/s** | **Numeric attribute state** | |
| | **Median[b]** | |
| | **Absolute[c]** | **Relative to reference[d]** |
| **Low-moderate**<br>Low-to-moderate cover relative to reference state providing excellent to fair habitat for biota. Risk of sensitive macroinvertebrate species being lost and change in community composition. | ≤30% | ≤15% |
| **high**<br>High likelihood of sediment cover exceeding reference state providing poor habitat for biota. High probability of loss of sensitive macroinvertebrate species. | >30% | >15% |

[a] hard-bottom streams are defined as having <50% fine sediment (<2mm) cover in bed sediments. Note that these thresholds suitable for hard bottom streams with 'low to medium' (<30%) level of sediment

[b] Based on a monthly monitoring regime where sites are visited on a regular basis regardless of weather and flow conditions. Record length for grading a site based on 5 years.

[c] refer to Table ES1 (p19) in Depree and Clapcott et al. (2018). *Development of ecosystem health bottom-line thresholds for suspended and deposited sediment in New Zealand rivers and streams*. NIWA Client Report (2017076HN) prepared for Ministry for the Environment. 358 p. https://environment.govt.nz/assets/Publications/Files/development-ecosystem-health-bottom-line-thresholds-for-suspended-deposited-sediment-in-NZ-rivers-streams.pdf

[d] based on Reid and Quinn (2011). Preliminary information for developing sediment guidelines for streams of the West Coast, New Zealand. NIWA Client Report HAM2011-012. 21 p.

# Non-contaminant Drivers (examples)

*Drafting note:*
*This table remains work in progress and could be preceded by a further explanation.*

| Attribute | Waterbody type | Reason for consideration | Indicative thresholds / guidance |
|---|---|---|---|
| **Shade** | rivers | Loss of stream shading result is increased stream temperatures, lower dissolved oxygen, increased sediment, and increased nuisance plant growths. For example, peak summer temperatures in small, unshaded pastoral streams can be 12°C warmer than equivalent forested stream (30 vs 18°C). | NIWA studies indicate a shade target of 70% to meet water temperature targets (Rutherford et al. 1997)[c] |
| **Stream/riparian habitat assessment** | rivers | Both stream and riparian habitat influence the structure and function of stream life, setting the basic template within which biological communities develop (WRC 2019)[d]. In other words, poor habitat may be a key driver of poor aquatic life outcome attribute states. Accordingly, actions need to respond to habitat limitations (in addition to any contaminant drivers). | While there are examples of grading systems (e.g. WRC 2019)[d], the challenge will be applying a habitat assessment at meaningful spatial scales (FMU vs site/reach).<br><br>**Habitat rating (and Indicative risk to relevant outcome attribute/s)** — **Habitat score**<br>Excellent (very low) — 40-34<br>Good (low) — 33-26<br>Fair (moderate) — 25-17<br>Poor (high) — 16-10 |
| **River flow regimes** | rivers | Water quantity (ecological flows) important for habitat quantity and quality (including temperature/deposited sediment/dissolved oxygen | Ecological flow values set according to Policy 3.1 |
| **Longitudinal river connectivity(fish passage barriers)** | Rivers | River network longitudinal connectivity influences the distribution of migratory and non-migratory native fish species. The Dendritic Connectivity Index (DCI) is method used to quantify the longitudinal connectivity within river networks (Cote et al. 2009).[e] Connectivity, like habitat, is likely to be a bigger driver of fish IBI than any contaminant | NIWA's NZ Barrier Assessment and Reporting Tool (BART)[f] has been used to model 'baseline connectivity' and future state based on remediating fish passage barriers (e.g. 'maximum connectivity gains'). This has been used to develop 'Fish Passage Action Plans' in several regions, including Northland, Waikato, Taranaki, Hawkes Bay and West Coast. Accordingly, estimates of baseline (current state) longitudinal connectivity (DCI) can inform FWAP about where remediations in fish passage are required (to achieve a target Fish IBI state), or what is realistic if fish passage barrier remediation are not included in the FWAP. |

<table>
<tr>
<td>Exotic/pest fish</td>
<td>Rivers / lakes / wetlands</td>
<td>Exotic pest fish can adversely effect ecosystem health and water quality process, which in turn can significantly alter native freshwater communities. Presence of exotic fish directly impacts (reduces) the fish IBI outcome attribute.</td>
<td>An example of an attribute developed in Northland for lakes is shown below.(Chakraborty et al. 2023)[b]
<table>
<tr><th>Baseline state</th><th>Attribute band description</th><th>Total pest fish score</th></tr>
<tr><td>Unimpacted</td><td>No pest fish detected, no impact</td><td><=3</td></tr>
<tr><td>Slightly impacted</td><td>Pest fish of low to serious type (based on FRAM score) detected, limited current impact</td><td>>3 and <=10</td></tr>
<tr><td>Moderately impacted</td><td>Pest fish of low to serious type (based on FRAM score) detected, moderate impact and possible risk of future impact</td><td>>10 and <=12</td></tr>
<tr><td>Severely impacted</td><td>Pest fish of serious type (based on FRAM score) detected, severe impact</td><td>>12</td></tr>
</table>
</td>
</tr>
<tr>
<td>Invasive plants – nuisance aquatic weeds</td>
<td>rivers</td>
<td>Choke/clog waterways; degrade habitat; reduce water velocity, reduce dissolved oxygen concentrations</td>
<td>≤50% channel cross sectional area/volume (Matheson et al. 2013)[a]<br><br>To provide for ecological condition, flow conveyance, and recreation</td>
</tr>
</table>