From: Thuy Pham
To: WaterReformPublicConsultation
Subject: Submission 03112 - Thuy Pham - Submission
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To whom it may concern,

FEEDBACK ON THE PROPOSED AMENDMENTS TO THE NATIONAL POLICY STATEMENT FOR FRESHWATER MANAGEMENT (2011) AND THE NATIONAL OBJECTIVES FRAMEWORK

Thank you for the opportunity to make a submission on the proposed NPS for freshwater management. We are a charitable organisation committed to freshwater conservation and education for the benefit of freshwater species, ecosystems and local communities.

We are deeply concerned about the widespread decline in ecological health, aquatic biodiversity and water quality across New Zealand.
We support the concept of a national objectives framework. We believe the current state and trends in water quality and aquatic biodiversity require a focussed, national approach. However, national bottom lines should not be confused with objectives. Objectives are outcome focused whereas bottom lines are minimum thresholds/limits. The difference between these two needs to be clear in any policy or regulation. Minimum bottom lines for freshwater are not objectives to aspire to. The NOF should re-emphasise the 'maintain or improve' approach of the NPS FM Objective A2 and the policy framework should be significantly robust enough to ensure that no water body should be allowed to degrade or worsen from its current state or to where it would fail to meet the national or local community objectives for it.

There is a risk that (i) without a strong policy framework the numeric attributes in the NOF tables will be misused to 'downgrade' or undermine more stringent limits at the regional level, (ii) the national bottom lines (lower end of the 'C band') will be misconstrued or misrepresented as best practice or all that is required for most water bodies and (iii) regions that have not yet gone down the challenging pathway of setting limits and targets will simply adopt the national bottom lines and make no further progress towards maintaining or improving existing water quality in the context of regional/local conditions.

Ensuring rivers are clean enough to swim in should be a compulsory national standard for councils, not optional. E coli (or faecal coliform levels) which are safe for boating and wading are too high for rivers and lakes to be clean and safe for swimming. The compulsory national value for human and ecosystem health should be to standards which people can safely swim in.

Too many recognised water quality indicators are missing. If councils don't have to monitor these indicators then New Zealanders won't get an accurate understanding of the state of our waterways.

Fill the gaps in by including these national indicators ("attributes") for human health:

Water clarity.
Periphyton cover which is a measure of how much algae, bacteria and detritus is covering the river bed.

The indicators (“attributes”) for ecosystem health should include:
The Macro-invertebrate Community Index which is a well-used and understood measure of river and stream health to monitor changes in the number and diversity of aquatic insects such as mayflies and caddisflies.
A limit on nitrogen and phosphorus as nutrients. The proposed bottom line for nitrate is the level where it is toxic to fish and other aquatic life. This will not prevent nuisance algal blooms.
A limit on deposited sediment. Soil belongs on the land not in rivers. Sediment smothers spawning areas and habitats.
A measure for dissolved oxygen across a river, not just in relation to point source discharges. Dissolved oxygen is critical for life and can vary hugely between day and night.
Measures for estuaries. Estuaries are vital as fish nurseries and pathways and have important recreational and cultural values.

Section CA of the proposed amendments holds the bulk of policies dealing with how the NOF will be applied. Policy CA1(f) lists matters for consideration when developing objectives, identifying values and applying relevant numeric attributes and governs the consideration of limits, the current and anticipated state based on current and past resource use, spatial scale, timeframes for achieving objectives and implications for resource users and communities “including for actions, investments, ongoing management changes and any social and economic implications;”. This clause in what is a critical policy for implementation is biased towards consideration of social and economic implications. There is no mention of ecological, recreational or cultural implications and therefore no balance to considerations.
Nitrate toxicity bands and national bottom lines proposed in the NOF will not protect rivers against the effects of eutrophication and will only provide for Ecosystem Health values and the life-supporting capacity of water at the extreme end of the spectrum (i.e. avoiding toxic effects and mortality). The toxicity bottom line proposed in the NOF (6900 µg/L or 6.9 mg/L) is 5 to 6 times higher than the 95th percentile of TN measured in New Zealand rivers (around 1100 µg/L or 1.1 mg/L).

An assessment of current median nitrate concentrations against the proposed NOF N toxicity attributes shows that setting nitrogen concentrations at toxicity levels will result in significant degradation of water quality in New Zealand, and will place New Zealand (depending on the attribute band for nitrate toxicity) within the 8 worst rivers in the OECD countries for water quality (note this is based on a nitrate toxicity attribute of 3.8 mg/L which is less than the proposed national bottom line median of 6.9

mg/L). Achieving the limits proposed for band B will degrade the waterbody to a worse state with respect to nitrate than that found in either the Yangtzee River in China or the Mississippi River in the USA according to OECD figures (Figure 2).
Currently, even the median nitrate concentration in the Waikato and Manawatu are 0.355 mg/L (Waikato River at Huntly) and 0.559 mg/L respectively (Manawatu River at Palmerston North). Only Canterbury spring-fed streams (1.8 mg/L) and the inflow streams to Lake Rotorua (0.670 - 1.4 mg/L) have nitrate concentrations close to the NOF proposed N toxicity attributes for bands A and B. The narrative attributes states for these bands considers them to provide for healthy to slightly impacted systems, however we know that these sites have significantly compromised ecosystem health and require rehabilitation.

Although we understand the eco-toxicological rationale underpinning the derivation of numeric attributes for toxicity we fail to see how a nitrate toxicity attribute will safeguard ecosystem health from the more pervasive and likely effects of eutrophication from nitrogen and phosphorus in rivers.

Eutrophication associated with nitrogen and phosphorus pollution is undoubtedly one of the major threats to the associated values of ecosystem health and life supporting capacity in New Zealand freshwaters. In the case of nitrogen, dissolved nutrients can cause severe eutrophication problems at concentrations that are far lower than those necessary for toxic effects. The overwhelming consensus of both international and national policy guidance that is published in the peer reviewed literature is that both nitrogen and phosphorus pollution need to be controlled to mitigate the adverse ecological effects of eutrophication, particularly in catchments that are upstream of sensitive receiving coastal waters.

Relying solely on nitrate nitrogen and ammonia (toxicity) as the key nutrient numeric attributes in rivers risks sending the message that nitrogenous contaminants are able to be increased up to toxic levels without adverse effects on Ecosystem Health either in rivers or the downstream ecosystems (i.e. lakes, estuaries and coastal waters) that receive loads of river contaminants.
At its heart, this example about the choice of nitrate numerics at toxicity is a reflection of a poor choice of indicator to define an appropriate degree of life supporting capacity. Life supporting capacity is not defined by an absence of death. Indeed, the proposed 'C' band lower threshold does not actually specify the avoidance of death in any case, since at that threshold there is an expected, albeit conservative, effect on the most sensitive 20% of aquatic species. This still risks the life supporting capacity of the most sensitive species being seriously compromised. We believe that whilst the research into chronic nitrate toxicity is helpful for freshwater management, its choice as a numeric indicator is inappropriate and poses considerable risk to the freshwater environment. Unless better and more sensitive thresholds for the effects of nitrate as a nutrient are introduced, reference to nitrate at toxicity should be removed.

Fish are an extremely important ecological component of freshwaters in New Zealand and they have immense recreational, commercial, customary, and conservation relevance. The viability of nationally popular activities such as trout-fishing, whitebaiting and eeling and the preservation of endemic nationally critical fish, are reliant on maintaining healthy functioning aquatic ecosystems with intact connectivity. As such, the inclusion of ecological indicators for species with long lifespans is essential for effectively evaluating the 'health' of the nation's waterbodies and managing their functional components in the long-term.

Fish communities provide excellent measures of overall ecosystem health and state because the species comprising the fish community are sensitive to changes in water quality, river flows and habitat. They are relatively long-lived and so integrate changes over many years. They also integrate changes occurring at lower trophic levels (i.e. periphyton and invertebrates) and at smaller spatial scales. The status of fish communities in rivers is also of great interest to the public and especially to iwi.
We note that fish are valued both for their intrinsic and biodiversity values, their cultural values and in relation to their productivity for harvest or utilisation. All of these aspects should be incorporated into any measure of the suitability of aquatic environments to support thriving fish populations. [ND]

Fish are highly mobile and species distributions vary within and between rivers and lakes such that meaningful measures of their status as indicators of ecosystem health will be required over large spatial scales. For most freshwater fish species in New Zealand, river catchments (headwaters to the sea) are islands within a terrestrial landscape and are therefore the appropriate ecosystem scale within which differences in fish community state (as measures of ecosystem health) can be sensibly compared. Migratory fish are an important ecological attribute to assess catchment connectivity; we recommend the development of a fish indicator to be included in any future review of the NOF.

With 67% of our native freshwater species classified as endangered, we have a long way to go before we can start seeing improvements in our waterways and ecosystems. The NPS as it stands is a far cry from effective freshwater management.

Thank you for considering our submission.

Thuy Pham