

**Office of the Minister for the Environment
Office of the Minister for Primary Industries**

Chair

Cabinet Economic Growth and Infrastructure Committee

Fresh water - proposals following *Next steps*

Proposal

1. This paper proposes consultation on the detail of three fresh water topics and the promulgation of the freshwater improvement fund. The most prominent proposal in this package is to address concerns raised during consultation last year about improving the swimmability of our freshwaters. We are proposing to shift the “wadeable” versus “swimmable” debate to a focus on improving the amount of time rivers and lakes are swimmable. Achieving swimmability across all waterways all of the time is impractical. In line with the Land and Water Forum recommendations, we propose that communities focus on improving the frequency that we can swim in our rivers and lakes.
2. We propose setting swimming targets that move from the current 72% of rivers and lakes length swimmable to 80% by 2030 and for 90% to be swimmable by 2040. These targets are aspirational, and over the coming months we will be asking councils how they can be achieved with an estimate of the costs.
3. Alongside the swimming targets, the paper sets out related policies that collectively would advance the recognition of iwi rights and interests in fresh water, contribute to water quality improvements, and improve the way in which our freshwater resources are used economically.
4. Specifically, this paper proposes:
 - a. Agreement to a long term target to improve water quality in rivers and lakes to meet community aspirations for swimming, and to seek feedback on that target
 - b. Agreement to the criteria for accessing the Freshwater Improvement Fund (eligibility criteria), and the standard required for applications to be investment-ready (assessment criteria)
 - c. Agreement to consult on the detail of the proposal for regulations to exclude stock from waterways, and after consultation and Parliamentary Counsel Office drafting, to release an exposure draft of the regulation to major stakeholders
 - d. Agreement to consult on proposed amendments to the National Policy Statement for Freshwater Management 2014.

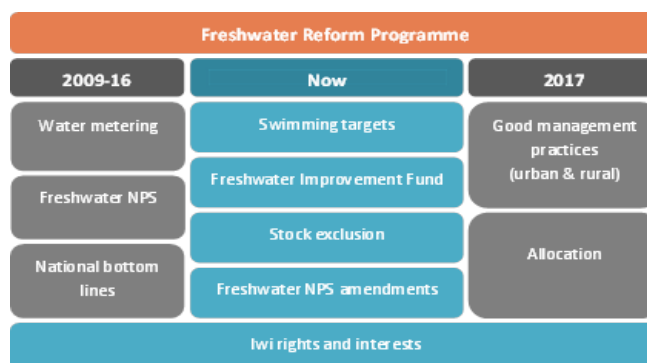
Executive summary

5. Since 2009, the Government has implemented a comprehensive programme of reforms to improve the management of fresh water in New Zealand.

6. This paper seeks agreement on the direction and support needed for councils and communities to make more progress on improving water quality.

7. In February 2016 we released a consultation document *Next steps for fresh water (Next steps)*. *Next steps* described a new fund for improving the management of fresh water within environmental limits, outlined proposals for excluding stock from waterways, providing for iwi and hapū rights and interests in fresh water, and refining the Freshwater NPS.

8. There were nearly 4,000 written submissions (expressing the views of over 6,000 organisations and individuals) about the proposals in *Next steps*. People's desire for lakes and rivers to be "swimmable" was a major theme in submissions (this was not proposed in *Next steps*).



Swimming targets

9. The first action proposed in this paper is to set a target for 80% of rivers and lakes to be swimmable by 2030, increasing to 90% by 2040. This target is to apply to those rivers and lakes that are an appropriate size for swimming. That is, rivers that are fourth order and above, and lakes with a perimeter more than 1.5 kilometres.

10. Currently 72% of New Zealand's rivers and lakes are suitable for swimming either more than 95 percent of the time ("excellent"), 90-95 percent of the time ("good"), or 80-90 percent of the time ("fair"). These categories are colour coded respectively as blue, green and yellow in the graphs and tables attached in Appendix 1. The rest of the rivers are swimmable 70-80 percent of the time ("intermittent" - orange), or not safe for swimming ("poor" - red).

11. The target needs to not only shift rivers into the swimmable category, but also improve the frequency of swimming over the full range. The national target also includes improving the percentage of time rivers and lakes are swimmable to 90% by 2040.

12. A map of New Zealand (included in Appendix 1) shows which rivers are likely to be suitable for swimming now. Bar graphs show what level of improvement is possible in rivers by 2040.

13. The cost for meeting the target for swimmable lakes and rivers will depend on the measures put in place locally to meet them. These costs are uncertain so we propose to announce them as the Government's aspiration for New Zealand.

14. Officials have done detailed work on getting a better appreciation of the costings based on practical experience. The programme of Horizons Regional Council, with Government funding, has shown that with an expenditure of \$46 million, they have been able to improve 600 kilometres of river by one category, from red to orange. This expenditure has been focused on issues of sediment and nutrients, as well as

swimmability, but would indicate a cost of about \$70,000 per kilometre, or \$40 million per 1% improvement. This would give a ballpark figure of a cost of \$880 million by 2030, and a further \$1.16 billion by 2040.

15. After the announcement, Minister Smith will write to all regional councils and ask them to report back by 31 March 2018 on where and how the swimming targets can be achieved and with an estimate of the costs and how feasible the targets are. This information will enable further modelling to be undertaken on costs.
16. The request to councils will be in the context of our proposal to amend the Freshwater NPS to provide clearer direction to councils to improve water quality so rivers and lakes can be swum in more often, and to monitor and report on progress. These amendments are intended to provide a transparent programme of improving water quality towards a swimmable quality over time.

Freshwater Improvement Fund

17. Our second action is to launch the Freshwater Improvement Fund (the Fund) and open it for applications. The Fund was approved as part of Budget 2016, subject to Cabinet's agreement on the eligibility criteria, the assessment criteria, and examples of projects that are "investment-ready" to illustrate the range of projects that may be supported through the Fund.
18. We are now seeking Cabinet's agreement to the Fund's criteria.

Excluding stock from waterways

19. In 2014, the Government signalled an intention to exclude stock from waterways to help improve water quality. This has also been discussed at length by the Land and Water Forum over the past year, and what we are proposing now is what the Forum has recommended as the most achievable timeframes and thresholds.
20. A willingness-to-pay study suggests that benefits gained nationally from excluding stock from waterways on flat and rolling land are up to \$983 million over 25 years depending on the types of stock excluded. The corresponding costs are up to \$367 million over 25 years. These costs would fall mainly on beef and deer farmers because dairy farmers have been working towards stock exclusion targets since 2003, and are nearly 95% there. To address concerns about costs and the difficulties some waterways present, we propose to stage the compliance deadlines for dairy support cattle, beef cattle and deer out to 2030, and allow farmers to make alternative arrangements where they cannot meet the exclusion requirements.

Proposed amendments to the National Policy Statement for Freshwater Management

21. The fourth action is to consult on proposed amendments to the National Policy Statement for Freshwater Management 2014 (Freshwater NPS). After considering all feedback on *Next steps*, and the advice from the Land and Water Forum, we propose to consult on:
 - a. Five proposed amendments to the Freshwater NPS (which are broadly in line with our proposals in the previous consultation):
 - i. clarifying that overall water quality is to be maintained or improved within a freshwater management unit; and within a band (A, B, or C)
 - ii. clarifying when catchments with significant infrastructure (such as hydro-electric power schemes) should be eligible for exceptions to bottom lines

- iii. applying water quality attributes for lakes to coastal lakes and lagoons that intermittently open to the sea
 - iv. strengthening the role of the concept of Te Mana o te Wai in the freshwater management framework, and
 - v. adding a requirement to monitor macroinvertebrates.
- b. In addition, based on feedback during the consultation period, we propose to consult on three more amendments to the Freshwater NPS as follows:
- i. A suite of changes to direct councils to improve water quality in rivers and lakes to a swimmable quality more often
 - ii. directing councils to manage nitrogen and phosphorus in rivers when they set their objectives for periphyton, and
 - iii. giving clearer direction that councils should be considering economic well-being in freshwater planning decisions.
22. Regional councils will retain discretion about which rivers and lakes are to be improved, the level of improvement being aimed for, and the timeframe for achieving these improvements. There will be some increased costs on regional councils to meet the associated monitoring requirements because not all councils monitor *E. coli* as regularly as will be required. Small district councils may find the costs onerous if they are required to improve sewage treatment and upgrade wastewater infrastructure on a faster schedule than planned upgrades.
23. The costs associated with excluding stock from waterways, which will contribute to improving water quality for swimming, are described in paragraph 21 above.

Consultation and further work

24. We are proposing to release a consultation document outlining these proposals and seeking submissions on the two regulatory proposals (stock exclusion regulations and Freshwater NPS amendments). A draft document is attached in Appendix 2.
25. Policy development on the allocation of water resources is progressing with the involvement of the Freshwater Iwi Leaders Group, as well as councils and other stakeholders. This is being reported to cabinet separately.

Background

Previous Cabinet consideration

26. In February 2016, Cabinet agreed to consult on proposals for freshwater reform (EGI-16-Min-0006). We released our consultation document *Next steps for fresh water (Next steps)* in February and ran a series of public meetings and hui around the country over the following two months.
27. In April 2016, Cabinet noted the appropriation changes needed for the Freshwater Improvement Fund and agreed that no expenses are to be charged against this appropriation until Cabinet has approved the criteria for accessing the fund, the standard required for an investment ready application, and examples of investment ready projects (CAB-16-Min-0189.11).

Feedback on Next steps proposals

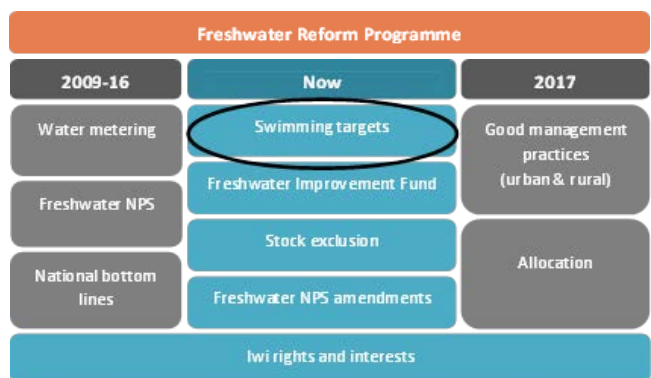
28. *Next steps* sought feedback on five areas as follows:

- a. setting up the \$100 million “Freshwater Improvement Fund”
 - b. excluding stock from water bodies through regulation
 - c. improving direction in the Freshwater NPS
 - d. strengthening iwi and hapū participation in freshwater management
 - e. promoting more efficient use of fresh water and good management practices
29. There were 3,966 written submissions about the proposals in *Next steps*, representing the views of 6,342 individuals, iwi/hapū groups, local government, environmental and community groups, sector groups and other stakeholders.
30. During consultation some submitters raised issues that were not canvassed in *Next steps*. These were:
- the view that all lakes and rivers should be suitable for swimming, and
 - the need for councils to actively manage nitrogen and phosphorus levels in rivers in addition to managing slime growth and nitrate toxicity.
31. Subsequently, we sought views and comments from stakeholders, including the Land and Water Forum (LAWF), and relevant iwi and hapū on how the Freshwater NPS should provide for these two matters, as well as two additional matters:
- whether the Freshwater NPS should be amended to change who can make decisions about which pieces of significant infrastructure can be eligible for exceptions to bottom lines, and
 - whether the Freshwater NPS should be amended to require more consideration of economic well-being in freshwater planning decisions.

Comment

Ninety percent of rivers and lakes swimmable by 2040

32. The Freshwater NPS currently sets the national bottom line for human health for recreation at a moderate level of risk when boating or wading. We want to address the ongoing mistaken public perception that the national bottom line is a ‘goal’ which rivers and lakes can be degraded down to, and shift the public discussion towards making feasible improvements to water quality that mean more rivers and lakes will be swimmable more often.



33. We propose a national target that by 2030, 80% of rivers and lakes will be swimmable, moving towards 90% by 2040. We are satisfied, having looked at practical examples of programmes being run by regional councils, that these targets are set at the right level of ambition given the importance of improving freshwater quality with the practicality and cost of achieving them, based on current information. We are proposing to work with regional councils to get more complete information on achieving this target.

34. We do not want the target to be a simplistic focus on improving water quality on the margins of the fair (yellow) and intermittent (orange) categories, but for it to drive an improvement in swimmability frequency across all categories. This is achieved by also requiring the overall percentage of the rivers and lakes nationally are swimmable is 90% by 2040 as expressed in Appendix 1.
35. The targets would be supported by:
 - Specification for swimmable rivers and lakes based on the amount of time they are suitable for swimming, rather than the binary “suitable” or “not suitable”.
 - Providing information to communities so they can have a clear understanding of the requirements for, and implications of, activities that involve full immersion (swimming) in rivers and lakes and where improvements to achieve these should be prioritised.
 - Leveraging available funding and developing tools to help people use resources more efficiently.
 - Our commitment to exclude stock from water bodies, and Freshwater NPS requirements to improve how often rivers and lakes are suitable for swimming.
36. The first step is to provide communities with national and regional maps that set out current *E. coli* levels in rivers, and toxic algae in lakes, and how those levels affect where and when people can swim (see Appendix 1).
37. The maps are complemented by the *Land, Air and Water Aotearoa* platform (LAWA) – a website that shares up-to-date water quality information for freshwater monitoring sites across the country and is intended to provide advice to assess risk on a day-by-day basis. This would give the public the most up-to-date information on whether they can swim in identified water bodies. The LAWA platform is a partnership between the Ministry for the Environment, regional councils, the Cawthron Institute, Massey University, and the Tindall Foundation.
38. To support the target, we are proposing a suite of amendments to the Freshwater NPS. These are described in paragraphs 78-88.

The costs of meeting the targets

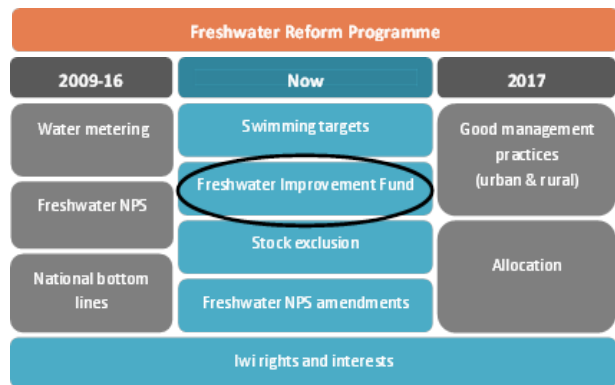
39. Achieving the national target will require improvements in water quality in relation to *E. coli* by 2030. The costs associated with those improvements will depend on the choices councils make about which water bodies are to be improved first, the level of improvement being aimed for, and the timeframe for achieving these improvements. Regional councils will retain discretion over those choices, and when making those choices, will have to consider the impacts of those choices on communities.
40. Costs in rural catchments will arise from fencing stock out of waterways, planting riparian buffers, and upgrading effluent treatment systems. Costs in urban catchments will arise from improving stormwater and wastewater infrastructure.
41. These costs are generally bound up with actions put in place to achieve other improvements in water quality. For example, reducing *E. coli* contributions to rivers and lakes by excluding stock access can also reduce sediment and nutrient contributions, which reduces impacts on aquatic habitats. Similarly, urban infrastructure upgrades (e.g. to move to land-based sewage treatment to address social and cultural concerns, and to reduce sewage overflows to streams during

high rainfall events) also reduces nutrients and other contaminants in rivers and lakes.

42. The costs of meeting the targets are uncertain so we propose to announce them as the Government's aspiration for New Zealand. We do have case studies, such as Manawatu, that give us estimates of the costs of improving the swimmability of rivers and lakes, where for \$46 million of expenditure, 600 kilometres of rivers have been improved from red to orange. This would suggest a cost of achieving the 2030 target of approximately \$880 million, or \$73 million per year, and a further \$1.16 billion, or \$110 million per year, to 2040. The total costs of the 2040 target are estimated at \$2 billion, of which \$367 million is for the proposed stock exclusion regulations. Part of this cost will fall on farmers, and on councils upgrading urban water systems. The Government has already committed \$395 million in clean-up and protection projects, such as those in Waikato and Manawatu, with an actual spend from this of \$170 million up to 31 December 2016. A further \$100 million fund is being established as part of this paper. In addition, the Government is contributing over \$50 million on research to improve farm practice and fresh water quality.
43. Minister Smith will write to all regional councils and ask them to report back by 31 March 2018 on where and how the swimming targets can be achieved with an estimate of the costs and how feasible the targets are. We will also talk to city and district councils and other stakeholders to establish the likely costs to them if they were required to put in place unplanned measures in order to contribute to achieving the targets.

Freshwater Improvement Fund

44. The Freshwater Improvement Fund (the Fund) was approved as part of Budget 2016. The agreed allocation is \$100 million over the period 2016/17-2025/26.



45. The Fund has the potential to support faster and more widespread transition to operating within quantity and quality limits set in accordance with the Freshwater NPS. This could mean achieving water quality and quantity objectives in a shorter timeframe, and/or with lower disruption costs.
46. *Next steps* sought public feedback on proposed criteria for the Fund. Around 8% of submissions commented on the criteria. We have considered the views expressed in submissions, as well as lessons learned from other funds, and the results from targeted interviews with potential applicants and potential co-funders. Criteria for demonstrating co-benefits, such as increased biodiversity or reduction of current or future impacts of climate change, and for ensuring that projects are not more appropriately funded through other sources, have been tightened accordingly. We are moving to a targeted approach to identify projects providing the greatest potential return on investment and resulting in the best measurable, long-term environmental, social and/or cultural outcomes.
47. We will provide guidance for applicants about the necessary level of detail to support applications when we launch the Fund.

Getting the most from investment in fresh water - using data to inform decision-making

48. International evidence shows that early intervention in water bodies beginning to exhibit signs of stress is the most effective way to use funds to support improvement. This means taking action before remediation costs escalate and options for future use are lost.
49. We propose to use data to identify at-risk or vulnerable water bodies (including lakes, rivers, wetlands and groundwater) which will then be considered a priority for funding, based on:
 - the current state of the water body (including water quality and flows); and
 - the nature and degree of pressures on the water body; and
 - the significance of the water body to the economy, society and the environment (e.g. local economy, destination for recreation, ecologically significant flora or fauna in terms of representativeness or uniqueness).
50. Applications for projects addressing non-priority water bodies will still be considered for funding; however those applications addressing priority water bodies will be given a weighted preference in the decision-making process.
51. Decisions will be informed by data and the likelihood of interventions addressing the challenges identified. Planned evaluation and evidence-based feedback loops will be applied to measure the performance of the Fund and overall effectiveness of spend.
52. Appendix 3 shows major funding programmes in operation across New Zealand. A mixture of government and non-government agencies are working together to identify long-term options to align funding so that opportunities to improve fresh water are maximised, greater transparency on future funding opportunities is provided to applicants, and the leverage of Crown funding is improved to achieve benefits at a whole-of-catchment scale.

Eligibility criteria

53. We propose two tiers of criteria for the Fund. The first tier is a set of eligibility criteria which applicants must fulfil in order to have an application considered. The proposed eligibility criteria are:
 - a. The project must contribute to the improvement of the management of New Zealand's freshwater bodies.
 - b. The project must meet one or more of the following:
 - i. achieve demonstrable co-benefits such as improved fresh, estuarine or marine water quality or quantity, increased biodiversity, habitat protection, soil conservation, improved community outcomes such as to recreational opportunity or mahinga kai, reduction to current or future impacts of climate change, reduced pressure on urban or rural infrastructure
 - ii. increase iwi/hapū, community, local government or industry capability and capacity in relation to freshwater management
 - iii. establish or enhance collaborative management of fresh water
 - iv. increase the application of Mātauranga Māori in freshwater management

- v. include an applied research component which contributes to improved understanding of freshwater interventions and their outcomes
- c. The minimum request for funding is \$200,000 (excluding GST).
- d. The Fund will cover a maximum of 50% of the total project cost.
- e. The project will be funded for a maximum period of up to 5 years after which the project objectives will have been achieved or the project will be self-funding.
- f. The project must achieve benefits that would not otherwise be realised without the Fund or are not more appropriately funded through other sources.
- g. The effectiveness of the project and its outcomes will be monitored, evaluated and reported.
- h. An appropriate governance structure is in place (or one will be established as part of the project).
- i. The applicant must be a legal entity.

Assessment criteria

54. We propose a second tier of criteria that eligible applications should demonstrate to provide a strong application. Applications will be expected to score strongly against the assessment criteria in order to be supported through the Fund.
- a. The extent to which the project addresses the management of freshwater waterbodies identified as vulnerable.
 - b. The project demonstrates improvement in the values and benefits derived from the freshwater body.
 - c. The extent to which public benefit is increased.
 - d. The project demonstrates a high likelihood of success based on sound technical information or examples of success achieved through comparable projects undertaken elsewhere.
 - e. The extent to which the project will leverage other funding.
 - f. The project will involve the necessary partner organisations to ensure its success.
 - g. The project will engage personnel with the required skills and experience to successfully deliver the project.

Decision-making process

55. To provide a high degree of independence to the process, we propose appointing a panel of experts to assess applications. A panel with the relevant expertise and experience will consider applications to the Fund and make recommendations to the Minister for the Environment for decision. The panel will have skills in the following areas:
- a. Knowledge of the Freshwater NPS and requirements for implementation
 - b. Freshwater ecosystems and water quality
 - c. Good practice land and water management
 - d. Mātauranga Māori

- e. Resource management
 - f. Economics
 - g. Business acumen
 - h. Project management and governance.
56. To ensure the best possible coordination of Crown funding, the panel will also include representation from the Natural Resources Sector. A representative from the Ministry for the Environment will act as Chair for the Panel.
 57. Guidance to help applicants prepare their applications will be available when the Fund is launched. All eligible applications will be assessed against the assessment criteria and on their merit compared with the other applications received. Proposals will not require a full cost benefit analysis to demonstrate a net public benefit.
 58. The Minister for the Environment will make the final funding decisions based on recommendations received from the Fund's assessment panel.

Operation of the Fund

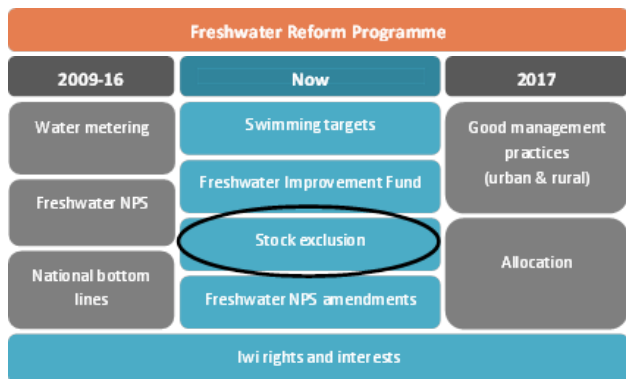
59. The Fund will be managed by the Ministry for the Environment as a single contestable fund that is able to respond to a range of emerging issues and opportunities in an agile and transparent manner.
60. Subject to Cabinet approval of the criteria, the inaugural funding round will open at the same time we open for consultation on the proposals for stock exclusion and Freshwater NPS amendments. We propose that \$24.5 million is available in the first funding round to cover three years of funding.
61. We propose an evaluation of the Fund is undertaken after three years of operation and prior to opening the second funding round. The evaluation will consider the performance of the Fund and overall effectiveness of spend. If the evaluation identifies anything that would improve the effectiveness of the Fund, recommended changes to its purpose or criteria will be brought back to Cabinet for approval.

Examples of investment ready projects

62. Examples of projects that are “investment ready” are provided in Appendix 4 to indicate the range of potential projects that may be supported through the Fund. These examples are intended to be illustrative only, and are not intended as a firm commitment from either the potential applicant, or the Crown that the projects will proceed as described or be supported through the Fund.

Excluding stock from waterways

63. The Government has committed to excluding dairy cattle on milking platforms from water bodies by 1 July 2017. Excluding stock from accessing rivers, lakes and estuaries will help to improve water quality in those water bodies and address some of the negative public perceptions around the environmental performance of farming.



64. The Land and Water Forum has recommended that stock other than dairy cattle and pigs (dairy support cattle, beef cattle and deer) should be excluded over time and that the Government should provide advice on the methods of exclusion and phase-in times that would be appropriate on differing farm and land types.
65. *Next steps* sought feedback on the Government's proposal. Iwi and hapū groups, territorial authorities, NGOs, science providers and individuals largely agreed with the proposal or wanted regulation to be either more stringent or implemented sooner. There was some opposition from primary industry and some regional councils.
66. We have considered the submissions on stock exclusion and propose to proceed as indicated in *Next steps*, with some refinements recommended by LAWF. These are:
- Dairy cattle on milking platforms (i.e. on the dairy farm, also while grazing), and pigs will be excluded from water bodies on all land, including hill country.
 - Dairy cattle on dairy support land (i.e. not being milked) will have the same deadline (1 July 2022) regardless of land ownership (dairy farmer or a third party).
 - Where stock exclusion is not feasible, the farmer can develop a stock exclusion plan.
67. The amended proposal is set out in Table 1 below. An illustration showing the timeframes these restrictions would apply to each stock type, and on each type of terrain, is included in the draft discussion document attached at Appendix 2.

Table 1. Proposed deadlines for stock to be excluded from water bodies

Farm/stock type	Plains (0-3°)	Undulating / rolling land (>3-15°)	Steeper land (> 15°)
Dairy cattle (on milking platforms) and pigs	1 July 2017 (across all terrain) (1 July 2020 for streams less than 1 metre wide on the plains)		
Dairy support cattle ¹ (on either land owned/leased by the dairy farmer or third party land)	1 July 2022		Only where break-feeding, by 1 July 2022
Beef cattle and deer	1 July 2025	1 July 2030	
	Where break-feeding, by 1 July 2022		

1. **Dairy support cattle** are dairy cattle not being milked (young animals or mixed-aged cows) that are grazed off the milking platform (land where milked cows are farmed) either temporarily or throughout the year.

68. The 1 July 2017 deadline for dairy cattle and pigs signalled in *Next steps* requires the regulations to be drafted by Parliamentary Counsel Office and agreed by Cabinet by 1 June. We would like to work closely with major stakeholders, in particular the Land and Water Forum, by providing an exposure draft of the regulations to those stakeholders for comment. To do this, we believe the 1 July 2017 timeframe is tight and we would be subject to progress on the Resource Management Act reform and this consultation. We may need to defer that deadline for dairy cattle and pigs to a later date in 2017. The exact date will be determined when Cabinet makes its decisions on the regulations (expected early August).

69. To meet our commitment to exclude dairy cattle from waterways in 2017, we propose that Cabinet delegates power to the Minister for the Environment to make final policy decisions and authorise the Parliamentary Counsel Office to draft the regulations after the consultation. Once drafting is complete, we propose to return to Cabinet with regulations (and a regulatory impact statement) for your approval to submit to the Executive Council.
70. Our preference is for a regulation to be drafted under section 360 of the RMA. A proposed RMA change to enable a s360 regulation for stock exclusion is included in the Resource Legislation Amendment Bill, which has been referred back to the select committee. Alternatively, the proposed approach to stock exclusion can be achieved through a national environmental standard. Consultation is required for either method.

The impacts of a regulation for excluding stock from waterways

71. A draft regulatory impact statement has been prepared (see Appendix 5) for this proposal. After consultation, a final regulatory impact statement will be prepared to accompany the Cabinet paper seeking agreement to make the regulations.
72. The National Stock Exclusion study¹ reviewed the effectiveness of stock exclusion at reducing *E. coli* levels. Removal efficiencies of the *E. coli* load are around 60 per cent for dairy cattle and deer, and around 40-50 per cent for beef cattle. The benefits gained nationally from excluding stock from waterways range from \$65 million for excluding dairy cattle on milking platforms where most exclusion has already occurred, to \$983 million when excluding dairy cattle, beef cattle and deer on flat and rolling land. Benefits were calculated from a survey of the willingness of people to pay for improvements in water quality for swimming (measured by reduced risk of Campylobacter infection).
73. The studies showed that the most favourable benefit-cost ratio (8.1) would be achieved if the regulations were to apply solely to dairy cattle. This is largely because fencing is relatively straightforward on flat land, most dairy cattle are already excluded from waterways, and temporary fencing can be used for dairy support. We propose to exclude all stock (with a benefit-cost ratio of 2.7) because this will bring about the greatest improvements in water quality, and this was the option recommended by the LAWF.
74. The study estimated national costs of stock exclusion (fencing and water reticulation) at \$20 million for dairy cattle on milking platforms or \$32 million for all dairy cattle (including dairy support). This rises significantly to \$358 million when beef cattle are added, and to \$367 million for dairy cattle, beef cattle and deer. These costings take into account existing levels of stock exclusion fencing, and assume a mix of permanent and temporary fencing.
75. The majority of these costs will be borne by farmers. Around half the regional councils offer funding towards streamside fencing costs (between 25 per cent and 50 per cent of the cost), although this is often only available for priority areas.
76. The dairy industry has been working towards stock exclusion targets since 2003 through the Sustainable Dairying: Water Accord and its predecessor, the Dairying and Clean Streams Accord. In 2014, Dairy NZ reported that 94 per cent of "Accord"

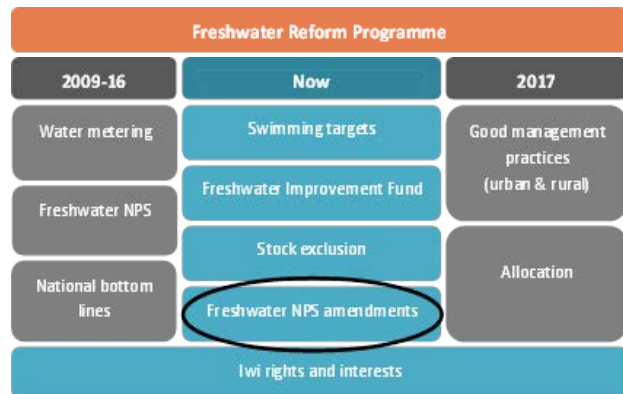
¹ Grinter and White (2016) "National Stock Exclusion Study: analysis of the costs and benefits of excluding stock from New Zealand waterways". Report prepared by the Ministry for Primary Industries and Ministry for the Environment.

water bodies had been fenced. The 1 July 2017 deadline for dairy aligns with the Accord's target. The pork industry is similarly well progressed with regards to stock exclusion, so we are proposing the same 1 July 2017 deadline for pig farms.

77. There is a lot of work left to do for dairy support cattle, beef cattle and deer, and the generally larger size of these farm types will make the costs for individual farmers higher. Later deadlines give those farmers time to budget and plan for stock exclusion work, and the ability to spread the costs over time.

Amending the National Policy Statement for Freshwater Management

78. There are eight proposed amendments to the Freshwater NPS. The majority of these have been previously agreed by Cabinet (EGI-16-Min-0006) and were consulted on as part of the *Next steps*. Consultation has resulted in some changes to the proposed amendments. The updated proposals are described below.



79. The text of the proposed amendments is provided in Appendix 6. There may be some minor changes required to the text to ensure that it meets legal requirements.
80. A draft regulatory impact statement and an evaluation of benefits and costs prepared under section 32 of the RMA have been prepared (see Appendices 7 and 8). After consultation, a final regulatory impact statement and revised section 32 evaluation will accompany the Cabinet paper seeking agreement to make the amendments.

Suitability of rivers and lakes for swimming

81. Around 55% of submissions to *Next steps* requested a change to the national bottom line from wading to swimming. The Freshwater 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.
82. In early 2016 we asked the Land and Water Forum to consider how the Freshwater NPS could better reflect community aspirations around swimmable rivers and lakes. Their view is that we should recognise New Zealanders' aspirations for primary contact in all lakes and rivers by strengthening objectives in the Freshwater NPS, adding a new compulsory value for swimming, and developing a new *E. coli* attribute table where the bands vary according to the proportion of time a water body meets a swimmable quality.
83. In July 2016 we sought further comments from iwi and regional councils on whether the Freshwater NPS should address iwi/hapū and community aspirations to work towards improving the suitability of lakes and rivers for swimming. Responses from iwi supported an increased focus on swimming in the Freshwater NPS, while the responses from regional councils were mixed. Some councils wanted to work with their communities to identify where water should be managed for swimming. Some expressed concerns about the use of *E. coli* as an indicator.
84. The Freshwater Iwi Advisors Group, while supporting the direction to improve rivers and lakes to a swimmable quality, were concerned that focussing on rivers greater

than fourth order and removing the national bottom line for *E. coli* could mean many smaller rivers need only be maintained at their current quality. Modelling shows that about 90% of catchments in New Zealand flow into rivers that are fourth order or more. We have decided to focus on improving these rivers, recognising that councils may decide to require improvements for smaller streams flowing directly to the sea if that is what their communities want.

85. We have considered the views expressed on this issue and propose to amend the Freshwater NPS as follows:
- a. Clearly state the Government's swimming targets in the Preamble, and what is expected of councils and communities.
 - b. Remove the definition of "secondary contact" in the Interpretation.
 - c. Remove the reference to "secondary contact" in Objective A1.
 - d. Add a new Objective to aim for water quality to be swimmable more often, and make it applicable to rivers that are fourth order and above, and lakes with a perimeter more than 1.5 kilometres
 - e. Require regional councils to identify in their regional plans which rivers and lakes are suitable for swimming now, and which will be improved so that they are suitable for swimming, and specify timeframes.
 - f. Require regional councils to update their implementation plans to reflect the requirements of these amendments.
 - g. Require consideration of swimming at all points in the objective setting process.
 - h. Require councils to monitor and report on water quality using the same *E. coli* methodology used for the swimming maps (including the frequency of sampling and the percentage of time each water body is swimmable).
 - i. Amend the "human health for recreation" value description to recognise swimming aspirations (this is also in accordance with a recommendation from the Iwi Advisors Group)
 - j. Replace the existing attribute table for *E. coli* with a new attribute table that more closely aligns with the bands used in the swimming maps, and removes the national bottom line for "boating and wading".
 - k. Require councils to monitor and report on water quality using the time-based *E. coli* measure (matching the methodology of the swimming maps).
86. The incremental changes needed (adoption of good management practices, increased fencing, urban infrastructure upgrades) will impose greater costs on communities than the status quo. The extent of the costs will depend on where councils and communities choose to prioritise improvements, and how that fits with complementary programmes underway.
87. The proposals to have an *E. coli* attribute table with band levels that vary according to the amount of time the water quality meets the swimmable threshold and require consistent monitoring are consistent with recommendations from the Land and Water Forum. The proposals differ from the Land and Water Forum's recommendation to retain the existing table with the bottom line because that approach would have been inconsistent with our desire to shift the public conversation to more swimmable rivers and lakes.

88. The Land and Water Forum also recommended adding a new value for “primary contact” to the Freshwater NPS. Instead, we have proposed changes to the description for the existing compulsory value of “human health for recreation” to make the value more inclusive of all recreation. This change to the value description is in line with recommendations from the Freshwater Iwi Advisors Group.

Maintaining or improving overall water quality

89. The Freshwater NPS directs that overall water quality is to be maintained or improved across a region. Some councils and communities are now debating what “maintaining” water quality means in relation to the water quality attributes that were introduced in 2014 as part of the national objectives framework.
90. *Next steps* proposed two ways to address these two issues. First, that overall water quality should be maintained or improved within a freshwater management unit (usually a catchment or sub-catchment, or sometimes multi-catchment) rather than across a region. Second, that overall water quality can be maintained or improved if a regional council can demonstrate that the value (e.g. ‘ecosystem health’) is no worse off, or that it will stay within bands (where they have been defined, e.g. the “B” band for nitrate toxicity).
91. The Freshwater Iwi Advisors Group is opposed to maintaining water quality within a band because this could allow further degradation of water quality. The Land and Water Forum and the Parliamentary Commissioner for the Environment have both recommended the band approach.
92. We have considered the views expressed in submissions and propose to amend the Freshwater NPS as indicated in *Next steps and supported by LAWF*. That is:
- a. amend Objective A2 to replace reference to ‘a region’ with ‘a freshwater management unit’
 - b. where attributes are defined in the Freshwater NPS, freshwater objectives to maintain overall water quality must be set within the same attribute band as existing water quality; and
 - c. where attributes are not defined in the Freshwater NPS, freshwater objectives to maintain overall water quality must be set so that the values identified are not worse off when compared to existing water quality.
93. There are no new impacts associated with this amendment because it does not add any new requirement, is not inconsistent with the approaches taken by regional councils to date, and provides greater certainty to communities.

Infrastructure exceptions

94. The Freshwater NPS allows councils to set freshwater objectives below a national bottom line (an “exception”) if:
- i. *the current water quality is below national bottom lines;*
 - ii. *infrastructure contributes to existing water quality; and*
 - iii. *the infrastructure is listed in Appendix 3 of the Freshwater NPS.*
95. Appendix 3 is currently empty. To date no infrastructure owner or regional council has provided evidence of a freshwater management unit with water quality below a national bottom line and identified that infrastructure is contributing to that quality.

96. The infrastructure owners are concerned that the evidential burden for them to be listed in the Freshwater NPS as eligible for an 'exception' is too high. Their preference is to have one process for setting objectives below a national bottom line, and this should be at the regional planning level (i.e. no reliance on being listed in the Freshwater NPS). Alternatively, they would like infrastructure to be listed in the Freshwater NPS now. It remains unclear, however, where any infrastructure is contributing to a water body being below a national bottom line.
97. We have considered the views expressed in submissions and subsequent views from the owners of hydro-electric power schemes. We propose to amend the Freshwater NPS as indicated in *Next steps*:
- a. to amend the 'exceptions' policy so that regional councils can set objectives below a national bottom line if that is necessary to realise the benefits provided by infrastructure (which must also be listed in the Freshwater NPS), and that such an objective can only apply in a water body, multiple water bodies, or parts of a water body where water quality is affected by the infrastructure
 - b. to clarify through guidance that infrastructure owners need to demonstrate a water quality problem in a water body and that infrastructure exists in the affected water body if they want the Government to consider amending the Freshwater NPS to list the infrastructure in Appendix 3
 - c. to not list any infrastructure in Appendix 3 of the Freshwater NPS (which would make the freshwater management unit eligible for having freshwater objectives set below a national bottom line) at this stage
98. There are no new impacts associated with this proposal because it clarifies the scope and effect of the policy, which will increase the certainty for infrastructure owners wanting infrastructure listed in Appendix 3, and that when infrastructure is listed, what regional councils must consider when deciding to allow an exception.

Coastal lakes and lagoons

99. The Freshwater NPS applies to all fresh water (whether it is in an aquifer, river, wetland, coastal lagoon or inland lake), but the application of the water quality attributes and national bottom lines to intermittently closing and opening coastal lakes and lagoons is ambiguous. There are few large freshwater coastal lakes in New Zealand, with most in the South Island, and one in the Chatham Islands. To date, councils have set objectives for coastal lakes both above and below the national bottom lines. Two councils are still in the process of setting objectives and may - or may not - use the lake attributes. Another has not started the process of setting objectives to give effect to the Freshwater NPS.
100. Advice from scientists with expertise in both freshwater lakes and estuaries is that the lake attributes and national bottom lines are applicable to coastal lakes. Water quality data indicate that most of these coastal lakes are either already above national bottom lines, or could achieve national bottom lines over time.
101. The exception to this is Te Waihora/Lake Ellesmere which is significantly degraded and if current land uses continue is unlikely to improve to a level above the national bottom lines for nitrogen and phosphorus in the foreseeable future. The Government, Environment Canterbury, and affected communities have collectively made considerable investments (e.g. fencing, planting native plants, re-shaping stream banks, changing stocking rates), to reduce sediment and nutrient loads on the lake but the results to date indicate that long term improvements will take generations.

102. *Next steps* proposed to amend the Freshwater NPS to clarify that all lake attributes apply to coastal lakes. Environment Canterbury raised issues with the proposal both during consultation and subsequently, on the grounds that coastal lakes in Canterbury have been degraded by previous land uses and it is unlikely that the national bottom lines could be achieved for them even within decades.
103. We have considered the views expressed in submissions and subsequent views from Environment Canterbury. We propose to amend the Freshwater NPS as indicated in *Next steps*:
- a. remove the footnote to the lake attribute table for total nitrogen in Appendix 2 that introduced ambiguity for coastal lakes, and clarify how the sampling regime for all lake attributes applies to coastal lakes and lagoons that intermittently open to the sea.
104. This proposal removes ambiguity and so reduces likely debate and litigation. But removing the ambiguity would have significant impacts when the national bottom lines are applied to Ellesmere/Te Waihora. Provisions in the operative plan for Te Waihora were developed and agreed on the council's understanding that the lake attributes do not apply to coastal lakes that intermittently open to the sea.
105. Environment Canterbury is required to evaluate the effectiveness of its current approach in 2021 (five years after its plan change became operative). At that time, the Government could amend the Freshwater NPS to include Ellesmere/Te Waihora in Appendix 4, and therefore make it eligible to have a transitional objective(s) below a national bottom line(s). At the end of the transitional period, the governance partners can review progress in water quality improvements and, if necessary, apply for another period where a transitional objective could apply.
106. *Next steps* also proposed to provide direction about the type of evidential thresholds needed to list a water body as being eligible for having an objective set below a national bottom line for a transitional period. More than 90 percent of those who submitted on this proposal (including Environment Canterbury) agreed. We intend to progress this proposal through guidance. Before considering adding a freshwater management unit to the Freshwater NPS, we would seek evidence that a council and community has examined all feasible options to improve water quality and concluded that the required interventions would place unreasonable costs (including social, cultural and economic costs) on the community.

Nitrogen and phosphorus in rivers

107. High levels of nitrogen and phosphorus in rivers can promote periphyton growth (slime), which in large amounts can adversely affect aquatic ecosystems (e.g. by smothering the bed or removing oxygen). Nitrate itself can be toxic to animals and humans in very high concentrations. The Freshwater NPS requires councils to manage the effects of nutrients in rivers by setting objectives for periphyton and nitrate toxicity. There is no direction that they must manage both nitrogen and phosphorus to manage periphyton.
108. Submitters to *Next steps* asked for the Freshwater NPS to include specific direction about nutrients in rivers (it was not part of any proposal). In early 2016 we asked the Land and Water Forum to consider how the Freshwater NPS should address nitrogen as a nutrient affecting rivers, and in July we sought further comments from Iwi and regional councils on whether further direction was needed in the Freshwater NPS for managing nutrients in rivers (in addition to managing periphyton). The Land and Water Forum recommended that councils be required to set maximum in-

stream concentrations for both nitrogen and phosphorus to support the existing periphyton attribute.

109. We propose to amend the periphyton attribute table in the Freshwater NPS as follows:
- a. direct councils to set maximum concentrations for dissolved inorganic nitrogen and dissolved reactive phosphorus when setting objectives for periphyton
 - b. direct councils to consider downstream environments when setting maximum concentrations for dissolved inorganic nitrogen and dissolved reactive phosphorus
110. There are no new impacts associated with this proposal, which makes the Freshwater NPS requirements for what is needed to set limits to achieve periphyton objectives more explicit. That is, councils must control nutrients in rivers in order to achieve objectives for maximum periphyton (slime) levels.

Addressing Iwi/hapū rights and interests

111. The Government has acknowledged in the Courts and to the Waitangi Tribunal that Iwi and hapū have rights and interests in fresh water. The Government's position has been that the recognition of Iwi/hapū rights and interests in fresh water must involve mechanisms that relate to the on-going use of those resources, and may include participation in freshwater decision-making processes. The Government has committed to considering how to provide appropriately for these rights and interests through freshwater reform.
112. We have previously advised Cabinet on the connection between the recognition of Iwi and hapū rights and interests and the freshwater work programme (see CAB Min (15) 26/10 and CAB Min (15) 1/9).

Te Mana o te Wai

113. *Next steps* included a description of Te Mana o te Wai as follows:

Te Mana o te Wai is a core concept for fresh water. It encompasses the integrated and holistic health and well-being of a water body. It represents the innate well-being and vitality (mauri) of a water body and its ability to provide for the health of the water (te hauora o te wai), the health of the environment (te hauora o te taiao), and the health of the people (te hauora o te tangata).

The health and well-being of our water bodies is integral to the health and well-being of our land and other resources (including fisheries, flora and fauna) and to our health and well-being both as communities and as a nation.

When Te Mana o te Wai is given effect, the water body will sustain the full range of environmental, social, cultural and economic values held by Iwi and the community. This is a concept that is relevant to all New Zealanders.

114. *Next steps* proposed that a purpose statement would be included in the Freshwater NPS to provide context about the meaning of Te Mana o te Wai, and that councils would be required to demonstrate its use as the platform for community discussions about freshwater management.

115. With the exception of individuals who interpreted Te Mana o te Wai as being Māori-centric, the majority of submitters supported this proposal. A common observation 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.
116. Since *Next steps* consultation, the Freshwater Iwi Advisors Group has informed the Land and Water Forum and engaged with officials to clarify how they see the concept of Te Mana o te Wai being applied by communities. The Freshwater Iwi Advisors Group and officials have reached agreement on the policy intent and the amendments proposed for Te Mana o te Wai.
117. We propose to amend the Freshwater NPS as indicated in *Next steps*, with some recommendations from the Freshwater Iwi Advisors Group to:
- a. move the section “National significance of fresh water and Te Mana o te Wai” to the body of Freshwater NPS under “Commencement”
 - b. include the text used in *Next steps* to describe Te Mana o te Wai (with some changes recommended by the Iwi Advisors Group) in the section “National significance of fresh water and Te Mana o te Wai”
 - c. add a new objective requiring councils to consider and recognise Te Mana o te Wai in the management of fresh water
 - d. add a new policy directing councils to ensure policy statements and plans consider and recognise Te Mana o te Wai, while noting the connection between fresh water and the broader environment and the need to inform the setting of freshwater objectives and limits through engagement with the community, including tāngata whenua
 - e. clarify within Policy CA2 how councils are to consider and recognise Te Mana o te Wai in the objective setting process
 - f. add a requirement to recognise the interactions, ki uta ki tai (from the mountains to the sea) between fresh water, land, associated ecosystems, and the coastal environment
 - g. amend Policy CB1(ba) to include mātauranga Māori as an established monitoring method that is appropriate for monitoring progress towards, and the achievement of, freshwater objectives that are set in line with the concept of Te Mana o te Wai
 - h. amend the names and order of the national values in Appendix 1 of the Freshwater NPS so they can more easily be linked to Te Mana o te Wai by associating each value 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)
 - i. amend the description of the compulsory value “human health for recreation” so that it removes the emphasis on boating and wading and provides a more positive explanation of what a healthy water body means for human health
 - j. amend the description of the additional value “natural form and character” so that it provides clearer links to Te Mana o te Wai
118. These changes will improve the connection between the Freshwater NPS and the process councils follow with their communities when deciding on their objectives for the water bodies, and when monitoring progress towards achieving those

objectives. The intended outcome is that Te Mana o te Wai will be more clearly seen as an integral part of the framework that forms the platform for community discussions as proposed in *Next steps*.

119. These changes build on the existing approach directed by the Freshwater NPS – to base objectives for fresh water on community discussions about the values held for the water. For this reason, they do not impose new impacts on what is already required.

Recognition of iwi and hapū relationships with fresh water

120. *Next steps* proposed that councils be required to engage with iwi and hapū so that all iwi and hapū relationships with water bodies are identified in regional policy statements and plans, and to engage with those iwi and hapū when identifying values and setting objectives for those water bodies.
121. Mana Whakahono a Rohe, as proposed in *Next steps*, is intended to provide a platform to facilitate improved working relationships between local authorities and iwi in resource management. Some aspects of Mana Whakahono a Rohe are currently being considered for integration into the Resource Management Legislation Amendment Bill. This would form part of the Iwi Participation Arrangement proposal currently in the Bill, which is being considered by select committee. Given this proposed RMA requirement, we have decided not to amend the Freshwater NPS to require councils to identify iwi and hapū relationships with water bodies in regional plans as proposed in *Next steps*. The Freshwater Iwi Advisors Group supports this approach.

Using macroinvertebrates as a measure of ecosystem health

122. The Freshwater NPS defines ecosystem health as a compulsory value. Many submitters on the 2014 amendments to the Freshwater NPS requested that macroinvertebrate measures (specifically the Macroinvertebrate Community Index, or MCI) be added to the Freshwater NPS, either as a monitoring tool or as an ecosystem health attribute with a national bottom line.
123. No MCI attribute was added to the Freshwater NPS in 2014 because macroinvertebrate populations in rivers vary for a very wide range of reasons, making it too difficult to predict at a national level what would be required to improve an MCI score. This made predictions of the impact of any MCI national bottom line extremely unreliable. No monitoring requirement was added because national policy statements can only include objectives and policies; they cannot include methods. Cabinet subsequently agreed for officials to investigate options for including MCI in the Freshwater NPS as a mandatory monitoring method (EGI Min (14) 11/15).
124. *Next steps* proposed making MCI a mandatory method for monitoring water quality and ecosystem health (alongside an amendment to the RMA to allow methods to be included in national policy statements).
125. We have asked the Land and Water Forum and the science community to investigate whether a macroinvertebrate attribute could be developed for the Freshwater NPS. This work is in progress.
126. We have considered the views expressed in submissions and the recommendations from the Land and Water Forum. We propose to amend the Freshwater NPS as indicated in *Next steps* and recommended by the Land and Water Forum, except that direction on the type of macroinvertebrate index to use (i.e. the MCI or another index) would be left to guidance rather than specified in the Freshwater NPS. The proposed amendment would require:

- a. the use of macroinvertebrate monitoring in shallow rivers as part of councils' assessment of the national value of ecosystem health
 - b. methods to be established to respond to monitoring results that indicate freshwater objectives are not met, and/or national values are not being provided for
 - c. that councils make their monitoring information publicly available
127. The amendment would increase monitoring and compliance costs for the regional councils that currently have limited macroinvertebrate monitoring. Gisborne District Council, which has no macroinvertebrate monitoring sites, could face annual costs of approximately \$10,000. Monitoring costs are generally recovered from resource consent holders. National coverage of macroinvertebrate monitoring would support a better information base for monitoring the effectiveness of freshwater management policies and programmes.
128. An RMA change to allow national policy statements to include methods as well as objectives and policies is proposed in the Resource Legislation Amendment Bill, which has been referred back to the select committee.

Economic well-being

129. New Zealand's economic growth, particularly for primary industry, depends on fresh water. When councils set limits to achieve freshwater objectives they are expected to have a community conversation to identify community values, and then work to maximise community benefits of water use within those values.
130. The Freshwater NPS requires councils to improve and maximise the efficient use of water (in terms of water quantity) and requires councils to consider economic implications when setting objectives. We have identified a risk that the current direction is not sufficient to ensure that a community discussion about economic wellbeing, including productive economic opportunities, happens before councils make decisions about whether or how to maintain or improve water quality. We believe there is an opportunity now to make our expectations on this matter clearer.
131. In July 2016 we sought comments from Iwi, regional councils and the Land and Water Forum about whether there should be more consideration of economic factors in freshwater planning decisions. The Freshwater Iwi Advisors Group oppose this proposal because it would pit water quality against economic objectives and could result in further degradation to water quality.
132. We have considered the views expressed on this issue and propose to amend the Freshwater NPS by:
- a. amending Objective A2 so that councils consider economic opportunities when deciding on what level of water quality improvements to aim for, and
 - b. amending Objective B1 so that councils consider economic opportunities when making decisions about water quantity, and
 - c. requiring councils to consider people's economic well-being when setting freshwater objectives
133. There are no new impacts associated with this proposal because councils are already required to consider the economic implications of the objectives they set. The proposed changes make this direction more explicit.

134.

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Programme of ongoing work: Allocation of water resources

135. As publicly signalled in 2013, the next phase of reforms will provide councils and communities with more direction and support for maximising the economic benefits of fresh water within the environmental limits they are required to set.
136. Policy development in this area is progressing with the involvement of the Iwi Leaders Group, as well as councils and other stakeholders. We have reported separately on a programme of work for 2017. This programme includes further developing options for allocation and enabling Iwi/hapū to access freshwater resources in order to realise and express their economic interests.

Programme of ongoing work: Good Management Practices

137. A significant amount of government, primary industry and council work is helping farmers and growers to use good management practices for water quality. These include Primary Growth Partnership and Sustainable Farming Fund projects, farm environment planning initiatives, industry initiatives and general work to strengthen primary sector skills and capability. Building on this work, the Water Directorate, regional councils and the primary sector are working to increase the speed of primary sector up-take of good management practices for water quality by:
- identifying, by 1 July 2017, agreed good management commitments for the next 5 – 10 years
 - strengthening the systems and processes for supporting credible implementation of good management practices
138. Officials have been promoting the idea of forming the commitments into a “Good Farming Accord” to provide more certainty to what is being committed to as provided by the Sustainable Dairy Water Accord. This work is ongoing.

Consultation

139. The following departments and agencies have been consulted on this paper and their views are reflected within this paper: Treasury, Ministry of Business, Innovation and Employment, Te Puni Kōkiri, Office of Treaty Settlements, Department of Internal Affairs, Ministry of Health, and Department of Conservation. The Department of Prime Minister and Cabinet has been informed.
140. Treasury provided the following additional comment: The Treasury supports the development of targets to improve the swimmability of New Zealand’s lakes and rivers. The cost of meeting the targets is still uncertain despite our best estimate and final costs will depend on a wide range of factors specific to each catchment. Given the costs involved and the quality of some rivers and lakes which the target is seeking to improve, there is a risk that the targets will not be achieved within the timeframes envisaged. Treasury supports consultation with local government to better determine the cost and feasibility of the 2030 and 2040 targets, and will provide assistance on the modelling of costs as required.

Financial implications

141. Cabinet approved funding of \$100 million for the Freshwater Improvement Fund through Budget 2016 (see CAB-16-Min-0189.11). The funding is subject to Cabinet approving the criteria for accessing funding, setting the standard required for an investment-ready application, and examples of investment-ready projects.

Human rights

142. No inconsistencies have been identified between the proposals in this paper and the Human Rights Act 1993.

Legislative implications

Excluding stock from waterways

143. This paper proposes to consult on the proposals for regulations to exclude stock from waterways. We propose that Cabinet delegates power to the Minister for the Environment and the Minister for Primary Industries to jointly make final policy decisions after this consultation and to authorise the Parliamentary Counsel Office to draft the regulations after the consultation. The regulations may be prepared under section 360 of the RMA, or as national environmental standards under the RMA.
144. Once drafting is complete, we seek your agreement to release an exposure draft to major stakeholders for comment before returning to Cabinet with regulations (and a regulatory impact statement) for your approval to submit to the Executive Council.

Amending the Freshwater NPS

145. This paper proposes to consult on amendments to the Freshwater NPS, which is a disallowable instrument and must be presented to the House of Representatives. The RMA requires two stages of consultation for amendments. The *Next Steps* consultation document served as the first consultation requirement for the majority of proposals, and additional pre-consultation in the form of targeted letters was done for the proposals that have been developed after that document. We have therefore completed the pre-consultation RMA requirement to seek and consider comments from relevant Iwi authorities and all persons the Minister considers appropriate before proposing amendments to a national policy statement.
146. This will be the second and final statutory consultation round for a national policy statement (as per section 46A of the RMA). We propose to use the “alternative process” under the RMA instead of the Board of Inquiry Process. Under our proposed alternative process, there will be public consultation, after which officials will prepare a report and recommendations on the submissions. We will then consider that report, and may make changes to the Freshwater NPS after which we will seek Cabinet approval to submit the changes to the Governor-General for approval.

Regulatory impact analysis

Amendments to the National Policy Statement for Freshwater Management

147. The Regulatory Impact Analysis (RIA) requirements apply to the proposed amendments to the Freshwater NPS in this paper and a draft Regulatory Impact Statement (RIS) has been prepared and is attached.

148. Treasury's Regulatory Quality Team has reviewed the RIS prepared by the Ministry for the Environment and associated supporting material, and considers that the information and analysis summarised in the RIS *partially meets* the quality assurance criteria.
149. The RIS enumerates, and suggests ways to address, stakeholder concerns about the way in which Councils are delivering, or might be expected to deliver, their obligations under the National Policy Statement as it currently stands.
150. However, the ongoing consultation process has not yet delivered an evidence-based view as to whether those concerns are justified by Council behaviour and the factors that drive it in practice. Neither does it yet enable assessment of the likely impacts, or possible unintended consequences, of proposals to address those concerns. In particular, at this stage, the costs of the proposal to require councils to improve water quality where it is not suitable for swimming, and the impacts of adding additional weight to the existing requirement on regional councils to consider economic wellbeing and opportunity, are highly uncertain.
151. It will be important, in the consultation exercise now being proposed, to look specifically for empirical evidence that will support further analysis of these and other points, and to set this out in a future RIS.
152. In addition, the ongoing monitoring and reporting process described should help promptly to identify cases where Council implementation of the NPS is not taking place, or delivering the impacts, as intended.

Policy proposals to exclude stock from waterways

153. The Regulatory Impact Analysis requirements apply to the proposal for a regulation for stock exclusion described in this paper and a Regulatory Impact Statement has been prepared and is attached.
154. Treasury's Regulatory Quality Team has reviewed the RIS prepared by the Ministry for the Environment and associated supporting material, and considers that the information and analysis summarised in the RIS *partially meets* the quality assurance criteria.
155. The analysis is based on extensive consultation and independent cost benefit studies, enabling confidence in the cost benefit analysis. However, it would have been useful to include analysis of how far the proposals meet the concerns raised by stakeholders. Further thought will need to be given to the implementation and enforcement of the proposed new regulation and how its impact on the ultimate objective, water quality, is to be monitored and assessed.

Publicity

156. We intend to announce this package of proposals at the end of this month.
157. The discussion document will outline the target for swimming and the criteria for the Fund and open the Fund for applications. It will also include the text for policy proposals for stock exclusion and the proposed amendments to the Freshwater NPS, and invite submissions on those regulatory proposals.
158. The publicity for the swimmable rivers and lakes targets will be focussed on the new approach to improve the frequency that rivers and lakes are swimmable. It will explain that the 2040 is aspirational.

159. Given the role of the Land and Water Forum and the Iwi Advisors Group in shaping the proposals in this paper, we propose to have conversations with members of both groups regarding the proposals prior to any announcements. We will also make clear in our publicity how the proposals relate to the recommendations from the Land and Water Forum.
160. We will issue a media release announcing the consultation process. We also propose to release the following Consultation Package:
- a discussion document (Appendix 2)
 - a draft Regulatory Impact Statement for regulatory proposals to exclude stock from waterways (Appendix 5)
 - a draft Regulatory Impact Statement for proposed amendments to the Freshwater NPS (Appendix 7)
 - a section 32 analysis for proposed amendments to the Freshwater NPS (Appendix 8)
 - the scientific and economic work underpinning the stock exclusion proposals and the proposed amendments to the National Policy Statement (costs and benefits of stock exclusion, sediment and *E. coli* in the Whangarei Harbour catchment, costs of managing urban development around Lucas Creek, the relationship between water management and hydro-electric power generation, and the impact of freshwater reforms on land-based greenhouse gas emissions)
 - this Cabinet paper (subject to any withholds under the Official Information Act 1982).
161. We intend to consult for eight to ten weeks on the regulatory proposals.

Recommendations

162. The Minister for the Environment and Minister for Primary Industries recommend that the Committee:

Overview

1. **Note** that in February 2016 the Government released *Next steps for fresh water* which sought feedback on five broad areas of freshwater reform proposals (see EGI-16-Min-0006).

Ninety percent swimmable rivers and lakes by 2040

2. **Note** that the suitability of rivers and lakes for swimming was a key theme coming out of consultation, with strong signals from the New Zealand public that we should be aspiring to a 'swimmable' or primary contact standard in all rivers and lakes.
3. **Agree** that the Minister for the Environment and the Minister for Primary Industries announce a national target that 80 percent of lakes and rivers will be swimmable by 2030, and 90 percent by 2040, and to improve the percentage of time that rivers and lakes are swimmable,
4. **Note** that we intend to release maps illustrating the amount of time water quality in New Zealand's rivers and lakes is suitable for swimming.

5. **Note** that additional interventions are likely to be needed to achieve the targets, including additional costs for both public and private sector, but it is not possible at this time to quantify these costs.
6. **Note** that we will seek more specific detail from councils by 31 March 2018 on where and how the swimming targets can be achieved and with an estimate of the costs and how feasible the targets are.

Freshwater Improvement Fund

7. **Note** that on 10 February 2016, Cabinet agreed to consult on a proposed new fund titled "*Next Steps for Freshwater Improvement Fund*" (now called the "Freshwater Improvement Fund"), with suggested criteria for the Fund.
8. **Note** that the Freshwater Improvement Fund was approved as part of Budget 2016 and that the agreed allocation of funding is \$100 million over the period 2016/17-2025/26 to support initiatives which contribute to managing New Zealand's freshwater bodies within environmental limits [CAB-16-MIN-0189.11].
9. **Note** that the Freshwater Improvement Fund will prioritise funding to vulnerable waterbodies based on:
 - the current state of the water body (including water quality and flows); and
 - the nature and degree of pressures on the water body; and
 - the significance of the waterbody to the economy, society and the environment (e.g. local economy, destination for recreation, ecologically significant flora or fauna in terms of representativeness or uniqueness).
10. **Note** that applications for projects addressing non-priority water bodies will still be eligible to apply and, where they meet all eligibility criteria, will be considered in full against the proposed assessment criteria.
11. **Agree** to the following eligibility criteria for applicants to the Freshwater Improvement Fund:
 - a. The project must contribute to the improvement of the management of New Zealand's freshwater bodies.
 - b. The project must meet one or more of the following:
 - i. achieve demonstrable co-benefits such as improved fresh, estuarine or marine water quality or quantity, increased biodiversity, habitat protection, soil conservation, improved community outcomes such as to recreational opportunity or mahinga kai, reduction to current or future impacts of climate change, reduced pressure on urban or rural infrastructure
 - ii. increase Iwi/hapū, community, local government or industry capability and capacity in relation to freshwater management
 - iii. establish or enhance collaborative management of fresh water
 - iv. increase the application of Mātauranga Māori in freshwater management
 - v. include an applied research component which contributes to improved understanding of freshwater interventions and their outcomes
 - c. The minimum request for funding is \$200,000 (excluding GST).
 - d. The Fund will cover a maximum of 50% of the total project cost.

- e. The project will be funded for a maximum period of up to 5 years after which the project objectives will have been achieved or the project will be self-funding.
 - f. The project must achieve benefits that would not otherwise be realised without the Fund or are not more appropriately funded through other sources.
 - g. The effectiveness of the project and its outcomes will be monitored, evaluated and reported.
 - h. An appropriate governance structure is in place (or will be established as part of the project).
 - i. The applicant must be a legal entity.
12. **Agree** to the following assessment criteria for eligible applications to the Freshwater Improvement Fund:
- a. The extent to which the project addresses the management of freshwater waterbodies identified as vulnerable.
 - b. The project demonstrates improvement in the values and benefits derived from the freshwater body.
 - c. The extent to which public benefit is increased.
 - d. The project demonstrates a high likelihood of success based on sound technical information or examples of success achieved through comparable projects undertaken elsewhere.
 - e. The extent to which the project will leverage other funding.
 - f. The project will involve the necessary partner organisations to ensure its success.
 - g. The project will engage personnel with the required skills and experience to successfully deliver the project.
13. **Agree** as examples of investment-ready projects those listed in Appendix 4.
14. **Note** that the Minister for the Environment will approve, and have ongoing responsibility for approving, the assessment panel.
15. **Note** that the Minister for the Environment will make final funding decisions based on recommendations received from the assessment panel.
16. **Note** that subject to Cabinet approval of the criteria, the inaugural funding round will open for applications in February/March 2017.
17. **Note** that an evaluation to consider the effectiveness of spend is planned after three years of the Fund's operation.
18. **Note** that any substantive changes to the operation of the Fund as a result of the planned evaluation will be brought back to Cabinet for approval.

Excluding stock from waterways

19. **Note** that there was substantial interest and support for the stock exclusion proposals in *Next steps*, and concerns from primary industry and regional councils have largely been addressed by refinements to those proposals.
20. **Note** that the 1 July 2017 timeframe for excluding dairy cattle from waterways is tight; confirmation of the date when any regulations would come into force will be made at the time Cabinet agrees to the detailed regulations.

21. **Agree** to consult on the proposal for a regulation to exclude stock from waterways as follows:
 - a. dairy cattle on milking platforms, across all terrain, by 1 July 2017 for waterways greater than one metre, and by 1 July 2020 for waterways under one metre wide on the plains
 - b. pigs on all terrain by 1 July 2017 for waterways greater than one metre, and by 1 July 2020 for waterways under one metre wide on the plains
 - c. dairy cattle not on milking platforms on plains and rolling land, and on steeper land where break-feeding, by 1 July 2022
 - d. beef cattle and deer on flat land by 1 July 2025, and on undulating, rolling land by 1 July 2030, and on all land where break-feeding by 1 July 2022
22. **Note** that a Resource Management Act change to restrict stock access to water bodies by regulation under section 360 of the Resource Management Act is provided for in the Resource Legislation Amendment Bill.
23. **Agree** the Minister for the Environment and the Minister for Primary Industries can make final policy decisions about excluding stock from waterways after the consultation, and instruct the Parliamentary Counsel Office to draft a regulation that gives effect to those policy decisions.
24. **Agree** to release exposure drafts of the regulation to exclude stock from waterways to major stakeholders for comment following drafting by the Parliamentary Counsel Office.
25. **Invite** the Minister for the Environment and the Minister for Primary Industries to report back, including a summary of any policy changes, to Cabinet for final decisions on submitting regulations for excluding stock from waterways to the Executive Council by 1 August 2017.

Proposed amendments to the National Policy Statement for Freshwater Management 2014

26. **Note** that the pre-consultation Resource Management Act requirement for making amendments to a national policy statement has been met.
27. **Note** that for this second and final statutory consultation round for a national policy statement the Minister for the Environment intends to use the “alternative consultation process” described in section 46A of the Resource Management Act instead of the Board of Inquiry Process.
28. **Agree** to consult on the following amendments to the National Policy Statement for Freshwater Management 2014

Swimming

- a. Clearly state the Government’s swimming targets in the Preamble, and what is expected of councils and communities
- b. Remove the definition of “secondary contact”
- c. Remove the reference to “secondary contact” in Objective A1

- d. Add a new Objective to aim for water quality to be swimmable more often, and make it applicable to rivers that are fourth order and above, and lakes with a perimeter more than 1.5 kilometres
- e. Add a new policy to require regional councils to identify which rivers and lakes are suitable for swimming now, and which will be improved so that they are suitable for swimming, and specify timeframes
- f. Require regional councils to update their implementation plans to reflect the amendments proposed in this paper
- g. Require consideration of swimming at all points in the objective setting process
- h. Add a new policy to require councils to monitor and report on water quality using the same *E. coli* methodology used for the swimming maps (including the frequency of sampling and the percentage of time each water body is swimmable)
- i. Amend the “human health for recreation” value description to recognise swimming aspirations
- j. Replace the existing attribute table for *E. coli* with a new attribute table that more closely aligns with the bands used in the swimming maps, and removes the national bottom line for “boating and wading”
- k. Require councils to monitor and report on water quality using the time-based *E. coli* measure (matching the methodology of the swimming maps)

Maintain or improve

- l. amend Objective A2 to replace “a region” with “a freshwater management unit”
- m. amend Policy CA2 so that where attributes are specified in the Freshwater NPS, freshwater objectives to maintain overall water quality must be set within the same attribute band as existing water quality
- n. amend Policy CA2 so that where attributes are not defined in the Freshwater NPS, freshwater objectives to maintain overall water quality must be set so that the identified values identified are not worse off when compared to existing water quality

Exceptions for significant infrastructure

- o. amend Policy CA3 so that regional councils can set objectives below a national bottom line if that is necessary to realise the benefits provided by infrastructure (which must also be listed in the Freshwater NPS), and that such an objective can only apply in a water body, multiple water bodies, or parts of a water body where water quality is affected by the infrastructure

Coastal lakes and lagoons

- p. amend the lake attribute table for total nitrogen in Appendix 2 by deleting the footnote that introduced ambiguity for coastal lakes, and clarify how the sampling regime for all lake attributes applies to coastal lakes and lagoons that intermittently open to the sea

Dissolved inorganic nitrogen

- q. amend the attribute table in Appendix 2 for periphyton in rivers to direct councils to set maximum concentrations for dissolved inorganic nitrogen and dissolved reactive phosphorus when setting objectives for periphyton, and to consider

downstream environments when setting maximum concentrations for dissolved inorganic nitrogen and dissolved reactive phosphorus in rivers

Te Mana o te Wai

- r. move the section “National significance of fresh water and Te Mana o te Wai” to the body of Freshwater NPS under “Commencement”
- s. include the text used in *Next steps* to describe Te Mana o te Wai (with some changes) in the section “National significance of fresh water and Te Mana o te Wai”
- t. add a new objective requiring councils to consider and recognise Te Mana o te Wai in the management of fresh water
- u. add a new policy directing councils to ensure policy statements and plans consider and recognise Te Mana o te Wai, while noting the connection between fresh water and the broader environment and the need to inform the setting of freshwater objectives and limits through engagement with the community, including tāngata whenua
- v. amend Policy CA2 to clarify how councils are to give effect to the new objective
- w. amend Policy C2 to add a requirement to recognise the interactions, ki uta ki tai (from the mountains to the sea) between fresh water, land, associated ecosystems, and the coastal environment
- x. amend Policy CB1(ba) to include mātauranga Māori as an established monitoring method that is appropriate for monitoring progress towards, and the achievement of, freshwater objectives that are set in line with the concept of Te Mana o te Wai
- y. amend the names and order of the national values in Appendix 1 of the Freshwater NPS so they can more easily be linked to Te Mana o te Wai by associating each value with te hauora o te wai, te hauora o te taiao, and te hauora o te tāngata
- z. amend the description of the compulsory value “human health for recreation” so that it removes the emphasis on boating and wading and provides a more positive explanation of what a healthy water body means for human health
- aa. amend the description of the additional value “natural form and character” so that it provides clearer links to Te Mana o te Wai

Monitoring for ecosystem health

- bb. amend Policy CB1 to require councils to use macroinvertebrate monitoring in shallow streams as part of an assessment of whether the national value of ecosystem health is being provided for in a freshwater management unit
- cc. amend Policy CB1 to require councils to establish methods to respond to monitoring results that indicate freshwater objectives are not met, and/or national values are not being provided for
- dd. add a new policy to require councils to make monitoring information available to the public

Economic well-being

- ee. amend Objective A2 so that councils are directed to consider economic well-being, including productive economic opportunities, within the context of

- environmental limits, when making decisions about levels of water quality improvements to aim for
- ff. amend Objective B1 so that councils are directed to consider economic well-being, including productive economic opportunities when making decisions about water quantity
 - gg. amend Policy CA2 to require councils to consider people's economic well-being when setting freshwater objectives
29. **Note** that the proposed amendments to the National Policy Statement for Freshwater Management 2014 are set out in Appendix 6 to this paper.
 30. **Note** that a Resource Management Act amendment to allow national policy statements to include methods as well as objectives and policies is proposed in the Resource Legislation Amendment Bill, which has been referred back to the select committee.
 31. **Agree** to the Minister for the Environment and Minister for Primary Industries making further minor changes, consistent with the decisions in this paper, to the proposed amendments to the Freshwater NPS set out in Appendix 6 to prepare for consultation
 32. **Note** that the final proposal for amendments to the National Policy Statement for Freshwater Management 2014 will be reported by the Minister for the Environment and Minister for Primary Industries to the Cabinet when seeking Cabinet endorsement of the amendments to be made under section 53(1) of the Resource Management Act 1991
 33. **Note** that the Minister for the Environment and Minister for Primary Industries will report back to Cabinet on the results of the consultation process and
 - a. seek approval for the final proposed amendments to the National Policy Statement 2014; and
 - b. seek agreement to recommend, under section 52(3) of the Resource Management Act 1991, to the Governor-General that the amendments are made and to submit to Executive Council for this purpose.

Publicity and public consultation process

34. **Note** that economic and technical studies that support and inform the policy proposals will be released in conjunction with the consultation document
35. **Note** that the regulatory proposals in the discussion document will be open for submission for a period of eight to ten weeks
36. **Agree** that the regulatory proposals will be discussed with the Land and Water Forum and the Freshwater Iwi Leaders Group prior to the release of the consultation documents.
37. **Agree** that the Minister for the Environment, Minister for Primary Industries and Minister of Finance can make changes to the draft discussion document and communication package attached to reflect the decisions made in this paper.

Programme for further work (water allocation and good management practice)

38. **Note** that we are continuing policy development for the allocation of water resources, including how allocation approaches address iwi/hapū rights and interests.
39. **Note** that we will return to Cabinet later in 2017 to discuss how farmers and growers can deliver on their vision on using good management practice to deliver improvements to water quality.

Hon Dr Nick Smith
Minister for the Environment

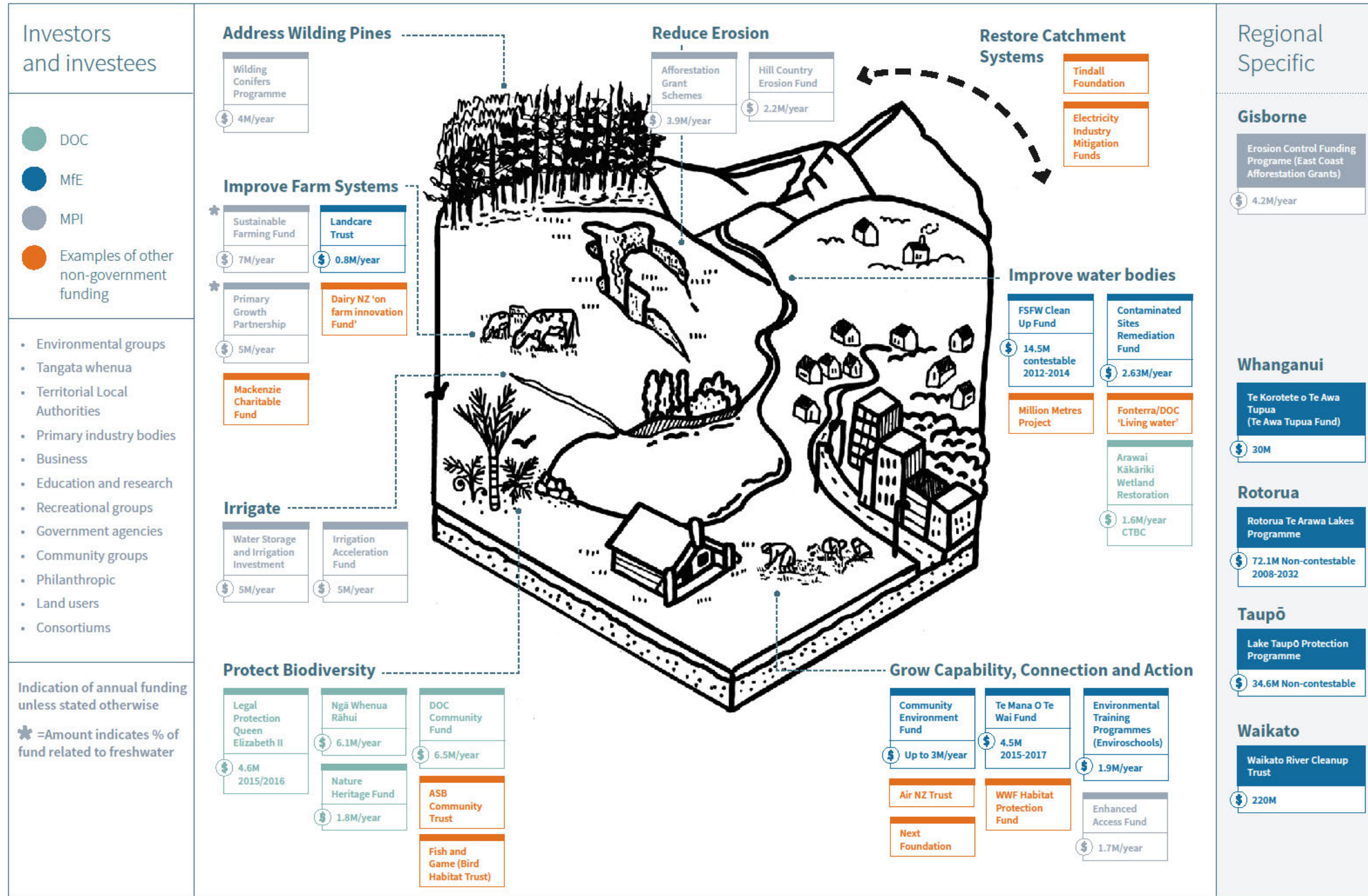
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Hon Nathan Guy
Minister for Primary Industries

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Investment system map prototype

• Version 2



Appendix 4: Examples of Investment Ready Projects

Examples of projects that are “investment ready” are provided to indicate the range of potential projects that may be supported through the Next Steps for Freshwater Improvement Fund. These examples are intended to be illustrative only, and are not intended as a firm commitment from either the potential applicant, or the Crown that the projects will proceed as described or be supported through the Fund.

Location:	Dune Lakes, Northland (Pouto, Kai Iwi, Waipoua and Aupouri Peninsula).
Problem:	<p>Northland lakes are of national and international significance, with dune lakes the predominant lake type. Northland has the greatest number of dune lakes nationally and internationally, and represents a large proportion of warm, lowland New Zealand lakes still with relatively good water quality. These lakes and their surrounding wetland margins support a range of endemic endangered species providing the only known habitat, or the national strongholds for a range of biota. Perhaps the most outstanding character of these lakes is the currently limited impact of invasive species on their biota, which is unparalleled in any other region of mainland New Zealand.</p> <p>Though many of Northland’s dune lakes are still in very good ecological condition, the overall trend is one of deterioration.</p> <p>Human mediated pressures and threats associated with declining water quality of Northland’s dune lakes include: biosecurity (submerged weeds, emergent weeds, pest fish and risk of spread of plant and animal pest species); eutrophication (a function of the percentage of pasture and/or pine forest in the lake catchment, and in-lake enrichment through other sources); and water level change through human or animal use.</p>
Opportunity:	<p>This is a project of prevention and management actions, to arrest the declining trend of water quality linked indicators in particular lakes by addressing human mediated pressures and threats.</p> <p>The project targets taonga dune lakes with a catchment approach to restoration, effects mitigation and kaitiaki capacity building activities contributing to freshwater quality.</p>
Summary of Project:	<p>Total project cost: approximately \$2M.</p> <ul style="list-style-type: none"> ● Detention bunds and dams to divert nutrients and sediment from lakes – identifying sites, installing and measuring effectiveness. ● Completing stock exclusion and riparian planting on outstanding lakes and culturally sensitive lakes ● Stock exclusion and riparian enhancement for high value lakes ● Extra resourcing for riparian planting efforts, including funding plants, labour and ongoing weed control

- Assuring locally sourced riparian plants ahead of planting.
- Biosecurity monitoring for pest species at lakes and nurseries that supply plants
- Empowering ongoing cultural monitoring capacity
- Training of local resources to identify aquatic and terrestrial pest species.
- Removal of unwanted fish species
- Analysis of non-native parasite loading in native fish populations
- Funding of “Smarter Technologies” (less herbicide dependant, community friendly) e.g. a biocontrol for Sydney golden wattle – benefits all northern lakes where this weed is dominant e.g. Kai Iwi, and use of grass carp to target removal of invasive hortwort, and weeds that impact water quality and lake biota.
- Evaluation of Nitrogen and Phosphorus contribution from exotic weeds
- Understanding hydraulic groundwater connections between dune lakes (in order to target interventions outside of surface water catchments).

Benefits of the project include:

- Stopping the decline in water quality in the Taonga lakes
- Restored catchment, including lakeside planting, riparian stream planting, and farm plans
- Building governance capability for the lakes.

Potential Partners:

Led by Northland Regional Council in partnership with Te Uri o Hau, Te Roroa, Te Hiku Iwi, Department of Conservation and Reconnecting Northland.

Location:	Whangamarino Wetland, Waikato
Problem:	<p>The Whangamarino wetland is a c.7000 ha Ramsar site, located in the Waikato near Meremere. It is the second largest wetland in the North Island (~7000ha).</p> <p>Sediment is a critical threat to the long-term health of the wetland. The operation of the Lower Waikato Flood Control Scheme results in the discharge of a large volume of sediment from Lake Waikare into Whangamarino. Waikato Regional Council is currently preparing a catchment management plan for this catchment.</p>
Opportunity:	<p>There is a significant opportunity for Waikato Regional Council (WRC) to work with Department of Conservation (DOC) and other partners to implement options to reduce sediment inputs into Whangamarino Wetland. A recent Rapid Options Assessment report has been compiled by experts and identifies 13 options to reduce the sediment load. WRC are required to implement sediment mitigation as part of their resource consent requirements, and Central government investment in this project would leverage off the regional council investment and extend further protection to the wetland.</p>
Summary of Project:	<p>Total project cost: Up to \$5M</p> <p>The sediment mitigation options include:</p> <ul style="list-style-type: none"> • Water quality treatment through establishment of a large-scale sediment trap and/or treatment wetland (with or without flocculation): • Reducing the quantity of sediment discharged to Whangamarino Wetland by using alternative discharge infrastructure • Water quality treatment in Lake Waikare using a combination of methods • Erosion and sediment control as a part of an integrated catchment management programme that is being scoped by WRC
Potential Partners:	<p>Waikato Regional Council, DOC.</p> <p>Potential future partners: Waikato River Authority, Fish & Game, Waikato-Tainui</p>

Location:	Miranda Stream, Waikato
Problem:	<p>Miranda Stream catchment, on the western side of the Firth of Thames, is within the bounds of the Pukorokoro -Miranda Living Water Project. It is also adjacent to the internationally significant Firth of Thames Ramsar site - one of six internationally significant (Ramsar) wetlands in New Zealand.</p> <p>Miranda Stream and wider Firth of Thames is under threat from elevated nutrient loads as a result of land use change in the catchment; land development and farming practices such as straightening of waterways and stock access to streams; loss of internationally significant shorebird habitat.</p>
Opportunity:	<p>An opportunity exists to purchase a coastal property at the Miranda Stream mouth for the purpose of retiring it from grazing, carrying out minor engineering (including shifting flood gates up stream) to restore a natural coastal wetland.</p> <p>The DOC/Fonterra Living Water project has funding available over the next 7 years to fund restoration activities but require funding for Land acquisition. Living Water and the Land Holding Trust are committed to undertaking additional restoration work such as wetland plantings and upstream (on-farm) biodiversity restoration activities to improve freshwater quality and overall ecosystem enhancement.</p> <p>DOC representing DOC/Fonterra Living Water partnership are facilitating the land acquisition. The land will be vested [REDACTED] WITHHELD s9(2)(a)</p> <p>[REDACTED]</p> <p>DOC through collaborations with Waikato Regional Council and stakeholders (via Muddy Feet Project) and Fonterra (via the DOC-Fonterra Living Water partnership) have already invested in substantial monitoring, research and on-ground projects over the past decade. This project would extend this previous work and unlock future restoration opportunities.</p>
Summary of Project:	<p>Costs approximately [REDACTED] WITHHELD 9(2)(b)(ii)</p> <p>[REDACTED] WITHHELD 9(2)(b)(ii)</p> <p>[REDACTED] This portion of the funding will be returned to the Crown (or re-directed to restoration activities associated with the Miranda Stream restoration project).</p> <p>[REDACTED] WITHHELD s9(2)(a)</p>
Potential Partners:	[REDACTED], DOC, Fonterra, Living Water and the Land Holding Trust, Waikato Regional Council

Location:	Rere Falls, Gisborne
Problem:	<p>Rere Falls and Rere Rockslide are significant recreational areas located in the upper part of the Wharekopae Catchment in Gisborne. They are popular with both locals and visitors – and are promoted as one of Gisborne’s premier tourist attractions.</p> <p>Water quality testing shows that <i>E.coli</i> counts are often beyond levels considered safe for swimming, and that ruminant animals are the main contributor to <i>E.coli</i> counts.</p>
Opportunity:	<p>The project is a collaborative effort between the regional council, NZ Sheep and Beef, 17 local farms, and central Government. This includes \$90k in funding from the Community Environment Fund.</p> <p>As a next step, there is an opportunity to undertake activities to reduce the <i>E. coli</i> levels and to apply the economic models developed by the project and implement improvements on the ground.</p>
Summary of Project:	<p>Estimated total project cost = \$0.5-1M</p> <p>Potential mitigation options include:</p> <ul style="list-style-type: none"> • Land use change (e.g. pasture to forestry) • Changing stocking rate/type • Stock exclusion • Water reticulation (with and without fencing) • Stock crossings/culverts • Riparian buffers and grass filter strips • Management of lanes, tracks, woolsheds, stock holding areas and other ‘hotspots’ • Avoiding high risk practices on some soils (e.g. pumicelands) and locations • Drain management (including vegetation in drains) • Wetland and seepage area stock exclusion • Settling ponds.
Potential Partners:	Gisborne District Council, NZ Beef and Lamb, 17 local farms

Location:	Whakaki Lake, Hawke's Bay
Problem:	<p>This culturally significant lake is the top priority wetland in Hawke's Bay's Regional Resource Management Plan, but experiences persistent toxic algal blooms and fails National Policy Statement for Freshwater Management National Objectives Framework (NOF) bottom lines. Nutrient and sediment concentrations in the lake are unacceptable, but its catchment is not intensively farmed.</p> <p>The hot Hawke's Bay summers, and sensitivity of this shallow lake, means that it will always have a high risk of algal blooms, unless dramatic land management occurs. However, dramatic land use change would pose high risk to local community and economic values. Similarly, the 'soft' geology means low-intensity grazing can still result in a high erosion risk, with trees being the only land cover likely to mitigate the risk of high sediment loss.</p>
Opportunity:	<p>There is the opportunity to construct a solar powered wetland filtering system for Whakaki Lake to address water quality issues. This potential engineering fix offers opportunities for improving both water aesthetics as well as biodiversity benefits.</p> <p>In addition HBRC, Wairoa District Council and MPI are in discussions for a project focusing on the Whakaki catchment. The desired outcomes are improved erosion control, water quality, plantation forestry management and land use activities.</p> <p>Significant iwi and community engagement is required to finalise the content of the project, which would include soil conservation plantings, as well as riparian fencing and planting, but discussions can't get underway until Crown funding has been confirmed.</p>
Summary of Project:	<p>The project includes the following components (with costs estimated approximately \$2.9M):</p> <ul style="list-style-type: none"> • An integrated package of remediation including \$400,000 for the solar powered wetland filtering system project. • Improved hydrological function of the lake would be supported by riparian fencing and planting at a cost of around \$200,000, and extensive erosion control planting in the wider catchment costing approximately \$2 million. • Land use change to reduce sediment deposition in the Lake will require extensive community engagement, as well as advice and financial support for landowners, expected to cost around \$300,000 over 3 years. • Remediation works would be complemented by the installation of boardwalks, signage and visitor interpretation as part of the regional economic development tourism opportunities. <p>A reasonable estimate for an area suitable for forestry plantation in the Whakaki catchment is approximately 1200 hectares with approximately another 500 hectares suitable for spaced pole planting.</p>
Potential Partners:	Hawke's Bay Regional Council, Wairoa District Council, MPI, Nga Whenua Rahui

Location:	Waituna Lagoon, Southland
Problem:	<p>Waituna Lagoon is a 1350 ha coastal lagoon situated in Southland, near Invercargill. It is part of the Awarua Wetland Ramsar site, and one of six internationally significant (Ramsar) wetlands in New Zealand.</p> <p>Waituna Lagoon is under threat from elevated nutrient loads (N & P) as a result of land use change in the catchment, and from lagoon opening events that have historically focused on drainage of agricultural land, without considering the ecological health of the lagoon.</p>
Opportunity:	<p>Improved management of lagoon water levels is needed to safeguard the health of Waituna Lagoon. The Ecological Guidelines for Waituna Lagoon (2013) recommend that the frequency of spring and summer openings is reduced to enable aquatic plants to recover and improve water quality. WITHHELD 9(2)(b)(ii)</p> <p>[REDACTED]</p> <p>The Department of Conservation (via its national Arawai Kākāriki programme) and Southland Regional, and Fonterra (via the DOC-Fonterra Living Water partnership) have invested in substantial monitoring, research and on-ground projects over the past decade.</p> <p>[REDACTED] WITHHELD 9(2)(b)(ii)</p> <p>To date \$785,000 from the Fresh Start for Fresh Water Fund has been provided for this site for a Southland Regional Council-led \$1.6M project which was completed in March 2016.</p>
Summary of Project:	<p>Costs are subject to specific interventions [REDACTED] WITHHELD 9(2)(b)(ii)</p> <p>[REDACTED] WITHHELD 9(2)(b)(ii)</p> <ul style="list-style-type: none"> • \$50K to create biodiversity corridors.
Potential Partners:	Environment Southland, DOC, Fonterra, Ngai Tahu, Fish & Game

Location: Managed Aquifer Recharge (MAR), Canterbury

Problem: Nitrate concentrations in specific shallow aquifers under free draining soils across the Canterbury Plains have been affected over many years by the combined effects of more variable rainfall, improved irrigation distribution and application efficiency and more intensive farming systems and now regularly exceed drinking water standards.

Collaborative work carried out by the Ashburton Zone Committee to set limits in the Hinds River Catchment has placed high significance on the potential of Managed Aquifer Recharge as an essential part of a package of measures to reduce concentrations of nitrates, as this is a top priority for the community, and replenish lowland stream flows during dry periods. Managed Aquifer Recharge concepts have been successfully implemented to manage non-point source pollution in other parts of the world, but are still relatively new to New Zealand.

Modelling work shows that relatively abundant, already allocated low-nutrient alpine water sourced from the Rangitata or Rakaia Rivers via existing irrigation infrastructure and available on shoulders of seasons, in combination with reducing nutrient losses from farming, could reduce the N concentration to target levels of 6.9 ppm. But until the approach is fully tested in a real example, the uncertainties remain too high for the community to accept, with the only other solution being to undergo major land use change at significant cost.

Opportunity: A pilot project is currently underway in the Hinds area, funded by Environment Canterbury, the irrigation and water supply schemes involved and the Ministry for Primary Industries Irrigation Acceleration Fund, to be setup and operate through to June 2017. The pilot project was planned and established by a world renowned expert in these systems to ensure the results will be scientifically valid. Early results are very positive for both groundwater levels and nitrate concentration, with no identified insurmountable risks at this stage – although it is recognised that the results are very site specific, and that there are potential long term challenges in introducing plentiful alpine water into porous soils.

Recognising this potential, the Project Working Group is also beginning to identify other potential sites. It is critically important, given the emphasis the communities involved have put on MAR as a mitigation tool, that projects are planned and set up to prove the efficacy of the approach and the viability.

The Zone Committee at its recent meeting sought to confirm funding for the full 4-5 years of operations and monitoring of the pilot project to enable the environmental flow and water quality benefits to materialise further down the catchment in the lowland streams and

ensure the monitoring results are robust across a number of climatic seasons.

They will also move to form a governance group to take ownership of the oversight, ensure wide involvement of all interests, and address issues ahead of implementation and enduring operations – such as who pays, how commercial interests and public entities can work together to continue to operate this and potentially other sites.

A combined 4-5 year monitoring, investigations and operational development project could be an early applicant to the new Freshwater Improvement Fund.

Summary of Project:

The cost of the next 4-5 years of monitoring and investigations for current the pilot is estimated to be \$300,000 p.a. **This part of the project does not meet Irrigation Acceleration Fund criteria.**

To ensure durable solutions beyond the potential funding from Freshwater Improvement Fund, further costs of estimated \$2-300k would be required to investigate and put in place commercial and on-going community funding mechanisms to ensure durable solutions.

Costs to establish the pilot project (ie site works, monitoring bores, etc) were approx. \$900k, indicating what the potential project establishment costs for other potential MAR-type projects could be, although costs would be very site and project specific (potentially involving land purchase).

Potential Partners:

Environment Canterbury, Ashburton District Council, Ashburton Zone Committee, Arowhenua runanga, Canterbury District Health Board, Rangitata Diversion Race Management Ltd, irrigation schemes operating in the areas supplying water into the MAR system.