

Implementation of farm-scale diffuse pollution mitigation systems

An update of relevant national and regional
regulatory provisions

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Cover photo: *Aerial view of a constructed wetland near Te Waikoropupū Springs, Golden Bay.*
[Jonathan Lopardo, DroneMate]

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Contents

- Executive summary 5**
- 1 Introduction 7**
 - 1.1 Scope and approach 7
 - 1.2 Report outline 8
 - 1.3 A note on terminology 8
- 2 Regulatory framework 9**
 - 2.1 Existing regulatory framework..... 9
 - 2.2 Proposed new regulatory framework..... 17
- 3 Regional plan provisions 19**
 - 3.1 Approach..... 20
 - 3.2 Regional plan objectives 20
 - 3.3 Regional plan policies 21
 - 3.4 Policy implementation methods..... 23
- 4 Discussion 27**
 - 4.1 Clarifying the problem 27
 - 4.2 Developing an easier implementation pathway..... 29
- Acknowledgments..... 36**
- References 37**
- Appendix A Regional Plan references 39**
- Appendix B Regional Plan provisions..... 41**
 - B.1 Objectives 41
 - B.2 Policies 43
- Appendix C Selected terms defined in regional plans..... 49**

Tables

- Table 2-1: Existing definition of ‘natural wetland’ in the NPS-FM 2020 (and, by default, the NES-F) and recent proposed amendments. 13
- Table 3-1: Summary of common themes in regional plan policies relevant to managing diffuse source pollution and/or implementation of diffuse pollution mitigation systems. 22

Table 4-1:	Examples of potential new and amended existing regional plan policies to support implementation of diffuse pollution mitigation systems.	30
Table 4-2:	A potential definition for a diffuse pollution mitigation system and definitions for some types of mitigation systems found in existing regional plans.	32
Table 4-3:	An example of a potential regional plan rule framework addressing two common activities associated with the construction, operation and maintenance of diffuse pollution mitigation systems.	33
Table 4-4:	Existing NZ-based guidance for diffuse pollution mitigations.	35

Figures

Figure 2-1:	Summary of the different classes (status) of activity under the RMA and provided for in regional plans.	10
Figure 2-2:	Simplified process for freshwater planning under the NOF.	12
Figure 2-3:	Overview of the interactions between different components of the future resource management system for NZ.	17
Figure 3-1:	Overview of a traditional RMA-based regional plan framework based around one aspect of managing freshwater quality and one activity (discharge of contaminants).	19

Executive summary

A growing number of ‘edge-of-field’ mitigation tools and devices (mitigation systems) are being developed and trialled in rural areas across Aotearoa New Zealand (NZ) to reduce the impact of intensive land use on freshwater quality. Examples include planted riparian buffers, constructed wetlands, woodchip denitrification filters, detention bunds and filamentous algae nutrient scrubbers. For operational efficiency, many of these mitigation systems should be located within or close to natural waterbodies. However, their construction, operation and maintenance in this location involves a range of activities that could potentially trigger the requirement for resource consent(s) in accordance with regional plans prepared under the Resource Management Act 1991 (RMA). These activities relate to the use of land (e.g., earthworks to construct a wetland), disturbance of river (or lake) beds (e.g., construction of a culvert or dam), the taking, use, damming or diversion of water, and the discharge of contaminants to land or water (e.g., stormwater during earthworks or agrichemicals from spraying). While permitted activity rules exist for many of these activities, Milne and Luttrell (2020) demonstrated that they are often generic in nature and were not written with mitigation systems in mind. It can therefore be difficult to meet all of the conditions of relevant permitted activity rules, so these activities default to a resource consent process, often under a discretionary classification.

This report updates and builds on the earlier regulatory assessment prepared by Milne and Luttrell (2020), recognising that NZ’s regulatory landscape for managing fresh waters has continued to evolve at pace over the last few years. Most notably, the Government has established a requirement for farmers to prepare a freshwater farm plan (FW-FP) under Part 9A of the RMA and passed its *Essential Freshwater* package into legislation in September 2020. The latter culminated in the release of an updated National Policy Statement for Freshwater Management (NPS-FM) and new National Environmental Standards for Freshwater (NES-F), as well as several other regulations. Regional and unitary councils are in the process of implementing this latest national direction and, as a result, are preparing new or revised regional policy statements and plans. In addition, as part of the Government’s *Resource Management Reform* programme, regional plan and resource consent processes will in future be managed under new national legislation.

A desktop review was carried out of provisions of relevance to edge-of-field diffuse pollution mitigation systems in 12 regional plans. The primary focus was at the level of plan objectives and policies as opposed to the rules that may result from these as the latter were addressed in detail by Milne and Luttrell (2020). The aim was to identify whether existing regional plan policies support implementation of diffuse pollution mitigation systems and, where they do not, suggest more specific policies and policy implementation methods that might help facilitate more efficient consenting of mitigation systems.

The work will help establish an ‘implementation pathway’ for mitigation tools developed through the NIWA-led “Doubling on-farm diffuse pollution mitigation” research programme funded by MBIE, as well as NIWA’s Freshwater Centre-led “Mitigation System Science” research funded through MBIE’s Strategic Science Investment Fund.

Eleven of the 12 regional plans reviewed have objectives and/or policies that address diffuse pollution. However, the expression of these objectives and/or policies varies between plans and, other than vegetated riparian buffers, few plans contain specific region-wide policies that promote or encourage the adoption of edge-of-field mitigation systems such as constructed wetlands and sediment detention bunds. Consequently, prescribed methods for policy implementation in regional plans also lack specific provisions to facilitate or encourage the adoption of edge-of-field mitigation

systems. Methods in most plans are limited to “advice and information” and supporting / promoting the development and adoption of “industry recognised guidelines or codes of practice” or “environmental good practices.” While edge-of-field mitigation systems are essentially captured within these methods, the lack of specific attention on mitigation systems means that the activities associated with their construction, operation and maintenance must, by default, be evaluated against a generic rule framework that makes this task cumbersome and complicated.

With all regional councils currently in the process of revising or creating new regional plans to implement the NPS-FM 2020, an opportunity exists now, prior to mandatory notification of plans by December 2024, to introduce specific provisions that better support implementation of edge-of-field diffuse pollution mitigation systems. At the same time, in line with national direction to standardised plan structure, format and definitions, there is an opportunity to develop some standardised provisions, including definitions to support the inclusion of diffuse pollution mitigation systems in a policy and rule framework.

A useful starting point would be to establish one or more policies that acknowledge the beneficial role edge-of-field diffuse mitigation systems can play in water quality enhancement and recognise that certain activities will be necessary to construct, operate or maintain them. In some cases, it may be possible to amend existing policies to include specific reference to diffuse pollution and/or mitigation systems. Examples of potential ‘new’ policies and amended existing policies are provided, together with a proposed definition for “diffuse pollution mitigation system”.

Amended or new policies should be supported by a revised rule framework comprising specific provisions relevant to implementation of diffuse pollution mitigation systems. In some cases, it may be possible to amend relevant existing rules for permitted, controlled, or restricted discretionary activities so that the activity purpose is inclusive of diffuse pollution mitigation systems or some of the specified restrictions on the nature and scale of the activity either do not apply to, or are modified to be more accommodating of, diffuse pollution mitigation systems. This could reduce the number of activities that, as illustrated in Milne and Luttrell’s (2020) evaluation of consented mitigation systems, currently default to a discretionary classification.

As well as a more streamlined regulatory pathway, guidance is needed to facilitate implementation of diffuse pollution mitigation systems. This guidance should address both technical and consenting considerations around the design, construction, operation, and maintenance of various mitigations and be written with several audiences in mind, including rural advisors and landowners as well as council policy and consent planners, and land management staff. While guidance could be prepared at a regional level, in the interest of both efficiency and consistency in implementation of diffuse pollution mitigation systems, particularly given the pending development and roll-out of FW-FPs across NZ, there should be at least some level of overarching national guidance first.

1 Introduction

A growing number of ‘edge-of-field’ mitigation tools, technologies and devices (hereafter “mitigation systems”) are being developed and trialled in rural areas across Aotearoa New Zealand (NZ) to reduce the impact of intensive land use on freshwater quality. Examples include planted riparian buffers, constructed wetlands, woodchip denitrification filters, detention bunds and filamentous algae nutrient scrubbers. For operational efficiency purposes, many of these mitigation systems are located within or close to natural waterways, waterbodies and wetlands where their construction, operation and maintenance involves a range of activities that potentially require resource consent(s) in accordance with regional plans prepared under the Resource Management Act 1991 (RMA). These activities relate to the use of land (e.g., earthworks to construct a wetland), disturbance of river (or lake) beds (e.g., for construction of a culvert or dam), the taking, use, damming or diversion of water, and the discharge of contaminants to land or water (e.g., stormwater during earthworks or agrichemicals from spraying). A review of regional plan rules by Milne and Luttrell (2020) found that permitted activity rules exist for most of these activities, but some are not covered by permitted activity rules (e.g., deposition of woodchips into land and associated leachate discharges and in many regions, construction of monitoring bores). Moreover, there are lengthy lists of conditions associated with many of the permitted activity rules. Failure to meet one or more of these conditions will trigger the need for resource consent.

New Zealand’s regulatory landscape for managing fresh waters has continued to evolve at pace since completion of the regional plan stocktake by Milne and Luttrell (2020). Most notably, the Government has established a requirement for farmers to prepare freshwater farm plans under Part 9A of the RMA and passed its *Essential Freshwater* package into legislation in September 2020. The latter culminated in the release of an updated National Policy Statement for Freshwater Management (NPS-FM) and new National Environmental Standards for Freshwater (NES-F), as well as several other regulations. Regional and unitary councils are in the process of implementing this latest national direction and are preparing new or revised regional policy statements and plans. In addition, as part of the Government’s *Resource Management Reform* programme, regional plan and resource consent processes will in future be managed under new national legislation, with the proposed Natural and Built Environments Act (NABA) expected to replace the RMA in 2023.

This report updates and builds on the regulatory assessment prepared by Milne and Luttrell (2020), to assist with understanding both current and pending new regulatory requirements for edge-of-field diffuse pollution mitigation systems. This information will help establish an ‘implementation pathway’ for mitigation systems developed through:

- the NIWA-led “Doubling on-farm diffuse pollution mitigation” research programme on next generation nutrient filter technologies funded by MBIE, and
- NIWA’s Freshwater Centre-led “Mitigation System Science” research funded through MBIE’s Strategic Science Investment Fund.

1.1 Scope and approach

This report provides a desktop review of regional plan provisions of relevance to edge-of-field diffuse pollution mitigations. The primary focus is at the level of plan objectives and policies as opposed to the rules that may result from these; the latter were addressed in detail by Milne and Luttrell (2020). However, implementation methods which include rules, including new rules that must be included in regional plans to give effect to the NES-F, are outlined.

In total, provisions in 12 of 16 regional plans were reviewed. The original intent was to focus on six regions where NIWA has projects underway or planned but, in the interest of capturing a more comprehensive understanding of the current regulatory environment, regional plans for a further six regions were reviewed.

Regional plan provisions are evolving at a rapid pace in response to national direction, with some proposed plan changes notified or becoming operative during the course of this research project. Best endeavours have been made to ensure that the plan provisions presented in this report represent the established (i.e., documented) current council 'position' as at 31 August 2022. This means that a preference was given to reviewing recent draft and proposed plan provisions over (in some cases quite dated) existing plan provisions.

As noted in Milne and Luttrell (2020), many regional plans now contain both regionwide and sub-regional (catchment-specific) provisions, with up to 10 sub-regional plans at various stages of preparation (e.g., the Canterbury region is divided into 10 zones and the Wellington region into five *whaitua*). The current report is focused on regionwide plan provisions. If a resource consent was being applied for, the provisions of any relevant sub-regional plan would also need to be examined to check for additional or specific location-based restrictions or caveats on activities. Similarly, recognising that city and district councils regulate land use under Section 9 of the RMA, the provisions of district plans would also need to be checked.

1.2 Report outline

This report comprises three further sections:

- Section 2 provides an overview of the current and pending new regulatory environment for freshwater management.
- Section 3 summarises a selection of regional plan objectives and policies of relevance to edge-of-field diffuse pollution mitigation systems, and outlines some of the common methods identified to implement the policies.
- Section 4 provides a discussion of the issues associated with implementation of diffuse pollution mitigation systems and some example regional plan provisions and guidance that might facilitate easier implementation.

1.3 A note on terminology

In this report the term "regional council" refers to both regional councils and unitary councils, the latter having the responsibilities of both district/city and regional councils under the RMA. Similarly, a "regional plan" can also be interchanged with a unitary plan insofar as the provisions in that plan address regional council functions under section 30 of the RMA.

It is recognised that "diffuse pollution mitigation" can potentially be associated with many activities, including 'at-source' mitigation measures such as nutrient budgeting and management of stock numbers. For the purposes of this report, the term "diffuse pollution mitigation systems" refers specifically to edge-of-field tools, technologies or devices that are constructed for the primary purpose of reducing the load of one or more diffuse source contaminants (e.g., nitrogen, phosphorus, sediment or microbes) entering surface water. In the context of NIWA's research activity, the suite of such mitigation systems includes riparian buffers, constructed wetlands, detention bunds, woodchip bioreactors, and filamentous algae nutrient scrubbers. See Milne and Luttrell (2020, 2021) for an overview of each of these mitigation systems.

2 Regulatory framework

This section provides an overview of the current and pending new regulatory environment for freshwater management. Brief commentary is included on specific regulatory provisions that may be important to the construction, operation, and maintenance of diffuse pollution mitigation systems. The potential implications of these provisions are discussed in Section 4.

2.1 Existing regulatory framework

The Resource Management Act 1991 (RMA) is the primary legislation for environmental management in NZ addressing the use, development and protection of natural and physical resources, including land, fresh water, air and the coastal marine area. The RMA seeks to promote the sustainable management of these resources and sets out a number of functions, duties and powers to enable regional and local councils to achieve this. In September 2020 the Government introduced the National Policy Statement for Freshwater Management (NPS-FM, replacing the 2017 amendments to the NPS-FM 2014) and the (new) National Environmental Standard for Freshwater (NES-F) in accordance with Subpart 1 of the RMA. This national direction serves to improve consistency in freshwater-related policy, standards and regulations implemented at regional levels through regional policy statements and regional plans.¹

Of particular relevance to diffuse pollution mitigation systems is Part 3 of the RMA that establishes duties and restrictions on activities relating to natural and physical resources. Specifically, the construction, operation and maintenance of some mitigation technologies will involve one or more activities (e.g., excavation of land, diversion of water) that may require resource consent from regional councils² under the following:

- Section 9: Restrictions on the use of land
- Section 13: Restrictions on certain uses of beds of lakes and rivers
- Section 14: Restrictions relating to the taking, using, damming or diversion of water
- Section 15: Discharge of contaminants.

In addition, the NES-F also establishes consent requirements for some relevant activities carried out in close proximity to natural wetlands (see Section 2.1.2).

Consent requirements are determined by examining regional plan rules to verify the status (or class) of relevant activities. Sections 77A and 87A of the RMA provide for six different classes of activity in regional (and district) plans, ranging from permitted (no consent required) to prohibited (no consent will be issued) (Figure 2-1). Most rules list conditions, permissions or requirements that must be met in order for that activity status to apply. If this is not possible, the activity status defaults to one that is more restrictive (as specified in the plan).

¹ The NPS-FM also has direction for district plans in relation to the effects of land use and development on freshwater. In a few regions, Treaty of Waitangi settlements between iwi and the Crown also come into play. For example, the Waikato-Tainui Raupatu Claims (Waikato River) Settlement Act 2010 (the Settlement Act) works in conjunction with the RMA and a number of other statutes, to provide direction through a "vision and strategy" for planning documents created under the RMA to protect the health and wellbeing of the Waikato River for future generations. The vision and strategy form part of the Waikato Regional Policy Statement and prevail over any national policy statements that affect the river.

² Some land use activities may also trigger a resource consent under the relevant district plan.



Figure 2-1: Summary of the different classes (status) of activity under the RMA and provided for in regional plans. Source: Milne and Luttrell (2020).

2.1.1 National Policy Statement for Freshwater Management 2020

The NPS-FM 2020 has one objective; “...to ensure that resources are managed in a way that prioritises:

- a) first, the health and wellbeing of waterbodies and freshwater ecosystems; and
- b) second, the essential health needs of people; and
- c) third, the ability of people and communities to provide for their social, economic, and cultural wellbeing, now and in the future.”

This objective relates to the concept of *Te Mana o te Wai* and imposes a ‘hierarchy of obligations’, ensuring that the health and wellbeing of the water is protected first, then the essential needs of people (such as drinking water), followed by other uses that provide for social, economic and cultural wellbeing (MfE 2020). Councils are to give effect to *Te Mana o te Wai* through a number of “requirements”. Three requirements particularly relevant to NIWA’s existing diffuse source mitigation research are:

- active involvement of tangata whenua in freshwater management, such as through joint management arrangements and transfer of powers,
- enabling the application of a diversity of systems of values and knowledge (such as mātauranga Māori) to the health and wellbeing of freshwater ecosystems, and
- adopting an integrated approach to freshwater management in accordance with the principle of *ki uta ki tai* (‘from the mountains to the sea’).

It is important to note that regional councils are still in the early stages of giving effect to *Te Mana o te Wai* and guidance is only just emerging to support this. Most of the relevant new NPS-FM-related provisions that need to be implemented through regional policy statements and regional plans are not required to be notified until December 2024.

The NPS-FM objective is supported by 15 policies, most of which are relevant to diffuse pollution mitigations. These are:

- Policy 1: Freshwater is managed in a way that gives effect to *Te Mana o te Wai*.
- Policy 2: Tangata whenua are actively involved in freshwater management (including decision-making processes), and Māori freshwater values are identified and provided for.

- Policy 3: Freshwater is managed in an integrated way that considers the effects of the use and development of land on a whole-of-catchments basis, including the effects on sensitive receiving environments.
- Policy 4: Freshwater is managed as part of NZ’s integrated response to climate change.
- Policy 5: Freshwater is managed through a National Objectives Framework to ensure that the health and well-being of degraded water bodies and freshwater ecosystems is improved, and the health and well-being of all other water bodies and freshwater ecosystems is maintained and (if communities choose) improved.
- Policy 6: There is no further loss of extent of natural inland wetlands, their values are protected, and their restoration is promoted.
- Policy 7: The loss of river³ extent and values is avoided to the extent practicable.
- Policy 8: The significant values of outstanding waterbodies are protected.
- Policy 9: The habitats of indigenous freshwater species are safeguarded.
- Policy 10: The habitat of trout and salmon is protected, insofar as this is consistent with Policy 9.
- Policy 12: The national target for water quality improvement (as set out in Appendix 3) is achieved.
[This relates to improvements in microbiological water quality for the purpose of contact recreation, as measured through the faecal indicator bacterium, Escherichia coli (E. coli).]
- Policy 13: The condition of water bodies and freshwater ecosystems is systematically monitored over time, and action is taken where freshwater is degraded, and to reverse deteriorating trends.
- Policy 15: Communities are enabled to provide for their social, economic, and cultural wellbeing in a way that is consistent with this National Policy Statement.

Part 3 of the NPS-FM sets out a list of things that councils must do to give effect to the objective and policies above. In some cases, specific objectives and policies are to be included in regional policy statements and plans (e.g., to provide for and promote the restoration of natural inland wetlands, and to maintain or improve fish passage by instream structures).

Subpart 2 (of Part 3) outlines the National Objectives Framework (NOF), the process by which councils must engage with communities and tangata whenua to manage freshwater in their regions (Figure 2-2). This begins with identifying the values and desired outcomes for freshwater at the scale of a freshwater management unit (FMU) and expressing these in the form of objectives in regional plans. As a minimum, all rivers and lakes must be managed for four mandatory values: “ecosystem health”, “human health for recreation”, “threatened species” and “mahinga kai”. Attributes (e.g., nitrate toxicity) relevant to each value must then be selected along with the baseline state (i.e., ‘current condition’) for each. From there, desired (future) target attribute states are established, together with environmental flows/levels, limits on resource use and/or action plans to support the achievement of environmental outcomes. Appendix 2 of the NOF contains a series of mandatory

³ A June 2022 exposure draft of proposed amendments to the NPS-FM replaces “river” with “river bed”.

attributes and minimum acceptable states (termed 'national bottoms lines' or NBL) for each (e.g., nitrate-N has a NBL of 6.9 mg/L as an annual median).

Councils are required to monitor and report on progress towards achieving the target states and environmental outcomes, including taking appropriate action if degrading trends are detected. On-farm diffuse pollution mitigations represent an example of an on-the-ground action that could be implemented to assist with achieving and/or maintaining target attribute states. Such mitigations could also assist with protecting or restoring natural wetlands (as required by Policy 6).

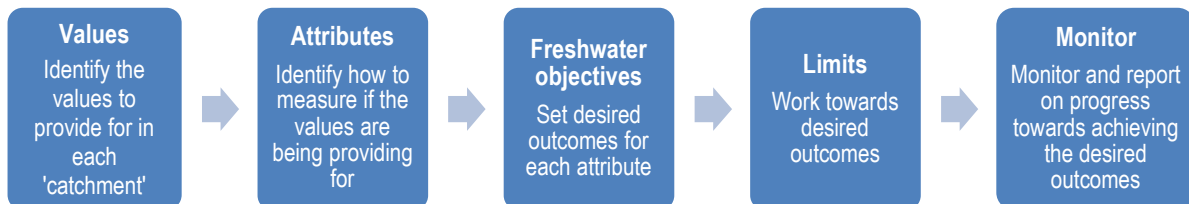


Figure 2-2: Simplified process for freshwater planning under the NOF. Feedback loops not shown.

2.1.2 National Environmental Standards for Freshwater Management (NES-F)

The NES-F 2020, established under section 43 of the RMA, regulates a selection of activities that pose risks to the health of freshwater and freshwater ecosystems (e.g., intensive winter grazing of forage crops, application of synthetic nitrogen fertiliser). It establishes activity classes that are to apply to rules in regional plans for these activities. Of primary relevance to constructing, operating and maintaining diffuse pollution mitigations is that resource consent will generally be required⁴ for:

- vegetation clearance, earthworks or other land disturbance within 10 m of a natural wetland, and for the drainage or taking, damming, diverting or discharge⁵ of water from within, or within 100 m setback of a natural wetland (as non-complying activities),
- new structures in rivers (e.g., weirs for flow monitoring, culverts) that do not meet permitted activity standards for fish passage,
- the use, alteration, extension, or reconstruction of new passive flap gates (as defined in the NES-F), and
- river or stream reclamation (and applications for consent must demonstrate there is no other option available to conduct the activity in that river/stream and any associated adverse effects of the activity can be managed).

Some diffuse pollution mitigations, notably constructed wetlands but also detainment bunds and denitrifying woodchip bioreactors, have traditionally been constructed in 'naturally wet' parts of (already highly modified) pasture that are often ideally suited for their construction. However, some areas of modified wet pasture suitable for such mitigations appear to have been captured within the definition of a natural wetland under the NPS-FM and NES-F (Table 2-1) or are located within the NES-F set-back distances from wetlands. A Ministry for the Environment (MfE) discussion document

⁴ Some exceptions exist to the requirement to apply for resource consent for vegetation clearance and earthworks (e.g., where these activities are for the purpose of scientific research or maintenance and operation of utility structures or infrastructure) but only if specific permitted activity conditions are met.

⁵ Proposed amendment 10B to the NES-F seeks to clarify that 'discharge' under Regulation 54 means discharges of water with adverse effects, thereby preventing the capture of small-scale discharges of water to wetlands and enabling activities to proceed if they do not adversely affect the hydrological functioning, habitat or biodiversity values of a natural wetland (MfE 2022a).

released in October 2021 proposed changes to the definition to make it easier to understand and ensure that only the areas intended are captured by the regulations (MfE 2021a). Feedback on the discussion document resulted in further changes (MfE 2022a, 2022b) released in a recent exposure draft of proposed amendments to the NPS-FM (Table 2-1). The most recent changes more clearly differentiate between a constructed wetland and a natural wetland, with any “deliberately constructed wetland” excluded from the natural wetland definition except where it is being/has been constructed “to offset impacts on, or to restore, an existing former wetland”.

Based on the latest definition of a natural wetland, constructing an artificial wetland or diffuse pollution mitigation device will not be possible in areas of permanently or intermittently saturated soils (RMA definition of “wetland”) where the vegetation is 50% or less exotic pasture species or they are known to contain threatened species. This is likely to be the case regardless of whether or not additional benefits the constructed wetland may offer, such as enhanced water storage, flood attenuation, contaminant processing and provision of aquatic habitat, are greater than those provided by an existing natural wetland. Two exceptions of wetlands that do not appear to be afforded protection under the NES-F regulations identified by MfE (2022a) are pasture dominated-wetlands that lack threatened species but may retain hydrological functioning and ephemeral wetlands.⁶ In these areas, construction of wetlands should be possible, subject to other wetland policy and rule provisions included in the relevant regional plan.

Table 2-1: Existing definition of ‘natural wetland’ in the NPS-FM 2020 (and, by default, the NES-F) and recent proposed amendments. The final definition may change again in response to submissions on the Government’s current exposure draft of proposed amendments to wetland regulations. Note that the RMA only defines a “wetland”, describing it as “*permanently or intermittently wet areas, shallow water, and land water margins that support a natural ecosystem of plants and animals that are adapted to wet conditions*”.

Existing definition in the NPS-FM 2020	Revised definition (MfE 2021a)	Proposed amended definition (MfE 2022b and NPS-FM exposure draft*)
<p>... a wetland (as defined in the Act [RMA]) that is not:</p> <p>(a) a wetland constructed by artificial means (unless it was constructed to offset impacts on, or restore, an existing or former ‘natural wetland’); or</p> <p>(b) a geothermal wetland; or</p> <p>(c) any area of improved pasture that, at the commencement date, is dominated by (that is more than 50% of) exotic pasture species and is subject to temporary rain-derived water pooling.</p>	<p>... a wetland (as defined in the Act [RMA]) that is not:</p> <p>(a) a wetland constructed by artificial means (unless it was constructed to offset impacts on, or restore, an existing or former ‘natural wetland’); or</p> <p>(b) a geothermal wetland; or</p> <p>(c) any area of pasture that has more than 50 percent ground cover comprising exotic pasture species or exotic species associated with pasture.</p>	<p>... a wetland (as defined in the Act [RMA]) that is not:</p> <p>(a) a deliberately constructed wetland, other than a wetland constructed to offset impacts on, or to restore, an existing or former natural wetland as part of giving effect to the effects management hierarchy; or</p> <p>(b) a wetland that has developed in or around a deliberately constructed water body, since the construction of the water body; or</p> <p>(c) a geothermal wetland; or</p> <p>(d) a wetland that:</p> <ul style="list-style-type: none"> (i) is within an area of pasture; and (ii) has ground cover comprising more than 50% exotic pasture species (as identified in the <i>National List of Exotic Pasture Species</i> (see clause 1.8)); and (iii) is not known to contain threatened species.

* https://consult.environment.govt.nz/freshwater/npsfm-and-nesf-exposure-draft/user_uploads/exposure-draft-changes-to-npsfm-2020.pdf

⁶ MfE (2022a, p14) refers to an inevitable exclusion of “a portion of ephemeral wetlands in pasture areas” but given that ephemeral is not included in the RMA component of the most recently proposed natural wetland definition, it would seem that no ephemeral wetlands are captured. In any case, ephemeral wetlands can still be protected through other policy and rule provisions adopted in regional plans.

The natural wetland setback distances in the NES-F, inside which specific activities such as earthworks are designated as non-complying activities, are also relevant to the implementation of diffuse pollution mitigations. The most stringent of these setbacks is 100 m for taking, using, damming, diverting or discharge of water. It will likely be difficult to get resource consents to construct wetlands within these wide setbacks. This is revisited in Section 4.1.

In terms of structures and fish passage, MfE (2021b) guidance indicates:

- the regulations do not specifically exempt temporary structures such as culverts to allow for stream crossings during construction, therefore all culverts regardless of their lifespan, need to comply with the permitted activity conditions or will require consent,
- anyone installing temporary structures can follow NZ Fish Passage Advisory Group guidance (e.g., Franklin et al. 2018) to avoid or limit the impacts,
- the NES-F does not apply to structures that were in rivers before 2 September 2020 (i.e., councils need to assess whether these existing structures meet permitted activity criteria under their regional plans; if consent is required, just as is the case for new structures, the NPS-FM fish passage provisions must be applied),
- The fish passage provisions are designed to apply to species that the community finds “desirable”, with the definition of desirable (and undesirable) left open for decision at the local level based on community values and local environmental outcomes – but, generally, the default is to provide unrestricted upstream and downstream passage to all species present unless there are reasons not to,
- any proposed new dam or diversion structure requires consideration by the Department of Conservation under the Freshwater Fisheries Regulations 1983 to determine if a fish facility⁷ is required or not, and
- activities that require a resource consent will, at a minimum, need to be monitored and maintained. The Fish Passage Assessment Tool (Franklin 2022) is endorsed by MfE to identify, assess and record the ‘performance’ of existing instream structures.

2.1.3 Freshwater Farm Plans

In July 2020, as part of a raft of wider amendments to the RMA, the Government established a requirement for farmers to prepare a freshwater farm plan (FW-FP) under Part 9A (section 217A to 217M) of the RMA “to better control the adverse effects of farming on freshwater and freshwater ecosystems”. A FW-FP is intended to provide a practical way for farmers to improve waterway health and meet freshwater outcomes. It is not intended to replace existing Farm Environment Plans (FEPs); the latter are considered broader in scope, addressing all aspects of farm management practice (MfE/MPI 2021).

The regulatory requirements of the FW-FP system are due to be gazetted in late 2022 after a regional pilot in August, with roll-out planned from early 2023 (Lissaman⁸, pers. comm. 2022). Based on section 217 of the RMA and a discussion document (MfE/MPI 2021) released for public comment in July 2021, a FW-FP is to:

⁷ A fish facility is defined in the regulations as “any structure or device, such as a fish pass or fish screen that is inserted in or by any waterway, to stop, allow or control the passage of fish through, around, or past any instream structure.”

⁸ Henry Lissaman, Policy Analyst, Climate & Water Agriculture Team, Ministry for the Environment, 1 June 2022.

- be mandatory for farms comprising:
 - 20 hectares or more in arable or pastoral use, or
 - 5 hectares or more in horticultural use, or
 - 20 hectares or more of combined use,
- identify clear outcomes or goals for a) farm practice, b) ecosystem health and c) the wider catchment,
- provide an assessment of the impacts and risks of farming activities for waterways, including irrigation, application of nutrients and effluent, winter grazing, stock-holding areas, stock exclusion, offal pits, and farm rubbish pits,
- include details on how the ‘regulated outcomes’ are to be met, including actions to avoid, remedy or mitigate the impact of activities on freshwater and freshwater ecosystems,
- comply with any consent requirements or regional or national rules,
- provide ‘base information’, such as details of landowner, farm operator, farm size and key activities, and maps showing natural and man-made features,
- be certified by someone who is accredited to meet nationally set standards for competency and experience to ensure the FW-FP meets the requirements and is fit for purpose,
- be independently audited at regular intervals, and
- be enforced by regional councils.

The catchment context component for each FW-FP, representing the values and priorities that the community and tangata whenua have for waterways, is to be provided by regional councils through their updating of regional plans to give effect to Te Mana o te Wai and the NPS-FM 2020. As these updated regional plans are not required to be notified until December 2024 and the first FW-FPs are expected to be rolled out from early 2023, the first tranche of FW-FPs certified would use “the best local information and catchment context available at the time” (MfE/MPI 2021). These plans could then be updated once catchment visions, values, limits and rules have been set by regional councils.

Of particular relevance to diffuse pollution mitigation systems (as underlined above) is the requirement of a FW-FP to identify specific and measurable actions the farm operator will take to avoid, remedy and mitigate impacts and risks of farming activities for waterways. Base information could also be a useful source of information on existing and future mitigation systems that have or are to be incorporated into the farm system.

Measurable actions are likely to encompass a range of methods, from stock, nutrient and riparian management through to engineered solutions such as sediment traps, constructed wetlands and other mitigation systems. Importantly, MfE/MPI (2021) note that actions should be considered in the context of the individual farm, the farm objectives and the FW-FP. Given that the FW-FP must consider the wider catchment, this means that mitigation systems should be considered in terms of how they might serve the needs of multiple farms within a catchment.

At this stage it is unclear what the process will be for identifying suitable actions needed to address identified risks/impacts of farming – and therefore the opportunity to consider adoption of specific diffuse pollution mitigation systems. However, based on informal conversations with council staff and farmers and a discussion with MfE and MPI staff in early June 2022, in terms of implementing mitigation tools as an action, it seems reasonable to assume that they will be more likely to be taken up provided:

- there is an established evidence base that they can effectively address specific issues, including any associated conditions/constraints,
- they are cost-effective and efficient relative to other options, and
- rural professionals engaged to advise on FW-FP development and implementation are aware of and can access information on the tools, with guidance available to support their design, operation, construction and maintenance (as well as consenting, where required).

2.1.4 Greenhouse gas emissions and climate change

As well as introducing FW-FPs, the Resource Management Amendment Act 2020 introduced changes to climate change provisions through sections 17 to 21, 35 and 36 of the RMA that will repeal sections 70A, 70B, 104E and 104F. Of primary relevance to diffuse pollution mitigations is that the existing RMA provisions direct councils to disregard the climate change effects of greenhouse gas (GHG) emissions from any activity other than where the use and development of renewable energy enables an overall reduction in the discharge of GHGs.

However, once the amendments come into force in November 2022⁹, considering the effects of the activity on climate change will no longer be out of bounds for councils when deciding whether or not to grant consent for an activity, or to adopt new rules and policies governing consents. It is unclear how or if this regulatory opportunity will be used by councils given the likely replacement of the RMA with the Natural and Built Environments Act and other legislation in 2023 (see Section 2.2). In any case, the new legislation will ensure that the effects of a proposal on climate change are considered both in regional/district plans and resource consents (Van der Wal 2021). This strongly suggests that GHG emissions from diffuse pollution mitigation systems will need to be better understood, and possibly even quantified, to support future plan making and consenting.

2.1.5 National Planning Standards

The 2017 amendments to the RMA introduced additional national direction in the form of National Planning Standards. These standards seek to make RMA plans more consistent with each other at both the regional and district level, as well as easier to use and faster to make. There are currently 17 planning standards, with the first set (MfE 2019) addressing plan structure, form and definitions, as well as establishing requirements for plans to be accessible through an online interactive plan (ePlan). Although only a few terms of potential relevance to construction of diffuse pollution mitigation systems are currently defined (e.g., *drain*, *vegetation clearance*), the standards framework may provide a potential pathway for introducing further standardisation of terms across regional plans. This is revisited in Section 4.2.

⁹ The repeal of the relevant sections was to take effect on 31 December last year but the Government delayed this until 30 November this year to allow time to develop options for managing GHGs in the short-term.

2.2 Proposed new regulatory framework

In February 2021 the Government announced its intention to repeal and replace the RMA with three new pieces of legislation:

- Natural and Built Environments Act – an integrated statute for land use and environmental protection,
- Strategic Planning Act – to provide a strategic and long-term approach to plans for using land and the coastal marine area (at the regional scale), and
- Climate Adaptation Act – to support NZ’s response to the effects of climate change.

Based on the June 2021 exposure draft of the Natural and Built Environments Bill¹⁰ and related commentary, the Natural and Built Environments Act (NBA) is intended to be the primary piece of legislation to replace the RMA and will work in tandem with the proposed Strategic Planning Act (SPA). The NBA is expected to promote positive outcomes for both the natural and built environments while ensuring that use, development and protection of resources only occur within prescribed environmental limits.

Under the NBA, there will be one Natural and Built Environment Plan (NBA plan) for each region of NZ, consolidating the current 100-plus RMA (regional and district) plans into 14. Each NBA plan must be consistent with a Regional Spatial Strategy, a new spatial plan that must be developed under the SPA (Figure 2-3). The NBA plans must also be consistent with national directions (e.g., NPS-FM, NES-F) which will be integrated into a single instrument provisionally known as the National Planning Framework (NPF). According to MfE (2021c), it is expected that the policy intent of existing national direction would be retained in each NBA plan, provided it aligns with the new purpose and principles of the proposed NPF (which are still to be established). It is also intended that the FW-FP process will be incorporated into the NBA, with any existing FW-FPs addressed through transitional provisions (MfE/MPI 2021).



Figure 2-3: Overview of the interactions between different components of the future resource management system for NZ. Source: Reproduced from MfE (2021c, p.19).

¹⁰ <https://environment.govt.nz/assets/publications/Natural-and-Built-Environments-Bill-Exposure-Draft.pdf>

The proposed Climate Adaptation Act (CAA) is intended to address complex issues associated with managed retreat from coastal areas and funding and financing adaptation to a changing climate. It is unclear at this stage what the CCA will provide but it will interact with the NBA and SPA.

Of particular relevance to diffuse pollution mitigations, is the current proposal for the NBA to comprise just four consent activity classes, compared with the current six under the RMA (refer Figure 2-1). The proposed activity classes outlined in MfE 2021(c) are:

- Permitted: activities where positive and adverse effects (including cumulative and those relevant to outcomes) are known (i.e., a consent is not required)¹¹,
- Controlled: activities where potential positive and adverse effects (including cumulative and those relevant to outcomes) are generally known, but where tailored management of effects is required (i.e., consent will probably be granted),
- Discretionary: activities that are less appropriate, have effects that are less known (or go beyond boundaries), and activities that were unanticipated at the time of plan development (i.e., consent may be granted or declined), and
- Prohibited: activities do not meet outcomes and/or breach limits (i.e., no consent applications will be allowed).

Under this revised framework, only two classes of activity, controlled and discretionary, will effectively apply to consent applications, with the controlled classification providing only limited abilities for councils to decline an application.

¹¹ Provided identified parties have given their written approval or a management plan is prepared by a suitably qualified person (MfE 2021c).

3 Regional plan provisions

This section examines regional plan objectives and policies of direct relevance to reducing the impacts of diffuse source pollution. While it is a regional plan’s rules that determine whether or not a resource consent is required to construct a sediment detention bund or other mitigation system within or in close proximity to a waterway, as illustrated in Figure 3-1, rules and other methods are the mechanism for implementing the plan’s policies, which in turn, are written to give effect to the plan’s objectives. Policies may be strategic policies that apply to all activities and provide an overall direction for integrated management of land and water, or specific policies on management of land and water resources. It is the specific policies that guide decision-making on resource consent applications for various activities (e.g., the disturbance of land or the diversion of water) and provide the rationale for rules on these activities. Rules in regional (and district) plans have the force and effect of regulations in statute (i.e., they are legally binding).

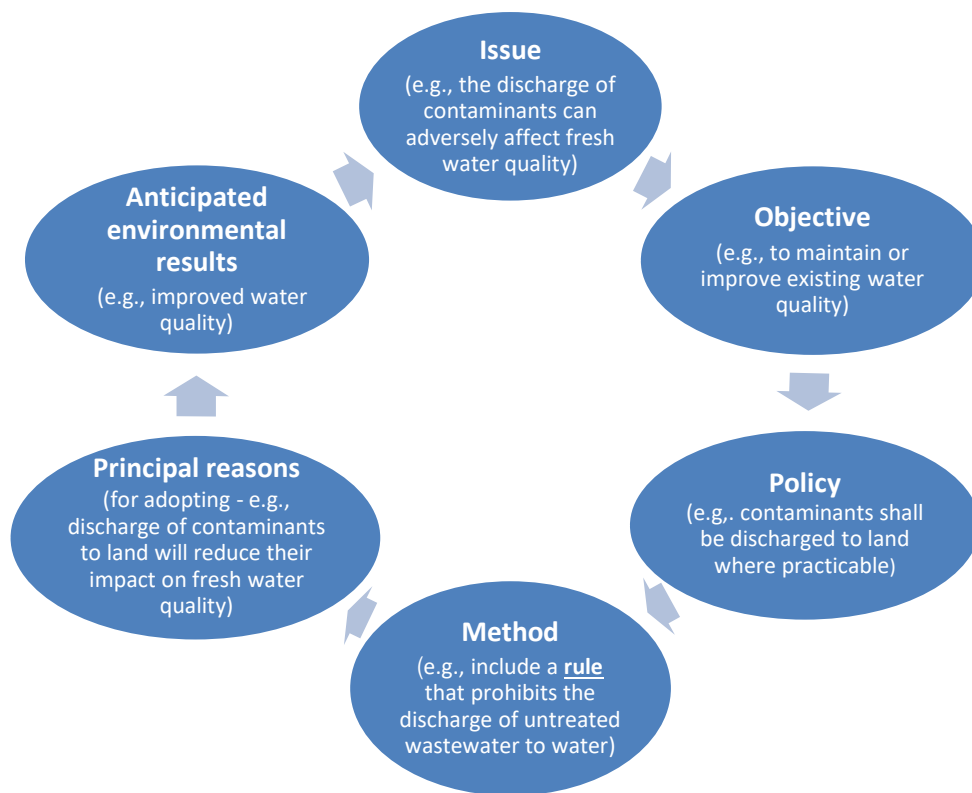


Figure 3-1: Overview of a traditional RMA-based regional plan framework based around one aspect of managing freshwater quality and one activity (discharge of contaminants). The mandatory components required in regional plans under the MfE (2019) National Planning Standards are objectives, policies and, where applicable, rules.

As noted in Section 1.1, a range of provisions in regional plans across NZ are currently being updated to give effect to recent national direction in the *Essential Freshwater* package, including the NPS-FM 2020 and NES-F 2020. The NPS-FM 2020 requires most new/revised provisions to be publicly notified by December 2024.¹² Therefore the objectives and policies presented in this section do not yet give full effect to the recent national direction outlined in Section 2.1. Similarly, some councils are still in the process of integrating individual regional plans (e.g., combining land and water plans) and/or giving effect to the National Planning Standards (MfE 2019) that seek to standardise the structure and form of RMA plans.

¹² December 2023 in the case of Otago Regional Council, owing to a recommendation issued by the Minister for the Environment in 2019.

3.1 Approach

As there are currently considerable differences between regions in the structural layout of regional plans, the approach taken in this project was to scan the table of contents of each plan to identify sections that were likely to contain objectives and policies relevant to:

1. managing the effects of diffuse source pollution on freshwater, or
2. implementing diffuse pollution mitigations.

Plan provisions relating to 1 above were generally contained within sections such as “Surface water quality” and/or “Discharges to land/water”, although the titles of the relevant sections and subsections varied across plans.¹³ In contrast, because constructing, operating and maintaining diffuse pollution mitigation systems such as constructed wetlands can involve a wide range of activities, the check of plan provisions relating to 2 above also involved checking sections with titles such as “Beds of lakes and rivers”, “Land use” and “Water takes/diversions”. In a few cases, all regionwide plan objectives (and sometimes policies) were contained within a single section of a regional plan and it was necessary to scan the full suite in order to identify the most relevant ones.

As noted in Section 1.1, a preference was given to reviewing recent draft and proposed plan provisions over (in some cases quite dated) existing plan provisions. In addition, for manageability, the review was largely limited to regionwide plan provisions, the main exception being where sub-regional (catchment-specific) objectives and policies were readily found within the same section as the regionwide provisions (e.g., the Tukituki catchment in Hawke’s Bay Regional Council’s Regional Resource Management Plan).

The variation in plan layout and the rapidly evolving nature of freshwater plan provisions means that some potentially relevant objectives and policies (and subsequent policy implementation methods) may have been missed. This makes the assessment indicative rather than definitive. In addition, while this section focuses on some specific individual objectives and policies, regional plan objectives and policies are intended to apply as a suite. Therefore, when evaluating how these provisions apply to particular activities in a regional plan, they must be read and considered together (i.e., in general no single objective has more importance than any another).

3.2 Regional plan objectives

All regional plans contain objectives of at least broad relevance to managing the effects of diffuse source pollution on freshwater. Table B.1 (Appendix B) lists examples of these objectives in existing operative, draft or proposed regional plans for 12 regions of NZ. Some of the more common themes captured in objectives across these plans are:

- managing land use to avoid, remedy or mitigate adverse effects on soil and/or receiving waters (3 of 12 plans),
- managing discharges of diffuse source contaminants to reduce adverse effects on water quality (3 plans),
- minimising sediment (and other contaminant) runoff and contaminant leaching (1 plan),

¹³ As documented in MfE (2017), some plans are topic based, structured according to environmental domain (land, water, air) with rules in a separate chapter and structured by domain. In other cases, rules are formulated according to RMA activity (e.g., discharges, takes) or contained in each topic chapter instead of being separate. Catchment based chapters are also common (e.g., giving effect to the NPS-FM) and tend to integrate issues, objective, policies and rules.

- maintaining and, where degraded, enhancing the quality of surface waters (2 plans),
- maintaining and enhancing riparian margins of surface water bodies (3 plans), and
- operating in accordance with industry or good environmental practices to protect against degradation of freshwater resources (3 plans).

Wellington is the only region with an objective in their regional plan that specifically mentions a diffuse pollution mitigation system (*vegetated riparian margins*), although the regional plans for Taranaki and Bay of Plenty have objectives that recognise the importance of maintaining and enhancing riparian margins and managing riparian margins, respectively. Further, most other objectives indirectly capture or support implementation of diffuse pollution mitigation systems, such as those in regional plans for Hawke’s Bay and Canterbury based around good practice for land and water management. Although not written with diffuse pollution mitigation systems in mind, Objective F.1.11 “*to enable and possibly recognise activities that contribute to improving... natural and physical resources*” in Northland’s Proposed Regional Plan could also be interpreted as supporting some land disturbance and other activities needed to implement mitigation systems for overall improved environmental outcomes.

3.3 Regional plan policies

Although often expressed quite differently, all 12 regional plans contain specific policies for managing diffuse source pollution. Table B.2 (Appendix B) lists examples of these policies in existing operative, draft or proposed regional plans for the relevant 12 regions. The most common recurring themes in policies across these plans (Table 3-1) are:

- encouraging (often industry) good / best management practice in land use,
- promoting streamside management, especially planting of riparian margins,
- providing land advisory services and education, and
- regulating specific activities such as intensive farming, land disturbance and vegetation clearance.

In the Taranaki Regional Freshwater Plan, the four policies that address adverse effects on surface water quality from diffuse source pollution make specific mention of retaining, restoring, maintaining or enhancing riparian vegetation/margins. This reflects a long-held view in Taranaki that fencing and planting of riparian margins is the most effective way of managing diffuse pollution (TRC 2012) and is supported by a NIWA report (Graham et al. 2018) that associated improving trends in some freshwater indicators (macroinvertebrate community index and *E. coli*) to riparian management in the region. In contrast, policies in other regional plans incorporate a mix of approaches, including regulation of specific activities and limits on nutrient loss (e.g., nitrogen leaching rates). Regulation is a focus of several policies in the case of the One Plan for the Manawatū-Whanganui region, including Policy 5-8¹⁴ for intensive farming land use activities associated with limiting nitrogen leaching, faecal contamination and, in surface water, elevated sediment levels. Regulation of diffuse source pollution also occurs in the Waikato Region but only for the Lake Taupo catchment (e.g., Policy 3 to cap nitrogen leaching from land in the catchment and Policy 6 to ensure phosphorus discharges from land do not get to levels where they could adversely affect water quality in Lake Taupo and inflowing tributaries).

¹⁴ Note that the One Plan is a combined Regional Policy Statement (RPS) and Regional Plan (RP), with all policies, including Policy 5-8, included within the RPS provisions. The exception are policies that guide resource consent decision-making which are located within the RP.

Table 3-1: Summary of common themes in regional plan policies relevant to managing diffuse source pollution and/or implementation of diffuse pollution mitigation systems. The expression of these themes varies widely, with some individual policies focused on one specific theme while other policies comprise several themes (e.g., by making use of subclauses). See Table B.2 in Appendix B for the details of these policies and other policies not captured here.

Region	Encouraging (often industry) good / best management practice in land use	Promoting streamside management, especially planting of riparian margins	Providing land advisory services, information and education	Regulating specific activities (e.g., intensive farming, land disturbance)	Promoting wetland construction / creation / restoration to improve water quality
Northland					
Waikato		✓			
Bay of Plenty	✓		✓	✓	
Hawke's Bay	✓		✓	✓	
Taranaki		✓			
Manawatū-Whanganui	✓			✓	
Wellington	✓	✓		✓	✓
Tasman	✓	✓	✓	✓	
West Coast	✓	✓			
Canterbury	✓	✓		✓	✓
Otago	✓	✓			
Southland					✓

Policies in most regional plans also extend to regulating many of the activities that are likely to be associated with the construction of diffuse pollution mitigations near water bodies (e.g., land disturbance, earthworks). In the case of the One Plan, Policy 13-1 states Horizons Regional Council *“must (a) regulate vegetation clearance, land disturbance,... through regional rules...”* and (b) *“manage the effects.. by requiring resource consents for those activities”* adjacent to some water bodies. However, Policy 13-2 does provide for the value of mitigations to be recognised when making a decision on a resource consent through clause (h) *“generally allowing activities that result in improved land stability or enhanced surface water quality”*.

Greater Wellington Regional Council’s Proposed Natural Resources Plan (PNRP) is one of the few regional plans that has a specific policy promoting the construction of artificial wetlands to meet water quality, aquatic ecosystem health and other objectives. However, the focus of this policy (P35, see Table B.2 in Appendix B) is restoration of natural wetlands, so constructed wetlands are not promoted for any other purpose. Policy 34 in Environment Southland’s Water and Land Plan similarly addresses both restoration of existing wetlands alongside the creation of new wetlands, with specific reference to *“establishing wetland areas”* on-farm (as well as other locations). Policy 4.92A of Environment Canterbury’s Land and Water Regional Plan (LRWP) to *“enable catchment restoration activities”*, also includes reference to creation of wetlands as well as removal of nuisance macrophytes and fine sediment from waterways. A second policy (4.13) in the LRWP references the use of constructed wetlands to treat contaminants, although this policy appears to be targeted at treatment of point source contaminants (e.g., wastewater) prior to discharge to land/water.

The Otago Regional Council’s Regional Plan Water (RPW) includes both a generic water quality policy (7.B.8) and a specific policy for discharges of water and contaminants (7.D.1) to encourage innovation in management practices to reduce contaminants in discharges. It would seem reasonable to assume that current diffuse pollution mitigation system research and implementation is consistent with this policy.

No regionwide policies of strong direct relevance to diffuse source pollution were evident in Northland Regional Council’s Proposed Regional Plan. Policy D.4.1 is titled *“Maintaining overall water quality”* but is limited to considering resource consent applications for the discharge of contaminants to land and water (the discharge of non-point source contaminants in Northland are not currently subject to regulation through a consenting framework). Within the catchments section (addressing the Doubtless Bay, Waitangi, Poutō, Mangere and Whangārei Harbour catchments), policy E.2.1 includes *“reducing the amount of sediment entering waterways from hill slope and stream-bank erosion”* but is similarly restricted to activities that require resource consent.

3.4 Policy implementation methods

Consistent with most regional plan policies promoting a non-regulatory approach to managing the effects of diffuse source pollution, the majority of policy implementation methods are also non-regulatory in nature. By far the most common non-regulatory methods are the provision of *“advice and information”* on sustainable land use practices and supporting / promoting the development and adoption of *“industry recognised guidelines or codes of practice”* or *“environmental good practices”*. Some of these methods are quite generic, with text that differs little from that expressed at the policy level of some plans. Other methods, especially those addressing high value or ‘at risk’ catchments, are more specific, such as those listed for the Lake Brunner catchment in West Coast’s Regional Council’s Regional Land and Water Plan (Table 3-2).

Table 3-2: Examples of non-regulatory methods in regional plans for implementation of policies relevant to managing diffuse source pollution. See Appendix A for plan references.

Region	Method
Waikato	<ul style="list-style-type: none"> ▪ Non-Point Source Discharges – 3.9.4.1 Waikato Regional Council will encourage the use of good practice in land use activities and practices that reduce non-point source discharges. Waikato Regional Council will, in conjunction with organisations and industry groups, provide guidance in the development, implementation and review of good practice guidelines and codes of practice for land use activities which cause non-point source discharges.
Bay of Plenty	<ul style="list-style-type: none"> ▪ IM M1 (Method 25, Education, promotion and provision of information) includes “Promote and encourage the adoption of site-specific sustainable land and water management practices by using the following:… (e) Encouraging the development and implementation of industry-based best management practices, codes of practice, environmental management systems and self-monitoring programmes that achieve the sustainable development and management of land.” ▪ LM M14 (Method 45): In conjunction with appropriate parties, investigate and document best management practices for nutrient management, including reduction and mitigation measures, for urban and rural land uses.
Taranaki	<ul style="list-style-type: none"> ▪ METH 1: Promote, through the Taranaki Regional Council’s sustainable land management programme, sustainable land use practices, that will avoid, remedy or mitigate the adverse effects of diffuse source discharges. ▪ METH 2 Promote the planting and appropriate management of riparian margins through the implementation of the Taranaki Regional Council’s riparian management strategy, including the preparation of riparian management plans in conjunction with landowners. ▪ METH 3 Support the preparation and adoption of codes of practice by industry aimed at reducing diffuse source discharges, and support their implementation and adoption where appropriate. ▪ METH 10 Prepare guidelines on principles and practices of riparian management including planting, fencing and management.
Tasman	<ul style="list-style-type: none"> ▪ 33.1.20.2 Education and Advocacy: (a) Liaison with resource user groups and interest groups and other statutory bodies. (b) Provision of information and advice concerning sustainable practices, including best practicable options for contaminant discharges and riparian and coastal land management to improve or maintain water quality. (c) Promotion or support of industry codes of practice, such as the code of practice for fertiliser use, and individual management practices that avoid, remedy or mitigate adverse effects of contaminant discharges or land uses on all receiving environments. (Refer to Method 12.1.20.3(b))
West Coast	<ul style="list-style-type: none"> ▪ 4.4.1: In conjunction with resource users and other interested persons (e.g. Landcare groups, industry organisations, etc.), the Council will encourage the development of codes of practice and environmental management systems in order to support sustainable land management practices. Existing codes of practice will be recognised if they meet the requirements of the RMA. <p><u>Lake Brunner/Kotuku-Whakaoho catchment special management area</u></p> <ul style="list-style-type: none"> ▪ 9.4.1: To encourage the development and implementation of codes of practice and environmental management systems. The Council will encourage and assist community, recreational and industry groups in the Lake Brunner catchment to prepare codes of practice and environmental management systems for land and water use activities, in order to avoid, remedy or mitigate adverse effects on water. This may involve identifying how land use activities can be carried out in ways which minimise non-point source contamination. ▪ 9.4.2: To promote and encourage the rehabilitation of river and lake edges in reaches where water quality may be enhanced as a result. The Council will identify those parts of wetlands, lakes and rivers in the Lake Brunner catchment where water quality has been degraded by land use activities. Whilst this Plan does not regulate land use activities, this method is designed to promote integrated management of non point source discharges from land use activities. Identifying degraded areas will enable the appropriate management response to occur. ▪ 9.4.3: To promote and encourage land use practices that maintain and/or enhance water quality... ▪ 9.4.6: Encourage the implementation of Nutrient Management Plans and Farm Plans to address best practice on individual farms to reduce effects on Lake Brunner.

Regulatory approaches to diffuse pollution require certain activities to be subject to resource consents, with this approach particularly strong in specific catchments of some regions (e.g., Lake Taupo catchment in Waikato, Tutituki River catchment in Hawke's Bay) or in some cases under specific land uses (e.g., intensive farming in Manawatū-Whanganui). More widespread regulation of diffuse pollution can be expected in future regional plans as a result of implementation of FW-FPs and limit-setting processes under the NPS-FM 2020.

3.4.1 Rules

While rules in regional plans represent the main regulatory mechanism for managing the effects of diffuse pollution (e.g., through establishing when resource consent is required for certain activities that result in sediment or nutrient loss to water), they also regulate the activities associated with constructing, operating and maintaining some diffuse pollution mitigation systems. Many of these activities, especially when carried out in close proximity to natural waterways, will not meet the conditions associated with relevant permitted activity rules (and in some cases relevant rules do not exist), thereby triggering the need for resource consent (Milne and Luttrell 2020).

Only two regional plans had permitted activity rules that directly address implementation of a diffuse pollution mitigation system other than a vegetated riparian buffer (Table 3-3). Rule 5.159 in the Canterbury Land and Water Plan provides for wetland construction as a permitted activity subject to restrictions on the taking of water. It is not known how many wetlands may have been constructed without resource consent as a result of this rule but Milne and Luttrell (2020) reported that the recent construction of Te Ahuriri wetland was not able to meet condition 1 of this rule and this condition will likely limit construction without resource consent to relatively small wetlands (Tanner pers. comm. 2022).

Rule 13.5.1.10 of the RPW for Otago provides for the installation and maintenance of sediment traps as a permitted activity in the beds of ephemeral or intermittently flowing rivers. This is a recent rule, only becoming operative in June 2022 as part of Plan Change 8 to the RPW. According to the RMA section 32 evaluation report (ORC 2020), this rule seeks to incentivise the use of sediment traps as a method for reducing sedimentation in water bodies. However, it is unclear from the S32 report, what evidence base supported the efficacy of in-river sediment traps for sediment mitigation. Prior to the inclusion of this rule in ORC's RPW, installation of a sediment trap, which involves disturbance of a river or lake bed, could only be assessed under an existing discretionary rule. Feedback from catchment groups noted that this requirement for a resource consent presented as *"a disincentive to installing sediment traps which might otherwise assist with mitigating sedimentation"* (ORC 2020, p31). Time will tell what impact the permitted activity rule has on supporting greater implementation of sediment traps and if trap installation can be done in accordance with the conditions of this rule but, as suggested by Milne and Luttrell (2020), rules like this with a specific focus on diffuse pollution mitigation systems would better support their implementation. These rules would be most appropriate where there is a strong evidence base that supports the efficacy of a specific diffuse pollution mitigation system. This is discussed further in Section 4.

Table 3-3: Examples of two rules in regional plans focussed specifically on implementation of diffuse pollution mitigation systems. See Appendix A for plan references.

Region	Rule
Canterbury	<p>5.159: The enhancing, restoring or creating of a wetland, including the associated taking, use, damming or diversion of water from groundwater or surface water, and discharge of excess or overflow water from the wetland into surface water is a permitted activity if the following conditions are met:</p> <ol style="list-style-type: none"> 1. The taking, use, damming or diversion of water is at a maximum rate of 5 L/s and 100 m3 per day; and 2. The taking of water is non-consumptive, is discharged back into the same waterbody and complies with any limits in Sections 6 to 15 of this Plan or any other Regional Plan for the relevant waterbody; and 3. The taking of water does not prevent water being taken by any domestic or stock water supply.
Otago	<p>13.5.1.10: The disturbance of the bed of any ephemeral or intermittently flowing river for the purpose of constructing or maintaining a sediment trap and any associated deposition of bed material is a permitted activity providing:</p> <ol style="list-style-type: none"> (a) The construction or maintenance of the sediment trap is undertaken solely for sediment control purposes or to maintain the capacity and effective functioning of the sediment trap; and (b) The construction or maintenance does not result in destabilisation of any lawfully established structure or cause increased risk of flooding or erosion; and (c) No works occur in flowing water; and (d) Any build-up of sediment and other debris (including vegetation) within the sediment trap is removed to maintain the effectiveness of the sediment trap; and (e) All reasonable steps are taken to minimise the release of sediment during the disturbance and there is no conspicuous change in the colour or clarity of the water body beyond a distance of 200 metres downstream of the disturbance; and (f) No lawful take of water is adversely affected as a result of the disturbance; and (g) There is no change to the water level range or hydrological function of any Regionally Significant Wetland; and (h) There is no damage to fauna or New Zealand native flora in or on any Regionally Significant Wetland. <p>(Sediment trap is defined in the RPW glossary as “an excavated or banded area in the bed of an ephemeral or intermittently flowing river designed and constructed solely for the purpose of allowing sediment to drop from the water column”. Note that neither “ephemeral” nor “intermittently flowing” are defined in the glossary.)</p>

4 Discussion

The need to reduce the effects of diffuse source pollution to improve the health of fresh waters in NZ is well established (e.g., Howard-Williams et al. 2010, Larned et al. 2016) and is reflected in recent national direction (Section 2). It is also reflected in existing and recent regional plan provisions, with 11 of the 12 regional plans reviewed in Section 3 having objectives and/or policies that address diffuse pollution. However, the expression of these objectives and/or policies varies between plans and other than vegetated riparian buffers, few plans contain specific region-wide policies that facilitate or encourage the adoption of edge-of-field diffuse pollution mitigation systems such as constructed wetlands and sediment detention bunds. Consequently, prescribed methods for policy implementation in regional plans also lack specific provisions to facilitate or encourage the adoption of mitigation systems, with methods across most plans limited to “advice and information” and supporting / promoting the development and adoption of “industry recognised guidelines or codes of practice” or “environmental good practices.” While mitigation systems are essentially captured within these methods, the lack of specific attention on mitigation systems means that the activities associated with their construction, operation and maintenance must, by default, be evaluated against a generic rule framework that makes this task cumbersome and complicated (Milne and Luttrell 2020). This section examines this problem further and suggests a way forward with regional plan provisions and the development of guidance that might facilitate easier implementation of edge-of-field mitigation systems.

4.1 Clarifying the problem

As illustrated in Figure 3-1, the structure of existing regional plans tends to follow a topic or issue-based approach, which in turn directs the content of objectives, the policies that give effect to the objectives, and the methods by which the policies will be implemented. In the context of this report, the relevant issue relates to the existence of adverse effects on water resources arising from diffuse pollution, as articulated in issue 33.1.1.1 of the Tasman Resource Management Plan:

*“Discharges of contaminants, including diffuse discharges from some land use activities:
(a) can cause significant adverse effects either on their own or cumulatively;
(b) degrade the suitability of some of the District’s water bodies for some of their natural and human values;
(c) cause elevated nutrient, pathogen, chemical or sediment levels in some of the District’s water bodies, particularly nitrate levels in some of the Waimea plains, Motupipi and Motueka aquifers.”*

The problem for edge-of-field diffuse pollution mitigation systems is that while they are designed to reduce the amount of non-point source contamination entering fresh water (i.e., generate overall positive effects on the natural environment):

- for efficiency and effectiveness, they often need to be implemented within or in close proximity, to the beds of rivers, lakes and wetlands, and
- their construction, operation and maintenance necessarily involve activities such as earth disturbance, vegetation clearance and damming or diversion of water (e.g., for wetland creation and operation), and
- these activities, especially if poorly managed, can have adverse effects on the environment (e.g., generation of sediment, impedance of fish passage).

Regional plan rules have been established to avoid, remedy or mitigate the potential adverse effects of any activities on rivers, lakes and wetlands, even where the overall result of diffuse pollution mitigation is likely to be positive, and any disturbance relatively minor and temporary. Identifying all of the relevant rules is an arduous task because of the varying format of regional plans and the many different sections containing rules of potential relevance. Further, while permitted activity rules exist for many of these activities, Milne and Luttrell (2020) demonstrated that they are often generic in nature and were not written with mitigation systems in mind. It can therefore be difficult to meet all of the conditions of a permitted activity rule,¹⁵ thereby triggering the need for resource consent. Often multiple resource consents will be required to construct, operate and maintain diffuse pollution mitigation systems. For example:

- land use consents to excavate material (earthworks), disturb a riverbed (culvert construction) and introduce new and/or remove existing vegetation in, on or under the bed of a lake or river,
- water permits to divert surface water (e.g., through a wetland) or dam water (e.g., to create a wetland), and
- discharge permits to discharge contaminants to land and/or water (e.g., stormwater during construction, addition of carbon as woodchips to promote nutrient stripping).

The list of activities requiring consent may extend to the (net) discharge of GHGs if the 2020 RMA amendments relating to the effects of GHGs on climate change from any activity come into force in November 2022 (refer Section 2.1.4).

With multiple activities involved in construction of a mitigation system, it is likely that at least one activity will be deemed at least a discretionary activity. This results in the suite of activities being 'bundled' together and collectively classified as discretionary. This was demonstrated in an assessment of five consented edge-of-field diffuse pollution mitigation projects by Milne and Luttrell (2020) where the overall classification for the suite of activities associated with the resource consent application was discretionary in three cases and non-complying in another (the other project related to a sediment detention bund and was classified as a controlled activity).

Regulations in the NES-F 2020 to protect natural wetlands and to a lesser extent, the beds of rivers and streams, came into force in September 2020 and look set to make the consent pathway for some diffuse pollution mitigations even more onerous. As outlined in Section 2.1.2, the NES-F regulations introduce minimum setback distances from natural wetlands for certain activities; inside the setbacks, these activities are deemed non-complying. The most limiting of these is the 100 m setback for the taking, use, damming, diversion or discharge of water. This will likely make it very difficult to consent the construction of off-line wetlands designed to 'polish' stream water prior to entry to a natural wetland.

The rationale for the 100 m setback in the NES-F is unclear and also makes no allowance for the fact that taking, use, damming or diversion of water in relation to a constructed wetland (and other activities) may occur downgradient of a natural wetland or in a neighbouring gully where there is no interaction with the hydrological functioning, habitat or biodiversity values of that natural wetland. Moreover, recently proposed amendments to the NES-F (as regulations 45A and 45B) will provide for

¹⁵ As noted in Section 1, in some cases conditions were not met on technical grounds (e.g., a permitted activity rule for disturbance of a riverbed did not authorise such disturbance for the purposes of wetland construction) or there was no relevant permitted activity rule that applied to an activity (e.g., depositing woodchips into land in a manner that may result in contaminants entering groundwater) (Milne and Luttrell 2020).

the same activities to be afforded discretionary status if they are associated with a quarry, landfill or cleanfill. As noted in NIWA's July 2022 submission on the proposed amendments to the NES-F, given the importance of diffuse pollution mitigation systems to the protection and enhancement of freshwater environments it seems reasonable that their construction, especially systems supported by a strong performance evidence base, could be afforded a similar or less onerous status.

It is unclear how non-complying activities under the RMA will be regulated in the future given that the Government has signalled its intent to exclude these (and the restricted discretionary) activities when the Natural and Built Environments Act supersedes the RMA (MfE 2021c). However, the transition from existing RMA plans to solitary regional Natural and Built Environment (NBA) plans is expected to take 7–10 years¹⁶, suggesting that effort should be made now to improve the consenting pathway for edge-of-field diffuse pollution mitigation systems under the existing RMA regional plan framework. There is also a need to determine how the Government's National Planning Framework (NPF) could support the transition of any revised consent pathway to future NBA plans, such as through provision of technical standards (e.g., infrastructure direction in the NPF may list standards for erosion and sediment control¹⁶). Further, with NBA plans likely to only allow a particular activity as "yes" (i.e., permitted), "probably" (controlled), "maybe" (discretionary) or "no" (prohibited), implementation of diffuse pollution mitigation systems is likely to be expedited where construction activities fall into the first two categories. It is desirable to ensure that any positive environmental benefits of mitigation systems are recognised to allow landowners and catchment groups to be incentivised and supported, rather than disincentivised and discouraged, to implement them (where appropriate).

4.2 Developing an easier implementation pathway

With all regional councils currently in the process of revising or creating new regional plans to implement the NPS-FM 2020, an opportunity exists now, prior to mandatory notification of plans by December 2024, to introduce specific provisions that better support implementation of the types of diffuse pollution mitigation systems addressed in this report, where appropriate. At the same time, in line with national direction to standardise plan structure, format and definitions (MfE 2019), there is an opportunity to develop some standardised provisions, including definitions to support the inclusion of diffuse pollution mitigation systems in a policy and rule framework. Some initial suggestions for discussion with council planners and practitioners are set out in Section 4.2.1. As well as a more targeted regulatory pathway, guidance is needed to facilitate implementation of mitigation systems. The need for this guidance has heightened with the introduction of mandatory FW-FPs because landowners may wish to implement edge-of-field mitigation systems, particularly where other actions (e.g., source controls such as a cap on stock numbers) may be more difficult or insufficient on their own. Guidance is discussed further in Section 4.2.2.

4.2.1 Regional Plan provisions

Several options could be explored to improve implementation pathways for diffuse pollution mitigation systems in regional plans. Establishment of permitted activity rules focussed on specific systems, such as the recently introduced rule for sediment traps in Otago Regional Council's Regional Plan Water (refer Section 3.4.1), provide the easiest pathway. However, in cases where a mitigation systems will be located in or very near to natural water bodies, it may be more appropriate that proposals are assessed through a consenting process. In addition, mitigation system design and implementation must be customised to address specific site and environmental requirements,

¹⁶ MfE resource management reform update, July 2022. [Resource Management Reform Update \(mailchi.mp\)](#), accessed 19 July 2022.

making it more difficult to establish a single set of standard conditions that could be applied to a permitted activity rule (Milne and Luttrell 2020). Nonetheless, it should be possible to provide a consenting framework for implementation of diffuse pollution mitigation systems as controlled or restricted discretionary activities.

A useful starting point would be to establish one or more policies that acknowledge the beneficial role edge-of-field diffuse mitigation systems can play and that certain activities will be necessary to construct, operate or maintain them. In some cases, it may be possible to amend an existing policy to include specific reference to diffuse pollution and/or mitigation systems. Two potential ‘new’ policies and two amended existing policies are listed in Table 4-1. The amended policies are drawn from Environment Canterbury’s Land and Water Plan and the ‘final 2022’ appeals version of GWRC’s Proposed Natural Resources Plan.

Table 4-1: Examples of potential new and amended existing regional plan policies to support implementation of diffuse pollution mitigation systems. Potential amendments to existing policies are indicated in strikeout and blue text. Italicised and underlined text indicates that the phrase would be and is defined in the plan, respectively.

New policy	Amended existing policy
<p>Enhancement of water quality</p> <p>The implementation of <i>diffuse pollution mitigation systems</i> to improve water quality in rivers, lakes and wetlands shall be encouraged and supported where appropriate.</p>	<p>Fine Sediment Contaminant Removal and Habitat Restoration</p> <p>4.92A: Enable catchment restoration activities that protect springheads, establish or enhance riparian margins, create, restore or enhance wetlands, <u>reduce contamination of surface waters from diffuse source pollutants</u>, and remove nuisance macrophytes and fine sediment from waterways.</p>
<p>Enhancement of water quality</p> <p>Promote and enable the implementation and use of <i>diffuse pollution mitigation systems</i>, where appropriate, that:</p> <ul style="list-style-type: none"> (a) reduce sediment, nutrients and other contaminants entering surface water bodies, and (b) are constructed, operated and maintained in accordance with <i>good practice guidelines</i>. 	<p>Policy P70 (Minimising effects of rural land use activities):</p> <p>The adverse effects of rural land use activities, including any associated discharge that may enter water, shall be <u>minimised</u> through the use of regulatory and non-regulatory methods that promote, as a minimum, the use of <u>good management practices</u> including:</p> <ul style="list-style-type: none"> (a) rules and methods in the Plan, and <u>(b) the implementation of diffuse pollution mitigation systems where appropriate, and</u> (b)<u>(c)</u> development and implementation of <u>farm environment plans</u>, and (e)<u>(d)</u> information gathering, monitoring, assessment and reporting, and (d)<u>(e)</u> integrated catchment management within the Wellington Regional Council and with the involvement of <u>mana whenua</u>, territorial authorities, water users, farmers, households, industry, environmental groups and technical experts.

As indicated in Table 4-1, it will be necessary to include a definition for “diffuse pollution mitigation systems” in regional plans. A possible definition is provided in Table 4-2, along with definitions in existing plans for three specific types of mitigations and two examples of an existing definition for “good management practice” that could be modified for use with the second potential new policy listed in Table 4-1. Because wetlands may be constructed for a range of purposes (leading to wide variation in design), there may be benefit in establishing a definition for constructed wetlands that are primarily designed to reduce or remove contaminants directed into them. An example definition

is included in Table 4-2 using the phrase “constructed treatment wetland”. Similarly, riparian buffers can be constructed for a range of purposes and it may be useful to define a specific term such as “vegetated riparian buffer zone”. Definitions for other types of established types of mitigation systems (e.g., sediment detainment bunds) could also be included in regional plans. See Appendix C for examples of existing regional plan definitions for other terms relevant to implementation of diffuse pollution mitigation systems (e.g., land disturbance, vegetation clearance).

After establishing one or more specific policies and definitions for key terms, the next step is to develop the rule framework for the various activities associated with construction, operation and maintenance of diffuse pollution mitigation systems. In some cases, it may be possible to amend relevant existing rules for permitted, controlled or restricted discretionary activities so that the activity purpose is inclusive of diffuse pollution mitigation systems or some of the specified restrictions on the nature and scale of the activity either do not apply to, or are modified to be more accommodating of, mitigation systems.¹⁷ This could reduce the number of activities that, as illustrated in Milne and Luttrell’s (2020) evaluation of consented mitigation systems, currently default to a discretionary classification.

An easier, more user-friendly, and stream-lined approach might be to establish a new rule framework that is specific to construction of diffuse pollution mitigation systems and incorporates as many of the ancillary activities as possible. This approach could link the rules with relevant conditions of other existing rules, as illustrated in Table 4-3. It would require the addition of an equivalent cross-reference within these existing rules back to the new rules. Stand-alone rules could be a variation on this option but the approach in Table 4-3 recognises that regional plan rules for activities such as earthworks and disturbance of riverbeds already include conditions with key controls or caveats to address the potential adverse effects associated with these activities (e.g., reduced visual water clarity, impedance of fish passage). Ultimately a hybrid approach is needed as conditions of some existing rules will likely need to be varied and/or new conditions imposed. For example:

- a case could be argued that owing to its primary function being to enhance water quality, activities associated with implementation of a diffuse pollution mitigation system should not be as tightly constrained through rule conditions as those associated with other activities, and
- consistent with the direction of both existing regional plan policies promoting best practice and the second example policy in Table 4-1, any rule for a permitted, controlled or restricted discretionary activity should include a requirement for a diffuse pollution mitigation system to be designed as well as constructed, operated and maintained in accordance with good practice guidance (Table 4-3).

Guidance needs for diffuse pollution mitigations are addressed next.

¹⁷ Paterson et al. (2019) describe this as “balancing risks with benefits and ‘greater good’” (i.e., acknowledging that while there are risks of adverse effects associated with implementation of mitigation systems these should be compared against the benefits of enhanced water quality that will result).

Table 4-2: A potential definition for a diffuse pollution mitigation system and definitions for some types of mitigation systems found in existing regional plans. Underlined text indicates a term that is defined in the plan. Note that the narrow definition of a sediment trap presented here is because it pertains to a single rule in Otago Regional Council’s Regional Plan Water (RPW) that provides for the use of traps in the bed of ephemeral or intermittently flowing river as a permitted activity. Text in blue indicates suggested modifications.

Term	Source	Definition
Diffuse pollution mitigation system	This report	A tool or device, including a riparian buffer, constructed treatment wetland, detention bund, woodchip bioreactor, filamentous algae nutrient scrubber, designed for the primary purpose of intercepting and reducing the load of one or more diffuse source contaminants (e.g., nitrogen, phosphorus, sediment or microbes) entering surface water.
Sediment trap	ORC RPW	An excavated or banded area in the bed of an ephemeral or intermittently flowing river, <u>swale or modified drainage channel</u> designed and constructed solely for the purpose of allowing sediment to drop from the water column.
Constructed wetland	NRC Proposed Regional Plan (PRP)	A wetland developed deliberately by artificial means or constructed on a site where: a wetland has not occurred naturally previously, or a wetland has been previously constructed legally. This does not include <u>induced wetland</u> , <u>reverted wetland</u> or <u>wetland</u> created for conservation purposes. Artificial water storage facilities, detention <u>dams</u> , reservoirs for firefighting, irrigation, domestic or community water supply; engineered soil conservation structures including sediment traps, and roadside drainage channels are not <u>constructed wetlands</u> or <u>natural wetlands</u> . (The above definition is accompanied by four notes providing additional information, including that a constructed wetland may contain emergent <u>indigenous vegetation</u> such as mangroves, rushes and sedges, and that "constructed wetland" is the same as "man-made wetland" in the Regional Policy Statement.)
	TRC Regional Fresh Water Plan	An artificial permanently or intermittently wet treatment area that supports an ecosystem of plants that are suited to wet conditions.
Constructed treatment wetland	This report	An artificial wetland that uses the natural functions of vegetation, soil and microorganisms to treat contaminants from point or non-point source discharges or run-off. May provide additional secondary outcomes or benefits such as wildlife habitat, flood control and amenity.
Vegetated riparian buffer zone	After McKergow et al. (2020a)	A vegetated zone established and managed as a buffer between agricultural land and a river, lake or wetland to remove contaminants that might otherwise degrade water quality in the receiving waterbody. May provide additional secondary outcomes or benefits such as wildlife or fish habitat, shade and amenity.
	NRC PRP	A set of tools or practical measures promoted by an industry sector or council <u>or government organisation</u> to help minimise the effects of activities on the environment.
Good management practice	GWRC Proposed Natural Resources Plan	Practices, procedures or tools that are effective at achieving the desired performance while contributing to the desired environmental outcomes as expressed in the relevant objectives and policies of this plan. Good management practice evolves through time and results in continuous improvement as new information, technology and awareness of particular issues are developed and disseminated. Examples of good management practice guidelines can be found on the Wellington Regional Council’s website.

Table 4-3: An example of a potential regional plan rule framework addressing two common activities associated with the construction, operation and maintenance of diffuse pollution mitigation systems.

Underlined text indicates a term that is or would be defined in the plan. Note that the restricted activity class used in the second example is intended to translate to a controlled activity class under a NBA plan (refer Section 4.1).

Rules for two example activities associated with implementing diffuse pollution mitigation systems (DPMS)

Example activity 1: Disturbance of land and/or riparian margins

Rule DPM1: Any disturbance of land and/or riparian margins for the purposes of constructing, operating and/or maintaining a diffuse pollution mitigation system, including any planting or removal of vegetation and any ancillary discharge of water and/or sediment into water or onto land is a permitted activity provided that:

- (a) the area is not classified as a natural wetland or a wetland known to contain threatened species, and
- (b) the diffuse pollution mitigation is designed, constructed, operated and maintained in accordance with good practice guidelines, and
- (c) conditions [list relevant ones – e.g., (a), (d) and €] of rule [link to relevant PA rules for earthworks] are met, and
- (d) conditions [list relevant ones] of rule [link to relevant permitted activity rules for plants and bed disturbance, etc] are met, and
- (e) conditions [list relevant ones] of rule [link to relevant rules for setback distances from natural wetlands as imposed by the NES-F] are met.

Rule DPM2: Any disturbance of land and/or riparian margins for the purposes of constructing, operating and/or maintaining a diffuse pollution mitigation system, including any planting or removal of vegetation and any ancillary discharge of water and/or sediment into water or onto land that does not meet the requirements of DPM1 is a restricted discretionary activity.

Matters of discretion:

- 1) The area and volume of earthworks
- 2) Effects on water quality
- 3) Methods to manage the discharge of sediment
- 4) ...etc.

Example activity 2: Disturbance of the bed of a river or lake

Rule DMP3: Any disturbance of the bed of a river or lake for the purposes of constructing, operating and/or maintaining a diffuse pollution mitigation system, including any planting or removal of vegetation and any ancillary discharge of water and/or sediment into water or onto land is a restricted discretionary activity provided that:

- (a) the diffuse pollution mitigation system is designed, constructed, operated and maintained in accordance with good practice guidelines, and
- (b) conditions [list relevant ones – e.g., (a), (d) and (e)] of rule [link to relevant existing rules for bed disturbance or establish new ones] are met, and
- (c) conditions [list relevant ones] of rule [link to relevant existing rules for plants and, etc] are met, and
- (d) conditions [list relevant ones] of rule [link to relevant rules for setback distances from natural wetlands as imposed by the NES-F] are met.

Matters of discretion:

- 1) The area and volume of earthworks
- 2) Effects on water quality
- 3) Methods to manage the discharge of sediment
- 4) ...etc.

Rule DPM4: Any disturbance of land and/or riparian margins for the purposes of constructing, operating and/or maintaining a diffuse pollution mitigation system, including any planting or removal of vegetation and any ancillary discharge of water and/or sediment into water or onto land that does not meet the requirements of DMP3 is discretionary activity.

4.2.2 Guidance

Milne and Luttrell (2020) suggested that researchers and experienced practitioners could provide the following information to assist policy and consent planners with establishing regulatory provisions and evaluating consent applications for implementation of edge-of-field diffuse pollution mitigations:

- an overview of common mitigation measures, evidence of the scale and extent of their environmental benefits, and any knowledge gaps around their performance, and
- standard design requirements and recommended best management practices to avoid, remedy or mitigate potential adverse effects associated with their construction, operation and maintenance.

Guidance does exist for some diffuse pollution mitigations but it tends to be limited to specific land uses (Table 4.4). The recently completed guidance on the design of constructed wetlands produced by DairyNZ and NIWA (Tanner et al. 2022) has been written specifically for practitioners, ensuring that the research on which it is underpinned can be implemented on the ground. However, the guidance is limited to surface-flow wetlands on agricultural land and does not extend to assisting practitioners with preparing or reviewing resource consent applications. It remains to be seen whether or not councils adopt the guidance as “good management practice” or a “code of practice” in regional plans or consenting. While 12 regional councils have their logos inside the guidance in support of it, there was no formal approval process involving regional council regulatory staff (Tanner, pers. comm. 2022).

Although guidance could be prepared at a regional level, in the interest of both efficiency and consistency in implementation of diffuse pollution mitigations, particularly given the pending development and roll-out of FW-FPs across NZ, some level of overarching national guidance would be helpful to councils. This guidance should:

- set out key requirements and considerations for selection and design of mitigation systems as well as ‘industry best management practices’ to optimise system performance and avoid, remedy or mitigate potential adverse effects associated with their construction, operation and maintenance, and
- be prepared not only with rural professionals, landowners and council land management staff in mind, but also so that there is readily useable information available to assist policy and consent planners with efficient preparation and implementation of regulatory (i.e., consenting) and non-regulatory processes via regional plans.

As noted in Section 4.2.1, for efficiency and consistency, standard definitions for various diffuse pollution mitigation systems and standard conditions for inclusion in regional plan rules and resource consents should be explored and coordinated nationally. This is likely best advanced in collaboration with MfE and the regional sector’s Policy Managers Special Interest Group and Consent Managers Special Interest Group.

Table 4-4: Existing NZ-based guidance for diffuse pollution mitigations. This list is not exhaustive.

Guidance	Author	Scope
Development of an in-channel coarse sediment trap best management practice	Environmental Management Associates for MAF (Hudson 2002)	Guidance for sizing and design of coarse sediment traps (mainly targeting sands and gravels) under NZ conditions. Includes modelled sediment trap performance estimates.
Reducing nitrogen in waterways: Constructing a bioreactor on a farm	Sustainable Wairarapa Incorporated (Praat 2020)	Brief practical advice on installation of wood chip bioreactors on farms to remove nitrate from drainage water. Based on limited end-of-pipe applications in Wairarapa drains.
A guide to sediment trap construction	Environment Southland (2020)	Basic 2-page guidance outlining the key design features of sediment traps. Refers to NIWA constructed wetland performance data which are not appropriate for in-channel sediment traps.
Attenuation of diffuse-source agricultural sediment and nutrients by riparian buffer zones: A review to support guideline development	NIWA (McKergow et al. 2020b)	Reviews the hillslope-scale performance of Riparian Buffer Zones (RBZ), summarising existing information and relevant quantitative field studies on the filtering of surface runoff and removal of nitrate from diffuse subsurface flow. Also presents a synthesis of existing guidelines for RBZ performance and a suggested guideline development process.
Preliminary riparian buffer guidelines: Filtering surface runoff and nitrate removal from subsurface flow	NIWA (McKergow et al. 2020a)	Addresses the appropriate size, design, construction, and maintenance of effective riparian buffer zones to reduce sediment, nitrogen and phosphorus in surface runoff and nitrate from shallow subsurface flow from hillslopes (principally on dairy farms) under pasture and during pasture renewal and cropping. Provides contaminant removal performance estimates. Specifically excludes seepage wetlands, stream bank and channel erosion and other riparian buffer functions, such as fish habitat or bird corridors. The guidelines are also not suitable for irrigated pasture (e.g., centre pivot), runoff from feedpads or farm dairy effluent application areas.
Constructed wetland practitioner guide: Design and performance estimates	DairyNZ & NIWA (Tanner et al. 2022)	Surface-flow wetlands on agricultural production land, outlining how they function, contaminant removal performance estimates, wetland design requirements, vegetation selection and planting, costings, maintenance, case studies and useful resources.

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References

- Environment Southland (2000) A guide to sediment trap construction. Environment Southland, July 2020. 2 p. Available at: [A guide to sediment trap construction.pdf \(es.govt.nz\)](#)
- Franklin, P. (2022) Fish passage assessment tool mobile application: User guide - version 2.0. *NIWA Client Report No. 2018349HN* prepared for MBIE Envirolink and the Ministry for the Environment. 46 p. + appendices.
- Franklin, P., Gee, E., Baker, S., Bowie, S. (2018) New Zealand fish passage guidelines for structures up to 4 metres. *NIWA Client Report No. 2018019HN* prepared for MBIE Envirolink. 160 p + appendices.
- Graham, E., Jones-Todd, C.M., Wadhwa, S., Storey, S. (2018) Analysis of stream responses to riparian management on the Taranaki ring plain. *NIWA Client Report No. 2018051HN* prepared for Taranaki Regional Council. 66 p.
- Howard-Williams, C., Davies-Colley, R., Rutherford, K., Wilcock, R. (2010) Diffuse pollution and freshwater degradation: New Zealand perspectives. In Eds E. van Bochove, P.A. Vanrolleghem, P.A. Chambers, G. Thériault, B. Novotná and M.R. Burkart. "Selected papers from the 14th International Conference IWA Diffuse Pollution Specialist Group", DIPCON 2010. *Issues and Solutions to Diffuse pollution*, pp. 126-140.
- Hudson, H.R. (2002) Development of an in-channel coarse sediment trap best management practice. Environmental Management Associates Report 2002-10 for Ministry of Agriculture and Forestry Project FRM 500.
- Larned, S. Snelder, T., Unwin, M.J., McBride G.B. (2016) Water quality in New Zealand rivers: Current state and trends. *New Zealand Journal of Marine and Freshwater Research*, 50:3, 389-417, DOI: 10.1080/00288330.2016.1150309.
- McKergow, L., Goeller, B., Woodward, B., Matheson, F. and Tanner, C. (2020a) Attenuation of diffuse-source agricultural sediment and nutrients by riparian buffer zones: A review to support guideline development. *NIWA Client Report No. 2020037HN* prepared for DairyNZ. 60 p + appendices.
- McKergow, L., Matheson, F., Goeller, B. and Woodward, B. (2020b) Preliminary riparian buffer guidelines: Filtering surface runoff and nitrate removal from subsurface flow. *NIWA Client Report No. 2020040HN* prepared for DairyNZ. 33 p + appendices.
- Milne, J., Luttrell, J. (2020) Regulatory barriers to uptake of farm-scale diffuse pollution mitigation measures: An assessment of Regional Plan requirements and regional council incentives. *NIWA Client Report No. 2019131HN* prepared for DairyNZ and MBIE, April 2020. 59 p.
- Ministry for the Environment (2017) National Planning Standards: Structure of regional plans and policy statements – Discussion paper D. Wellington: Ministry for the Environment, Publication No. ME 1297.
- Ministry for the Environment (2019) National Planning Standards. Wellington: Ministry for the Environment, Publication No. ME 1482, November 2019.
- Ministry for the Environment (2020) Te Mana o te Wai factsheet. Ministry for the Environment, Wellington and Ministry for Primary Industries, Publication No: INFO 968.

- Ministry for the Environment (2021a) Managing our wetlands: A discussion document on proposed changes to the wetland regulations. Wellington: Ministry for the Environment, Publication No. ME 1588, September 2021.
- Ministry for the Environment (2021b) Clarification on national direction on freshwater management: Fish passage policy and regulation. Wellington: Ministry for the Environment, Publication No. INFO 1013, July 2021.
- Ministry for the Environment (2021c) Transforming Aotearoa New Zealand's resource management system: Our future resource management system – materials for discussion. Wellington: Ministry for the Environment, Publication No. ME 1609.
- Ministry for the Environment (2022a) Essential Freshwater amendments: Report recommendations and summary of submissions: Managing our wetlands: Proposed changes to the wetland regulations. Wellington: Ministry for the Environment, Publication No. ME 1656, May 2022.
- Ministry for the Environment (2022b) Managing our wetlands: Policy rationale for exposure draft amendments 2022. Wellington: Ministry for the Environment, Publication No. INFO 1657, May 2022.
- Ministry for the Environment and Ministry for Primary Industries. (2021). Freshwater farm plan regulations: Discussion document. Wellington: Ministry for the Environment, Publication No. ME 1577, August 2021.
- Otago Regional Council (2020) Section 32 Evaluation Report: Consideration of alternatives, benefits and costs. Proposed Plan Change 8 (Discharge management) to the Regional Plan: Water for Otago and Proposed Plan Change 1 (Dust suppressants and landfills) to the Regional Plan: Waste for Otago. Otago Regional Council, 9 April 2020. 78 p.
- Our Land and Water (2021) Designing effective farm environment plans. Guidance prepared by Our Land and Water (Toitū te Whenua, Toiora te Wai) National Science Challenge, New Zealand. 8 p. https://ourlandandwater.nz/wp-content/uploads/2021/03/OLW-Guidance_Designing-Effective-Farm-Environment-Plans_March-2021_v2.pdf
- Paterson, J.H., Clarke, D.T., Levine, B. (2019) Detainment Bund^{PS120}: A Guideline for on-farm, pasture based, storm water run-off treatment. The Phosphorus Mitigation Project Inc. 200518 V13, 65 p.
- Praat, J-P. (2020) Reducing nitrogen in waterways: Constructing a bioreactor on a farm. Sustainable Wairarapa Incorporated. [Constructing-a-Bioreactor-on-a-Farm-v6.pdf \(groundtruth.co.nz\)](#)
- Tanner, C.C., Depree, C.V., Sukias, J.P.S., Wright-Stow, A. E., Burger, D.F., Goeller, B.C. (2022) Constructed wetland practitioners guide: Design and performance estimates. DairyNZ/NIWA, Hamilton, New Zealand. ISBN: 978-0-473-63490-2.
- Tanner, C.C., Sukias, J.P.S., Yates, C.R. (2010). New Zealand guidelines: Constructed wetland treatment of tile drainage. *NIWA Information Series No. 75*. 48 p.
- Taranaki Regional Council (2012) Managing diffuse source discharges to land and water in the Taranaki region: Review of the regional fresh water and soil plans for Taranaki. Taranaki Regional Council working paper (Document 1030233). 45 p. + appendices.
- Van der Wal, H. (2021) Climate change and the RMA: A sea change has begun. *LawTalk*, 945 (Autumn 2021): 18-19. New Zealand Law Society.

Appendix A Regional Plan references

All regional plans were accessed on-line between January and August 2022. References listed below were checked and current as of 31 August 2022.

Council	Regional/Unitary Plan reference
Northland RC (NRC)	Proposed Regional Plan for Northland (Updated Appeals Version, August 2022) https://www.nrc.govt.nz/media/indhlhln/proposed-regional-plan-appeals-version-august-2022.pdf
Waikato RC (WRC)	Waikato Regional Plan (WRP) (e-plan, revision dated 10 August 2022) https://eplan.waikatoregion.govt.nz/eplan/
Bay of Plenty RC (BoPRC)	Bay of Plenty Regional Natural Resources Plan (RRNP) (Amended 29 March 2021 to incorporate Plan Change 17 and NPS-FM amendments) https://atlas.boprc.govt.nz/api/v1/edms/document/A3759647/content
Hawke's Bay RC (HBRC)	Regional Resource Management Plan (28 August 2006, republished in part dated 18 December 2021) https://www.hbrc.govt.nz/assets/Document-Library/Plans/Regional-Resource-Management-Plan/View-RRMP/RRMP-Chapters-1-9.pdf
Taranaki RC (TRC)	Regional Fresh Water Plan for Taranaki (Version 1.1 dated June 2021) https://www.trc.govt.nz/assets/Documents/Plans-policies/FreshwaterPlan/v3-Public-Regional-Fresh-Water-Plan-as-amended-March-2021.PDF Also checked provisions of the Draft Freshwater and Land Management Plan for Taranaki (Draft dated April 2015 – has no legal effect) https://www.trc.govt.nz/assets/Documents/Plans-policies/SoilWaterPlanReview/DraftPlan-April2015W.pdf
Manawatū-Wanganui (Horizons) RC (HRC)	One Plan (25 November 2014, updated 22 August 2018) https://www.horizons.govt.nz/publications-feedback/one-plan
Greater Wellington RC (GWRC)	Proposed Natural Resources Plan (PNRP) (Appeals Version – final 2022) http://pnrp.gw.govt.nz/home/pnrp-final-appeals-version-2022/
Tasman DC (TDC)	Tasman Resource Management Plan (TRMP) (Operative, updated 22 July 2022) https://www.tasman.govt.nz/my-council/key-documents/tasman-resource-management-plan/volume-1-text/
West Coast RC (WCRC)	Regional Land and Water Plan (RLWP) (Operative 27 May 2014, incorporating Plan Change 1 operative 20 July 2021) https://www.wcrc.govt.nz/repository/libraries/id:2459ikxj617q9ser65rr/hierarchy/Documents/Publications/Regional%20Plans/Regional%20Land%20and%20Water%20Plan/L%26WP%20signed%20pages%20with%20minor%20consequential%20amendments%20re%20Lk%20Kini%20wetland%20boundary%20changes%20clean%20copy%2020%20July%202021.pdf
Environment Canterbury (ECan)	Canterbury Land and Water Regional Plan (LWRP) https://www.ecan.govt.nz/your-region/plans-strategies-and-bylaws/canterbury-land-and-water-regional-plan/

Council	Regional/Unitary Plan reference
Otago RC (ORC)	Regional Plan: Water for Otago (RPW) (Operative 1 January 2004 and updated to 4 June 2022 to include partially operative Plan Change 8). Glossary updated 1 September 2015 and updated 4 June 2022. https://www.orc.govt.nz/media/12421/regional-plan_water-for-otago-updated-to-4-june-2022-chapters-1-19.pdf
Environment Southland (ES)	Proposed Southland Water and Land Plan (SWLP) (Partially operative, Decisions Version April 2018 updated as version #7, 26 March 2021) https://www.es.govt.nz/repository/libraries/id:26gi9ayo517q9stt81sd/hierarchy/about-us/plans-and-strategies/regional-plans/proposed-southland-water-and-land-plan/documents/2021%2003%2026%20-%20Water%20and%20Land%20Plan%20-%20Part%20A%20-%20Appeals%20Version%20%2826%20March%202021%29.pdf

Appendix B Regional Plan provisions

B.1 Objectives

Table B-1: Selected examples of regional plan objectives of relevance to edge-of-field diffuse pollution mitigation systems. This list is not intended to be exhaustive. See Appendix A for plan references.

Region	Objective
Northland	<ul style="list-style-type: none"> ▪ F.1.2: Manage the use of land and discharges of contaminants to land and water so that: 1) existing water quality is at least maintained, and2) the sedimentation of continually or intermittently flowing rivers, lakes and coastal water is minimised, and... ▪ F.1.11: Enable and positively recognise activities that contribute to improving Northland's natural and physical resources.
Waikato	<ul style="list-style-type: none"> ▪ 3.1.2: The management of water bodies in a way which ensures: <ul style="list-style-type: none"> ...k. the management of non-point source discharges of nutrients, faecal coliforms and sediment to levels that are consistent with the identified purpose and values for which the water body is being managed <ul style="list-style-type: none"> o. concentrations of contaminants leaching from land use activities and non-point source discharges to shallow ground water and surface waters do not reach levels that present significant risks to human health or aquatic ecosystems... ▪ 4.3.2: Physical alteration to the beds or banks of waterways, the deliberate introduction of vegetation to the beds or banks of rivers or lakes, the destruction or removal of vegetation from the beds and banks of rivers and lakes, and the access of livestock to the banks and beds of rivers and lakes managed so that: <ul style="list-style-type: none"> ...b. adverse effects on aquatic habitat, downstream water uses and on the passage of trout and indigenous fish of elevated suspended solids and temperature levels in surface water bodies are not inconsistent with objectives in Chapter 3.1 d. bank stability and channel stability is maintained...
Bay of Plenty	<ul style="list-style-type: none"> ▪ LM O1 (Objective 9): Land use and land management practices are appropriate to the environmental characteristics and limitations of the site, and avoid, remedy or mitigate adverse effects on the life-supporting capacity of soil resources, the receiving environment and heritage values. ▪ LM O2 (Objective 17): Riparian margins are appropriately managed to protect and enhance their soil conservation, water quality and heritage values.
Hawke's Bay	<ul style="list-style-type: none"> ▪ OBJ TT4A: To recognise that industry good practice for land and water management can assist with achieving Objectives TT1, TT2 and TT4.
	<p><i>Draft Land and Water Plan (2015)</i></p> <ul style="list-style-type: none"> ▪ 7: Overall freshwater quality in Taranaki is maintained and enhanced through the management of discharges at source and sustainable land use practices. <p><i>Existing (operative) Regional Freshwater Plan</i></p>
Taranaki	<ul style="list-style-type: none"> ▪ 6.3.1: To maintain and enhance the quality of the surface water resources of Taranaki by avoiding, remedying or mitigating the adverse effects of contaminants discharged to water from diffuse sources. ▪ 6.3.2: To maintain and enhance the riparian margins of surface waterbodies in order to avoid, remedy, or mitigate the adverse effects of activities on water quality, and aquatic and instream habitat.
Manawatū-Whanganui	<ul style="list-style-type: none"> ▪ 4-1: By the year 2017, 50% of farms within hill country land subject to an elevated risk of accelerated erosion will have in place, or be in the process of putting in place, farm-wide sustainable land management practices to minimise accelerated erosion and to provide for the Surface Water Management Values set out in Schedule B by reducing sediment loads entering water bodies as a result of accelerated erosion.

Region	Objective
Wellington	<ul style="list-style-type: none"> ▪ Objective O21: Vegetated riparian margins are established, maintained or restored to enhance water quality, aquatic ecosystem health, mahinga kai and indigenous biodiversity of rivers, lakes, natural wetlands and the coastal marine area. ▪ Objective O36: The runoff or leaching of contaminants to water from discharges to land is minimised, including to assist with achieving the outcomes and indicators of desired environmental states for water in Tables 3.1 to 3.8. ▪ Objective O37: The amount of sediment-laden runoff entering water is minimised, including to assist with achieving the outcomes and indicators of desired environmental states for water in Tables 3.1 to 3.8.
Tasman	<ul style="list-style-type: none"> ▪ 33.1.2.1: The discharge of contaminants in such a way that avoids, remedies or mitigates adverse effects while: (a) maintaining existing water quality; and (b) enhancing water quality where existing quality is degraded for natural and human uses or values.
Canterbury	<ul style="list-style-type: none"> ▪ Objective 3.24: All activities operate at good environmental practice or better to optimise efficient resource use and protect the region's fresh water resources from quality and quantity degradation.
West Coast	<ul style="list-style-type: none"> ▪ 4.2.1: To avoid remedy or mitigate adverse effects from land disturbance so that the region's water and soil resources are sustainably managed. ▪ 12.2.1: To ensure that the adverse effects from the discharge of agricultural contaminants into or onto land, on water and soil quality, social, cultural, and amenity values, and human health are avoided, remedied, or mitigated.
Otago	<ul style="list-style-type: none"> ▪ Objective 7.A.1: To maintain water quality in Otago lakes, rivers, wetlands, and groundwater, but enhance water quality where it is degraded. ▪ Objective 7.A.3: To have individuals and communities manage their discharges to reduce adverse effects, including cumulative effects, on water quality. ▪ Objective 8.3.2: To minimise reduction in water clarity caused by bed disturbance.
Southland	<p><u>Region-wide objectives</u></p> <ul style="list-style-type: none"> ▪ Objective 18: All persons implement environmental practices that optimise efficient resource use, safeguard the life-supporting capacity of the region's land and soils, and maintain or improve the quality and quantity of the region's water resources.

B.2 Policies

Table B-2: Selected examples of regional plan policies of relevance to edge-of-field diffuse pollution mitigation systems. This list is not intended to be exhaustive. See Appendix A for plan references.

Region	Policy
Northland	<ul style="list-style-type: none"> ▪ D.4.27 (Land preparation, earthworks and vegetation clearance): When assessing an application for a resource consent for an earthworks, vegetation clearance or land preparation activity and any associated discharge of a contaminant, ensure that the activity: <ol style="list-style-type: none"> 1) will be done in accordance with established good management practices, and 2) avoids significant adverse effects, and avoids, remedies or mitigates other adverse effects on: <ol style="list-style-type: none"> a) drinking water supplies, and b) areas of high recreational use, and c) aquatic ecosystem health, indigenous biodiversity in water bodies and coastal water and receiving environments that are sensitive to sediment or phosphorus accumulation.
Waikato	<ul style="list-style-type: none"> ▪ Non-Point Source Discharges Policy 1: Reduce the adverse effects of non-point source discharges arising from land use practices and activities by: <ol style="list-style-type: none"> a. minimising the leaching and run-off of contaminants including fertilisers, faecal matter, agrichemical residues, and sediment into water bodies (surface and ground water) b. avoiding bed and bank erosion and instability c. recognising and avoiding the effects of non-point discharges on the relationship tangata whenua as Kaitiaki have with water d. avoiding, remedying or mitigating adverse effects on rivers, lakes, wetlands and their margins so as to maintain and enhance natural character. ▪ Non-Point Source Discharges Policy 2: Promote the use of streamside management that: <ol style="list-style-type: none"> a. recognises the importance of existing appropriate riparian vegetation b. promotes new planting of appropriate riparian vegetation c. reduces sediment and other contaminants entering the water body d. improves habitat for aquatic life e. Improves bank stability. ▪ River and Lake Bed Disturbances Policy 2 (Introduction of Vegetation): Ensure that the deliberate introduction or planting of plants in, on or under the bed or bank of any river or lake and the ongoing maintenance of such plantings: <ol style="list-style-type: none"> a. does not result in the introduction of aquatic plant pests as noted in Waikato Regional Council's Regional Pest Management Strategy, or b. does not result in an increase in the adverse effects of flooding on neighbouring properties, or c. does not cause or accentuate bed and bank erosion, or d. does not overgrow, invade, smother, replace, or damage desirable species already present in areas adjacent to, and downstream from, where the plants are introduced. ▪ River and Lake Bed Disturbances Policy 7 (Positive Benefits of Resource Use): Recognise the positive benefits that can arise from the use, development and protection of river and lake beds whilst ensuring that any adverse effects are controlled...
Bay of Plenty	<ul style="list-style-type: none"> ▪ IM P2 (Policy 24): To recognise and provide for people and organisations who have adopted proven good environmental management practices. ▪ LM P3 (Policy 27): To use a range of mechanisms, including education, and regulation where necessary and appropriate, to avoid, remedy or mitigate the adverse effects of land use activities on water quality, or for soil conservation purposes, in order to achieve stated environmental objectives. Areas of particular concern in the Bay of Plenty are riparian margins, steep slopes, erosion-prone soils, the recharge areas of potable groundwater supplies, and the catchments of the Rotorua lakes.

Region	Policy
Bay of Plenty	<ul style="list-style-type: none"> ▪ DW P4 (Policy 41): To encourage the change from the discharge of contaminants to water to the land-based treatment and disposal of contaminants, where this is environmentally sustainable. ▪ DW P10 (Policy 48): To encourage, as appropriate, discharge activities to comply with current best engineering practices and best practicable options to avoid or mitigate adverse effects on the environment so that the requirements of this regional plan and other Regional Council requirements are met. Best engineering practices are relevant where the scale, intensity and potential adverse effects require such engineering practices. ▪ BW P13 (Policy 110): To encourage and promote the use of appropriate indigenous plant species for plantings in the beds of rivers and lakes, including the use of eco-sourced stock where and when available.
Hawke's Bay	<ul style="list-style-type: none"> ▪ RPS POL LW4: To use non-regulatory methods, as set out in Chapter 4, in support of regulatory methods, for managing fresh water and land use and development in an integrated manner, including:... e) industry good practice – HBRC will strongly encourage industry and/or catchment-based good practices for production land uses along with audited self management programmes as a key mechanism for achieving freshwater objectives at a catchment or sub-catchment level. ▪ POL TT4: 1. To ensure that the Table 5.9.1B nitrate-nitrogen and dissolved inorganic nitrogen surface water quality limits and the Table 5.9.1D Tuketuki LUC Natural Capital Leaching Rates are not exceeded on a whole of farm property or whole of farming enterprise basis:... (c) Require industry good practices to be implemented on farm properties or farming enterprises in order to minimise nitrogen losses;... ▪ POL TT5: 1. To ensure that the Table 5.9.1B dissolved reactive phosphorus (DRP) surface water quality limits are not exceeded and to attain the Table 5.9.1B DRP targets by 1 July 2030 Hawke's Bay Regional Council will:... (f) Provide land advisory services and incentives, in collaboration with the primary industry sector and the community, prioritising efforts on tributary catchments which significantly exceed the DRP targets. In particular Hawke's Bay Regional Council will:... (ii) Encourage industry good practices to be implemented on farm properties or farming enterprises in order to reduce phosphorus losses; (iii) Encourage riparian planting...; (v) Encourage surface runoff from stock races, stock yards, bridges and culverts to be diverted away from rivers and streams and discharged to land.
Taranaki	<p><u>Draft Land and Water Plan (2015)</u></p> <ul style="list-style-type: none"> ▪ 5.2: Freshwater quality will be maintained and enhanced by: (a)... (b) requiring riparian margins of surface water bodies to be appropriately vegetated or planted... (c) having regard to the extent to which an activity enables the freshwater objectives (identified in Schedule 2) to be met overall... ▪ 9.8: Vegetation clearance, establishment and protection activities in river or lake beds will be managed so that: (a) ... (d) plant debris resulting from plant removal activities that have the potential to cause flooding effects, restrict fish passage or cause damage to existing structures and activities are removed from, and prevented from entering, the floodway of rivers; (e) re-contouring of river banks for riparian planting or stock exclusion purposes will be allowed provided the existing channel area is not reduced, and disturbance and sedimentation effects are kept to a minimum; and (f) the introduction of plants will be allowed provided the plant species are appropriate to the location, values and use of the waterbody, with preference being given to the use of indigenous local genetic stock.

Existing (operative) Regional Freshwater Plan

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| Taranaki | <ul style="list-style-type: none"> ▪ 5A.3.1: The loss of extent of natural inland wetlands is avoided, their values are protected, and their restoration is promoted, except where: (a) the loss of extent or values arises from any of the following:... (ii) restoration activities... ▪ 6.3.1: Land use practices which avoid, remedy or mitigate adverse effects on water quality will be encouraged and promoted including: (a)... (f) land management practices, including the discharge of contaminants to land, that avoid or reduce contamination of surface water; (g) land management practices that retain riparian buffer zones. ▪ 6.3.2: Existing riparian vegetation along the margins of Taranaki’s rivers, streams and lakes will be protected and enhanced, as far as is practicable, for the purpose of maintaining or enhancing water quality and the effective functioning of riparian zones. ▪ 6.3.3: The Taranaki Regional Council will promote the restoration of riparian margins where riparian vegetation will provide net water quality benefits. ▪ 6.3.4: The retirement and Planting of riparian margins will be promoted, where appropriate, on all or parts of the ring plain catchments listed in Table 3. |
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| Manawatū-Whanganui | <ul style="list-style-type: none"> ▪ 4-1: ... encourage and support the adoption of sustainable land management practices by: (a) working with relevant owners and occupiers of farms within hill country land subject to an elevated risk of accelerated erosion to prepare voluntary management plans under the Council’s Sustainable Land Use Initiative or Whanganui Catchment Strategy, which identify sustainable land management practices for each farm and work programmes for implementing any agreed changes, (b) monitoring the implementation of voluntary management plans and sustainable land management practices... ▪ 4-2: (a)... the Regional Council must regulate vegetation clearance, land disturbance... through rules...and... resource consents, so as to minimise the risk of accelerated erosion, minimise discharges of sediment to water, and maintain the benefits of riparian vegetation for water bodies. ▪ 4-3: The Regional Council must, and territorial authorities may: <ul style="list-style-type: none"> (a) support the development of codes of practice, standards, guidelines and other sector-based initiatives targeted at achieving sustainable land use, (b) recognise appropriately developed and administered codes of practice, standards, guidelines or environmental management plans targeted at achieving sustainable land use, and incorporate them within the regulatory framework where applicable, and (c) make information describing best management practices for reducing erosion and maintaining water quality and soil health available to all relevant landowners, occupiers, asset owners, consultants, developers and contractors. ▪ 5-8: (a)...(ii) Intensive farming land use activities must be regulated ...to achieve the nitrogen leaching maximums specified in (i). ▪ 13-2: For vegetation clearance, land disturbance, forestry or cultivation and ancillary discharges to and diversions of surface water that requires resource consent under Rule 13-2, Rule 13-6 or Rule 13-7, the Regional Council must make decisions on consent applications and set consent conditions on a case-by-case basis, having regard to:... (h) generally allowing activities that result in improved land stability or enhanced surface water quality, (i) any relevant codes of practice, standards, guidelines, or environmental management plans and accepting compliance with them to the extent that they can be used as conditions on resource consents... |
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Region	Policy
Wellington	<ul style="list-style-type: none"> ▪ Policy P35 (Restoration of wetlands): The restoration of natural wetlands and the construction of artificial wetlands to meet the water quality, aquatic ecosystem health and mahinga kai objectives set out in Tables 3.7 and 3.8, to provide habitat for indigenous flora and fauna, to carry out the physical and ecological functions of natural wetlands, and to provide for amenity values where this aligns with restoration appropriate to the area and wetland type shall be encouraged and supported. ▪ Policy P70 (Minimising effects of rural land use activities): The adverse effects of rural land use activities, including any associated discharge that may enter water, shall be minimised through the use of regulatory and non-regulatory methods that promote, as a minimum, the use of good management practices including: (a) rules and methods in the Plan, and (b) development and implementation of farm environment plans, and (c) information gathering, monitoring, assessment and reporting, and (d) integrated catchment management within the Wellington Regional Council and with the involvement of mana whenua, territorial authorities, water users, farmers, households, industry, environmental groups and technical experts. ▪ Policy P109 (Management of riparian margins): Maintain or restore water quality, aquatic ecosystem health, mahinga kai and natural character, and reduce the amount of contaminants entering surface water bodies, through the management of riparian margins including: (a) the exclusion or restricted access of livestock likely to affect riparian margins or water quality, (b) set-back distances from surface water bodies for some land use activities including earthworks, vegetation clearance, cultivation and break-feeding, (c) encouraging the planting of appropriate riparian vegetation, and (d) the control of pest plants and animals.
Tasman	<ul style="list-style-type: none"> ▪ 33.1.3.7: To ensure the loss of nutrients and sediment to water is minimised through: (a) working with industry and landowners to develop good industry practices that maximise nutrient use efficiency and minimise nutrient run-off and leaching; (b) requiring through conditions on consent or plan rules that activities that discharge nutrients, or take and use water for irrigation, or are land disturbances, are carried out with good industry practice. ▪ 33.1.3.11: To avoid, remedy or mitigate the adverse effects of non-point source contamination arising from land use and discharge activities by a mixture of methods, including regulation of discharge activities, particularly through advocacy of best management practices, and to review the mixture of methods used if environmental monitoring shows that water quality standards are not being maintained. ▪ 33.1.3.12: To seek to improve water quality by appropriate riparian and coastal land management.
West Coast	<ul style="list-style-type: none"> ▪ 12.3.3: To promote land management practices which minimise the effects on surface and ground water of runoff and leachate from discharges of agricultural contaminants to land, including: (a) Management of riparian margins to reduce surface water pollution from animal residues and fertilisers; and (b) Applying fertilisers and agrichemicals at rates which are appropriate to site and weather conditions. ▪ 4.3.3: To manage the disturbance of riparian margins to: (a) Maintain or enhance water quality (including clarity, turbidity, and temperature), and in-stream values, (including aquatic ecosystems); (b) Promote soil conservation;... ▪ 4.3.9: To promote land management being undertaken in accordance with industry best practice, so that leaching of faecal material and nutrients, and loss of sediment to water is avoided, remedied or mitigated. ▪ 4.3.10: To encourage the retention, maintenance, or planting of appropriate riparian vegetation.

Region **Policy**

Canterbury	<ul style="list-style-type: none"> ▪ 4.13: ...the effects of any discharge are minimised by the use of measures that: (a) first, avoid the production of the contaminant; (b) secondly, reuse, recovers or recycles the contaminant; (c) thirdly, minimise the volume or amount of the discharge; or (d) finally, wherever practical utilise land-based treatment, a wetland constructed to treat contaminants or a designed treatment system prior to discharge; and (e) in the case of surface water, results in a discharge that after reasonable mixing meets the receiving water standards in Schedule 5... ▪ 4.22: Sedimentation of water bodies as a result of land clearance, earthworks and cultivation is avoided or minimised by the adoption of control methods and technologies, such as maintaining continuous vegetation cover adjacent to water bodies, or capturing surface run-off to remove sediment and other contaminants... ▪ 4.36: Water quality outcomes are met by: <ul style="list-style-type: none"> (a) all farming activities minimising nutrient losses through the implementation of good practice; (e) encouraging industry, principal water supplier and irrigation scheme-based initiatives to improve land and water use practices for farming activities, reduce nutrient loss and nutrient discharges... ▪ 4.381: Manage the loss of phosphorus to water from land used for farming activities by:... (c) requiring actions to be implemented to minimise phosphorus and sediment loss. ▪ 4.92A: Enable catchment restoration activities that protect springheads, establish or enhance riparian margins, create restore or enhance wetlands, and remove nuisance macrophytes and fine sediment from waterways.
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Water quality – general policies

- **Policy 7.B.1:** Manage the quality of water in Otago lakes, rivers, wetlands and groundwater by: ... (d) Enhancing water quality where it does not meet Schedule 15 limits, to meet those limits by the date specified in the Schedule; and (e) Recognising the differences in the effects and management of point and non-point source discharges; and...
- **Policy 7.B.3:** Allow discharges of water or contaminants to Otago lakes, rivers, wetlands and groundwater that have minor effects or that are short-term discharges with short-term adverse effects.
- **Policy 7.B.7:** Encourage land management practices that reduce the adverse effects of water or contaminants discharged into water.
- **Policy 7.B.8:** Encourage adaptive management and innovation that reduces the level of contaminants in discharges.

Policies for discharges of water and contaminants

Otago	<ul style="list-style-type: none"> ▪ Policy 7.D.1: Encourage innovation in management practices and the sharing of information, including by:... (b) Landholders: (i) Implementing practices that reduce the level of contaminants in discharges; and... ▪ Policy 7.D.4: Provide for the restricted discretionary consenting of any discharge under section 12.C: <ul style="list-style-type: none"> (a) Where changes to land management practices or infrastructure have not been sufficient to meet permitted activity rules; or (b) As part of the development of technology or innovative practices associated with improving water quality; or (c) From a short-term activity with short-term adverse effects, and the duration will not exceed: (i) Two years for discharges from a short-term activity with short-term adverse effects;... ▪ Policy 7.D.9: Enable farming activities while reducing their adverse environmental effects by: <ul style="list-style-type: none"> (a) Promoting the implementation of good management practices (or better) to reduce sediment and contaminant loss to water bodies; and (b) Managing the risk of sediment and contaminants in runoff entering water as a result of farming activities by: (i) Implementing setbacks from rivers, lakes, drains (excluding sub-surface drains), natural wetlands or the coastal marine area, and establishing or maintaining riparian vegetation; and (ii) Limiting areas and duration of exposed soil; and... (v) Managing critical source areas.
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Region	Policy
Otago	<p>Policy 8.6.2: To promote best management practices for activities that occur within or adjacent to the bed of lakes and rivers in order to avoid, remedy or mitigate any adverse effect.</p> <p><i>Policies applying to vegetation</i></p> <ul style="list-style-type: none"> ▪ Policy 8.7.1: To promote the creation, retention and enhancement of appropriate riparian vegetation where it will: <ul style="list-style-type: none"> (a) Maintain or enhance water quality, through the interception of non-point source contamination from adjacent land; (b) Enhance the aquatic ecosystems within a water body, and the habitat for flora and fauna on the margins; (c) Maintain or enhance the natural character of lakes and rivers and their margins; (d) Maintain or enhance amenity values; (e) Avoid, remedy or mitigate the adverse effects arising from flooding or erosion; (f) Be unlikely to have a significant adverse effect on desirable species already present, or adjacent to, and downstream from, that riparian vegetation; ...(j) Enhance mahika kai values. <p><i>Groundwater</i></p> <ul style="list-style-type: none"> ▪ Policy 9.4.21: To support appropriate codes of practice and management guidelines for land use activities which may result in contaminants entering groundwater.
Southland	<ul style="list-style-type: none"> ▪ Policy 13 (Management of land use activities and discharges) <ol style="list-style-type: none"> 1. Recognise that the use and development of Southland’s land and water resources, including for primary production, enables people and communities to provide for their social, economic and cultural wellbeing. 2. Manage land use activities and discharges (point source and non-point source) to enable the achievement of Policies 15A, 15B and 15C <i>[relating to maintaining and improving water quality]</i>. ▪ Policy 34 (Restoration of existing wetlands, the creation of wetlands and riparian planting) – Recognise the importance of wetlands and indigenous biodiversity, particularly their potential to improve water quality, offset peak river flows and assist with flood control, through encouraging: <ol style="list-style-type: none"> 1. the maintenance and restoration of existing natural wetlands and the creation of new wetlands; and 2. the establishment of wetland areas and associated indigenous riparian plantings, including on-farm, in subdivisions, on industrial sites and for community sewerage schemes.

Appendix C Selected terms defined in regional plans

Regional plans define a number of terms in policies and/or rules for activities that are relevant to constructing, operating and maintaining diffuse source pollution mitigation systems. A selection of some of the relevant terms included in regional plans for three different regions are listed Table C01 below: Canterbury, Hawke’s Bay and Northland. As discussed in detail in Milne and Luttrell (2020), there is considerable variation across existing regional plans in what and how various relevant terms are defined. Text in blue font indicates a term that is defined elsewhere in the regional plan.

The table below also includes selected relevant definitions from the RMA and the National Planning Standards (MfE 2019). The latter direct councils to adopt the national definitions for a term where that term is used in a plan in the same context as that defined in the Standards. Currently, the regional plans for Canterbury, Hawke’s Bay and Northland all have a different definition for *earthworks*; only the MfE (2019) definition is included here as it is expected that the next iteration of regional plans will adopt this national definition.

See Table 4-2 for some additional regional plan definitions.

Table C-1: Definitions from three regional plans for selected terms used in policies and/or rules for activities that are relevant to implementation of edge-of-field diffuse pollution mitigation systems.

Definitions from the RMA and National Planning Standards (MfE (2019) are also shown. See Appendix A for plan references.

Term	Region	Definition in regional plan glossary
Abstraction	Canterbury	means the taking of water from a waterbody or the diverting of water outside of the bed of a river, lake or artificial watercourse.
Bed	RMA	Means: (a) In relation to any river: (i) For the purposes of esplanade reserves, esplanade strips, and subdivision, the space of land which the waters of the river cover at its annual fullest flow without overtopping its banks. (ii) In all other cases, the space of land which the waters of the river cover at its fullest flow without overtopping its banks, and (b) In relation to any lake, except a lake controlled by artificial means: (i) For the purposes of esplanade reserves, esplanade strips, and subdivision, the space of land which the waters of the lake cover at its annual highest level without exceeding its margin, and (ii) In all other cases, the space of land which the waters of the lake cover at its highest level without exceeding its margin, and (c) In relation to any lake controlled by artificial means, the space of land which the waters of the lake cover at its maximum permitted operating level, and (d) In relation to the sea, the submarine areas covered by the internal waters and the territorial sea.
Berm	Hawke’s Bay	That area of land located adjacent to the river bed that is periodically covered by flood waters that overtop the banks of the river.
Construction	Canterbury	includes all forms of building activity and infrastructure construction.
Construction-phase stormwater	Canterbury	Means water, sediment and entrained contaminants resulting from precipitation on exposed or unstabilised land and which arises from construction or demolition activities, or the development of a building site.

Term	Region	Definition in regional plan glossary
Contaminant	RMA	Includes any substance (including gases, liquids, solids, and micro-organisms) or energy (excluding noise) or heat, that either by itself or in combination with the same, similar, or other substances, energy, or heat: (a) When discharged into water, changes or is likely to change the physical, chemical, or biological condition of water, or (b) When discharged onto or into land or into air, changes or is likely to change the physical, chemical, or biological condition of the land or air onto or into which it is discharged.
Dam	Canterbury	Means a structure used or to be used for the damming of any water, or waterbody where the structure is the full width of the waterbody and includes stormwater treatment ponds, sediment retention ponds and temporary impoundments used during site dewatering. It excludes bridges, intake bunding or structures for water takes provided the structures for water takes are not the full width of a waterbody, culverts except any culverts which have a mechanism that can be used to completely block the flow of water through the culvert, and any activities involved in the enhancement, creation or restoration of wetlands.
	Hawke's Bay	Any structure across the bed of a river or lake or artificial watercourse which impounds water.
	Northland	A structure intended primarily to retain or control surface water flows to form a reservoir, including a weir, but excluding a stopbank.
Diffuse source discharge	Hawke's Bay	A discharge that does not have a particular point of origin or is not introduced into receiving waters from a specific outlet, but arises from a wide or diffuse area.
Disturbance	Hawke's Bay	Includes excavation, dredging, drilling and tunnelling.
Diversion	Canterbury	means the deflection of water from its natural course, but remaining within the bed or the banks of the water body, or artificial lake or artificial watercourse. For the purpose of this Plan and unless the diversion is the result of a lawful permanent re-alignment of the bed of a surface water body, taking water from the bed of any watercourse, even if only for a short distance before it is returned, is considered a take and discharge.
	Hawke's Bay	In relation to the diversion of water, means the process of redirecting the flow of water from its existing course to another by modification of its course.
Drain	MfE (2019)	means any artificial watercourse designed, constructed, or used for the drainage of surface or subsurface water, but excludes artificial watercourses used for the conveyance of water for electricity generation, irrigation, or water supply purposes.
Earthworks	MfE (2019)	means the alteration or disturbance of land, including by moving, removing, placing, blading, cutting, contouring, filling or excavation of earth (or any matter constituting the land including soil, clay, sand and rock); but excludes gardening, cultivation, and disturbance of land for the installation of fence posts.

Term	Region	Definition in regional plan glossary
Effect	RMA	Includes: (a) Any positive or adverse effect, and (b) Any temporary or permanent effect, and (c) Any past, present, or future effect, and (d) Any cumulative effect which arises over time or in combination with other effects regardless of the scale, intensity, duration, or frequency of the effect, and also includes (e) Any potential effect of high probability, and (f) Any potential effect of low probability which has a high potential impact.
Ephemeral river or stream	Northland	Reaches with a natural bed level above the water table at all times, with water only flowing during and shortly after rain events, and which do not meet the definition of an intermittently flowing river.
Industry Good Practice	Hawke's Bay	Refers to any farm management practice, the use of technology or changes to farming systems that provide for sound farm production methods, improved performance and reduces the environmental impact of the use of production land on the environment and that is promoted by the relevant primary production sector as industry good practice.
Intermittent river	Hawke's Bay	A river that does not flow continuously and has a bed that is predominantly unvegetated and comprises silt, sand, gravel, boulders or similar material.
Intermittently flowing river or stream	Northland	A river that is naturally dry at certain times of the year and has two or more of the following characteristics: 1) it has natural pools, and 2) it has a well-defined channel, such that the bed and banks can be distinguished, and 3) it contains surface water more than 48 hours after a rain event which results in river flow, and 4) rooted terrestrial vegetation is not established across the entire cross-sectional width of the channel, and 5) it appears as a blue line on topographical maps at 1:50,000 scale.
Land	RMA	(a) includes land covered by water and the airspace above land; and (b) in a national environmental standard dealing with a regional council function under section 30 or a regional rule, does not include the bed of a lake or river; and (c) in a national environmental standard dealing with a territorial authority function under section 31 or a district rule, includes the surface of water in a lake or river.
Land disturbance	MfE (2019)	means the alteration or disturbance of land (or any matter constituting the land including soil, clay, sand and rock) that does not permanently alter the profile, contour or height of the land.
Maintenance	Canterbury	means repairing and keeping a structure, land or vegetation in good and safe condition and includes upgrading and minor alterations as long as any upgrading or minor alteration does not materially increase the footprint, height, or external envelope of the structure.

Term	Region	Definition in regional plan glossary
	Hawke's Bay	In relation to structures, means to keep in existing order, to prevent loss or deterioration, or to restore to working order. It does not include extending, replacing, removing or demolishing a structure, or any substantive change to the form, orientation, or outline of the structure.
Organic matter	Canterbury	means all living and dead material derived from living organisms, or any compounds containing carbon as an essential component. Organic matter includes organic material from production land, industrial or trade premises, or industrial or trade processes, such as dead vegetation, organic farm waste, organic freezing works waste and organic fish processing factory waste.
Pest or pest organism	Northland	These include: 1) any unwanted living organism including microorganisms, pest agents, plants, animals and marine pests and any genetic structure that is capable of replicating itself (whether that structure comprises all or only part of an entity, and whether it comprises all or only part of the total genetic structure of an entity) that may affect plants, animals, or raw primary produce, and 2) any organism listed in the Northland Regional Pest Management Plan, and 3) any organism listed in the Unwanted Organisms Register held by the Ministry for Primary Industries, and 4) does not include any human being or living organism which affects only human beings; or any living organism declared not to be a pest for the purposes of the Biosecurity Act.
Reclamation	MfE (2019)	means the manmade formation of permanent dry land by the positioning of material into or onto any part of a waterbody, bed of a lake or river or the coastal marine area, and: (a) includes the construction of any causeway; but (b) excludes the construction of natural hazard protection structures such as seawalls, breakwaters or groynes except where the purpose of those structures is to form dry land.
Riparian management	Hawke's Bay	The activities and practices that can be applied to the riparian margin in order to improve the natural characteristics and functioning of the whole riparian zone (which includes the waterway itself as well as the riparian margins).
Riparian margin	Canterbury	means the land within the following distances of the bed of any lake, river or wetland boundary: 1. In Hill and High Country land or land shown as High Soil Erosion Risk on the Planning Maps – within 10 m; and 2. In all other land not shown as High Soil Erosion Risk on the Planning Maps or defined as Hill and High Country – within 5 m.
	Hawke's Bay	A strip of land of varying width adjacent to a waterway and which contributes or may contribute to the maintenance and enhancement of the natural function, quality and character of the waterway and its margins.
River	RMA	means a continually or intermittently flowing body of fresh water; and includes a stream and modified watercourse; but does not include any artificial watercourse (including an irrigation canal, water supply race, canal for the supply of water for electricity power generation, and farm drainage canal).
Sediment-laden water	Canterbury	means water and entrained sediment arising from earthworks, geotechnical investigations, vegetation clearance, or the introduction or removal of vegetation, but excludes construction-phase stormwater which is separately defined.

Term	Region	Definition in regional plan glossary
Stormwater	Canterbury	means runoff water and entrained contaminants arising from precipitation on the external surface of any structure or any land modified by human action, and that has been channelled, diverted, intensified or accelerated by human intervention. It excludes construction-phase stormwater, sediment-laden water and drainage water which are separately defined.
Structure	RMA	Any building, equipment, device, or other facility made by people and which is fixed to land; and includes any raft.
Surface water or surface water body	Canterbury	means water above the ground surface and within a lake, river, artificial watercourse or wetland, but does not include water in the sea, snow or rain or water vapour in the air. When a distance to a surface water body is being considered, it means the distance to the bed of a lake, river, artificial watercourse or to the boundary of a wetland (see wetland boundary definition).
	Hawke's Bay	In terms of this Plan, water which is above the surface of the ground, whether flowing or not, including rivers, lakes, artificial watercourses and wetlands.
	Northland	All water, flowing or not, above the ground. It includes water in a continually or intermittently flowing river, an artificial watercourse, an overland flow path, and a lake and or wetland; water impounded by a structure such as a dam; and water that inundates land during flood events. It does not include water in any form while in a pipe, tank or cistern.
Swale	Canterbury	means a shallow depression on the land surface, that is covered in grass or other vegetation, that is natural or man-made and that serves to collect and drain overland stormwater runoff.
Taking	Hawke's Bay	In relation to the taking of water, is the process of extracting the water for any purpose and for any period of time.
Vegetation	Canterbury	includes all plants and seeds, fruit or parts thereof, live or dead, standing, fallen, windblown, cut, broken, pulverised, sawn, or harvested, natural or disturbed.
	Hawke's Bay	Any vegetation, exotic or indigenous.
Vegetation clearance	Canterbury	means removal of vegetation by physical, mechanical, chemical or other means but Canterbury Land and Water Regional Plan Page 52 Word Definition excludes: (a) cultivation for the establishment of, or harvesting of, crops or pasture; (b) clearance for the establishment or maintenance of utilities or structures; (c) removal of a species listed in the Biosecurity NZ Register of Unwanted Organisms or the Canterbury Regional Pest Management Plan; (d) clearance for the purposes of maintaining existing fence lines, vehicle tracks, firebreaks, drains, ponds, dams or crossings; (e) domestic gardening and the maintenance of amenity planting; (f) clearance by, or on behalf of, the Canterbury Regional Council for the purposes of maintaining the flood-carrying capacity of a river; or (g) exotic vegetation clearance by the Department of Conservation or Land Information New Zealand for the purposes of pest management and maintenance of public access.

Term	Region	Definition in regional plan glossary
Vegetation clearance <i>cont.</i>	Hawke's Bay	The cutting, burning, clearing or destruction (including destruction by spraying) of trees, shrubs or plants but excluding grasses, forest thinnings, agricultural and horticultural crops and noxious weeds covered by the Regional Plant Pest Management Strategy prepared under the Biosecurity Act 1993. It excludes the normal maintenance of legally established structures, roads, tracks, railway lines and river beds.
	Northland	<p>The cutting, burning, crushing, removal or destruction of vegetation, but does not include clearing:</p> <ol style="list-style-type: none"> 1) hedges and amenity plants, or 2) vegetation along fences and around dams and ponds, or 3) vegetation around network utilities, or 4) vegetation alongside roads and tracks, or 5) vegetation that is infected by an unwanted organism as declared by the Ministry of Primary Industries Chief Technical Officer or an emergency declared by the Minister under the Biosecurity Act 1993, or 6) pasture, or 7) agricultural or horticultural crops, or 8) weeds and pest plants. <p><i>Note: The vegetation clearance definition only applies to vegetation clearance in the coastal riparian and foredune management area or within 10 metres of a natural wetland, or within 10 metres of the bed of a continually or intermittently flowing river or lake, as provided for by the rules in C.8.4 Vegetation clearance in riparian areas and foredune management area and related policies.</i></p>
Water	RMA	<p>(a) Means water in all its physical forms whether flowing or not and whether over or under the ground.</p> <p>(b) Includes fresh water, coastal water, and geothermal water.</p> <p>(c) Does not include water in any form while in any pipe, tank, or cistern.</p>
Water body	RMA	means fresh water or geothermal water in a river, lake, stream, pond, wetland, or aquifer, or any part thereof, that is not located within the coastal marine area.
Water race or water supply race	Canterbury	means a type of artificial watercourse used for the managed conveyance of water often, but not exclusively, for stockwater or irrigation purposes and excludes any drain.
Weir	Canterbury	means a dam erected across a river to raise the level of the water.
Wetland	RMA	includes permanently or intermittently wet areas, shallow water, and land water margins that support a natural ecosystem of plants and animals that are adapted to wet conditions.
Wetland boundary	Canterbury	means the point in the transition from wetland to dryland where wetland plant species occur at more than four times their ungrazed height apart. Wetland edge has a similar meaning.
Wetted bed	Canterbury	means the area of the bed of a lake or river that is at or below the water level at a particular point in time.