Regulatory Impact Statement: Amendments to the National Policy Statement for Freshwater Management 2014

Agency Disclosure Statement

This Regulatory Impact Statement has been prepared by the Water Directorate, a joint-directorate of the Ministry for the Environment and the Ministry for Primary Industries.

It provides an analysis of options to address issues that have arisen, or have the potential to arise, in the implementation of the National Policy Statement for Freshwater Management 2014.

The analysis for this regulatory impact statement has been informed by public consultation on *Next steps for fresh water* released in February 2016 and on *Clean Water* which sought feedback on specific proposed amendments in March-May 2017. It accompanies the proposed amendments to the National Policy Statement for Freshwater Management, the RMA section 32 evaluation of those amendments, and the RMA section 52 report with recommendations on submissions to the proposed amendments.

In an effort to achieve workable solutions, government officials worked with the Iwi Advisors Group, the Land and Water Forum and sought advice from technical experts.

The Land and Water Forum were asked by the Government to provide their views on the management of nitrogen and phosphorus in rivers, the use of macroinvertebrates in measuring stream health, and the public aspiration for swimming. Their recommendations were analysed along with other options to address the problems.

The proposal with the highest potential impacts is to amend the Freshwater NPS to require rivers and lakes to be improved over time so that they become more suitable for swimming more often. Three attempts at putting a cost impact on this proposal revealed that any estimates would be speculative and not reliable. While estimating the costs of improving water quality in terms of its suitability for swimming have proven very difficult, there are no benefits from deferring action to address poor water quality.

Martin Workman, Director Water Directorate *26 July 2017*

Executive summary

The National Policy Statement for Freshwater Management (Freshwater NPS) provides national direction on freshwater management under the Resource Management Act 1991 (RMA). It was introduced in 2011 and amended in 2014. Section 67 of the RMA requires regional councils[1] to give effect to national policy statements in their regional plans. Regional plans, which are also prepared under the RMA, provide the regulatory framework (objectives, policies and rules) for resource use.

The impacts of giving effect to the Freshwater NPS will depend to some extent on the objectives, policies and rules councils adopt in their regional plans and the extent to which those measures require resource users to change their practices and over what time. Regional councils must have fully implemented the Freshwater NPS by 2030, but the timeframe for them to achieve any objectives they set is given in their regional plans. That is, they may set a 20 or 30 year timeframe to improve water quality or reduce water abstractions if that is determined through their regional plan development process.

Major stakeholders in freshwater use and freshwater management, including Iwi/hapū and the Land and Water Forum,[2] have expressed concern that regional councils are not giving effect to the Freshwater NPS as intended or are not properly reflecting community aspirations in freshwater management.

Continuing with the status quo risks potentially inconsistent or ineffective approaches to freshwater management, in particular in relation to giving effect to Te Mana o te Wai in freshwater management, and providing for the public's aspiration for swimmable lakes and rivers.

The preferred option is to amend the Freshwater NPS by

a. Rewriting the statement of national significance so that it explains the meaning and intent of Te Mana o te Wai;

b. Adding more direction about how to apply Te Mana o te Wai in the management of fresh water;

c. Direct improvement to all freshwater management units in terms of 'primary contact', unless natural processes prevent waterbodies from improving further;

d. Require regional councils to identify 'primary contact sites' and improve these for primary contact (in addition to the 'fourth order' rivers and lakes as proposed);

e. Include the Government target for swimmable rivers and lakes in an appendix and require councils to work towards achieving the Government target;

[1] For the purposes of this document 'regional councils' includes unitary councils, which have the functions of both regional councils and city/district councils.

[2] The Land and Water Forum is a collaborative stakeholder group convened in 2009 to advise the Government on freshwater management reform. Its membership includes iwi/hapū, environmental interest groups, the primary sector, freshwater scientists, hydroelectricity generators and local government.

f. Require regional councils to develop regional targets that contribute to achieving the Government target, making a draft available to the public by the end of 2017, and a final regional target by the end of 2018;

g. Require regional councils to report on improvements at five year intervals, consistent with environmental reporting required under the RMA;

h. Include the detailed *E. coli* attribute table in Appendix 2, and change the narrative attribute states in the table to reflect risk in a way that is able to be understood by the public;

i. Require surveillance *E. coli* monitoring only in 'primary contact sites' identified in regional plans and make the requirement consistent with the 2003 guidelines, but allow some flexibility for when some sampling is not practical.

j. Clarifying the meaning of "maintaining" water quality;

k. Clarifying that the lake attributes for nutrients apply to coastal lakes that intermittently open to the sea;

l. Clarifying when regional councils may adopt freshwater objectives for freshwater management units affected by infrastructure;

m. Clarifying how regional councils are to manage nutrients in rivers in order to achieve freshwater objectives for periphyton while recognising sensitive downstream environments;

n. Requiring regional councils to monitor macroinvertebrates and indigenous flora and fauna as measures of ecosystem health, and requiring them to use the macroinvertebrate community index to as a reporting measure;

o. Clarifying that regional councils must consider economic wellbeing when setting freshwater objectives and limits;

p. Some consequential amendments arising from these amendments.

The main impact of these amendments will arise from amendments to address concerns about the quality of water for swimming. Other amendments largely clarify the intent of the existing policies.

The cost of improving water quality for swimming will differ between rural and urban catchments because of the different pressures on water quality. Costs in rural catchments will arise from fencing stock out of waterways, planting riparian buffers, and upgrading stock and sewage effluent treatment systems. Costs in urban catchments will arise from improving stormwater and wastewater infrastructure.

The proposed amendments have been informed and refined by public consultation in March-April 2016 (Next steps) and March-April 2107 (Clean Water).

Government agencies were consulted on the detail of the proposed amendments. The public provided feedback on all the proposals consulted on in the discussion document and a report of recommendations on those submissions has been prepared for the Minister. If the amendments are adopted, the Government will provide a comprehensive package of guidance, workshops and technical support to councils to assist them with the implementation of the amended Freshwater NPS.

Contents

Status quo and problem definition

1. National direction on freshwater management is primarily provided through the National Policy Statement for Freshwater Management 2014 (Freshwater NPS), a national policy statement prepared under the Resource Management Act 1991. The Freshwater NPS came into effect in 2011 and was amended in 2014. It sets out objectives and policies that regional councils must give effect to in their regional plans. Councils must fully implement the objectives and policies of the Freshwater NPS by 2030.

2. The Freshwater NPS requires regional plans to have objectives, policies and methods, including rules, that:

   a. Safeguard the life-supporting capacity, ecosystem processes and indigenous species of fresh water, including their associated ecosystems.

   b. Establish systems to account for all freshwater taken and contaminants entering freshwater bodies in the region.

   c. Maintain or improve the overall quality of fresh water within the region.

   d. Identify the values[3] the community holds for all freshwater bodies in the region, and set freshwater objectives[4] and limits[5] to provide for those values.

   e. Establish systems to monitor the progress towards achieving freshwater objectives.

   f. Avoid over-allocation[6] of freshwater resources, and phase out existing over-allocation. Where there is over-allocation, councils must set targets in the regional plan, including defined timeframes, to transition to sustainable allocation.

   g. Improve the integrated management of fresh water, land and the coastal environment.

   h. Reflect tāngata whenua values in freshwater management and take reasonable steps to include iwi and hapū in freshwater management.

Implementation of the Freshwater NPS

3. Since 2011 all regional councils have started processes to give effect to the Freshwater NPS in their regional plans. Implementation by all councils is expected to be complete by 2028.[7]

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[3] Regional councils must set objectives for the two compulsory values – ecosystem health and human health for recreation – in all freshwater bodies, and must consider another 11 national values such as fishing and hydro-electric power generation, as well as any regional or local values.

[4] Freshwater objectives are expressed using attributes, e.g. *E.coli*. Some attributes for the two compulsory values (with national bottom lines) are provided in Appendix 2 of the Freshwater NPS. Councils cannot set a freshwater objective below a national bottom line except in specified circumstances.

[5] Limits are the maximum amount of resource use available to meet freshwater objectives.

[6] Over-allocation refers both to quantity, i.e. too much water is extracted from a water body, and quality, i.e. too many contaminants are entering a water body.

[7] Based on the progressive implementation programmes of each council, which can be accessed at: http://www.mfe.govt.nz/fresh-water/national-policy-statement/regional-councils-implementation-programmes

4. The procedural costs of implementing the Freshwater NPS are largely borne by regional councils, with tāngata whenua, water users and other stakeholders bearing their own costs of participating in the plan development process. The costs generated by the methods, including regional rules, which councils adopt to give effect to the Freshwater NPS, fall on resource users and ratepayers.

5. The introduction of the national objectives framework in 2014 went some way to standardising approaches to setting freshwater objectives (by requiring councils to use specified attributes for nutrients and human health risks), but regional councils still have discretion about how strict the objectives may be, the timeframes within which they are to be achieved, and the activities they apply to (for example, nutrients from direct discharges or overland runoff).

6. The regulatory impact analysis accompanying the proposed amendments to the 2011 Freshwater NPS forecast that Freshwater NPS implementation would have a medium impact on regional councils, costing them each between $2 million and $100 million to implement.[8] Actual costs will depend on the size of the region, the scale of issues affecting freshwater resources in the region, and the timeframe chosen for implementation. Costs may be higher than those estimated in 2014 because of some ambiguities and uncertainties in the Freshwater NPS.

7. Uncertainty in the interpretation of the Freshwater NPS increases the likelihood of costly court appeals. These costs might fall largely on a few "fast adopting" councils or be spread across many councils if they are each facing similar arguments about their interpretations of Freshwater NPS objectives or policies.

8. The varied approaches to implementing the Freshwater NPS makes the participation costs borne by iwi and hapū and stakeholders equally difficult to ascertain.

Issues emerging with implementation

9. The review of implementation of the Freshwater NPS found that

> "A significant degree of uncertainty still exists about terms and concepts in the NPS-FM, in particular, the meaning of Te Mana o Te Wai and its linkage to the implementation of freshwater policy, water quality limits, what constitutes an accounting system, and how to measure if water quality is being 'maintained or improved' across a region. These interpretation challenges can slow progress and lead to inconsistent approaches as their meaning is debated in collaborative groups and at hearings around the country." [9]

10. Feedback and consultation with tāngata whenua and stakeholders, including the Land and Water Forum,[10] indicates that there is a level of dissatisfaction with the way that

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[8] Ministry for the Environment (2014). Regulatory impact statement: National Policy Statement for Freshwater Management 2014: http://www.mfe.govt.nz/more/cabinet-papers-and-related-material-search/regulatory-impact-statements/national-policy

[9] Ministry for the Environment (2017). National Policy Statement for Freshwater Management Implementation Review, page 61.

[10] The Land and Water Forum is an independent forum of industry groups, environmental and recreational NGOs, iwi, scientists, and other organisations with a stake in freshwater and land management. The forum has produced four reports with recommendations on to the Government on land and water management

regional councils are giving effect to the Freshwater NPS. Some felt that councils are not applying the policies as was intended, and that councils are not properly reflecting community aspirations in freshwater management. Regional councils have found the Freshwater NPS does not provide clear enough direction on some matters.

11. Specific areas of concern are:

    a. The meaning of Te Mana o te Wai is unclear and the statement of national significance appears to be having no effect in freshwater management.

    b. The requirement that the "overall quality of fresh water in a region is maintained or improved" is being applied in various ways.

    c. The public's desire for swimmable fresh water is not being recognised in regional plans.

    d. Councils are taking different approaches to applying the lake water quality attributes and national bottom lines to coastal lakes and lagoons.

    e. Infrastructure owners believe they are operating in an uncertain regulatory environment in relation to meeting national bottom lines in water bodies affected by some of their infrastructure.

    f. Communities are concerned that councils are not explicitly managing both nitrogen and phosphorus when setting objectives for periphyton in rivers.

    g. Communities are concerned that councils are not taking a consistent approach to measuring the compulsory value of ecosystem health.

    h. Economic wellbeing may not be adequately considered in freshwater planning decisions (despite existing Freshwater NPS and RMA requirements).

12. The evidence for some of these issues is limited, and not all issues are matters that, on their own, would warrant intervention. Nevertheless, failing to address some or all of these issues could undermine public confidence that the Freshwater NPS provides an effective freshwater management framework that safeguards ecosystem health and appropriately recognises the social, cultural and economic values of communities.

13. The analyses of options to address the problems have been made on the assumption that regional councils will give full effect to the provisions of the Freshwater NPS. If a regional council fails to properly give effect to a national policy statement in its regional plans, the RMA provides these intervention options to the Minister for the Environment:

    a. Ministerial consultation and submissions on plan changes;

    b. Ministerial power to investigate the performance by a local authority of any of its duties under the RMA;

    c. Ministerial power to direct a review of a regional plan;

    d. Ministerial power to make regulations to prescribe the form, content, and conditions of water permits and discharge permits; and

    e. For matters of national significance under Part 6AA of the RMA, ministerial power to appoint project coordinators or commissioners to assist the council or a hearing panel.

14. These are significant and often costly interventions that would not provide an effective freshwater management framework that reflects community aspirations.

15. The use of legislative reform or establishing new policy instruments (such as a national regulation for water quality monitoring) were rejected as a means to address the problems identified because they could result in a piecemeal approach to national direction and create unnecessary confusion for councils and communities.

Relevant decisions already made

16. In 2015, the Government confirmed five 'bottom lines' to guide the development of options for further freshwater reform and addressing iwi/hapū rights and interests.[11] These are:

    a. no one owns fresh water, including the Crown;

    b. there will be no generic share of freshwater resources provided for iwi;

    c. there will be no national settlement of iwi/hapū claims to freshwater resources;

    d. freshwater resources need to be managed locally on a catchment-by-catchment basis within the national freshwater management framework; and

    e. the next stage of freshwater reform will include national-level tools to provide for iwi/hapū rights and interests.

Objective

17. To address the issues described above within the constraints of the decisions already made, the objective of any reform is as follows:

    The Freshwater NPS provides an effective freshwater management framework that safeguards ecosystem health and can provide for the social, cultural and economic values of communities.

Consultation

18. In February 2016, the Government released *Next steps for fresh water* (*Next steps*), a consultation document.[12] *Next steps* outlined five issues of concern in the Freshwater NPS. The Government said it would:

    a. Provide further meaning and context of Te Mana o te Wai and explicitly require regional councils to give effect to it while implementing all relevant policies of the Freshwater NPS;

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[11] Cabinet paper 14-C-02011: http://www.mfe.govt.nz/sites/default/files/media/Legislation/Cabinet%20paper/freshwater-reform-next-steps-and-waitangi-discussions.pdf

[12] *Next steps for fresh water*: http://www.mfe.govt.nz/publications/fresh-water/next-steps-fresh-water-consultation-document

b. Amend Objective A2 so regional councils would be required to maintain or improve overall water quality across a freshwater management unit rather than within their region;

c. Require regional councils to monitor macroinvertebrates as a mandatory method of monitoring freshwater ecosystem health;

d. Address the impact of national bottom lines on infrastructure; and

e. Apply water quality lake attributes and national bottom lines to coastal lakes and lagoons.

19. Public consultation on these proposals took place over two months (March-April). About 1050 people attended a series of meetings and hui held throughout the country during that time. There were 3,966 written submissions, representing the views of 6,342 people.[13]

20. Additionally, in early 2016 the Government asked the Land and Water Forum to consider how the Freshwater NPS could address:

a. Nitrogen as a nutrient

b. Monitoring macroinvertebrates

c. The public aspiration for swimming

21. One further issue relating to the inadequate provision for economic wellbeing was not proposed in *Next steps*, nor considered in-depth by the Land and Water Forum. Instead the Minister undertook targeted consultation with key stakeholders and relevant iwi authorities in mid-2016.

22. In February 2017 the Government released *Clean Water*, its consultation package on fresh water proposals. As part of that package, a suite of amendments were proposed to the National Policy Statement for Freshwater Management.[14]

23. There were 684 unique submissions, including a summary report from ActionStation representing the views of 1,787 individuals, and 6,586 template submissions based on three separate campaigns by the Green Party of Aotearoa New Zealand, Forest & Bird and Greenpeace. Submissions included comments and views on the stock exclusion regulations that were proposed alongside changes to the NPS as part of the *Clean Water* package.

24. The views expressed in consultation on each topic are provided in each of the subsections below. A report and recommendations on the submissions will be made publicly available when any amendments to the Freshwater NPS are made.[15]

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[13] See a summary of the outcomes of that consultation here: www.mfe.govt.nz/publications/fresh-water/next-steps-fresh-water-summary-submissions

[14] Ministry for the Environment (2017). Clean Water, available at www.mfe.govt.nz/publications/fresh-water/clean-water-90-of-rivers-and-lakes-swimmable-2040

[15] Submissions report and recommendations on the proposed amendments to the National Policy Statement for Freshwater Management 2014

Options and impact analysis

Te Mana o te Wai

Status quo

25. Te Mana o te Wai is the integrated and holistic health and well-being of a water body. IN 2014, the Government introduced the concept of the national significance of Te Mana o te Wai in freshwater management in the preamble and in the statement of national significance at the start of the of the Freshwater NPS. The statement reads:

> *"This National Policy Statement for Freshwater Management is about recognising the national significance of fresh water for all New Zealanders and Te Mana o te Wai" and "A range of community and tāngata whenua values, including those identified as appropriate from Appendix 1, may collectively recognise the national significance of fresh water and Te Mana o te Wai. The aggregation of community and tāngata whenua values and the ability of fresh water to provide for them over time recognises the national significance of fresh water and Te Mana o te Wai".*

26. The policy intent is that when Te Mana o te Wai is given effect in freshwater management, the health and wellbeing of the water is able to sustain the full range of social, cultural and economic values held by iwi and the community.

27. The review of implementation of the Freshwater NPS found that "A significant degree of uncertainty still exists about terms and concepts in the NPS-FM, in particular, the meaning of Te Mana o Te Wai and its linkage to the implementation of freshwater policy, water quality limits, what constitutes an accounting system". [16]

Problem statement

28. Councils, iwi and hapū and interested stakeholders believe the meaning of Te Mana o te Wai is unclear, and the direction provided to councils is uncertain. In particular

- The statement of national significance has no weight;
- The policy intent is not clear; and
- Councils do not know what is expected of them when giving effect to this statement in their regional plans.

Options

Option A: Guidance

29. Guidance could:

a. outline the best practice approach to incorporating Te Mana o te Wai in freshwater management; and

[16] Ministry for the Environment (2017). National Policy Statement for Freshwater Management Implementation Review, page 61.

b. describe and explain the meaning of Te Mana o te Wai, and how councils can work with communities and iwi and hapū to give expression to Te Mana o te Wai in their regions.

Option B: Amend the Freshwater NPS

30. Possible amendments:

    a. Rewrite the statement of national significance so that it explains the meaning and intent of Te Mana o te Wai;

    b. Add a new objective and policy directing councils how to apply Te Mana o te Wai in the management of fresh water (or include direction about Te Mana o te Wai throughout the existing objectives and policies the Freshwater NPS);

    c. Increase the direction for integrated management in terms of 'mountains to the sea'

    d. Make clear links between relevant national values in Appendix 1 of the Freshwater NPS and Te Mana o te Wai by associating some values as appropriate with te hauora o te wai (health of the water), te hauora o te taiao (health of the environment), and te hauora o te tangata (health of the people);

    e. amend the descriptions of the values "human health for recreation" and "natural form and character" so that they are better aligned with Te Mana o te Wai.

Option C: Amend the Freshwater NPS

31. Amendments as per Option B, but without any links between relevant national values in Appendix 1 of the Freshwater NPS and Te Mana o te Wai.

Impacts

Option A: Guidance

32. Guidance should reduce uncertainties and help create a common understanding of the meaning of Te Mana o Te Wai and its connection and intended effect on the implementation of freshwater policy. The lack of legal weight of guidance means that its use is discretionary and the best practice guidelines will not necessarily be used. This could mean that some councils or communities may debate how Te Mana o te Wai is to be applied in their regions or neighbourhoods, leading to litigation with associated costs.

33. Costs associated with the development of guidance will fall to the Government, as well as to councils and iwi/hapū involved in its development. Guidance will be required to support any amendments to the Freshwater NPS so these costs would be incurred with or without amendments.

Options B and C - amend the Freshwater NPS

34. Amending the Freshwater NPS would build on the existing approach – to base freshwater objective setting on community discussions about the values held for the water. For this reason, amendments should reduce uncertainty costs for regional councils and stakeholders and should not impose new impacts.

35. There is a risk that providing clear links between some values (those that are instream) and not others (the use values that take, dam or divert water from the water body) may be perceived as elevating the instream values over the other non-compulsory values.

This may lead to litigation, or in an extreme situation, could lead to water not being made available for those extractive uses. This could oblige those users to seek water from elsewhere, or go without, with associated costs.

36. The amendments should not present significant litigation risks if the amendments are well integrated with the existing policies and objectives by being clear that, while Te Mana o te Wai puts the health and wellbeing of fresh water first, the objective setting process must be based on all values held by the community.

37. The amendments proposed as Option C will mitigate the risk that the status of values associated with Te Mana o te Wai in Appendix 1 are elevated above those that are not. However, this option will decrease the direction provided to councils on the implementation of Te Mana o te Wai. This may increase the debate about how Te Mana o te Wai is to be applied, increasing litigation.

Effectiveness

38. Guidance on its own is has no regulatory weight so councils may choose not to improve on the status quo. This may mean that Te Mana o te Wai is not made an integral part of freshwater management. This is not likely because the existing uncertainties faced by councils mean the uptake of guidance is likely to be high.

39. Amending the Freshwater NPS improves the existing statutory direction to councils to manage the water body so that it can sustain the social, cultural and economic values held by the community, including iwi/hapū. New specific policy direction would direct councils to consider and recognise Te Mana o te Wai in freshwater management. Associating some of the national values listed in Appendix 1 as appropriate with one of the three healths (Option B) would help councils understand what Te Mana o te Wai means in practice.

40. The amendments proposed as Option B would provide councils and communities with clear direction about what is meant by integrating the health and wellbeing of a water body in discussions and decisions about fresh water (as outlined in *Clean Water*). Providing direction in a national policy statement promotes the sustainable management of natural resources (as required by the purpose of the RMA) while adding valuable national direction to make Te Mana o te Wai an integral part of freshwater management.

41. The amendments proposed as Option C would have no link between Te Mana o te Wai and the values listed in Appendix 1, reducing the direction provided to councils on the meaning of Te Man o te Wai and its linkages to the implementation of freshwater policy.

Consultation

42. There were two stages of consultation on addressing the issues arising with the 2014 Freshwater NPS. In early 2016, *Next steps* outlined a possible new statement of national significance to provide context about the meaning of Te Mana o te Wai and its status as the underpinning platform for community discussions on freshwater management, and proposed that councils reflect Te Mana o te Wai in the implementation of the Freshwater NPS.

43. Feedback on these proposals was generally positive (except that a significant number of individuals interpreted Te Mana o te Wai as being Māori-centric whereas it intended to be water-centric). A common observation by those in support was that council engagement with iwi and hapū is necessary to ensure that Te Mana o te Wai is implemented in a way that is meaningful to the whole community and is used in discussions about freshwater management.

44. Officials and the Iwi Advisors Group[17] then developed the *Next steps* proposals into a suite of proposed amendments that were consulted on in the *Clean Water* package in early 2017 (Option B).

45. There was unanimous support for providing context and meaning to Te Mana o te Wai. The inclusion of Mātauranga Māori in Policy CB1(aa)(v) and the reference to Ki uta ki tai in Policy C1(b) were supported.

46. There was strong support for the other amendments as drafted, with the exception of some hydro-electric power generators and some in the primary sector who were concerned about the association of some national values in Appendix 1 with te hauora o te wai (health of the water), te hauora o te taiao (health of the environment), and te hauora o te tangata (health of the people). Their concern was that the association of some values and not others created a hierarchy not envisaged from earlier consultation and would prioritise environmental values above use values (water supply, animal drinking water, irrigation and food production, hydro-electric power generation, commercial and industrial use) which are listed separately as “extractive uses”. This concern was not expressed by councils, who indicated that the amendments as drafted (Option B) were useful in directing the implementation of Te Mana o te Wai.

Conclusions and recommendations

47. Associating values as appropriate with te hauora o te wai (health of the water), te hauora o te taiao (health of the environment), and te hauora o te tangata (health of the people) (Option B) will help councils understand how Te Mana o te Wai links to freshwater policy and what is expected of them when giving effect to the Freshwater NPS in their regional plans. Nevertheless, the perceived hierarchy of this association could influence community choices in objective- setting in a way that gives insufficient consideration to use values.

48. Guidance about applying Te Mana o te Wai in freshwater management will be prepared during 2018. This can be used to provide the help to councils in understanding what applying Te Mana o te Wai means in practice, and can address in more detail how all values are associated with Te Mana o te Wai.

Recommendation: Choose Option C.

[17] A group of technical experts who advise the Freshwater Iwi Leaders Group

Overall water quality is maintained or improved

Status quo

49. Objective A2 of the Freshwater NPS directs regional councils to maintain or improve the overall water quality in their region. Objective A2 has been in the Freshwater NPS since 2011 and was not amended in 2014 when the national objectives framework was introduced.

50. The national objectives framework requires regional councils to identify freshwater management units that include all water bodies in their region. Regional councils must manage freshwater resources at the freshwater management unit scale. A freshwater management unit can comprise a water body, part of a water body, groups of water bodies or any combination of these. To date, councils have generally set freshwater management units at catchment or sub-catchment level, though collections of small coastal catchments have also been grouped into a freshwater management unit.

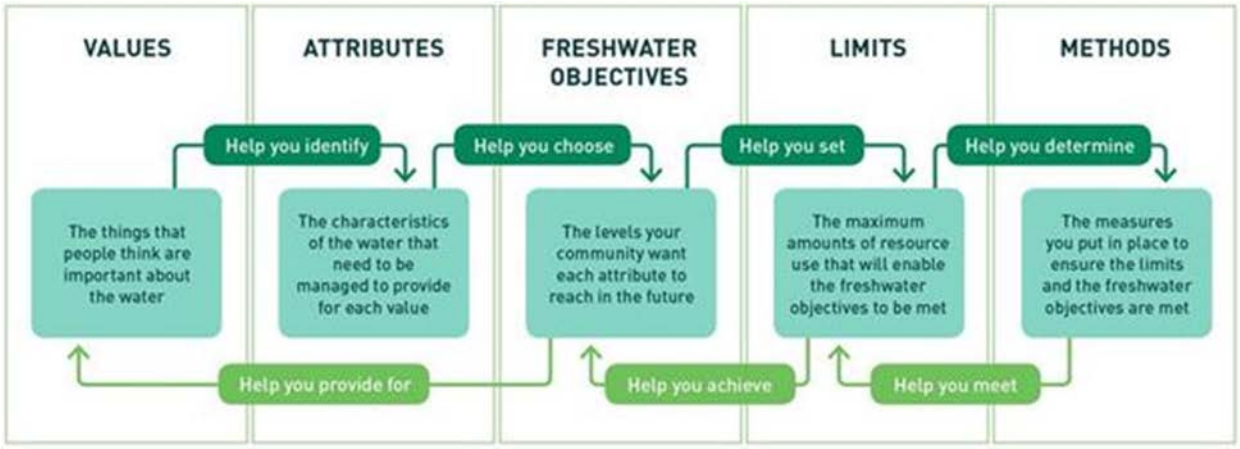
51. Within each freshwater management unit, councils are required to:

    a. identify the values the community holds for the water body or bodies in the freshwater management unit;[18]

    b. establish freshwater objectives (the intended state of the water body or bodies) to provide for those values using specified attributes,[19] or if no relevant attribute is identified in the Freshwater NPS, using an attribute the council considers appropriate; and

    c. establish limits on resource use to ensure the freshwater objectives are met.

52. This process is illustrated in the diagram below:



53. By allowing water quality to be maintained or improved across a region, Objective A2 provides councils and their communities with some flexibility in the freshwater objectives and limits they choose in their region. The main concern with this is that councils and communities are uncertain about whether water quality must be

[18] This must include the two compulsory values – ecosystem health and human health for recreation.

[19] There are nine attributes described in Appendix 2 of the Freshwater NPS for the two compulsory values. The attribute state ranges from an A band, which describes natural or near natural state, through to D band, which describes an unacceptable state.

maintained at an exact attribute state when this was not an eventuality that was envisaged when Objective A2 was first adopted (because attributes were not included in the Freshwater NPS until the national objectives framework was added in 2014).

54. Another consequence of the current wording of Objective A2 is that one area may be allowed to degrade if another area is improved. Communities are concerned that water bodies significantly distant from each other (such as the Ruamahanga River in Wairarapa and the Otaki River in Kapiti) could be traded off against each other simply because they are in the same region.

55. To date, no regional council has decided to trade-off water quality across a region – they are all operating at the freshwater management unit scale. The main problem is the various approaches that can be taken to give effect the meaning of "maintain".

56. The review of implementation of the Freshwater NPS found that "[t]here is still a significant degree of uncertainty around some terms and concepts in the NPS-FM, in particular…how to measure if water quality is being "maintained or improved" across a region. These interpretation challenges can slow progress and can lead to inconsistent approaches as their meaning is debated in collaborative groups and at hearings around the country." [20]

Problem Statement

57. Councils may interpret the requirement in Objective A2 to "maintain" inconsistently and potentially allow for inappropriate spatial trade-offs in water quality.

Options

Option A: Guidance

58. In June 2016 the Ministry for the Environment published guidance with general direction on matters councils could take into account when identifying freshwater management units.[21] Further guidance could be produced outlining circumstances when it may be appropriate to trade off water quality within a region across multiple freshwater management units, and to provide a Government position about the meaning of 'maintain'.

Option B: Amend the Freshwater NPS

59. Potential amendments are:

    a. Require water quality to be maintained

        i) Within a catchment, rather than within a region; or

        ii) Within a freshwater management unit, rather than within a region.

    b. Define 'maintain' to mean freshwater objectives must be set

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[20] Ministry for the Environment (2017). *National Policy Statement for Freshwater Management Implementation Review*

[21] Ministry for the Environment (2016), *A guide to identifying freshwater management units under the National Policy Statement for Freshwater Management 2014*.

i) at the current state within the attribute band;

ii) so that water quality must not degrade more than a certain percentage of the current state;

iii) so that identified values will not be worse off when compared to existing water quality;

iv) within the same attribute band as existing water quality.

60. Amendments may comprise any combination of these options.

Impacts

61. Option A would provide some direction to councils and communities about government expectations when trading off water quality decisions within a region. There is likely to be no reduction in costs to councils or communities because councils may still be under pressure to trade off water quality around the region from some sectors, or to maintain water quality at exactly the same state everywhere by others.

62. Option B (a)(i) would entail an increase in monitoring requirements and costs because councils would need to find representative monitoring sites in every catchment for every attribute, rather than in every freshwater management unit as is the status quo and the approach in Option B (a)(ii).

63. The options in Option B to define ‘maintain’ would reduce the discretion councils can exercise in giving effect to Objective A2. Costs associated with the uncertainty caused by the current drafting are likely to be reduced.

64. Being required to maintain water quality at its current state within a band (Option B (b)(i)), would remove the flexibility available to councils to allow development within limits in a freshwater management unit. This may present opportunity costs to potential resource users.

65. A values based approach to defining ‘maintain’ (Option B (b)(iii)) would require sound technical evidence to support choices (i.e. to assess whether a value will be worse off given a set of freshwater objectives), and require additional council resources.

66. The bands test (Option B (b)(iv)) is likely to have lower impacts than the proportional approach (Option B (b)(ii)) because it provides clear boundaries on the meaning of “maintain”. This is because each band threshold has been determined according to state change of the water body. Also, many of the attributes do not follow a linear distribution from D up to A so a proportional approach could be difficult for councils to work with.

Effectiveness

67. Option A would provide some direction to councils and communities about government expectations when trading off water quality decisions within a region but this would not address the concern communities have that such trade-offs should not be allowed across that scale. Given the public dissatisfaction with trading off water quality across a region the litigation risk for councils would remain high. Relying on guidance about the meaning of “maintain” would still leave risks of litigation.

68. Option B (a)(i) is not consistent with the existing freshwater management approach required for setting objectives and limits for a freshwater management unit and so may not provide an effective means of setting objectives according to the social, cultural and economic wellbeing of the affected communities.

69. Options B (a)(ii), (b)(iii) and (b)(iv) in combination would provide clear direction that any trade-offs in water quality can only be made within a freshwater management unit. It also defines how much variation in water quality there can be within that freshwater management unit. This means that discussions about variations in water quality will be undertaken within the community whose social, cultural and economic wellbeing would be affected by the objective.

70. The 'bands test' is a pragmatic approach designed to better relate to the conditions of rivers and lakes, where attribute states vary regularly, depending on factors such as flow/level or climate.

Consultation

71. *Next steps* outlined options (a)(ii), (b)(ii) and (b)(iii) of Option B. Amendments were then proposed in *Clean Water*, taking this approach.

72. Feedback to the *Clean Water* consultation was largely the same as for *Next steps*. There was broad support for requiring overall water quality to be at least maintained at the freshwater management unit scale.

73. There was some support for using the bands to provide some flexibility (including from the Land and Water Forum and the Parliamentary Commissioner for the Environment), although some submitters (including NIWA and the Freshwater Sciences Society) were concerned that the large size of the bands means this approach allows degradation in water quality. This risk is highest if current water quality is near the top of a band. The only safeguard to prevent this happening is public feedback during the objective setting process.

74. Those who opposed this proposal generally wanted water quality at least maintained at its current state, and were opposed to any level of flexibility.

Conclusions and recommendations

75. The amendments proposed as options (a)(ii), (b)(iii) and (b)(iv) of Option B are the most effective means to address the problem because they provide clear direction about the meaning of 'maintain' with the lowest impacts. This approach was supported in consultation.

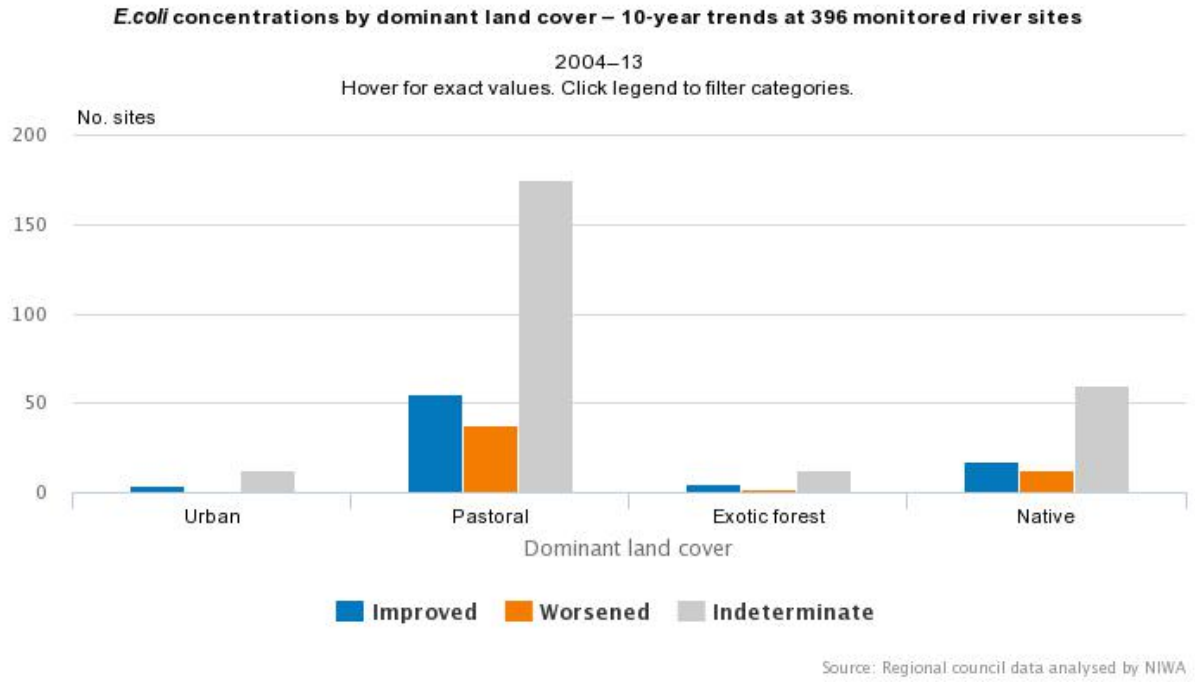
Recommendation: Choose options (a)(ii), (b)(ii) and (b)(iv) of Option B.

Suitability of lakes and rivers for swimming

Status quo

Existing water quality

76. Analysis of *E. coli* (an indicator of risk to human health) data is presented on the Department of Statistics website.[22] The analysis shows that the streams dominated by urban land cover have the highest *E. coli* levels (median of 440 per 100 ml), while land in pastoral cover has a median level of 189 per 100 ml. The number of rivers with worsening levels of *E. coli* is slightly lower than those where *E. coli* levels have improved, but these sites are far outweighed by the number of sites where there is an indeterminate trend (see the figure below, or go to the website link below to click on legend or hover for exact values).



77. Contact with recreational water was a risk factor in 16.5% of cases of campylobacter in 2015. Campylobacter is New Zealand's most commonly notified disease, comprising 43.5% of all notifications in 2015.Contact with recreational water was a risk factor in 34.6% of Giardiasis cases, and 23.3% of Cryptosporidiosis cases, although these diseases comprise a lower proportion of notified diseases.[23]

78. Public feedback on water reform consultation in 2013 and 2016 revealed that many people see a river's suitability for swimming in binary terms. That is, people seem to think "it is suitable and I won't get sick", or "it is not suitable and I will get sick". In

[22] See http://www.stats.govt.nz/browse_for_stats/environment/environmental-reporting-series/environmental-indicators/Home/Fresh%20water/river-water-quality-bacteria-ecoli.aspx

[23] The Institute of Environmental Science and Research Ltd. *Notifiable Diseases in New Zealand: Annual Report 2015* Porirua, New Zealand. This report is available at www.surv.esr.cri.nz

reality, the levels of *E. coli* in water provide an indication that there is a risk of infection, and the higher the *E. coli* concentrations, the higher the risk.

Existing national direction for water quality in terms of swimming

79. The Freshwater NPS requires councils to safeguard the health of people and communities "at least as affected by 'secondary contact' with fresh water". Human health for recreation is one of two compulsory values in the Freshwater NPS (the other is ecosystem health). Councils must set freshwater objectives in their regional plans for the compulsory values using the attribute tables in Appendix 2 of the Freshwater NPS. There are two attribute tables for the human health for recreation value: *E. coli* and planktonic cyanobacteria. The national bottom line for the *E. coli* attribute is set at a threshold where people are exposed to moderate risk of infection from contact with water during activities with occasional immersion (boating and wading).

80. Objectives must be set above the national bottom line, or at a level that maintains or improves water quality. Despite this, people believe that councils need only aim for rivers and lakes to be of a sufficient quality that protects people's health when boating or wading.

Results of earlier consultation

81. Throughout the consultation on the proposed amendments to the Freshwater NPS in 2013, the national bottom line for the human health for recreation value was the most contentious part of the amendments. Three-quarters of the 725 unique submissions and all 6,426 form submissions commented on setting the compulsory value for human health at the level of secondary contact recreation, with 84% of the unique submissions and all form submissions opposed. The most common request was for the compulsory value to be set at a level that would allow water to be suitable for swimming, with many also asking for fishing, food gathering and some for drinking water quality as a compulsory value.[24]

82. The Government decided that water quality improvements required to achieve a national bottom line set at swimming would be too onerous on the resource users and preferred that the affected communities decide which water bodies should be improved. When the Government sought public feedback on its proposals for fresh water in early 2016, the public again asked that rivers and lakes should be swimmable, rather than wadeable.[25] The issue of swimmable rivers has continued to be of widespread interest across the country and has been widely covered in the media.

Views of Iwi/hapū and the Land and Water Forum

83. In March 2012, the Waitangi Tribunal granted an application for an urgent hearing into a claim about Māori proprietary rights in freshwater bodies. Wai 2358 is about the

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[24] Ministry for the Environment (2014). Report and recommendations on the proposed amendments to the National Policy Statement for Freshwater Management and public submissions. http://www.mfe.govt.nz/publications/fresh-water/report-and-recommendations-proposed-amendments-national-policy-statement

[25] Ministry for the Environment. 2016. Next steps for fresh water: Summary of submissions. www.mfe.govt.nz/publications/fresh-water/next-steps-fresh-water-summary-submissions

Crown's resource management reforms, which the claimants say are happening without a plan to recognise and provide for Māori rights and interests in water.

84. Stage 2 of the inquiry may focus on the following question, as noted by the Tribunal in its June 2015 directions: 'Which reform options need to be implemented and/or adjusted by the Crown in order to ensure that Māori rights and interests in specific water resources, as found by the Tribunal at Stage 1, are not limited to a greater extent than can be justified in terms of the Treaty?'

85. Evidence for the claimants often cites the regional councils' lack of response to their concerns to improve water quality, reduce contamination from sewage and stock effluent. As an example, Ngati Kahungunu said in evidence:[26]

Swim ability to secondary recreation level as a bottom line offers little aspiration and has little correlation to the values of tangata whenua. The significance for tangata whenua in being immersed and 'cleansed' by their awa is far greater than the commonly used western recreational thinking and term 'swimmable'. In effect this is a total disregard and does not provide for the relationship of Maori our culture and traditions with our ancestral waters. Tangata whenua have never knowingly consented to the degradation of the waterways to a point that they are no longer swimmable; it contravenes our spiritual values and section 6e of the Resource Management Act.

86. The Iwi Leaders Group has consistently expressed the view that we should at least aim for lakes and rivers to be suitable for swimming, even as a long-term aspiration.

87. The Land and Water Forum is a collaborative stakeholder group convened in 2009 to advise the Government on freshwater management reform. Its membership includes iwi/hapū, environmental interest groups, the primary sector, freshwater scientists, hydroelectricity generators and local government. In their first report,[27] the Land and Water Forum observed that

Water is also causing disputes – disputes about Water Conservation Orders and water infrastructure development; disputes about the intensification of farming and about run-off; disputes about water infrastructure in cities and towns, its discharges, and how it should be organised and paid for; disputes about who should be involved in its management, including around the role of iwi. Recent attempts to improve our policies for dealing with these problems have not succeeded and New Zealanders have spent a great deal of time fighting one another about them, politically, at hearings and in Courts – and often with sub-optimal outcomes.

88. In 2016, the Forum wrote to the Minister for the Environment and said that they share the public's view that the Freshwater NPS "does not do enough to promote the community value and management of rivers for primary contact".[28] In their view, the Freshwater NPS should include a new compulsory value for primary contact recreation.

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[26] Ngati Kahungunu, September 2016. Wai 2358, D040.pdf, paragraph 13 (b). Available at https://forms.justice.govt.nz/search/Documents/WT/wt_DOC_112512079/Wai%202358%2C%20D040.pdf

[27] Land and Water Forum. 2010. *Report of the Land and Water Forum: A Fresh Start for Fresh Water.* Available at www.landandwater.org.nz/

[28] The Forum's advice is on their website here - www.landandwater.org.nz/includes/download.ashx?ID=146454

Costs of status quo to councils and communities

89. Continuing with the status quo will mean regional councils are highly likely to be debating this issue with various sectors in their communities every time they make changes to their regional plans, imposing litigation costs on them and their communities. Measures to improve water quality have been underway around the country. For example, responding to significant community concerns about the poor state of the Manawatu River, Horizons Regional Council has worked with its communities to improve the water quality of the Manawatu River and its tributaries. With a total investment of $30 million (including $5.2 million of Crown funding), the Manawatu River Leaders oversaw riparian planting, fish habitat restoration, sewage treatment plant upgrades, and community projects. Their goals are for safe, accessible waterways that are returned to a healthy condition and provide for recreation and food sources.[29]

90. Their investment followed around eight years and over $10 million developing the "One Plan" for the region, involving plan preparation, council hearings, and appeals to the Environment and High Courts. While the One Plan covered all resource management in the region, the appeals related largely to water management provisions. One of the issues considered by the Environment Court in 2012 was the effect of activities on surface water quality and, in particular, nutrient runoff from agricultural activities. The decision demonstrated the increased pressure being placed on the agricultural sector to reduce and manage nutrient discharges that affect water quality.[30] As evidenced by the public response to the Government's water reform proposals since 2012, the focus of the pressure to improve water quality has now widened to include contamination that affects human health and the suitability of rivers and lakes for swimming.

Problem Statement

91. Many rivers and lakes (throughout the country and throughout the year) are unsuitable for the range of recreational activities that people want to engage in and there is widespread public concern that this state will continue.

Options

Option A: Guidance

92. Guidance could be developed to describe and explain:

    a. the existing suitability of rivers and lakes for swimming (to give communities a clear understanding of where improvements could be prioritised);

    b. health risks associated with *E. coli* level in rivers and lakes; and

    c. the direction that water quality cannot be degraded to a national bottom line from its current state (because of the direction to "maintain").

93. Guidance is not a feasible option to address the problem because communities have clearly expressed their dissatisfaction with the status quo and guidance does not

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[29] See their website www.manawaturiver.co.nz/

[30] See Adderley Head, Environmental Law specialists: www.adderleyhead.co.nz/updates/2012/november/172

introduce any actual requirements to improve water quality. Explanations about health risks would not address the problem on its own and would be needed to accompany any regulatory change in any case. This option was not analysed further.

Option B: set a Government target for swimmable river and lakes

94. The target would be non-statutory, along the lines of the Government's target for New Zealand to be Predator-Free by 2050. The target could apply to rivers and lakes of a suitable size for swimming.

Option C: Amend the Freshwater NPS

95. The Freshwater NPS could be amended to:

    a. Require councils to improve water quality in terms of its suitability for swimming, directed at either

        i) all rivers and lakes; or

        ii) all rivers and lakes that are of a size where people swim; or

        iii) all freshwater management units.

    b. Replace the *E. coli* attribute table with either

        i) an *E. coli* attribute table where the national bottom line is 'swimmable' and councils must apply for freshwater management units to be listed as exceptions if it is not feasible to meet the national bottom line; or

        ii) an *E. coli* attribute table where the grade varies according to the amount of time the water quality is 'swimmable', with no national bottom line but supported a national target to define the desired outcome.

    c. In addition to the existing monitoring required to measure progress towards long term *E. coli* objectives, require councils to monitor *E. coli* levels weekly:

        i) in rivers and lakes; or

        ii) in rivers and lakes identified as places where people recreate.

        and communicate health risks to the public.

Impacts

96. A non-statutory target on its own would rely on providing information to the public about current state and ways to improve on this. A set of maps showed the levels of risk to human health for 47,540 km of fourth order rivers and 6,856 km of lake shores where the permitter was greater than 1.5 km.[31]

97. About 240,000 km^2 of New Zealand's land area eventually drains into one of the modelled fourth order or higher rivers, before reaching the sea. Approximately 25,000 km^2 of land is drained by third or lower rivers and flowing to the coast. This means

[31] A first order stream is the smallest of the streams and has no tributaries. First order streams, which may not be permanently flowing, flow into second order streams, which flow into third order streams and so on.

about 90% of land draining water is accounted for at some point in the proposed swimming target. The target wouldn't necessarily require all streams flowing into the larger rivers to be swimmable – but that these smaller streams must collectively result in an improvement downstream.

98. The Ministry investigated three ways of estimating the costs of improving these water bodies to a swimmable quality.

99. The first approach was based on the estimated costs of stock exclusion (including fencing and water reticulation), with a theoretical upper cost estimated by applying modelled improvements in the Waikato catchment nationally. These approaches produced an estimated range between $24 and $975 million over 25 years. Modelling indicated that stock exclusion will improve 7.2% of water bodies (by length) into a better attribute state. This equates to about $50 million to improve 1 per percent of total river and lake shore length into a better attribute state.[32] However, stock exclusion is only one means of reducing *E. coli* levels in water bodies, and is not necessarily the most efficient way to improve water quality for swimming.

100. The second approach was based on studies about land uses changes that would reduce greenhouse gas emissions and improve water quality (for example, riparian planting or changing from dairying to forestry). This study showed that mitigations that regional councils were already implementing would reduce *E.coli* loads from agriculture by 10 percent nationally by 2030 could cost $440 million annually. The suite of mitigations would provide other benefits to water bodies, reducing phosphorus and nitrogen loads nationally by up to 5.5 and 7 percent respectively.[33]

101. The problems with this approach were that:

    a. The modelled objectives and costs are not optimised to achieve *E. coli* reductions at the lowest cost, and would be an inefficient approach to achieving them.

    b. The estimated cost of objectives are based on policies and rules that regional councils are already setting, or expected to set. This means the $440m per year figure is a sunk cost. This also indicates there will be some level of improvement, and cost, regardless of any regulatory changes.

    c. *E. coli* loads do not directly translate to exceedances of 540 *E. coli*/100ml, which are used to define swimmability.

102. The third approach was based on the cost of improving 1% (or 540 km) of water in rivers and lakes into a better category; and the percentage (or kilometres) of river that needs to improve into a better category. Costs associated with a clean-up project in the Manawatu catchment indicated that improving one per cent of water bodies (by length) into a better category would be approximately $40 million.

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[32] This modelling was based on assumptions about quantities of faecal inputs from farms that could be mitigated by fencing stock from waterways. More recent modelling from Waikato University has challenged these assumptions, in particular about the amount of runoff from sheep and beef farms compared to dairy farms, and the relationships between rainfall and various river flows.

[33] *Modelling the potential impact of New Zealand's freshwater reforms on land-based Greenhouse Gas emissions*. Daigneault et al. 2016. MPI report.

103. This ‘cost per percent’ figure was applied to the length of waterway that would need to improve into a higher category to achieve the national target. Based on the current state of water bodies nationally, this would mean 51% of water bodies need to improve by 2040, at an approximate cost of $2 billion.

104. All cost estimates were applied to the length of rivers and lakes that are of a suitable size for swimming. The costs of improving all rivers and lakes to a swimmable quality are likely to be greater, but the scale of the increased cost is not possible to quantify. In practice water quality is managed at the freshwater management scale (catchments and sub-catchments). This means that efforts to improve larger rivers and lakes will require methods and rules that manage the effects of resource use in the freshwater management unit as a whole (e.g. farm environment plans, fencing, discharge limits). The effect is that smaller rivers and lakes will be improved, even if the requirement to improve is only applied to larger rivers and lakes.

105. While estimating the costs of improving water quality in terms of its suitability for swimming have proven very difficult, the costs of not acting are likely to be high. Tourism is New Zealand's largest export industry in terms of foreign exchange earnings. It directly employs 7.5 per cent of the New Zealand workforce and it has the potential to improve the economies of communities around the country.[34] Tourism New Zealand data show that in 2016, 28% of all tourists (both domestic and international) took part in raft, kayak, canoe, jet boat or fresh water fishing activities. These visitors stayed an average length of 31 days and spent well above the norm. Thus, not acting to improve water quality could ultimately damage New Zealand’s reputation as a tourist destination.

106. Amending the Freshwater NPS would mean that councils must increase restrictions on activities (such as effluent discharges and intensive stock farming) currently causing the water quality in rivers and lakes to be unsuitable for swimming. The cost of improving water quality for swimming will differ between rural and urban catchments because of the different pressures on water quality. Costs in rural catchments will arise from fencing stock out of waterways, planting riparian buffers, and upgrading stock and sewage effluent treatment systems. Costs in urban catchments will arise from improving stormwater and wastewater infrastructure.

107. Moving the national bottom line to what is currently the “minimum acceptable state” for swimming (swimming is not a compulsory value, so achieving the minimum acceptable state is not a mandatory requirement of the Freshwater NPS) and allowing councils to apply to have catchments listed in the Freshwater NPS as exceptions would incur large (unquantified) costs on local and central government. These costs would comprise the costs of councils assessing the achievability of making the improvements (based on sampled and modelled data) and presenting the evidence for qualifying as an exception to central government (with public input from the affected communities). The Government would then follow a public process of amending the Freshwater NPS to list the catchments that could not meet the national bottom line.

108. Adding an *E. coli* table where the grade varies according to the amount of time the water quality is ‘swimmable’, would allow councils to require improvements to water quality in areas and at a rate that meets the needs of people and communities. If

[34] See www.tourismnewzealand.com/about/about-the-industry/

improvements are made within the timeframe set by Government (90% of rivers and lakes swimmable by 2040), the costs would be spread according to programmes already underway, and future programmes could be planned and budgeted for.

109. The intent of the proposed amendments for surveillance monitoring was to make existing guideline recommendations into mandatory requirements.[35] Regional councils currently monitor *E. coli* in around 130 rivers and lakes used for bathing, and generally follow the recommendations in the 2003 guidelines. Requiring *E. coli* monitoring in all large rivers and lakes rather than allowing councils to choose the kind of surveillance monitoring they undertake, will add significant costs to councils, particularly if they do not currently follow all guideline recommendations (such as daily follow-up sampling after high *E. coli* levels are recorded). The benefit of having all councils following the same approach is that communities will be presented with the same type of information around the country.

Effectiveness

110. The catchments for fourth order rivers and greater cover around 90 percent of New Zealand, meaning that improvements to smaller rivers, especially those that are identified by the community as places they want to swim, will be required as part of the overall improvement. Further, of the 130 recreational river sites currently managed and monitored for swimming, almost all are in rivers that are fourth order or greater. This suggests that amending the Freshwater NPS to direct councils to improve water quality everywhere rather than only in larger rivers and lakes would not only address much of the public concern about the state of the rivers and lakes but would not necessarily change the costs imposed.

111. If an *E. coli* attribute state is defined according to the amount of time the water quality is 'swimmable', with no national bottom line, councils must set objectives that at least maintain the current state. The current state will effectively be the "bottom line". This was the amendment proposed in *Clean Water*, but many submitters were concerned that a lack of a national bottom line, even though it was for 'secondary contact', would mean that there was no requirement to improve smaller – generally urban – streams.

112. Requiring surveillance monitoring of *E. coli* to be done consistently everywhere will mean that the reported swimmability of rivers should be more comprehensible to people regardless of where they live. This is more effective at communicating health risks than relying on the current guidelines which are applied inconsistently from region to region.

Consultation

113. Following the public call for swimmable rivers during the *Next steps* consultation, the Minister sought the views of the Land and Water Forum and relevant iwi authorities on how amendments to the Freshwater NPS could address the issue of swimming.

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[35] Microbiological water quality guidelines for marine and fresh water recreational areas 2003. Ministry of Health and Ministry for the Environment. www.mfe.govt.nz/publications/fresh-water/microbiological-water-quality-guidelines-marine-and-freshwater-0

114. The Iwi Leaders Group has consistently expressed the view that we should at least aim for lakes and rivers to be suitable for swimming, even as a long-term aspiration. The view of the Land and Water Forum was that councils and communities should set objectives for, and assess the infection risk from, primary contact activities according to the proportion of time a waterway exceeds a primary contact *E. coli* threshold. In their view, this would involve:

    a. setting objectives and assessing the attribute state according to the general level of microbiological infection risk using a new time-based primary contact *E. coli* attribute; and

    b. providing communities with more finely detailed site and time specific information on the level of infection risk from primary contact that they can use to decide when and where to engage in primary contact activities.

115. The Land and Water Forum recommendation formed the basis of the amendments proposed in *Clean Water*. As for water reform proposals in 2013 and 2016, submissions on the suitability of water for swimming dominated the feedback to the proposed amendments.

116. Tourism Industry Aotearoa submitted that fresh water is a pivotal resource for the tourism industry and felt that the proposed time frames to improve water quality for swimming and the lack of application to all rivers and lakes do not reflect the importance of the fresh water resource to the tourism industry. In their view, fresh water is integral to many specific products in New Zealand's iconic and high value adventure tourism industry and to New Zealand's world class guided fresh water fishing industry.

117. Submissions from the Land and Water Forum, the majority of regional councils, research organisations and primary sector expressed support in principle for managing water towards primary contact recreation quality (rather than secondary) according to how often *E. coli* exceeds a given threshold (time-based management of *E. coli*). Nevertheless, submissions considered that the proposed attribute table would allow water quality to exceed a threshold that is too permissive, too often, while still being described as 'excellent'. Some submissions recommended aligning the proposed attribute bands with the microbiological guidelines.

118. People were concerned that the proposed narrative descriptions did not adequately describe the health risks associated with contact with water. If retained, the proposed narrative descriptions would not describe risk to human health in a way that is useful for community engagement in regional planning.

119. About a third of regional councils, smaller portions of environmental groups and iwi/Maori, and the Land and Water Forum were concerned at the absence of a national bottom line in the proposed *E. coli* attribute table. They felt this removed an important safeguard.

120. Under the status quo, regional councils must monitor *E. coli* sufficiently often to measure progress towards achieving their freshwater objectives (reported as annual medians) over the ten life of their regional plan (this state of the environment monitoring is required for all attributes in the Freshwater NPS). Under the proposed amendments, councils would also be required to undertake weekly surveillance monitoring of all 'fourth order' rivers and lakes to provide up-to-date information to the public about the risk to human health in any particular week. Councils provided detailed

submissions on the surveillance monitoring requirements with significant concerns about: the costs of making surveillance monitoring mandatory, applying surveillance monitoring to all 'fourth order' rivers and lakes, rather than where people swim, and requiring repeat sampling of *E. coli* in response to every high value recorded.

121. Councils estimated that the proposed requirements for surveillance monitoring would require increases in staff, with associated field sampling costs. In its submission, Gisborne District Council indicated that the costs of surveillance monitoring of all rivers and lakes in their districts would amount to a 3% increase in rates. Many councils preferred that the surveillance monitoring requirements remained in guidance.

122. The Ministry of Health strongly supported having the surveillance monitoring requirements specified in the Freshwater NPS because this is important for communicating health risks to people and the risks need to be monitored consistently around the country. NIWA submitted that surveillance monitoring requirements were an important addition for understanding public health risks. The advice from the Centre for Public Health Research at Massey University was to "rely on any advice and comments you have received from subject area specialists at NIWA and the Ministry of Health".

123. Some submitters, including the Land and Water Forum, NIWA, and environmental organisations, commented that the national swimming targets are not directly included in the objectives and policies of the Freshwater NPS. The Land and Water Forum was concerned that the targets would not be enforceable if they are not backed by regulation.

124. Submissions from most research organisations, half of regional councils, and a smaller portion of iwi/Maori and environmental groups wanted the more detailed attribute table provided on the Ministry website be used instead of the version in the Clean Water document. They felt that the more detailed table provided a more robust and accurate measure of risk to human health, in particular that the 130 *E. coli* median value provides a more constraining and important test for safeguarding human health.

125. Research organisations and some councils commented on technical matters related to sampling requirements.

Conclusions and recommendations

126. Continuing with the status quo will mean that the public pressure to improve water quality so that it suitable for swimming will be applied region by region. The result is likely to be delays in adopting policies and rules in regional plans, and associated litigation costs. In addition, continuing with the status quo will not address the significant concerns from Iwi/hapū that the Crown needs to act to improve water management, particularly in regard to its quality for cultural uses and swimming.

127. While improving water quality will impose costs on resource users, there could be costs to the tourism industry, and to people's health, if improvements are not made.

128. The most effective means to address the problem is to amend the Freshwater NPS so that all rivers and lakes are improved to meet community expectations over time, and that freshwater objectives are set according to an *E. coli* attribute table with attribute states that vary according to the amount of time the water is 'swimmable' (with no national bottom line).

129. To address the concern about the lack of a national bottom line, councils can be required to improve water quality in all freshwater management units, rather than allow that water quality to be maintained, and rather than directing improvement in the 'fourth order' rivers and lakes only. Measures to require improvements require a public process of changing the regional plans, meaning that communities will be involved in decisions about the timeframes and extent of improvements.

130. If the public are to understand the risks of swimming in any water body, surveillance monitoring needs to be undertaken consistently from region to region, and the results need to be communicated consistently from region to region. National direction through the Freshwater NPS is an appropriate means to achieve that consistency. Concerns from councils about the costs that surveillance monitoring would impose can be addressed by limiting the requirement to places where people swim, or want to swim (as decided through their regional plan consultation process). This is consistent with the approach recommended in guidelines.

131. Amending the Freshwater NPS to require all rivers and lakes are improved so that by 2040 at least 90 percent of 'fourth order' rivers and lakes are suitable for swimming will mean increased on costs on resource users, but it is extremely difficult to quantify these costs with any level of certainty. Many costs will be imposed by existing approaches or by the stock exclusion regulations that will come into force by the end of 2017.

132. Recommendations – amend the Freshwater NPS as follows:

    a. Direct improvement to all freshwater management units in terms of 'primary contact', unless natural processes prevent waterbodies from improving further;

    b. Require regional councils to identify 'primary contact sites' and improve these for primary contact (in addition to the 'fourth order' rivers and lakes as proposed);

    c. Include the Government target for swimmable rivers and lakes in an appendix and require councils to work towards achieving the Government target;

    d. Require regional councils to develop regional targets that contribute to achieving the Government target, making a draft available to the public by the end of 2017, and a final regional target by the end of 2018;

    e. Require regional councils to report on improvements at five year intervals, consistent with environmental reporting required under the Resource Management Act;

    f. Include the detailed *E. coli* attribute table in Appendix 2, and change the narrative attribute states in the table to reflect risk in a way that is able to be understood by the public;

    g. Require surveillance *E. coli* monitoring only in 'primary contact sites' identified in regional plans and make the requirement consistent with the 2003 guidelines, but allow some flexibility for when some sampling is not practical.

Coastal lakes and lagoons

Status quo

133. Some coastal lakes and lagoons are intermittently opened to the sea, usually to reduce flooding, but also for other reasons such as to allow migratory species access to the sea. New Zealand has seven large coastal lakes and lagoons like this that councils manage as fresh water – six in the South Island and Te Whanga Lagoon on Rekohu of the Chatham Islands. Some coastal lakes, such as Lake Onoke in Wairarapa, are maintained as open coastal lagoons and managed as coastal water.

134. The Freshwater NPS applies to all fresh water, whether it is in an aquifer, river, wetland or lake. It does not apply to coastal water. A footnote to the total nitrogen attribute for lakes ("intermittently closing and opening lagoons are not included in brackish lakes") has caused confusion about which lake attributes, if any, would apply to coastal lakes and lagoons that are intermittently open to the sea, but are managed as fresh water.

Problem statement

135. It is unclear whether the lake attributes in Appendix 2 apply to coastal lakes and lagoons that intermittently open to the sea.

Options

Option A: Guidance

136. The Ministry for the Environment has published a technical report about appropriate attributes for coastal lakes and lagoons that are intermittently opened to the sea. [36] This report could be supplemented with guidance about how to use all lake attributes when setting freshwater objectives for coastal lakes and lagoons.

Option B: Amend the Freshwater NPS

137. Amend the attribute tables in Appendix 2 to align with expert advice about the application of attribute states for lakes to lakes that intermittently open to the sea.

Impacts

138. Making it clear that lake attributes apply to all lakes will reduce uncertainty costs for regional councils and stakeholders but this would be the case only if the clarification was provided in in the Freshwater NPS itself. Guidance on its own would not reduce uncertainty costs because the ambiguous footnote would still apply and council decisions would be vulnerable to legal challenge.

139. Applying the attributes and national bottom lines to all freshwater lakes would mean that water quality in lakes that is currently below a national bottom line would now have to be improved to the national bottom line. Evidence about current lake water quality suggests that the coastal lakes will be able to meet the national bottom lines over time.

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[36] K. D. Hamill et al (2014). Attributes for Intermittently Open and Closed Lakes and Lagoons (ICOLLs) applicable to the National Objectives Framework for Fresh Water

The exception to this is Te Waihora/Lake Ellesmere in Canterbury. Removing the ambiguity would have significant impacts for the communities of Ellesmere/Te Waihora because the rules in the operative plan for Ellesmere/Te Waihora were developed and agreed on the council's understanding that the lake attributes do not apply to these coastal lakes.

140. The regional plan change for Selwyn Te Waihora (adopted in February 2016) will drive improvements to the lake water quality, but not to a level that meets the national bottom lines for nutrients. Environment Canterbury did not quantify the costs of what would be needed to achieve the national bottom lines for Te Waihora because their assessment showed that there are no feasible means of improving water quality to that extent.

141. The Resource Management Act requires Environment Canterbury to evaluate the effectiveness of its current approach in 2021 (five years after its rules became operative). At that time, the governance partners for Te Waihora (Environment Canterbury, Te Rūnanga o Ngāi Tahu and Selwyn District Council) will have better information to determine if their assumptions about the difficulty of improving the water quality in the lake still apply, and whether the costs are as prohibitive as they currently appear to be.

142. If evidence demonstrates that is not possible to further improve water quality in Ellesmere/Te Waihora, the governance partners may seek to have Ellesmere/Te Waihora listed in Appendix 4 of the Freshwater NPS, enabling the creation of a transitional objective below a national bottom line. This would be within the 2025 deadline to fully implement the Freshwater NPS (or 2030 if it is impracticable to complete implementation by 2025), and would allow the current approach to continue with no new impacts.

143. At the end of that transitional period, the governance partners can review the situation and if necessary, apply for another transitional period where an objective below the national bottom line could apply. The Government has discretion over the period a transitional objective can apply.

Effectiveness

144. The existing guidance presents expert evidence that the lake attributes should apply to all lakes but would not be sufficient to remove the legal ambiguity of the footnote.

145. Removing the footnote that created the uncertainty removes the legal ambiguity and would enable councils to manage fresh water in an integrated and sustainable manner, while providing for economic growth within limits.

Consultation

146. *Next steps* proposed amending the Freshwater NPS to clarify that lake attributes apply to intermittently closing and opening lakes and lagoons. Amendments were then proposed in *Clean Water*, taking this approach.

147. There was strong support for this proposal during both periods of consultation except from Environment Canterbury. In their view the coastal lakes in Canterbury have been degraded by previous land uses and it is unlikely that the national bottom lines could be achieved in the foreseeable future. They believe that this difficulty applies particularly to

Ellesmere/Te Waihora, where agreements have been made with affected communities to establish an ongoing inter-generational programme of work with targets out to 2035 and beyond.

148. Environment Canterbury did not support listing Te Waihora in Appendix 4, thereby making it eligible to set a transitional objective below a national bottom line, because they believe that would not reflect the long term commitment made in the regional plan and that some of the community would perceive this approach as an "opt out". Te Rūnanga o Ngai Tāhu, their governance partners for the lake, did not oppose the use of Appendix 4.

Conclusions and recommendations

149. The amendments proposed as Option B are the most effective means to address the problem because they remove the ambiguity and impacts can managed within existing policies.

Recommendation: choose Option B.

Addressing the impact of national bottom lines on infrastructure

Status quo

150. The Freshwater NPS has two compulsory values – ecosystem health and human health for recreation – with nine attributes for those two values. Regional councils must set freshwater objectives for these values using the attributes (where relevant), and cannot set freshwater objectives below national bottom lines defined in those attribute tables unless Policies CA3 or CA4[37] apply.

151. Policy CA3 allows regional councils to set freshwater objectives below national bottom lines if current water quality is below the national bottom line and:

    i) The existing freshwater quality is caused by naturally occurring processes; or

    ii) Any of the existing infrastructure listed in Appendix 3 of the Freshwater NPS contributes to existing freshwater quality.

152. Clause (ii) was introduced to provide an opportunity for regional councils and their communities to balance the benefits of environmental safeguards with the benefits provided by existing infrastructure, such as dams for renewable electricity production. This clause was intended to reduce the impact of national bottom lines in some exceptional circumstances. By requiring the infrastructure to be listed in a national policy statement, the clause also meant that there would be national consultation about the potential use of an 'exceptions' clause.

[37] Policy CA4 directs situations when a freshwater objective can be set below a national bottom line for a defined transitional period. Policy CA3 directs situations when a freshwater objective can be set below a national bottom line for an undefined and indefinite period.

153. Appendix 3 is currently empty, meaning that no regional council can consider setting a freshwater objective below a national bottom line even if water quality in a water body is affected by the presence of infrastructure. Even so, communities and infrastructure owners are uncertain about what matters a regional council might choose to consider when making the decision to set an objective below a national bottom line for listed infrastructure. Specifically they are concerned that:

    a. Freshwater objectives could be set below national bottom lines regardless of the age or significance of the infrastructure;

    b. Freshwater objectives could be set below national bottom lines in parts of a freshwater management unit where the infrastructure does not contribute to existing water quality;

    c. Freshwater objectives could be set below national bottom lines in circumstances where setting freshwater objectives at or above national bottom lines would not reasonably affect the benefits provided by the relevant infrastructure; and

    d. Being listed in Appendix 3 could provide an opportunity to be exempt from all national bottom lines even if only one is breached.

154. Any proposal to list infrastructure in Appendix 3 would require an amendment to the Freshwater NPS. Listing infrastructure in Appendix 3 of the Freshwater NPS was not considered as an option because there is limited evidence that any infrastructure is contributing to existing water quality being below a national bottom line. This means that the provisions of Policy CA3 relating to infrastructure cannot be triggered and the concerns are hypothetical.

Problem statement

155. Infrastructure owners, councils and communities want greater certainty about how the framework for setting an objective below a national bottom line will be applied in practice.

Options

Option A: Guidance

156. Guidance about the scope of Policy CA3 could provide examples of circumstances where freshwater objectives could be set below national bottom lines. These could include the circumstances identified in the description of the status quo.

Option B: Amendments to the Freshwater NPS

157. Policy CA3 of the Freshwater NPS could be amended to limit the setting of freshwater objectives below national bottom lines to situations where:

    a. an attribute is currently below a national bottom line;

    b. the freshwater objective applies to a water body, multiple water bodies or any part of a water body where water quality is affected by the listed infrastructure;

    c. doing so is reasonably necessary for the realisation of the benefits provided by the listed infrastructure; and

d. the infrastructure was operational on 1 August 2014 (the date in which Policy CA3, which refers to 'existing infrastructure' came into force)

Impacts

158. Any clarification provided, either in guidance or as an amendment, would impose no new impacts because no infrastructure is listed in Appendix 3, or proposed to be listed. It should, however, reduce uncertainty costs for regional councils and infrastructure owners that might want to have infrastructure listed in Appendix 3 in the future.

159. Some hydro-electricity generators are particularly concerned about the impact of the Freshwater NPS on their operations. The kinds of impacts hydro-electric power infrastructure owners may face if they are obliged to alter their operation to contribute to meeting national bottom lines include: increased cost of generating electricity; increased cost of electricity for consumers; reduced revenue for infrastructure operators; additional fuel, capital and operating costs for replacement generation, and increased carbon dioxide emissions.[38]

160. These impacts on hydro-generators will continue to apply until the option of setting an objective below a national bottom line can be exercised, and will be imposed when resource consents for the relevant infrastructure have been changed in accordance with regional plans that in turn give effect to the Freshwater NPS. In the short- to medium-term there is a low risk that any of the impacts identified above will occur.

Effectiveness

161. Guidance could describe the kinds of situations the Government considers would be appropriate to set an objective below a national bottom line but it does not hold regulatory weight. Regional councils would not be constrained from pursuing policies, objectives or rules that are contrary to the intent of Policy CA3, should the Government decide to list infrastructure in Appendix 3.

162. Clarifying the intent of Policy CA3 in relation to infrastructure through amendments to the Freshwater NPS would provide regional councils and infrastructure owners with certainty about the scope of possibilities for freshwater objectives should the Government decide to list infrastructure in Appendix 3. Amending the policy that directs the circumstances when an objective below a national bottom line can be contemplated would provide infrastructure owners more certainty. It would better direct councils to manage fresh water in an integrated and sustainable manner, while providing for economic growth within environmental limits.

Consultation

163. *Next steps* outlined an indicative list of evidential requirements people (for example councils or infrastructure owners) should provide to a minister so that infrastructure could be considered for listing in Appendix 3. Infrastructure owners and regional councils raised concerns about the evidential burden this would impose. Others raised

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[38] www.mfe.govt.nz/publications/fresh-water/assessment-of-impact-of-flow-alterations-electricity-generation
Note that none of the modelled scenarios reflect regional council policies. These hypothetical scenarios are not exhaustive and were modelled to illustrate the nature and scale of potential impacts, where exceptions to national bottom lines are not available.

concerns about the potential broad ambit of Policy CA3 and requested its ambit be limited.

164. Following the *Next steps* consultation, officials from the Ministry for the Environment and the Ministry for Business, Innovation and Employment worked with representatives of hydroelectricity generators and regional councils to improve the application of Policy CA3 in relation to infrastructure. The discussions resulted in some potential amendments that were proposed as part of the *Clean Water* package.

165. The main comment on the amendments proposed in *Clean Water* was that the meaning of the "benefits provided by listed infrastructure" needs clearer definition.

166. A large proportion of submitters representing a wide range of interests took the opportunity to comment on the use of Appendix 3. Many sought to have infrastructure listed as soon as possible, while others wanted Appendix 3 removed and regional councils empowered to set freshwater objectives below bottom lines where infrastructure is contributing to current water quality. Others opposed exceptions to bottom lines in principle and wanted Policy CA3 removed or significantly amended.

Conclusions and recommendations

167. The amendments proposed as Option B are the most effective means to address the problem because they increase certainty to all resource users. To address concerns raised in consultation, the explanation about the "benefits" to be considered need not be included.

168. Given the widespread comment on Appendix 3, it would be appropriate to start a formal process to consider which, if any, infrastructure should be listed. Any process for doing so is likely to take 6-18 months including meeting the public consultation requirements for amending a Freshwater NPS, should Ministers decide to list infrastructure in Appendix 3.

169. Recommendation:

    a. choose the amendments proposed in Option B.

    b. consider adding infrastructure to Appendix 3 and conduct a consultation process about this

Addressing nitrogen and phosphorus

Status quo

170. High levels of nitrogen and phosphorus in rivers can promote aquatic plant growth, such as periphyton. Excessive blooms of periphyton can smother habitat, reduce invertebrate diversity and abundance, and affect dissolved oxygen levels in the water. In high concentrations, some forms of nitrogen can be toxic to freshwater fauna.

171. Approximately 75% of rivers in New Zealand are able to support the growth of periphyton. Many factors (nutrients, flow rates, shading, temperature and bed substrates), influence periphyton abundance in those rivers. The conditions that promote periphyton growth are complicated and dynamic, but in the right conditions periphyton will generally continue growing until there is a flushing flow.

172. While managing any combination of the factors described above can have an effect on periphyton abundance in rivers, managing the inputs of nutrients to the water body will generally be necessary to ensure periphyton objectives are met in the main stems of most rivers. The Freshwater NPS requires councils to set objectives and limits for periphyton in their regional plans, but does not specifically require them to manage dissolved inorganic nitrogen (DIN) and dissolved reactive phosphorus (DRP) as part of that process.

173. The Freshwater NPS also requires councils to manage the effects of fresh water on the coastal environment. There is a risk that objectives and limits for periphyton may not be sufficiently protective of downstream environments.

Problem statement

174. Nutrients in rivers may reach levels that do not safeguard indigenous species, or may cause adverse effects on associated ecosystems and the coastal environment.

Options

Option A: Guidance

175. Guidance could set out a decision support tool for setting nutrient levels in rivers, including DIN and DRP concentrations to support periphyton objectives. If appropriate, the process could be incorporated into the Freshwater NPS as a mandatory requirement.

Option B: Amend the Freshwater NPS to require councils to set in-stream concentrations for DIN and DRP (this is the approach recommended by the Land and Water Forum)

176. The Freshwater NPS could be amended to require regional councils:

    a. To set in-stream concentrations for DIN and DRP when managing for the periphyton attribute as a step in the limit setting process; and

    b. Follow a specified decision support process for setting appropriate in-stream concentrations DIN and DRP within and FMU while considering nutrient sensitive downstream environments.

Option C: Amend the Freshwater NPS to include attribute tables for DIN and DRP

177. The Freshwater NPS could be amended to include DIN and DRP attribute tables for the ecosystem health value. These attribute tables would set out attribute states and a national bottom line, which would define levels of DIN and DRP that cause unacceptable impacts on ecosystem health.

Impacts

178. Draft guidance on the role and use of attributes, including how attributes are used to set freshwater objectives, and the implications that the objectives have for setting limits

and monitoring progress towards them has been available since 2015.[39] This guidance has been tested by regional councils and will be finalised in 2017. It can be supplemented with a decision support tool for setting DIN and DRP concentrations to support periphyton objectives (recognising effects on nutrient sensitive downstream environments).

179. The costs of preparing a nutrient setting decision-support system for all river types would fall on both central and local government, but is part of the necessary support needed to improve water management generally, and is budgeted for within the implementation programme.

180. Requiring regional councils to follow a process specified in the Freshwater NPS (option B), would confirm the existing requirement to set objectives and limits. Implementation costs for option B should not be greater than the status quo because it reduces uncertainty and does not require anything in addition to what they are currently required to do.

181. Option C was not progressed because attribute tables for DIN and DRP would be overly complex to include in national regulation. An attribute table would oblige regional councils to set freshwater objectives for DIN and DRP above the national bottom lines in all freshwater management units. To date there is no agreed attribute table for DIN and DRP in rivers with defensible thresholds for national bottom lines. This means the impacts of any new national bottom lines for DIN and DRP could not be tested.

Effectiveness

182. Guidance (option A) can accommodate the complex scenarios associated with determining nutrient levels for various river systems and downstream environments. Given the difficulties many councils are experiencing in setting limits (see paragraph 9)[40] the uptake of guidance is likely to be high.

183. A multi-variate look-up table will need to be developed so that councils can account for the spatial variation in all relevant controlling variables including: temperature, light, substrate, flow regime, and nutrients. The table will also need to account for the risk to ecosystem health of nutrient sensitive downstream receiving environments from nutrient loads in rivers. Developing a multi-variate look-up table is a long-term piece of work and the science behind it will require significant development before it could be included in any guidance package.

184. Setting out the process in the Freshwater NPS for managing DIN and DRP (option B) provides regional councils and resource users certainty about what is required when they set objectives for periphyton to give effect to the Freshwater NPS. The disadvantage is that condensing direction about such a complex process into a short advisory note is not as helpful to councils as comprehensive guidance. It could also raise inconsistencies with the other attribute tables which don't have advisory notes about steps to follow when setting the objective.

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[39] Ministry for the Environment (2015), A draft guide to attributes in appendix 2 of the National Policy Statement for Freshwater Management 2014. See www.mfe.govt.nz/publications/fresh-water/draft-guide-attributes-appendix-2-national-policy-statement-freshwater

[40] Ministry for the Environment (2017). National Policy Statement for Freshwater Management Implementation Review.

185. Option B would require the development of further guidance to provide the technical support behind each step in the decision support process. This is part of ongoing implementation of the Freshwater NPS.

186. Requiring regional councils to set objectives for DIN and DRP according to attribute tables (option C), would largely duplicate the existing requirement to set objectives and limits for periphyton, ammonia toxicity and nitrate toxicity.

Consultation

187. There was no proposal in *Next steps* about providing specific direction in the Freshwater NPS to manage DIN and DRP in order to manage periphyton. This was seen as a significant omission by many submitters who called for specific direction on managing nitrogen and phosphorus in the Freshwater NPS.

188. In early 2016 the Minister for the Environment asked the Land and Water Forum to consider how the Freshwater NPS should address nitrogen as a nutrient, and in July 2016 the Minister sought further comments from iwi, councils and other relevant stakeholders. In August 2016 the Land and Water Forum recommended that a mandatory decision-support tool should be developed to help councils set maximum in-stream concentrations for DIN and DRP to support the existing periphyton attribute. This tool would be based on a flow chart they provided. The Land and Water Forum did not support the addition of an attribute table with national bottom lines because "attribute tables would not be credible or scientifically defensible as it is not feasible to deal with the range of site specific factors in a numeric, tabular way at a national level".[41]

189. Clean Water proposed to add an explanatory note to the periphyton attribute table directing councils to set maximum concentrations for DIN and DRP before setting the periphyton objective. Around a fifth of unique submissions, representing a mix of submitter types, supported the intent of the proposal. Many of these submissions agreed in principle that setting appropriate concentrations for DIN and DRP was important for managing periphyton in rivers, with some submissions strongly supporting the reference to downstream receiving environments. Some submissions recommended changes to the proposal and wanted further research to be undertaken to develop better tools for managing nutrients in water bodies.

190. Submitters raised the following specific issues:

- The proposed advisory note is confusing and contains factual errors.
- The decision support tool developed by the Land and Water Forum should be made mandatory
- The development of a multi-variate lookup table for DIN/DRP concentrations is needed to support the implementation of the proposal.
- Focussing on nutrients may not be helpful or desirable because periphyton biomass growth is influenced by multiple factors which have complex and non-linear relationships.

[41] The Forum's advice is on their website here - www.landandwater.org.nz/includes/download.ashx?ID=146454

Conclusions and recommendations

191. The guidance proposed as Option A is an effective means to address the problem that nutrients in rivers may reach levels that do not safeguard indigenous species, or may cause adverse effects on associated ecosystems and the coastal environment. This is because the effect of nutrients on problematic periphyton growth in water bodies is intimately related to other site specific factors (temperature, light, substrate, and flow regime). Guidance can provide the necessary detail for what needs to be managed for various river systems and downstream environments.

192. But Option B would provide the communities with greater confidence that councils will manage nutrients sufficiently to manage effects on periphyton and downstream environments. To address concerns raised in submissions, the advisory note and the decision support process need to be amended to clarify technical matters. This option needs to be supported by more detailed direction that can be provided in guidance.

Recommendation: choose Option B.

Ecosystem health monitoring

Status quo

193. The Freshwater NPS requires regional councils to establish plans to monitor the progress towards, and the achievement of, freshwater objectives. Freshwater objectives are set using the attribute tables in Appendix 2. An attribute is a "measurable characteristic of fresh water, including physical, chemical and biological properties, which supports particular values". As such, monitoring progress towards achieving an objective does not and cannot provide a whole picture about the maintaining the value.

194. Ecosystem health is a compulsory value in the Freshwater NPS. A healthy freshwater ecosystem is described as one where "ecological processes are maintained, there is a range and diversity of indigenous flora and fauna, and there is resilience to change."

195. Submissions to Next Steps for Freshwater[42] and the earlier consultation to amendments to the Freshwater NPS in 2013[43] identified strong council and public interest in improving the evidence base for action on water quality issues, especially in relation to the ecosystem health value. This interest focused on the importance of monitoring indigenous flora and fauna, and especially macroinvertebrate communities, as reliable indicators of aspects of ecosystem health.

196. The range of different types of invertebrates present in a stream along with their relative abundances (often referred to as a "community") reflects the environmental characteristics of the stream and its catchment, as well as the pool of species available to colonise freshwater habitats in the region. Macroinvertebrates have a long history of use for monitoring water quality and general ecological health of waterways both internationally and in New Zealand. All regional councils, except Chatham Islands

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[42] See www.mfe.govt.nz/publications/fresh-water/next-steps-fresh-water-summary-submissions

[43] Ministry for the Environment. 2014. *Report and recommendations on the proposed amendments to the National Policy Statement for Freshwater Management and public submissions* www.mfe.govt.nz/publications/fresh-water/report-and-recommendations-proposed-amendments-national-policy-statement

Council, undertake some form of macroinvertebrate monitoring, though Gisborne established its programme only recently.

197. Multiple macroinvertebrate indices are used in New Zealand. Some are calculated from the presence or absence of different taxa, some rely on measures of relative taxa abundance. In some cases, indices have been combined into multi-metric indices. The most commonly used indices in New Zealand are based on taxa richness (simply the number of different taxa collected), so-called EPT indices based on the occurrence or percent abundance of sensitive Ephemeroptera (mayfly), Plecoptera (stonefly) and Trichoptera (caddisfly) taxa, and the Macroinvertebrate Community Index (MCI), which assigns tolerance scores to different taxa, has presence-absence or quantitative versions, and uses established quality classes to provide narrative assessments.[44]

Problem statement

198. Ecosystem health is a compulsory value in the Freshwater NPS but there are no direct and meaningful indicators of ecosystem health mandated by the Freshwater NPS.

Options

Option A: Guidance

199. Guidance would provide direction on the best-practice use of meaningful indicators of ecosystem health. This would include, but not be limited to, using macroinvertebrates to measure the state of the fresh water ecosystem. Guidance could be supplemented with National Environmental Monitoring Standards (NEMS) for macroinvertebrate communities and for native fish.

Option B: Introduce a narrative attribute for macroinvertebrates

200. Amend the Freshwater NPS to

    a. Add a narrative attribute table for macroinvertebrates to Appendix 2 of the Freshwater NPS, with attribute states based on the abundance and or diversity of macroinvertebrates;

    b. Require regional councils to set narrative (or numeric) freshwater objectives for macroinvertebrates and monitor progress towards achieving those objectives.

Options C(1), C(2) and C(3) are variations on the option to monitor macroinvertebrates, and report on results using the Macroinvertebrate Community Index, or another index decided by the regional council.

Option C(1): Require MCI to be used as a compulsory monitoring tool to measure progress towards whether the Freshwater NPS Objective A2 to 'maintain or improve' the quality of fresh water is being met in terms of ecosystem health (this option was recommended by the Land and Water Forum)[45]

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[44] Collier KJ, 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. http://www.mfe.govt.nz/publications/fresh-water/macroinvertebrate-attribute-assess-ecosystem-health-new-zealand-waterways

[45] The Forum's advice of August 2016: www.landandwater.org.nz/includes/download.ashx?ID=146454

201. Amend the Freshwater NPS to require regional councils to

    a. monitor, report and analyse Macroinvertebrate Community Index scores and trends;

    b. use monitoring information as a trigger requiring action if there is a downward trend in MCI scores or if MCI is below a threshold of 80 (unless this is caused by naturally occurring processes, invasive species or by specified infrastructure);

    c. investigate and develop an action plan to either maintain or improve MCI scores in the waterbody; and

    d. Report to the public on the monitoring and actions.

Option C(2): Require monitoring of indigenous flora and fauna and require councils to set threshold numerical values for macroinvertebrate community monitoring scores.

202. Amend the Freshwater NPS to require regional councils to

    a. Use macroinvertebrate monitoring and measures of indigenous flora and fauna as part of an assessment of the extent to which the national value of ecosystem health is being provided for;

    b. Establish methods to respond to monitoring results that indicate freshwater objectives are not met and/or national values are not being provided for; and

    c. Set numeric thresholds for macroinvertebrate monitoring scores that will trigger the development of action plans without dictating the index or threshold value.

Option C(3): Require monitoring of indigenous flora and fauna and macroinvertebrates

203. Amend the Freshwater NPS to require regional councils to:

    a. Use monitoring of macroinvertebrates and indigenous flora and fauna as part of an assessment of the extent to which the national value of ecosystem health is being provided for; and

    b. Establish methods to respond to monitoring results that indicate freshwater objectives are not met and/or national values are not being provided for.

Impacts

Option A

204. Guidance on the macroinvertebrate monitoring in the context of giving effect to the Freshwater NPS would build on existing guidance.[46] The Ministry and other organisations have programmes underway to review to the sampling protocols and the analysis of the sampling results. By building on these programmes, there would be low costs of developing new guidance. The impacts on councils of implementing the

[46] See 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, www.mfe.govt.nz/publications/fresh-water-environmental-reporting/protocols-sampling-macroinvertebrates-wadeable and Stark JD, Maxted JR (2007) *A user guide for the Macroinvertebrate Community Index*. Prepared for the Ministry for the Environment www.mfe.govt.nz/publications/freshwater-publications/user-guide-macroinvertebrate-community-index

guidance would be similar to the status quo because most councils already undertake macroinvertebrate monitoring in accordance with guidelines.

Option B

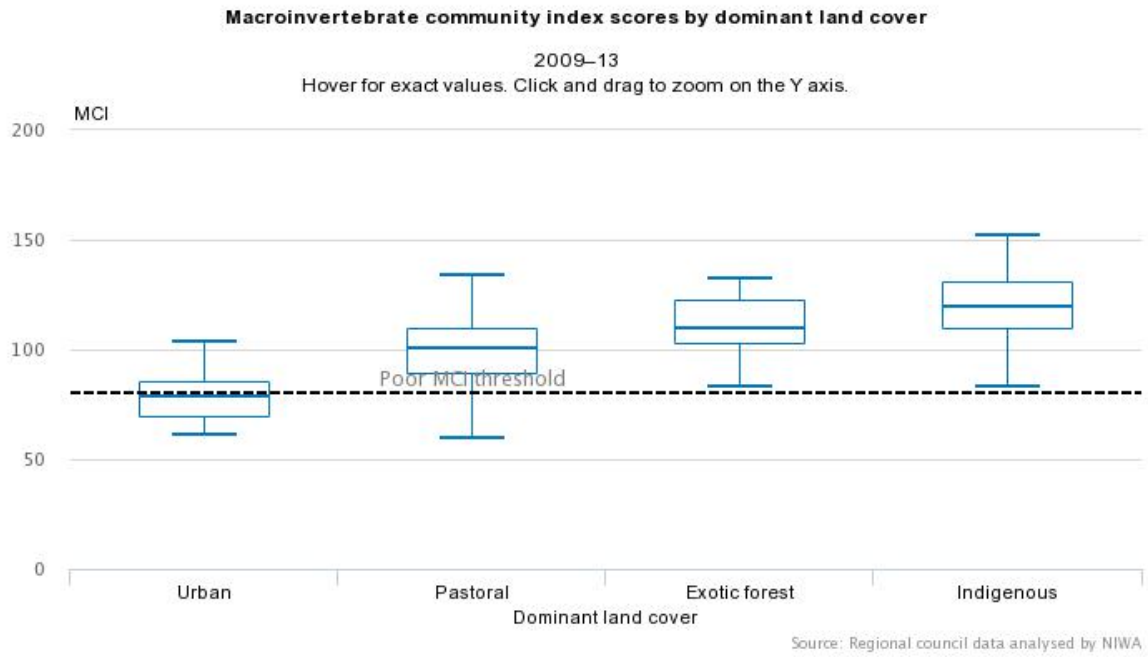
205. Regional councils would set freshwater objectives in every freshwater management unit using the narrative attribute according to the current state and the pressures in the catchment. Given the difficulty in determining the causes of trends in macroinvertebrate results, it is not possible to determine the likely impacts at a national scale.

Option C

206. All variations on Option C require councils to monitor macroinvertebrates and respond to changes in macroinvertebrate populations.

207. The LAWF preference (option C(1)) is to require councils to use the MCI and take action for results less than 80 or a declining trend. Analysis in 2013 showed that 28% of rural streams and around half of urban streams would fall below 80 MCI on average, although these monitoring sites are targeted towards more intensively developed streams that are unlikely to be representative.[47]

208. More recent analysis from NIWA is presented on the Department of Statistics website.[48] Using an MCI score of 80 as the threshold for "poor", NIWA determined that median MCI scores were excellent or good at 62.9 percent, fair at 26.4 percent, and poor at 10.7 percent of monitored sites. The lowest scores are generally associated with urban land cover (see figure below, or go to the website link below to click on legend or hover for exact values).



[47] Collier KJ, 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. http://www.mfe.govt.nz/publications/fresh-water/macroinvertebrate-attribute-assess-ecosystem-health-new-zealand-waterways

[48] http://www.stats.govt.nz/browse_for_stats/environment/environmental-reporting-series/environmental-indicators/Home/Fresh%20water/river-water-quality-macroinvertebrates.aspx

209. These results show that Option C(1) would have the greatest implementation costs because the biggest improvements to MCI scores will be required for urban freshwater management units, which is where the costs to achieve those improvements will be the highest (because urban catchments have such a variety of stressors including organic and inorganic contaminants, stream channelling, and extreme flow variations). In addition, implementing the exceptions regime for MCI thresholds could open councils to litigation costs because the grounds of naturally occurring processes and invasive species could be interpreted differently by various groups.

210. The second variation of Option C would require councils to set macroinvertebrate index thresholds based on characteristics specific to the freshwater management unit. This would accommodate situations where naturally occurring processes, invasive species, or hydrological modifications mean that a national number is not appropriate, and where improvements to achieve a healthy ecosystem (such as in an urban freshwater management unit) may take considerable time or have unknown costs. The costs of implementation would be lower than Option C(1) because the councils' choice of thresholds would be influenced by the feasibility of making the improvements.

211. The third variation on option C would allow councils to choose the macroinvertebrate assessment approach. The impacts would be similar to those for Option C(2).

212. Adding a requirement to monitor indigenous flora and fauna will have cost implications for councils but as for macroinvertebrates, most already do this monitoring to some extent.

Effectiveness

Option A

213. Guidance can accommodate the range of macroinvertebrate indices used in New Zealand and allow councils to choose the methodology that best suits the freshwater ecosystem in the freshwater management unit. Given the existing obligations on councils to monitor the effectiveness of their plans (section 35 of the RMA), and their use of existing guidance, the uptake of guidance is likely to be high.

Option B

214. A narrative attribute may mandate the gradings generally used for MCI (good, fair and poor) and will be partially effective in addressing the problem because higher MCI scores generally indicate better river health. A drawback, which also applies to other attributes in Appendix 2, is that some river types do not achieve an excellent rating even under natural conditions.

215. The main disadvantage with having a narrative attribute table is that a council must then set objectives and limits for MCI in every freshwater management unit. The limit-setting requirement ("the maximum amount of resource use available, which allows a freshwater objective to be met") would be difficult to apply to MCI scores because of the multiple stressors that affect the presence and absence of macroinvertebrates. Further, MCI scores do not respond in a predictable manner to interventions at a freshwater management unit level, making it extremely difficult to assess the impacts of any national bottom line associated with the attribute table.

Option C

216. The variable response of macroinvertebrates to local and catchment conditions means that all variations of Option C will be only partially effective in providing meaningful indicators of ecosystem health and enabling regional councils to manage fresh water in an integrated and sustainable manner.

217. Option C(1) sets a nationally consistent threshold value for council action to address poor or deteriorating status of MCI scores but it would lock in the MCI as the chosen index for the next generation of plans and preclude the use of improved management-oriented indices that are currently under development. Option C(2) and C(3) would have no national consistency in threshold values because each council would set its own thresholds and indices of choice.

218. Despite the lack of national consistency, Option C(2) is likely to be the most effective variation of Option 3 because it allows councils to use the monitoring methodology that fits the freshwater management unit, and therefore would provide locally meaningful indicators of ecosystem health.

Consultation

219. *Next steps* proposed requiring the use of the macroinvertebrate community index (MCI) as a mandatory method of monitoring ecosystem health. Clean Water proposed amendments in line with Option C(3) – require councils to monitor macroinvertebrates and indigenous flora and fauna without specifying the methodology, and to establish methods to respond to results that indicate freshwater objectives are not met and/or national values are not being provided for.

220. The Land and Water Forum confirmed their preference for the kind of monitoring requirements and responses they recommended in August 2016 (Option C(1)). Their view was supported by Forest and Bird (with 3,617 template submissions). ActionStation (with 1,787 contributors) wanted MCI used as an attribute along with a habitat quality index.

221. Submissions who opposed the Land and Water Forum recommendation argued that the MCI is not a management-oriented index because it does not measure overall ecosystem health of the freshwater management unit or identify the primary stressors on the macroinvertebrate communities. Further, over 80% of sites councils monitor for macroinvertebrates are sampled annually only, meaning that trends become apparent over long time frames.

222. Overall, a wide range of submitters supported requiring MCI as a mandatory monitoring tool. Submitters wanted councils to set “meaningful” thresholds to trigger council action to provide for the ecosystem health value, others mentioned the need for consistent and regionally-comparable monitoring. The Department of Conservation expressed concerns about framing the monitoring of macroinvertebrate communities or ecosystem health in terms of MCI and preferred not stipulating MCI as the reporting metric.

223. Some, including the Forest and Bird template submissions, supported the Land and Water Forum proposed threshold of 80, others consider councils should set their own and a third group thought a meaningful threshold should be set at the national level (but not necessarily the threshold proposed by the Land and Water Forum). Many

noted that if a trigger were included, an exceptions framework would need to be developed.

224. There were seven submissions on the new requirement for methods to monitor the health of indigenous flora and fauna, including support from the Land and Water Forum and the Freshwater Science Society. The Department of Conservation supported the addition of specific items to be monitored, especially health of indigenous flora and fauna. One concern was that the burden of monitoring might remove the ability of councils to support improvements to matters that would improve the health of indigenous flora and fauna. Council submissions on this part of the proposal commented on the need to develop frameworks and measures for indigenous flora and fauna.

Conclusions and recommendations

225. The amendments proposed as Option C(2) are an effective means to address the problem because they would provide direct and meaningful indicators of ecosystem health without the higher implementation costs of other options. Option C(2) would accommodate situations where a national number is not appropriate, and where improvements to achieve a healthy ecosystem (such as in an urban freshwater management unit) may take considerable time or have unknown costs. It would also address concerns that macroinvertebrate community metrics other than MCI are more appropriate for use as an indicator of Ecosystem Health.

226. Notwithstanding this, there is widespread support for using the MCI and the trigger level of 80 indicating an ecosystem health problem is widely used. The Freshwater NPS applies to all fresh water, and public feedback is that urban streams should be improved alongside rural streams. This option would have the greatest impacts in terms of remediating urban streams, but the requirement for councils to establish an action plan, with discretion over the contents of the action, provides councils with the necessary flexibility without imposing significant impacts.

Recommendation: choose Option C(1), with Option C(2) as a second choice.

Economic wellbeing

Status quo

227. The Freshwater NPS requires councils to improve and maximise the efficient use of fresh water (in respect of water quantity) and to consider economic implications when identifying community values for freshwater bodies, establishing freshwater objectives to provide for those values, and setting limits to ensure those freshwater objectives are met.

228. There is a perceived risk that this direction is not sufficient to ensure that a community's economic wellbeing is considered when councils are choosing appropriate objectives and limits in their regional plans. Inadequate consideration of economic wellbeing may result in constraints on potential future economic uses of the water resource.

229. There is a limited evidence base showing this risk playing out but the potential impacts, such as lost regional economic activity, if the risk does eventuate could be high. These

risks were not identified in the Ministry's implementation review because councils are still in the early stages of giving effect to the Freshwater NPS in their regional plans.

Problem statement

230. Regional councils may give insufficient consideration to a community's economic wellbeing when setting freshwater objectives and limits, resulting in constraints on future economic uses of fresh water.

Options

Option A: Undertake research into the actual risk to economic wellbeing

231. Further research into this potential risk within future evaluations of the implementation of the Freshwater NPS would establish a clearer understanding of the likelihood of this risk and its potential impacts.

Option B: Guidance

232. Guidance could explain how regional councils must consider implications for economic wellbeing when they establish freshwater objectives and limits.

Option C: Amend the Freshwater NPS

233. The Freshwater NPS could be amended to make clear that regional councils must consider how to enable communities to provide for their economic wellbeing when making decisions about water quantity and where water quality will be improved.

234. This could be done either through creating specific objectives and policies related to economic wellbeing, or by referring to economic wellbeing in various existing policies and objectives of the NPS.

Impacts

Option A

235. The next review of the implementation and effectiveness of the Freshwater NPS is scheduled for 2020. The scale of the problem could be assessed then. Waiting until 2020 to do this may carry significant opportunity costs if economic wellbeing is not adequately considered in the meantime. Also, deferring any action to address this risk, rather than packaging an amendment with this current suite of amendments, would present higher costs than making amendments now.

Option B

236. Costs associated with developing guidance will fall to the Government, as well as to councils, iwi/hapū and other community and industry groups involved in its development. Guidance may be required to support any amendments to the Freshwater NPS so these costs may be incurred with both Options B and C.

Option C

237. Amending the Freshwater NPS would require regional councils and their communities to consider economic wellbeing when establishing freshwater objectives and limits.

This could mean that opportunities for growth would be able to take legitimate precedence over opportunities to improve water quality in some cases.

238. Councils must already assess the benefits and costs of opportunities for economic growth and employment that are expected to be provided or reduced by any policies and rules they adopt in regional plans (section 32 of the Resource Management Act), and must consider the implications that their choices of freshwater objectives will have on resource users (Policy CA2 of the Freshwater NPS). Any amendment would add to regional councils' existing responsibilities and their approach to freshwater management.

239. Making a specific requirement for councils to consider economic wellbeing can be perceived as prioritising economic wellbeing over social and cultural wellbeing, which are identified alongside economic wellbeing in the purpose of the Resource Management Act. Regional council decisions must be made within the requirement of giving effect to the purpose of the Resource Management Act. There is a risk of litigation and delays to council decision-making and implementation if they are perceived as prioritising economic wellbeing in a way that is inconsistent with giving effect to the purpose of the Act.

Effectiveness

240. Without further evidence, both on the nature of the risk and on councils' existing approaches to providing for economic wellbeing, it is not possible to ascertain the effectiveness of these options in improving councils' consideration of economic wellbeing during freshwater management decision-making.

241. An amendment along the lines of Option C may increase council consideration of economic wellbeing, or may simply align with existing council processes. Councils are already required to make their decisions about freshwater management after considering how their choices affect economic opportunities.

Consultation

242. Addressing this issue was not part of the *Next steps* consultation in February 2016. In July 2016 the Minister for the Environment asked the Land and Water Forum, regional councils and relevant iwi authorities whether there should be more consideration of economic factors in freshwater planning decisions. Most respondents wanted more detail about what this would look like before they could present a position.

243. In March 2017, amendments to the Freshwater NPS related to economic wellbeing were proposed in *Clean Water*. The majority of submissions on these proposals either rejected the proposed amendments outright or sought significant changes to prioritise environmental wellbeing over economic wellbeing. Many submissions cited a legal opinion from Sir Geoffrey Palmer, prepared for the Fish and Game Council. In his opinion, the proposed amendments may increase the risk of litigation and delays to council decision-making processes. This risk was related to the way drafted amendments were perceived to prioritise economic wellbeing over social and cultural wellbeing, or put them in contest.

Conclusions and recommendations

244. The research and guidance proposed as Options A and B could address the perceived risk that councils may give insufficient consideration to a community's economic wellbeing when setting limits and freshwater objectives. Option C is not preferred because specific direction about economic wellbeing could lead to litigation and delays to council decision-making processes and implementation. This could be partially mitigated through drafting and guidance.

Recommendation: choose Options A and B, unless litigation risks of Option C can be sufficiently mitigated.

Conclusions and recommendations

245. The objective the reform package is that "The Freshwater NPS provides an effective freshwater management framework that safeguards ecosystem health and can provide for the social, cultural and economic values of communities" (see paragraph 17 of this report).

246. The amendments proposed in Clean Water generally provided the most appropriate means to address the implementation problems identified with the Freshwater NPS. Consultation revealed some practical issues with applying the surveillance monitoring requirements to rivers and lakes in terms of human health risks, and revealed a strong public desire for adopting the recommendations form the Land and Water Forum in relation to managing nutrients in rivers and measuring ecosystem health using the macroinvertebrate community index. After assessing the effectiveness of the proposed amendments and their impacts against the objective of any reform our recommendations for these two issues are to follow the recommendations of the Land and Water Forum.

247. Amendments to the Freshwater NPS are recommended to

    a. Rewrite the statement of national significance so that it explains the meaning and intent of Te Mana o te Wai;

    b. Add more direction about how to apply Te Mana o te Wai in the management of fresh water;

    c. Require regional councils to improve the water quality in freshwater management units so that it is suitable for swimming more often (maintaining current quality in relation to human health is not permitted);

    d. Replace the *E. coli* attribute table in Appendix 2 with an *E. coli* attribute table that has grades that vary according to how often the water is suitable for swimming (with no national bottom line);

    e. Require regional councils to undertake weekly surveillance monitoring of the *E. coli* of identified swimming sites (consistent with existing guidelines);

    f. Require regional councils to develop regional targets that contribute to the Government target for swimmable rivers and lakes;

    g. Clarify the meaning of "maintaining" water quality;

h. Clarify that the lake attributes for nutrients apply to coastal lakes that intermittently open to the sea;

i. Clarify when regional councils may adopt freshwater objectives for freshwater management units affected by infrastructure;

j. Clarify how regional councils are to manage nutrients in rivers in order to achieve freshwater objectives for periphyton while recognising sensitive downstream environments;

k. Require regional councils to monitor macroinvertebrates and indigenous flora and fauna as measures of ecosystem health, and requiring them to use the macroinvertebrate community index to as a reporting measure;

l. Clarify that regional councils must consider economic wellbeing when setting freshwater objectives and limits;

m. Make consequential amendments arising from these amendments.

248. Specific recommendations are provided in the relevant sections above. The main impact of these amendments will arise from amendments to address concerns about the quality of water for swimming. Other amendments largely clarify the intent of the existing policies.

Implementation plan

249. These proposed changes generally support and clarify what is required by the Freshwater NPS. Any introduced changes will be supported by a comprehensive package of guidance and support to regional councils to assist with translating these changes into their regional freshwater management.

Monitoring, evaluation and review

250. Section 35 of the RMA requires regional councils to monitor the state of the environment to the extent required to perform its functions set out in the RMA, including those prescribed in the Freshwater NPS. Councils must also monitor the efficiency and effectiveness of their policies and rules in their regional plans, and report on a review of their monitoring at least every five years. As a result of these requirements regional councils monitor freshwater quality attributes, such as *E.coli* levels, dissolved oxygen levels and water clarity.[49] The Freshwater NPS requires regional councils to monitor all of the water quality attributes set out in Appendix 2.

251. This monitoring information is used to inform national environmental reporting under the Environmental Reporting Act framework. The first report, *Environment Aotearoa*, was released in 2015.[50] It contained an overview of the state of fresh water based on

[49] An example of such reporting on the monitoring of the rivers in the Greater Wellington region can be accessed at: http://www.gw.govt.nz/assets/Our-Environment/Environmental-monitoring/Environmental-Reporting/Rivers-State-of-the-Environment-monitoring-programme-Annual-data-report-2015-16.pdf

[50] Ministry for the Environment & Statistics New Zealand (2015). *New Zealand's Environmental Reporting*

data through to 2013. A freshwater domain report, which provides a more detailed overview of the state of fresh water nationally was published in 2017.[51] Freshwater domain reports will be published every three years.

252. The Water Directorate maintains close relationships with regional councils, iwi and hapū (particularly through the relationship with the Iwi Leaders Group) and other stakeholders, such as those in the primary sector or representing environmental interests. These relationships are critical to our ability identify challenges in the implementation of the Freshwater NPS and to help develop responses to these challenges that are proportionate and practical.

253. This monitoring data and these relationships are the primary vehicles through which the Freshwater NPS is monitored, evaluated and reviewed. Freshwater ecosystems are extremely complex and improvements in water quality as a result of improved resource management practices may take decades to become apparent. However, recurrent environmental reporting will enable early identification of trends and regular interaction with our wider network will highlight local decisions that are not likely to give full effect to the provisions of the Freshwater NPS. For example, by 2030 monitoring data should show whether the limits and methods regional councils have set are halting further declines in water quality.

254. Should a regional council not give full effect to the provisions of the Freshwater NPS, the options identified in paragraph 13 will be considered where appropriate.

255. A review of the implementation of the Freshwater NPS was undertaken in 2016. The findings of the review are expected to be published later this year.

Series: Environment Aotearoa 2015. Available from www.mfe.govt.nz and www.stats.govt.nz.

[51] Ministry for the Environment & Stats NZ (2017).*New Zealand's Environmental Reporting Series: Our fresh water 2017.* Retrieved from www.mfe.govt.nz and www.stats.govt.nz.