



AGENDA

Policy & Planning

Tuesday 26 July 2022, 10.30am

Policy and Planning Committee

26 July 2022 10:30 AM

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Purpose of Policy and Planning Committee meeting

This committee attends to all matters of resource management, biosecurity and related environment policy.

Responsibilities

Prepare and review regional policy statements, plans and strategies and convene as a Hearing Committee as and when required for the hearing of submissions.

Monitor plan and policy implementation.

Develop biosecurity policy.

Advocate, as appropriate, for the Taranaki region.

Other policy initiatives.

Endorse submissions prepared in response to the policy initiatives of organisations.

Membership of Policy and Planning Committee

Councillor C L Littlewood (Chairperson)	Councillor N W Walker (Deputy Chairperson)
Councillor M G Davey	Councillor M J McDonald
Councillor D H McIntyre	Councillor C S Williamson
Councillor E D Van Der Leden	Councillor D N MacLeod (ex officio)
Councillor M P Joyce (ex officio)	

Representative Members

Councillor C Young (STDC)	Councillor S Hitchcock (NPDC)
Councillor G Boyde (SDC)	Mr P Moeahu (Iwi Representative)
Ms B Bigham (Iwi Representative)	Ms L Tester (Iwi Representative)

Health and Safety Message

Emergency Procedure

In the event of an emergency, please exit through the emergency door in the committee room by the kitchen.

If you require assistance to exit please see a staff member.

Once you reach the bottom of the stairs make your way to the assembly point at the birdcage. Staff will guide you to an alternative route if necessary.

Earthquake

If there is an earthquake - drop, cover and hold where possible. Please remain where you are until further instruction is given.



Date 26 July 2022

Subject: **Confirmation of Minutes - 7 June 2022**

Approved by: A D McLay, Director - Resource Management
S J Ruru, Chief Executive

Document: 3085587

Recommendations

That the Policy and Planning Committee of the Taranaki Regional Council:

- a) takes as read and confirms the minutes and resolutions of the Policy and Planning Committee of the Taranaki Regional Council held in the Taranaki Regional Council Boardroom, 47 Cloten Road, Stratford on Tuesday 7 June 2022 at 10.30am
- b) notes the recommendations therein were adopted by the Taranaki Regional Council on Tuesday 28 June 2022.

Matters arising

Appendices/Attachments

Document 3072900: Minutes Policy and Planning Committee 7 June 2022



Date 7 June 2022, 10.30am
Venue: Taranaki Regional Council Boardroom, 47 Cloten Road, Stratford
Document: 3072900

Members	Councillor	C L Littlewood	Committee Chairperson
	Councillor	N W Walker	Committee Deputy Chairperson
	Councillor	M G Davey	
	Councillor	M J McDonald	
	Councillor	D H McIntyre	
	Councillor	C S Williamson	
	Councillor	E D Van Der Leden	
	Councillor	M P Joyce	<i>ex officio</i>
Representative			
Members	Councillor	S Hitchcock	New Plymouth District Council
	Councillor	C Young	South Taranaki District Council
	Councillor	G Boyde	Stratford District Council
	Ms	B Bigham	Iwi Representative <i>zoom</i>
	Ms	L Tester	Iwi Representative
	Mr	P Moeahu	Iwi Representative
	Mr	P Muir	Federated Farmers
Attending	Councillor	D L Lean	Taranaki Regional Council
	Mr	S J Ruru	Chief Executive
	Mr	A D McLay	Director - Resource Management
	Ms	A J Matthews	Director - Environment Quality <i>zoom</i>
	Mr	D R Harrison	Director - Operations
	Mr	M Nield	Director - Corporate Services
	Mr	C Spurdle	Planning Manager
	Mr	S Tamarapa	Iwi Communications Advisor
	Ms	V McKay	Science Manager
	Mr	C Wadsworth	Strategy Lead
	Ms	K Holland	Communications Adviser
	Mr	C Vicars	Team Leader, Hill Country
	Mr	S Ellis	Environment Services Manager
	Mrs	L Miller	Team Leader, Environmental Assurance
	Ms	L Honnor	Programme Lead - Biodiversity
	Mrs	J Hyland	Team Leader, Riparian
	Miss	R Sweeney	Governance Administrator
	Mrs	J Mack	Governance Administrator

Apologies Apologies were received and sustained from Councillor D N MacLeod McIntyre/Van Der Leden

Notification of and Late Items Due to the LGNZ Conference 2022 coinciding with the July Policy and Planning Committee, an alternative date will need to be set.

1. Confirmation of Minutes – 26 April 2022

Resolved

That the Policy and Planning Committee of the Taranaki Regional Council:

- a) takes as read and confirms the minutes and resolutions of the Policy and Planning Committee of the Taranaki Regional Council held in the Taranaki Regional Council Boardroom, 47 Cloten Road, Stratford on Tuesday 26 April 2022 at 10.30am
- b) notes the recommendations therein were adopted by the Taranaki Regional Council on Tuesday 17 May 2022.
McIntyre/Van Der Leden

Matters arising

There were no matters arising.

2. Climate Change projections and impacts for Taranaki

- 2.1 Ms V McKay, Science Manager, spoke to the memorandum on the findings and recommendations of a recent report on climate change projections and impacts for Taranaki, commissioned by Council and undertaken by the National Institute of Water and Atmospheric Research.
- 2.2 Councillor E Van Der Leden suggested that a media release of the findings be organised by the Council to notify the community.
- 2.3 Members of the Committee enquired how the report would impact the Council. Officers responded that the effects of greenhouse gases will be a Government requirement within consenting later in the year. Climate change is also a matter for consideration in the development of the Council's Natural Resources Plan. Further information will be passed to the Committee as it arises.
- 2.4 Mrs A J Matthews advised the Committee that work in collaboration with Taranaki Emergency Management Office and Venture Taranaki, along with the territorial authorities, was an opportunity to help us plan ahead and make the most of any opportunities.

Recommended

That the Taranaki Regional Council:

- a) receives the memorandum
- b) notes the findings and conclusions of the Climate change projections and impacts for Taranaki report, as outlined in the memorandum
- c) notes the report will be made available to the public.
Joyce/Muir

3. Essential Freshwater Implementation Review

- 3.1 Mr C Wadsworth, Strategy Lead - Resource Management, spoke to the memorandum to provide the Committee with a Freshwater implementation programme update.
- 3.2 Mr D R Harrison, Director – Operations, provided an update on the riparian field monitoring device test phase. He noted some technical issues were being addressed and it will be operational in the near future.
- 3.3 Councillor N W Walker advised that the Ministry for Primary Industries are in the process of setting up an entity called ‘integrated farm planning’ that will assist farmers to meet their freshwater and greenhouse gas requirements by 2025.
- 3.4 Mr M J Nield gave further details surrounding the Waitara Catchment fund (currently \$19.6m) which is currently held in trust. To date the only funds that have been spent are for bank fees. The establishment of the Committee is progressing well with consultation with iwi taking place.

Recommended

That the Taranaki Regional Council:

- a) receives the Memorandum on Freshwater implementation programme.
Walker/Van Der Leden

4. Key Native Ecosystems Programme Update

- 4.1 Mr D R Harrison, Director – Operations, spoke to the memorandum to present, for Members’ information, an update on the identification of sixteen new Key Native Ecosystem (KNE) sites.
- 4.2 Councillor N W Walker requested a media release be prepared to highlight the amount of land that will be preserved and that the Council finds an appropriate way to celebrate the success of the programme.
- 4.3 Mr D R Harrison, advised Mr Walker that all KNE’s were listed on the Council’s website. However, further consideration will be given to how to further acknowledge the efforts.

Recommended

That the Taranaki Regional Council:

- a) receives this memorandum and the attached inventory sheets for Patui, Barrel's Creek, Morrison's Bush (QEII 5/06/358), Pukekotahuna Headwaters Reserve, Whare Piwakawaka, NERGE Orchid Haven and Swamp Forest, Middle Bush, Cool Acres, Sunman Farms QEII Covenant, Gillett Family Bush, Patea Saltmarsh Estuary, Fangorn and Forbidden Forest, Ben's Block, Bruce's Bush & Danny's Pond, Mangamaio, Manui Farm QEII Covenants
- b) notes that the aforementioned sites have indigenous biodiversity values of regional significance and should be identified as Key Native Ecosystem sites.
Williamson/Young

5. Submission on Space Invaders: A review of how New Zealand manages weeds that threaten native ecosystems

- 5.1 Mr D R Harrison, Director – Operations, spoke to the memorandum to introduce the Council's submission. This was prepared in response to the report and recommendations made by the Parliamentary Commissioner for the Environment, on Space invaders: A review of how New Zealand manages weeds that threaten native ecosystems.
- 5.2 Mr D R Harrison further noted that uncertainty surrounding leadership and responsibilities still exists and requires clarification. Weeds located on conservation land will need to be handled by the Department of Conservation.

Recommended

That the Taranaki Regional Council:

- a) receives this memorandum entitled Submission on Space invaders: A review of how New Zealand manages weeds that threaten native ecosystems
- b) endorses the attached submission.

Muir/Hitchcock

6. Weedbusters Taranaki Guide

- 6.1 Ms L Honnor, Programme Lead - Biodiversity, spoke to the memorandum to introduce the Taranaki Regional Council's newly published *Weedbusters Taranaki* guide.
- 6.2 Councillor C L Littlewood suggested that before the mid period review of the Pest Management Plan , a workshop be held that allowed an in-depth review on why certain plants are or are not within the Pest Management Plan.
- 6.3 Councillor E D Van Der Leden requested the engagement statistics for the Weedbusters email and social media relating to this.

Recommended

That the Taranaki Regional Council:

- a) receives this memorandum entitled Weedbusters Taranaki guide
- b) notes that the *Weedbuster Taranaki* guide is available to the community online or for free as a hard copy upon request to the Council.

Davey/McDonald

7. Towards Predator-Free Taranaki Project

- 7.1 Mr S Ellis, Environment Services Manager, spoke to the memorandum to present for Members' information a quarterly update on the progress of *Taranaki Taku Tūrangā Our Place - Towards Predator-Free Taranaki project*.
- 7.2 Mr S Ellis, provided an update on scheduled 1080 drops noting that the National Park is on a rotational cycle which will be due next year. Works with Taranaki Mounga Project and conservation groups are under way.
- 7.3 An update on the programme's timeline, productivity and budget was provided. In summary the programme is in year four out of five year funding commitment from the Government. The complete eradication of possums has ended up costing more

than what was budgeted for, however other portions such as rural rollout has come in under budget, so reallocation of funds has been able to take place.

Recommended

That the Taranaki Regional Council:

- a) receives this memorandum Taranaki Taku Tūranga Our Place - Towards Predator-Free Taranaki project
- b) notes the progress and milestones achieved in respect of the urban, rural and zero density possum projects of the *Taranaki Taku Tūranga Our Place - Towards Predator-Free Taranaki project*
Davey/Van Der Leden

8. Hill Country Sustainable Land Management Programme

- 8.1 Mr C Vicars, Team Leader – Hill Country, spoke to the memorandum to provide Members an overview of Council’s hill country sustainable land management programme. This included what it had achieved to date and provide insight on the future work planned to meet the requirements of Government's Essential Freshwater reforms.
- 8.2 Mr C Vicars advised the Committee that the performance of the additional resources is being measured by two monitoring regimes. Firstly, an in house hill country monitoring app has been developed and background work feeding into this has occurred to address data accuracy. The second, is state of environment monitoring
- 8.3 Mr C Vicars responded to a statement made about the proposal to restrict exotic forestry advising it is appropriate to make sure that the right trees are planted in the right place and central Government was aware of the impacts of carbon farming impacting traditional land uses.

Recommended

That the Taranaki Regional Council:

- a) receives the memorandum on the Council’s current hill country sustainable land management programme
- b) notes the progress that the sustainable land management programme has achieved and the focus areas for future work.
Williamson/Young

Councillor S Hitchcock left at 12.05pm

9. Riparian Programme and Public Waterways and Ecosystem Restoration Fund Achievements.

- 9.1 Mrs J Hyland, Team Leader - Riparian, spoke to the memorandum to provide the Members with an overview of the Council's riparian programme and the delivery of the Ministry for the Environment’s Public Waterways and Ecosystem Restoration Fund.

- 9.2 The Committee gave thanks to those involved, including farmers, for achieving the large target.
- 9.3 Clarification surrounding suitable planting and use within the riparian buffer zone was provided.

Recommended

That the Taranaki Regional Council:

- 9.4 notes the recent completion of the Transforming Taranaki PWER funding project and its achievements, and the focus areas for future work.

Davey/Boyde

10. General Business

19 July 2022 Policy and Planning Committee Date

Due to the Local Government New Zealand regional tour coinciding with the 19 July 2022 Policy and Planning Committee, a resolution was passed unanimously to delegate authority to the Chief Executive and Chairperson to formally assign an alternative date.

McIntyre/Van Der Leden

There being no further business the Committee Chairperson, Councillor C L Littlewood, declared the meeting of the Policy and Planning Committee closed at 12.17pm. The meeting closed with a karakia.

Confirmed

Policy and Planning

Chairperson: _____

C L Littlewood
26 July 2022



Date 26 July 2022

Subject: **Freshwater Plan Implementation Update**

Approved by: A D McLay, Director - Resource Management
S J Ruru, Chief Executive

Document: 3069421

Purpose

1. The purpose of this memorandum is to provide the Committee with a Freshwater implementation project update.

Recommendations

That the Taranaki Regional Council:

- a) receives the update on Freshwater implementation programme.

Background

2. The Council has prepared an implementation programme of the Government's Freshwater programme. The purpose of this memorandum is to update Members on progress in implementing the project. The implementation programme has previously been presented to, and approved by, the Committee.

Financial considerations—LTP/Annual Plan

3. This memorandum and the associated recommendations are consistent with the Council's adopted Long-Term Plan and estimates. Any financial information included in this memorandum has been prepared in accordance with generally accepted accounting practice.

Policy considerations

4. This memorandum and the associated recommendations are consistent with the policy documents and positions adopted by this Council under various legislative frameworks including, but not restricted to, the *Local Government Act 2002*, the *Resource Management Act 1991* and the *Local Government Official Information and Meetings Act 1987*.

Iwi considerations

5. This memorandum and the associated recommendations are consistent with the Council's policy for the development of Māori capacity to contribute to decision-making processes (schedule 10 of the *Local Government Act 2002*) as outlined in the adopted long-term plan and/or annual plan. Similarly, iwi involvement in adopted work programmes has been recognised in the preparation of this memorandum.

Community considerations

6. This memorandum and the associated recommendations have considered the views of the community, interested and affected parties and those views have been recognised in the preparation of this memorandum.

Legal considerations

7. This memorandum and the associated recommendations comply with the appropriate statutory requirements imposed upon the Council.


Appendices/Attachments


Document 3087107: Freshwater Implementation Project - Report to Policy & Planning Committee (15 July 2022)



Freshwater Implementation Project Report to Policy & Planning Committee

15 July 2022

Executive Summary	
	<p>Progress has continued well, with all programme areas on or slightly ahead of planned May activities.</p>
Project Programme	
<p>Key project achievements during the last reporting period</p> <ul style="list-style-type: none"> • Specific implementation activities: <ul style="list-style-type: none"> ○ Policy and plan drafting continuing – internal workshops on structures and water takes; drafting begun on wetlands; targeting starting provisions on Te Mana o Te Wai by early June. ○ Preparations underway in readiness for commencement of Iwi Planning Officers. ○ N-Cap reporting system is closer to a go live. Communications updated with farmers, including providing systems to allow manual entry of data for those not linked to fertiliser companies. ○ Intensive winter grazing audit showed only 250 ha of IWG land in the region – much lower than many other regions. ○ Hill country plans covered 7,500 ha – a good total given the disruptions faced during the year. 	
<p>Key upcoming activities and milestones in the next reporting period</p> <ul style="list-style-type: none"> • Continue iwi engagement – including beginning collaboration with Iwi Planners and iwi management plan briefings from iwi te taiao staff. • Continue plan drafting – focusing on wetlands and Te Mana o Te Wai. • Continue phosphorus monitoring, limit setting (starting with E.Coli) and water quantity accounting work. • Prepare for FMU Stocktakes to go live using StoryMaps (GIS system). • General community engagement – including the first use by Council of the Social Pinpoint tool to support engagement. • Compliance programme work on stock holding/IWG. • Prepare for go live of nitrogen reporting system and developing plan to work with any farmers who exceed the caps. • Commence next round of hill country farm planning. 	
HSE Updates	
<p>Nothing significant to report</p>	

Workstream Status Summary		
Workstream	Tracking	Comments/Clarifications
Tangata whenua partnerships		<ul style="list-style-type: none"> Overall iwi engagement programme is underway – Ngaruahine taiao staff delivered briefings to FW focused officers about iwi management plans. Further rounds (starting with Ngati Mutunga) planned for coming months Recruitment of the two Council funded Iwi Planning Officers by Iwi confirmed; with a planned commencement late July/early August. Preparations underway (in conjunction with Policy & Planning) in readiness for their commencement.
Policy and Planning		<ul style="list-style-type: none"> On track – plan drafting continues in accordance with overall implementation targets. Policy & Planning taking the lead on structure, focus and timing of plan for iwi engagement on key elements of FW vision. Currently in development and will be reported through in future meetings (following confirmation and agreement with iwi).
Science Services		<ul style="list-style-type: none"> State of the Environment (“SoE”) report published. Commenced investigation into natural levels of phosphorus in waterways due to flows from the National Park. Some focused additional sampling (eg., faecal source tracking) will also be conducted alongside this work. Commenced work on water quantity accounting systems – targeting December completion.
Consents		<ul style="list-style-type: none"> Continued reviewing in stream structures consent conditions and working with Compliance to review farm dairy effluent consent replacement processes. Participated in national Freshwater Farm Plans working group initial meeting. Focus will be on ensuring practical application of the framework.
Compliance		<ul style="list-style-type: none"> Working with Operations to engage the 77 farmers found to be non-compliant on stock-holding/IWG. Most are due to proximity to water courses. Closing out dairy consents – 130 are currently up for renewal. Good progress overall, and (anecdotally) better than many other regions, given the covid induced disruptions across the year
Operations		<ul style="list-style-type: none"> Aerial photography showed approximately 260 ha of intensive winter grazing in the region on approximately 160 properties. Working with Compliance to identify and engage the relevant parties. Missed annual target of 10,000ha new farm plans – hitting 7,500ha instead. Given the disruptions of the year, this is still a good result.
Engagement		<ul style="list-style-type: none"> Main focus on close out and follow up work from the June SIG workshops and preparing for general community engagement (July-August) and next series of SIG meetings (September). Continued preparing communications material for staff (eg., updates on wetlands, IWG, nitrogen) and preparing for the further community and focused engagement planned for the next quarter.

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Project Risk/Opportunity Management

Description	Effect	Mitigation Strategy	Risk Rating (unmitigated)	Actions currently being taken
<p>Lack of a clear strategy and timeline for engagement on key strategic issues.</p>	<p>Engagement in this sense is the two way discussions needed to obtain external stakeholder input on key FW programme and FW Plan elements.</p> <p>Engagement requirements for FW are significantly higher than previous TRC experience (due to NPS-FW requirements). Experience from other RC's is that the process can be long and involved.</p> <p>Lack of dedicated engagement (as opposed to comms) resources to manage this process.</p>	<p>Build greater alignment around the nature and timing of the engagement that is needed.</p> <p>Develop specific strategies and plans to undertake the focused engagement.</p> <p>Consider ways to address Council's current gaps in capacity and capability to lead engagement processes.</p>	<p>High</p>	<p>Currently developing position description and beginning recruiting process for engagement officer role.</p> <p>Detailed engagement plan developed and being implemented. Plan identifies two key stakeholder groups who will receive more extensive engagement – as well as higher level consultation and information for more general groups.</p> <p>Plan will be implemented in parallel with the current workstreams to develop iwi partnering (led by CEO and Iwi Communications, with support from all FW Focus Leads).</p>

Description	Effect	Mitigation Strategy	Risk Rating (unmitigated)	Actions currently being taken
<p>Lack of clarity and guidance due to gaps in key Government advice or changes in the policy/legal framework</p>	<p>Some FW Implementation elements need to be developed in the absence of clear guidance – which may result in changes later if Government position changes. This lack of guidance also increases risks of a need for rework.</p> <p>Examples of areas where there are gaps in clear guidance include:</p> <ul style="list-style-type: none"> • Managing diffuse nitrogen loss risks (including the applicability of Overseer) • Managing climate change impacts on freshwater. 	<p>Recognise that some level of risk is unavoidable.</p> <p>Maintain strong presence on Government (especially MfE) and sector working groups.</p> <p>Maintain contacts with other regional council <i>Essential Freshwater</i> teams.</p> <p>Develop tools and processes that based on established or determined best practice.</p>	<p>High</p>	<p>Risk has impacted delivery and is a factor behind the revised project timeline.</p> <p>Officers are progressing activities to the extent that they can – with a constant attempt to balance between maintaining progress and minimising the risk of potential rework. Policy & Planning and Science Services activities are the most impacted.</p> <p>Risk is expected to remain high for the duration of the project.</p>



Date 26 July 2022

Subject: **Submission on the exposure draft of proposed changes to the National Policy Statement for Freshwater Management and the National Environmental Standards for Freshwater**

Approved by: D Harrison, Director - Operations

S J Ruru, Chief Executive

Document: 3084099

Purpose

1. The purpose of this memorandum is to seek Members' endorsement of the submission on the Exposure draft of proposed changes to the *National Policy Statement for Freshwater Management* (NPS-FM) and the *National Environmental Standards for Freshwater* (NES-F).
2. The deadline for submissions was Friday 8 July 2022.

Executive summary

3. On 31 May 2022, the Ministry for Environment (MfE) released the *Exposure draft of proposed changes to the NPS-FM and NES-F* (the exposure drafts).
4. The exposure draft contained a number of amendments to the NPS-FM and the NES-F. Many of the changes related to clarifying the policy intent and workability of wetland provisions.
5. The Government sought feedback on these proposed changes by 10 July 2022.
6. In response, Council officers made a submission that was largely supportive of the amendments. The changes are likely to improve the operation and implementation of the NPS-FM and NES-F.
7. Notwithstanding that support, the submission highlighted a number of issues relating to proposed changes to NPS-FM and NES-F provisions. The submission made a number of recommendations outlined in this memorandum.

Recommendations

That the Taranaki Regional Council:

- a) receives the memorandum *Submission on the exposure draft of proposed changes to the National Policy Statement for Freshwater Management and the National Environmental Standards for Freshwater*
- b) endorses the submission on the exposure drafts
- c) determines that this decision be recognised not significant in terms of section 76 of the *Local Government Act 2002*
- d) determines that it has complied with the decision-making provisions of the *Local Government Act 2002* to the extent necessary in relation to this decision; and in accordance with section 79 of the Act, determines that it does not require further information, further assessment of options or further analysis of costs and benefits, or advantages and disadvantages prior to making a decision on this matter.

Background

8. As Members are aware, the Government released its *Essential Freshwater* package on 5 August 2020 with it taking effect from 3 September 2020. The NPS-FM and the NES-F are key instruments within the *Essential Freshwater* package.
9. As Members are aware, a number of provisions within the NPS-FM and NES-F posed significant issues and difficulties in relation to their interpretation and application – particularly in relation to wetlands.
10. In response to these issues, MfE has made a number of proposed amendments to the NPS-FM and NES-F. The full suite of proposed changes can be found in the Exposure drafts. MfE supplemented the release of the proposed changes with the rational document *Managing our wetlands: Policy rationale for exposure draft amendments 2022* (the rational report).
11. On 31 May 2022, MfE released the exposure drafts of proposed changes to the NPS-FM and NES-F.
12. The proposed amendments address all areas of the NPS-FM and NES-F. The proposed amendments include relatively minor changes for the purposes of certainty and clarity to the National Objective Framework, river bed, and feedlot and stockholding area provisions. However, more substantive amendments are proposed to address major deficiencies in the workability of the current wetland provisions. Proposed amendments to the wetland provisions including the addition of four new consenting pathways for activities involving wetlands plus major changes to the ‘natural wetland’ definition.
13. The Government sought feedback on these proposed changes by 10 July 2022 with Council officers preparing and forwarding the attached submission.

Key submission points on proposed amendments to the NPS-FM

14. In brief, the submission was generally supportive of many of the proposed amendments to the NPS-FM. However, a number of further changes and amendments were sought. Key changes sought include:
 - **Amend the definition of biosecurity:** The submission supported the addition of a definition for biodiversity but noted that the draft definition refers to pests and unwanted organisms, both of which have a very limited statutory meaning under

the *Biosecurity Act 1993*. The submission recommended that the biosecurity definition be amended to cover other invasive species (and not just declared 'pests' and 'unwanted organisms')

- **Amend definition of natural wetland:** The submission sought further technical amendments to the definition. Namely, amendment of (d)(ii) so that reference to 'ground cover' is replaced with 'vegetation cover'
- **Amend National List of Exotic Pasture Species:** The submission recommended that *Ranunculus repens* (creeping buttercup) be included in the species list. Historically *Ranunculus repens* was sown widely in New Zealand and its legacy will remain amongst damp New Zealand pastures for decades to come. The inclusion of *Ranunculus repens* would prevent areas of wet pasture being classified as 'natural wetlands in the Taranaki region, particularly in hill country areas
- **Amend definition of specified infrastructure:** The submission noted that the definition of specified infrastructure was extended to include 'any water storage infrastructure'. The submission expressed concerns regarding the scope of activities to which the definition now extends to. As it stands, the exposure draft definition of specified infrastructure could arguably capture farm dams and ponds, which the submission viewed as an unintended and inappropriate consequence of the proposed amendment. The submission recommended further amendment to clarify that for water storage infrastructure to be considered as specified infrastructure it must be for public use
- **Amend provisions relating to riverbeds:** The submission noted that terminology within the NPS-FM was amended to refer to 'river beds'. Although the amendment provides useful clarity when determining river extent, the submission opposed its use concerning river values. Riverine values including ecosystem health, indigenous biodiversity, and hydrological functioning are generally associated with the 'river' in its entirety, not specifically the 'river bed'. The submission recommended applying the use of 'river bed' only where extent is under consideration, but retaining use of the term 'river' when considering values.

Key submission points on proposed amendments to the NES-F

15. In brief, the submission was also generally supportive of many of the proposed amendments to the NES-F. However, the submission highlighted some issues and concerns where further changes are warranted.
16. The term 'natural wetlands' includes the coastal marine area (CMA) and as such, use of the term in the NES-F has resulted in many undesirable consequences for management of the CMA. Protection of the CMA was supported. However, the submission opposed use of the NES-F to achieve this. The submission noted that regional coastal plans, the RMA, and the *New Zealand Coastal Policy Statement* have been developed to work in unison to adequately manage and protect the CMA.
17. The submission further recommended that the term 'natural inland wetland' be applied throughout the NES-F and NPS-FM (rather than natural wetland) to reflect the fact these legislative instruments are designed for the freshwater environment. The submission suggested reference to 'natural wetland' only be made where there is an express desire and firm rationale to include the CMA within a specific policy or regulation.
18. The proposed regulations 45A to 45D of the NES-F introduce new consenting pathways for quarrying, landfills and cleanfills, urban development and mining. However, the

submission questioned whether the proposed consenting pathways for landfills/clean fills and urban development undermine the concept of Te Mana o Te Wai. In general, the submission opposed aspects of the proposed consenting pathways (usually the activity description) noting that the ecological and biodiversity values of wetlands far exceed the expected benefits of landfills, clean fills and urban development. The submission highlighted some of the conflicting national direction being promulgated with national directions on the protection of wetlands being at odds with providing for urban development as required under the National Policy Statement for Urban Development yet alone restoration targets being set for urban environments under in the exposure draft of the *National Policy Statement for Indigenous Biodiversity*.

Guidance

19. Finally, the submission strongly urges Government prepare comprehensive and up-to-date guidance to assist in the interpretation and implementation of NPS-FM and NES-F provisions (once amendments are enacted).
20. The submission sought specific guidance relating to the proposed definitions of natural wetlands, wetland maintenance and biosecurity. Clarification is also sought regarding MfE's recommended level of protection for constructed wetlands (that have gradually reverted to important wetland habitat) and on what constitutes 50% of an area under (d)(ii) of the natural wetland definition.
21. Lastly, guidance was also required to better understand the policy intent of (d)(iii). The protection of threatened species habitat is a commendable objective. However guidance as to how, where and for how long protection must be provided is necessary for local authorities.

Where to from here

22. Consultation on the Exposure Draft of proposed changes to the NPS-FM and NES-F ended 10 July 2022. Feedback received will be analysed and advice will be provided to the Minister for the Environment before a final decision whether or not to adopt the proposed changes is made. MfE have not yet provided an estimate as to when a final decision regarding the proposed changes can be expected.

Financial considerations—LTP/Annual Plan

23. This memorandum and the associated recommendations are consistent with the Council's adopted Long-Term Plan and estimates. Any financial information included in this memorandum has been prepared in accordance with generally accepted accounting practice.

Policy considerations

24. This memorandum and the associated recommendations are consistent with the policy documents and positions adopted by this Council under various legislative frameworks including, but not restricted to, the *Local Government Act 2002*, the *Resource Management Act 1991* and the *Local Government Official Information and Meetings Act 1987*.

Iwi considerations

25. This memorandum and the associated recommendations are consistent with the Council's policy for the development of Māori capacity to contribute to decision-making processes (schedule 10 of the *Local Government Act 2002*) as outlined in the adopted long-term plan and/or annual plan. Similarly, iwi involvement in adopted work programmes has been recognised in the preparation of this memorandum.

Community considerations

26. This memorandum and the associated recommendations have considered the views of the community, interested and affected parties and those views have been recognised in the preparation of this memorandum.

Legal considerations

27. This memorandum and the associated recommendations comply with the appropriate statutory requirements imposed upon the Council.

Appendices/Attachments

Document 3082546: Feedback on the Exposure draft of proposed changes to the NPS-FM and NES-F (including wetland regulations).

Document 3086283: Exposure draft changes to the NPS-FM 2020

Document 3086284: Exposure draft changes to RM NES-F regulations 2020



8 July 2022
Document: 3080607

Ministry for the Environment
PO Box 10362
WELLINGTON 6134

Feedback on the Exposure draft of proposed changes to the NPS-FM and NES-F (including wetland regulations)

1. The Taranaki Regional Council (the Council) thanks the Ministry for the Environment (MfE) for the opportunity to provide feedback on the *Exposure Draft of proposed changes to the National Policy Statement for Freshwater Management* (the draft NPS-FM) and the *Exposure Draft of the proposed changes to the National Environmental Standards for Freshwater* (the draft NES-F).
2. The Council makes this submission in recognition of its:
 - functions and responsibilities under the *Resource Management Act 1991* (RMA) and under the *Local Government Act 2002*;
 - responsibilities and costs to be incurred by the Council to implement the Government's Essential Freshwater programme, including the protection of wetlands;
 - regional advocacy responsibilities whereby it represents the Taranaki regional on matters of regional significance or concern; and
 - experience having successfully protected freshwater bodies and wetlands within Taranaki.
3. The Council has also been guided by its Mission Statement 'To work for a thriving and prosperous Taranaki' across all of its various functions, roles, and responsibilities, in making this submission.
4. The Council notes that the Government's goal of maintaining and enhancing freshwater quality is consistent with the Council's own Mission Statement.

General comments

5. The Council commends MfE for undertaking a review into the workability of some aspects of the NPS-FM and NES-F. With some further refining, the Council believes proposed amendments will vastly improve the operation and implementation of the NPS-FM and NES-F.

6. Notwithstanding its general support, the Council provides specific comments on the exposure drafts where it believes further consideration and/or amendment is necessary.

National Policy Statement for Freshwater Management

Biosecurity Definition:

7. The proposed biosecurity definition provides clarity for implementation of the NPS-FM and NES-F, particularly regulations 38 and 39 of the NES-F. However, the Council notes that the definition of biosecurity is unduly restrictive and will derogate from the policy intent of providing for appropriate pest and weed control work in wetlands.
8. The Council notes that 'pest' has a (very limited) statutory meaning. The *Biosecurity Act 1993* defines pest as follows:

"pest means an organism specified as a pest in a pest management plan"
9. As MfE should be aware, only a very small proportion of the thousands of potentially invasive plants and animals that threaten wetland values are identified as 'pests' in pest management plans. Therefore 'permitted' biosecurity activities under the NES-F is limited to only a small selection of the potential threats. The Council recommends that the biosecurity definition be amended to cover other invasive species (and not just declared 'pests' and 'unwanted organisms'). This is in keeping with the policy intent of the proposed changes.

Relief sought:

- a) That the NES-F definition of 'biosecurity' is amended to read:

*"**biosecurity** means eliminating or managing ~~pests and unwanted organisms~~ invasive animals and plants"*

Natural Wetland Definition:

10. Amendments to the definition of 'natural wetland' represent a significant improvement for the implementation of both the NPS-FM and NES-F. However, the Council seek minor changes to give better effect to the policy intent.
11. The Council notes that the amended 'natural wetland' definition reads as follows:

*"**natural wetland** means a wetland (as defined in the Act) that is not:*

(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

(b) a wetland that has developed in or around a deliberately constructed water body, since the construction of the water body; or

(c) a geothermal wetland; or

(d) a wetland that:

(i) is within an area of pasture; and

(ii) has ground cover comprising more than 50% exotic pasture species (as identified in the National List of Exotic Pasture Species (see clause 1.8)); and

(iii) is not known to contain threatened species.”

12. The Council suggests that use of the term ‘ground cover’ in (d)(ii) may cause issues in certain situations where there is bare ground, water, or where there is established sub-canopy and canopy wetland vegetation cover, but the herb/ground cover is dominated by exotic pasture species. Standard best practice vegetation assessments (including wetland delineation) assess the percent cover of tree, shrub, and herb stratum. The Council suggests that we should be aligning with best practice assessments and that the term ‘ground cover’ be replaced with ‘vegetation cover’.
13. The Council further requests that guidance be developed to support the implementation and application of the NPS-FM and NES-F and to clarify what constitutes 50% of an area in (d)(ii) of the ‘natural wetland’ definition. It is the Council's preference that the delineated boundary of a wetland is assessed as the wetland system in its entirety.
14. The Council suggests that in the absence of such guidance there is a risk of variable delineations being carried out across New Zealand. For example, wetlands that run through multiple property boundaries may be assessed as a wetland per property rather than being considered in the entirety of its wetland system. With that said, a nuanced approach may be required in locations where wetland areas sprawl intermittently throughout an area. Assessing the whole wetland system would pick up the exotic pasture cover, potentially excluding the area from the natural wetland definition, whereas identifying smaller wetland fragments as separate from the rest would provide greater protection isolating it from neighbouring pastures
15. The Council supports the use of a *National List of Exotic Pasture Species* (the species list). Using a list provides certainty to resource users and simplifies the application of the natural wetland definition.
16. Notwithstanding this support, the Council notes that the species list could deem large proportions of select farmland properties as natural wetlands, having a significant impact on those landowners.
17. Although a sound concept, the Council does not yet consider the list to be complete. Council suggests that *Ranunculus repens* (creeping buttercup) should be included in the species list. *Ranunculus repens* has a wetland rating of facultative, as per the New Zealand Wetland Plant List 2021. Therefore, its inclusion would not be introducing any wetland adapted (e.g. facultative wetland or obligate wetland) species to the list. Historically *Ranunculus repens* was sown widely in New Zealand and its legacy will remain amongst damp New Zealand pastures for decades to come. The inclusion of

Ranunculus repens would prevent areas of wet pasture being classified as Natural Wetlands in the Taranaki Region, particularly in hill country areas. While, *Ranunculus repens* is considered an undesirable species, it is difficult to control and is commonly associated with *Holcus lanatus* and *Lotus pedunculatus* which are already included in the list.

Relief sought:

- b) Seek the amendment of (d)(ii) to replace the reference of 'ground cover' with 'vegetation' cover.
- c) Seek that guidance be developed to clarify what constitutes 50% of an area in (d)(ii) of the 'natural wetland' definition.
- d) Seek that the species list be extended to include *Ranunculus repens* (creeping buttercup).

Wetland maintenance definition:

18. The Council commends MfE for providing clarification for the definition of 'wetland maintenance' and generally agrees with the objective of the amendments. Notwithstanding this support, the Council is concerned about the use of 'intent' within a definition. 'Intention' is too subjective of a measure and likely to be problematic in enforcement situations.

Relief sought:

- e) Seek the definition of wetland maintenance be amended to:

wetland maintenance means activities, such as weed control, ~~intended to prevent~~ which have or are likely to have the effect of preventing the deterioration of a wetland's condition.

Specified Infrastructure

19. The Council generally supports encouraging and providing for specified infrastructure that provides a public benefit. Notwithstanding this support, the Council is concerned regarding the scope of activities to which the definition now extends to and, in particular, reference to 'any water storage'. As it stands, the exposure draft definition of specified infrastructure could arguably capture farm dams and ponds and Council does not consider this appropriate.
20. The Council recommends further amendment to (c) of the 'specified infrastructure' definition to limit the scope of its application and better reflect the NPS-FM and NES-F policy intent. It is the Council's view that the capturing of private water storage units was unintended, and minor amendment is required to clarify that position.
21. The Council further seeks guidance in the interpretation and the application of wetland provisions relating to specified infrastructure. The Council suggests the definition could create some grey areas when delineating if an environment is a wetland. There are some locations in the Taranaki context which were originally

created as lake dams but have reverted to wetland environments due to the gradual infilling of sediment. They are ecologically valuable areas that could be considered either a natural wetland or specified infrastructure (as a water storage unit). The Council requests clarification as to when an area ceases to be a water storage unit and begins to be considered a natural environment such as a wetland.

Relief sought:

- f) Seek guidance for the interpretation and application of wetland provisions relating to specified infrastructure, in particular water storage infrastructure.
- g) Seek (c) of the 'specified infrastructure' definition be amended to:

"(c) any public water storage infrastructure"

"River Beds"

22. The Council notes that terminology within the NPS-FM has been amended to refer to 'river beds'. Although MfE has not provided a rationale, the Council speculates that this amendment was made to better align terminology found in s 13 of the RMA with that in the NPS-FM. The amendment provides useful clarity when determining river extent, however, the Council opposes its use concerning river values. Riverine values including ecosystem health, indigenous biodiversity, and hydrological functioning are generally associated with the 'river' in its entirety, not specifically the 'river bed'. The Council recommends applying the use of 'river bed' only where extent is under consideration, but retain the use of the term 'river' when considering values. For example, the Council recommends that 3.24 (1) of the NPS-FM should read as follows:

"The loss of river bed extent and river values is avoided...."

Relief sought:

- h) Seek 'river bed' only be used in relation to river extent, and use of 'river' be retained when referring to values.

National Environmental Standards for Freshwater

Coastal Marine Environment

23. The Council notes that 'natural wetlands' includes the coastal marine area (CMA) and as such the use of the term 'natural wetland' in the NES-F has resulted in many undesirable consequences for the management of the CMA. Protection of the CMA is supported, however, the Council opposes the use of the NES-F to achieve this. Regional coastal plans, the RMA, and the New Zealand Coastal Policy Statement have all been extensively developed to work in unison to adequately manage and protect the CMA.

24. The Council suggests that 'natural inland wetland' be applied throughout the NES-F and NPS-FM to reflect the fact these legislative instruments are designed for the freshwater environment. The Council recommends reference to 'natural wetland' only be made where there is an express desire and firm rationale to include the CMA within a specific policy or regulation.

Relief sought:

- i) Seek that regulations 37 to 45 and regulations 46 to 55 be amended to only apply to 'natural inland wetlands'.
- j) Seek 'natural wetland' only be used where there is clear justification to include the CMA within the provision scope.

New consenting pathways

25. Te mana o te wai, the overarching principle of the NPS-FM and NES-F denotes the primacy of water, however the Council questions whether the proposed consenting pathways for landfills/clean fills, urban development and mining undermines the concept of Te mana o te wai. In general, the Council opposes the proposed consenting pathways noting that the ecological and biodiversity values of wetlands far exceed the expected benefits of landfills, clean fills and urban development.
26. The Council strongly opposes a consenting pathway for landfills and clean fills. Providing a consenting pathway for landfills and clean fills is inconsistent with the intent of Policy 1 and Policy 6 of the NPS-FM. The Council has considered the rationale for amendment 4 provided by MfE in *Managing our wetlands: Policy rationale for exposure draft amendments 2022* and finds it to be insufficient. It appears greater significance has been placed on convenient landfill and clean fill placement over the ecological values of wetlands which again is inconsistent with the policy intent of the NPS-FM in relation to protecting wetlands
27. The Council notes that gateway test in 3.22(1)(e) of the NPS-FM negated to include a functional need requirement. It has been replaced with a 'no practicable alternative location' assessment. As a result, the NPS-FM policy for the placement of landfills and clean fills in wetlands is far too permissive. It has the potential to become a common and widespread occurrence, resulting in the loss of wetland habitat at a devastating scale.
28. Noting the insufficient justification for the placement of landfill and cleanfill areas, coupled with the devastating effects which their placement will have on wetland habitat, the Council seek that regulation 45B of the NES-F be amended to a non-complying or preferably a prohibited activity.
29. The intention of Policy 1 and Policy 6 of the NPS-FM is once again undermined given the proposed discretionary consenting pathway for urban development. The national direction provided under the National Policy Statement for Urban Development must be appropriately balanced against the national direction of the NPS-FM.

30. The Council supports the provision of a consenting pathway for urban development. However, the Council seeks that the activity status of regulation 45C be amended to discretionary. Urban wetlands are particularly important for habitat corridors and the natural management of urban storm water. Furthermore, wetlands in the urban environment are rare, and under greater pressures from surrounding land use such as pollution, domestic predators and invasive weeds. They therefore require at least as much, if not more protection, than other wetlands. It is not yet apparent the rate at which they will be lost under the amended consenting pathway. However the Council holds concerns that urban development will have a devastating impact on the extent and value of urban wetland habitat. The proposed benefits of urban development must be equitably weighed against the significance of wetland ecology. The Council also highlights the restoration targets set out in the exposure draft of the National Policy Statement for Indigenous Biodiversity. It is the Council's view that the proposed restricted discretionary pathway for urban development will not achieve this.

Relief sought:

- k) Seek the placement of landfills and cleanfills in and near natural wetlands be a non-complying or prohibited activity.
- l) Seek urban development in and near natural wetlands be a discretionary activity.

NPS-FM and NES-F Guidance

31. Following the enactment of the proposed changes, the Council requests that general guidance for the implementation and interpretation of the NPS-FM and NES-F be updated. Comprehensive and up-to-date guidance is essential for local authorities who must implement and action NPS-FM and NES-F provisions. The Council notes the NPS-FM 2014 was accompanied by *A guide to the National Policy Statement for Freshwater Management 2014 (as amended 2017)*. The Council seek that this guidance be updated once the proposed amendments are finalised.
32. The Council seeks specific guidance to assist the interpretation of changes and additions to 1.4 and 3.21 of the NPS-FM. Understanding the proposed definitions of wetland maintenance and biosecurity is fundamental to the correct and consistent implementation of regulations 38 and 39 of the NES-F.
33. The proposed changes to the natural wetland definition could have a significant impact on the management and conservation of wetlands. The Council specifically seeks guidance in relation to (b) of the natural wetland definition. Clarification regarding MfE's recommended level of protection for constructed wetlands that have gradually reverted to important wetland habitat would assist local authorities in the application of NES-F and NPS-FM provisions.
34. As previously mentioned in this submission, the Council seeks specific guidance as to what constitutes 50% of an area under (d)(ii) of the natural wetland definition.
35. Guidance is also sought to better understand the policy intent of (d)(iii). The protection of threatened species habitat is a commendable objective. However guidance as to

how, where and for how long protection must be provided is necessary for local authorities.

Relief sought

- m) Seek that supplementary guidance be development for the NPS-FM and NES-F that is updated once amendments are enacted.

Conclusion

- 36. The Council again thanks MfE for the opportunity to comment on amendments to the Draft Exposure of the National Policy Statement for Freshwater Management and National Environmental Standards for Freshwater. The Council expects the proposed amendments will significantly improve operation and workability of the NPS-FM and NES-F.
- 37. The Council recommends a number of additional amendments to further improve drafting of the NPS-FM and NES-F. We expect that the amendments proposed in this submission should provide for greater coherency between Resource Management Planning instruments including National Policy statements, National Environmental Standards, Regional Policy Statements and Regional Plans.
- 38. The Council looks forward to continuing to work with MfE and the government to successfully implement the proposed changes to the NPS-FM and NES-F.

Yours faithfully
S J Ruru
Chief Executive



per: D Harrison
Director - Operations



Ministry for the
Environment
Manatū Mō Te Taiao

New Zealand Government

Exposure draft of amendments to the National Policy Statement for Freshwater Management 2020

This is one of two documents that set out the proposed drafting of 2022 amendments to the *Essential Freshwater* package. This document shows changes to the **National Policy Statement for Freshwater Management (NPS-FM)**.

Reading this document

This document sets out, in draft, proposed amendments to the National Policy Statement for Freshwater Management 2020 (NPS-FM) for consultation. These proposals fall into two categories:

- amendments to wetlands provisions
- technical amendments or clarifications to other provisions.

We are now providing an opportunity for people to make submissions on the draft proposals.

Amendments to the wetland provisions

These changes are highlighted in **blue** in this document and were developed in response to feedback on the Managing our wetlands consultation process, which occurred throughout September and October 2021.

For background and further detail refer to [Managing our Wetlands: Policy rationale for exposure draft amendments 2022](#).

Amendments to other provisions

These changes are highlighted in **yellow** in this document. Since the NPS-FM was gazetted in August 2020, officials have maintained a record of technical issues and provisions that could require clarification. These changes aim to improve clarity, reduce complexity of drafting, and in some cases correct errors, without changing policy intent.

For background and further detail refer to [Overview of technical corrections and clarifications in the NPS-FM exposure draft](#).

[Exposure Draft – For Consultation Purposes Only]

New Zealand Government

National Policy Statement for Freshwater Management 2020

August 2020

[Exposure Draft – For Consultation Purposes Only]

This National Policy Statement was approved by the Governor-General under section 52(2) of the Resource Management Act 1991 on 3 August 2020, and is published by the Minister for the Environment under section 54 of that Act.

This National Policy Statement replaces the National Policy Statement for Freshwater Management 2014 (as amended in 2017), which came into force on 7 September 2017.

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Part 1: Preliminary provisions

1.1 Title

- (1) This is the National Policy Statement for Freshwater Management 2020.

1.2 Commencement

- (1) This National Policy Statement comes into force on 3 September 2020.
- (2) See Part 4 for provisions about the timing of the implementation of this National Policy Statement.

1.3 Fundamental concept – Te Mana o te Wai

Concept

- (1) Te Mana o te Wai is a concept that refers to the fundamental importance of water and recognises that protecting the health of freshwater protects the health and well-being of the wider environment. It protects the mauri of the wai. Te Mana o te Wai is about restoring and preserving the balance between the water, the wider environment, and the community.
- (2) Te Mana o te Wai is relevant to all freshwater management and not just to the specific aspects of freshwater management referred to in this National Policy Statement.

Framework

- (3) Te Mana o te Wai encompasses 6 principles relating to the roles of tangata whenua and other New Zealanders in the management of freshwater, and these principles inform this National Policy Statement and its implementation.
- (4) The 6 principles are:
 - (a) *Mana whakahaere*: the power, authority, and obligations of tangata whenua to make decisions that maintain, protect, and sustain the health and well-being of, and their relationship with, freshwater
 - (a) *Kaitiakitanga*: the obligation of tangata whenua to preserve, restore, enhance, and sustainably use freshwater for the benefit of present and future generations
 - (b) *Manaakitanga*: the process by which tangata whenua show respect, generosity, and care for freshwater and for others
 - (c) *Governance*: the responsibility of those with authority for making decisions about freshwater to do so in a way that prioritises the health and well-being of freshwater now and into the future
 - (d) *Stewardship*: the obligations of all New Zealanders to manage freshwater in a way that ensures it sustains present and future generations
 - (e) *Care and respect*: the responsibility of all New Zealanders to care for freshwater in providing for the health of the nation.

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- (5) There is a hierarchy of obligations in Te Mana o te Wai that prioritises:
- (a) first, the health and well-being of water bodies and freshwater ecosystems
 - (b) second, the health needs of people (such as drinking water)
 - (c) third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.

1.4 Interpretation

- (1) In this National Policy Statement:

Act means the Resource Management Act 1991

attribute means a measurable characteristic (numeric, narrative, or both) that can be used to assess the extent to which a particular value is provided for

baseline state, in relation to an attribute, means the best state out of the following:

- (a) the state of the attribute on the date it is first identified by a regional council for the purposes of this National Policy Statement
- (b) the state of the attribute on the date on which a regional council set a freshwater objective for the attribute under the National Policy Statement for Freshwater Management 2014 (as amended in 2017)
- (c) the state of the attribute on 7 September 2017

commencement date means the date on which this National Policy Statement comes into force (ie, 3 September 2020)

compulsory value means the 4 values described in Appendix 1A, being: ecosystem health, human contact, mahinga kai, and threatened species

degraded, in relation to an FMU or part of an FMU, means that as a result of something other than a naturally occurring process:

- (a) a site or sites in the FMU or part of the FMU to which a target attribute state applies:
 - (i) is below a national bottom line; or
 - (ii) is not achieving or is not likely to achieve a target attribute state; or
- (b) the FMU or part of the FMU is not achieving or is not likely to achieve an environmental flow and level set for it; or
- (c) the FMU or part of the FMU is less able (when compared to 7 September 2017) to provide for any value described in Appendix 1A or any other value identified for it under the NOF

degrading, in relation to an FMU or part of an FMU, means that any site or sites to which a target attribute state applies is experiencing, or is likely to experience, a deteriorating trend (as assessed under clause 3.19)

environmental flows and levels means the flows and levels set for an FMU or part of an FMU under clause 3.16

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environmental outcome means, in relation to a value that applies to an FMU or part of an FMU, a desired outcome that a regional council identifies and then includes as an objective in its regional plan^(s) (see clause 3.9)

Freshwater management unit, or FMU, means all or any part of a water body or water bodies, and their related catchments, that a regional council determines under clause 3.8 is an appropriate unit for freshwater management and accounting purposes; and **part of an FMU** means any part of an FMU including, but not limited to, a specific site, river reach, water body, or part of a water body

kaitiakitanga has the meaning given in the Act but includes the principle referred to in clause 1.3(4)(b)

limit means either a limit on resource use or a take limit **and includes environmental flows and levels**

limit on resource use means the maximum amount of **a**-resource use that is permissible while still achieving a relevant target attribute state (see clauses 3.12 and 3.14)

long-term vision means a long-term vision developed under clause 3.3 and included as an objective in a regional policy statement

Māori freshwater values means the compulsory value of mahinga kai and any other value (whether or not identified in Appendix 1A or 1B) identified for a particular FMU or part of an FMU through collaboration between tangata whenua and the relevant regional council

national bottom line means an attribute state identified as such in Appendix 2A or 2B

naturally occurring process means a process that occurs, or would occur, in the absence of human activity

natural inland wetland has the meaning in clause 3.21

National Objectives Framework, or NOF, means the framework for managing freshwater as described in subpart 2 of Part 3

outstanding water body means a water body, or part of a water body, identified in a regional policy statement, a regional plan, or a water conservation order as having one or more outstanding values

over-allocation, in relation to both the quantity and quality of freshwater, **is means** the situation where:

- (a) resource use exceeds a limit; or
- (b) if limits have not been set, an FMU or part of an FMU is degraded or degrading

primary contact site means a site identified by a regional council that it considers is regularly used, or would be regularly used but for existing freshwater quality, for recreational activities such as swimming, paddling, boating, or watersports, and particularly for activities where there is a high likelihood of water or water vapour being ingested or inhaled

publish, in relation to an obligation on a local authority to publish material, means to make the material freely available to the public on the local authority's internet website or another web-based platform

receiving environment includes, but is not limited to, any water body (such as a river, lake, wetland or aquifer) and the coastal marine area (including estuaries)

take limit means a limit on the amount of water that can be taken from an FMU or part of an FMU, as set under clause 3.17

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Te Mana o te Wai has the meaning set out in clause 1.3

threatened species means any indigenous species of flora or fauna that:

- (a) relies on water bodies for at least part of its life cycle; and
 - (b) meets the criteria for nationally critical, nationally endangered, or nationally vulnerable species in the *New Zealand Threat Classification System Manual* (see clause 1.8).
- (2) Terms defined in the Act and used in this National Policy Statement have the meanings in the Act, except as otherwise specified.

(3) Terms defined in the National Planning Standards issued under section 58E of the Act and used in this National Policy Statement have the meanings in those Standards, unless otherwise specified.

(4) A reference in this National Policy Statement to a zone is:

- (a) a reference to a zone as described in Standard 8 (Zone Framework Standard) of the National Planning Standards; or
- (b) for local authorities that have not yet implemented the Zone Framework Standard of the National Planning Standards, a reference to the nearest equivalent zone.

1.5 Application

- (1) This National Policy Statement applies to all freshwater (including groundwater) and, to the extent they are affected by freshwater, to receiving environments (which may include estuaries and the wider coastal marine area).

1.6 Best information

- (1) A requirement in In implementing this National Policy Statement to local authorities must use the best information available at the time is a requirement to use, which means, if practicable, using complete and scientifically robust data.
- (2) In the absence of complete and scientifically robust data, the best information may include information obtained from modelling, as well as partial data, local knowledge, and information obtained from other sources, but in this case local authorities must:
- (a) prefer sources of information that provide the greatest level of certainty; and
 - (b) take all practicable steps to reduce uncertainty (such as through improvements to monitoring or the validation of models used).
- (3) A person who is required to use the best information available at the time local authority:
- (a) must not delay making decisions solely because of uncertainty about the quality or quantity of the information available; and
 - (b) if the information is uncertain, must interpret it in the way that will best give effect to this National Policy Statement.

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1.7 Application of section 55(2A) of Act

- (1) The changes to regional policy statements and regional plans required by the following provisions of this National Policy Statement are amendments referred to in section 55(2) of the Act (which, because of section 55(2A) of the Act, means that the changes must be made without using a process in Schedule 1 of the Act):
 - (a) clause 3.22(1) (Natural inland wetlands)
 - (b) clause 3.24(1) (Rivers **beds**)
 - (c) clause 3.26(1) (Fish passage).
- (2) See clause 4.3(3) about changes that merely update wording or terminology.

1.8 Incorporation by reference

- (1) Clause 2(1) of Schedule 1AA of the Act does not apply to any material incorporated by reference in this National Policy Statement.
- (2) All material incorporated by reference in this National Policy Statement is available at: www.mfe.govt.nz/fresh-water/npsfm/documents-incorporated-by-reference.

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Part 2: Objective and policies

2.1 Objective

- (1) The objective of this National Policy Statement is to ensure that natural and physical resources are managed in a way that prioritises:
 - (a) first, the health and well-being of water bodies and freshwater ecosystems
 - (b) second, the health needs of people (such as drinking water)
 - (c) third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.

2.2 Policies

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-catchment basis, including the effects on receiving environments.

Policy 4: Freshwater is managed as part of New Zealand's integrated response to climate change.

Policy 5: Freshwater is managed (including 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 river bed extent and values is avoided to the extent practicable.

Policy 8: The significant values of outstanding water bodies are protected.

Policy 9: The habitats of indigenous freshwater species are protected.

Policy 10: The habitat of trout and salmon is protected, insofar as this is consistent with Policy 9.

Policy 11: Freshwater is allocated and used efficiently, all existing over-allocation is phased out, and future over-allocation is avoided.

Policy 12: The national target (as set out in Appendix 3) for water quality improvement is achieved.

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.

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Policy 14: Information (including monitoring data) about the state of water bodies and freshwater ecosystems, and the challenges to their health and well-being, is regularly reported on and published.

Policy 15: Communities are enabled to provide for their social, economic, and cultural well-being in a way that is consistent with this National Policy Statement.

Part 3: Implementation

3.1 Overview of Part

- (1) This Part sets out a non-exhaustive list of things that local authorities must do to give effect to the objective and policies in Part 2 of this National Policy Statement, but nothing in **this Part 3** limits the general obligation under the Act to give effect to the objective and policies in Part 2 of this National Policy Statement.
- (2) Nothing in this Part:
 - (a) prevents a local authority adopting more stringent measures than required by this National Policy Statement; or
 - (b) limits a local authority's functions and duties under the Act in relation to freshwater.
- (3) In this Part:
 - (a) subpart 1 sets out how local authorities must implement this National Policy Statement, particularly in relation to giving effect to Te Mana o te Wai
 - (b) subpart 2 sets out the National Objectives Framework for managing freshwater
 - (c) subpart 3 sets out additional **specific** requirements on regional councils relating to freshwater management.

Subpart 1 Approaches to implementing the National Policy Statement

3.2 Te Mana o te Wai

- (1) Every regional council must engage with communities and tangata whenua to determine how Te Mana o te Wai applies to water bodies and freshwater ecosystems in the region.
- (2) Every regional council must give effect to Te Mana o te Wai, and in doing so must:
 - (a) actively involve tangata whenua in freshwater management (including decision-making processes), as required by clause 3.4; and
 - (b) engage with communities and tangata whenua to identify long-term visions, environmental outcomes, and other elements of the NOF; and
 - (c) apply the hierarchy of obligations, as set out in clause 1.3(5):
 - (i) when developing long-term visions under clause 3.3; and
 - (ii) when implementing the NOF under subpart 2; and
 - (iii) when developing objectives, policies, methods, and criteria for any purpose under subpart 3 relating to natural inland wetlands, rivers, fish passage, primary contact sites, and water allocation; and
 - (d) enable the application of a diversity of systems of values and knowledge, such as mātauranga Māori, to the management of freshwater; and

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- (e) adopt an integrated approach, *ki uta ki tai*, to the management of freshwater (*see* clause 3.5).
- (3) Every regional council must include an objective in its regional policy statement that describes how the management of freshwater in the region will give effect to *Te Mana o te Wai*.
- (4) In addition to subclauses (1) to (3), *Te Mana o te Wai* must inform the interpretation of:
 - (a) this National Policy Statement; and
 - (b) the provisions required by this National Policy Statement to be included in regional policy statements and regional and district plans.

3.3 Long-term visions for freshwater

- (1) Every regional council must develop long-term visions for freshwater in its region and include those long-term visions as objectives in its regional policy statement.
- (2) Long-term visions:
 - (a) may be set at FMU, part of an FMU, or catchment level; and
 - (b) must set goals that are ambitious but reasonable (that is, difficult to achieve but not impossible); and
 - (c) identify a timeframe to achieve those goals that is both ambitious and reasonable (for example, 30 years after the commencement date).
- (3) Every long-term vision must:
 - (a) be developed through engagement with communities and *tangata whenua* about their long-term wishes for the water bodies and freshwater ecosystems in the region; and
 - (b) be informed by an understanding of the history of, and environmental pressures on, the FMU, part of the FMU, or catchment; and
 - (c) express what communities and *tangata whenua* want the FMU, part of the FMU, or catchment to be like in the future.
- (4) Every regional council must assess whether each FMU, part of an FMU, or catchment (as relevant) can provide for its long-term vision, or whether improvement to the health and well-being of water bodies and freshwater ecosystems is required to achieve the vision.

3.4 Tangata whenua involvement

- (1) Every local authority must actively involve *tangata whenua* (to the extent they wish to be involved) in freshwater management (including decision-making processes), including in all the following:
 - (a) identifying the local approach to giving effect to *Te Mana o te Wai*
 - (b) making or changing regional policy statements and regional and district plans so far as they relate to freshwater management
 - (c) implementing the NOF (*see* subclause (2))

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- (d) developing and implementing mātauranga Māori and other monitoring.
- (2) In particular, and without limiting subclause (1), for the purpose of implementing the NOF, every regional council must work collaboratively with, and enable, tangata whenua to:
- (a) identify any Māori freshwater values (in addition to mahinga kai) that apply to any FMU or part of an FMU in the region; and
 - (b) be actively involved (to the extent they wish to be involved) in decision-making processes relating to Māori freshwater values at each subsequent step of the NOF process.
- (3) Every regional council must work with tangata whenua to investigate the use of mechanisms available under the Act, to involve tangata whenua in freshwater management, such as:
- (a) transfers or delegations of power under section 33 of the Act
 - (b) joint management agreements under section 36B of the Act
 - (c) mana whakahono a rohe (iwi participation arrangements) under subpart 2 of Part 5 of the Act.
- (4) To avoid doubt, nothing in this National Policy Statement permits or requires a local authority to act in a manner that is, or make decisions that are, inconsistent with any relevant iwi participation legislation or any directions or visions under that legislation.

3.5 Integrated management

- (1) Adopting an integrated approach, ki uta ki tai, as required by Te Mana o te Wai, requires that local authorities must:
- (a) recognise the interconnectedness of the whole environment, from the mountains and lakes, down the rivers to hāpua (lagoons), wahapū (estuaries) and to the sea; and
 - (b) recognise interactions between freshwater, land, water bodies, ecosystems, and receiving environments; and
 - (c) manage freshwater, and land use and development, in catchments in an integrated and sustainable way to avoid, remedy, or mitigate adverse effects, including cumulative effects, on the health and well-being of water bodies, freshwater ecosystems, and receiving environments; and
 - (d) encourage the co-ordination and sequencing of regional or urban growth.
- (2) Every regional council must make or change its regional policy statement to the extent needed to provide for the integrated management of the effects of:
- (a) the use and development of land on freshwater; and
 - (b) the use and development of land and freshwater on receiving environments.
- (3) In order to give effect to this National Policy Statement, local authorities that share jurisdiction over a catchment must co-operate in the integrated management of the effects of land use and development on freshwater.

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- (4) Every territorial authority must include objectives, policies, and methods in its district plan to promote positive effects, and avoid, remedy, or mitigate adverse effects (including cumulative effects), of urban development on the health and well-being of water bodies, freshwater ecosystems, and receiving environments.

3.6 Transparent decision-making

- (1) This clause applies to all decisions by regional councils relating to made under this National Policy Statement, and applies in addition to any other requirement under the Act relating to processes for making or changing regional policy statements or plans.
- ~~(a) clause 3.4(3) (about mechanisms to involve tangata whenua in freshwater management); and~~
- ~~(b) clause 3.15 (about preparing action plans).~~
- (2) Every regional council must:
- ~~(a) make decisions,~~ record the matters considered and the decision reached; and
- ~~(b) specify~~ the reasons for the decisions reached; and
- ~~(c) publish~~ this the matters considered, the decision reached, and the reasons for the decision, as soon as practicable after a the decision is reached, unless publication would be contrary to any other legal obligation.
- (3) In this clause, **decision** includes a decision not to decide on, or to postpone deciding, any substantive issue and, in relation to decisions about mechanisms to involve tangata whenua in freshwater management, includes a decision to use or not use a mechanism.

Subpart 2 National Objectives Framework

3.7 NOF process

- (1) At each step of the NOF process, every regional council must:
- (a) engage with communities and tangata whenua; and
- (b) apply the hierarchy of obligations set out in clause 1.3(5), as required by clause 3.2(2)(c).
- (2) By way of summary, the NOF process requires regional councils to undertake the following steps:
- (a) identify FMUs in the region (clause 3.8)
- (b) identify values for each FMU (clause 3.9)
- (c) set environmental outcomes for each value and include them as objectives in regional plans (clause 3.9)
- (d) identify attributes for each value and set baseline states for those attributes (clause 3.10)
- (e) set target attribute states, environmental flows and levels, and other criteria to support the achievement of environmental outcomes (clauses 3.11, 3.13, 3.16)

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- (f) set limits as rules and prepare action plans (as appropriate) to achieve environmental outcomes (clauses 3.12, 3.15, 3.17).
- (3) The NOF also requires that regional councils:
- (a) monitor water bodies and freshwater ecosystems (clauses 3.18 and 3.19); and
 - (b) take action if degradation is detected (clause 3.20).

3.8 Identifying FMUs and special sites and features

- (1) Every regional council must identify FMUs for its region.
- (2) Every water body in the region must be located within at least one FMU.
- (3) Every regional council must also identify the following (if present) within each FMU:
 - (a) sites to be used for monitoring
 - (b) primary contact sites
 - (c) the location of habitats of threatened species
 - (d) outstanding water bodies
 - (e) natural inland wetlands.
- (4) Monitoring sites for an FMU must be located at sites that are either or both of the following:
 - (a) representative of the FMU or relevant part of the FMU
 - (b) representative of one or more primary contact sites in the FMU.
- (5) Monitoring sites relating to Māori freshwater values:
 - (a) need not comply with subclause (4), but may instead reflect one or more Māori freshwater values; and
 - (b) must be determined in collaboration with tangata whenua.

3.9 Identifying values and setting environmental outcomes as objectives

- (1) The compulsory values listed in Appendix 1A apply to every FMU, and the requirements in this subpart relating to values apply to each of the 5 biophysical components of the value Ecosystem health.
- (2) A regional council may identify other values applying to an FMU or part of an FMU, and must in every case consider whether the values listed in Appendix 1B apply.
- (3) The regional council must identify an environmental outcome for every value that applies to an FMU or part of an FMU.
- (4) The regional council must include the environmental outcomes as an objective, or multiple objectives, in its regional plan⁽⁵⁾.
- (5) The environmental outcomes must:

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- (a) describe the environmental outcome sought for the value in a way that enables an assessment of the effectiveness of the regional policy statement and plans (including limits and methods) and action plans in achieving the environmental outcome; and
- (b) when achieved, fulfil the relevant long-term visions developed under clause 3.3 and the objective of this National Policy Statement.

3.10 Identifying attributes and their baseline states, or other criteria for assessing achievement of environmental outcomes

- (1) For each value that applies to an FMU or part of an FMU, the regional council:
 - (a) must use all the relevant attributes identified in Appendix 2A and 2B for the compulsory values listed (except where specifically provided otherwise); and
 - (b) may identify other attributes for any compulsory value; and
 - (c) must identify, where practicable, attributes for all other applicable values; and
 - (d) if attributes cannot be identified for a value, or if attributes are insufficient to assess a value, must identify alternative criteria to assess whether the environmental outcome of the value is being achieved.
- (2) Any attribute identified by a regional council under subclause (1)(b) or (c) must be specific and, where practicable, be able to be assessed in numeric terms.
- (3) Every regional council must identify the baseline state of each attribute, **using the best information available at the time.**
- (4) Attribute states and baseline states may be expressed in a way that accounts for natural variability and sampling error.

3.11 Setting target attribute states

- (1) In order to achieve the environmental outcomes included as objectives under clause 3.9, every regional council must:
 - (a) set a target attribute state for every attribute identified for a value; and
 - (b) identify the site or sites to which the target attribute state applies.
- (2) The target attribute state for every value with attributes (except the value human contact) must be set at or above the baseline state of that attribute.
- (3) The target attribute state for the value human contact must be set above the baseline state of that attribute, unless the baseline state is already within the A band of Tables 9 or 10 in Appendix 2A, as applicable.
- (4) **Despite subclauses (2) and (3), if** the baseline state of an attribute is below any national bottom line for that attribute, the target attribute state must be set at or above the national bottom line (see clauses 3.31, 3.32, and 3.33 for exceptions to this).
- (5) Every target attribute state must:

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- (a) specify a timeframe for achieving the target attribute state or, if the target attribute state has already been achieved, state that it will be maintained as from a specified date; and
 - (b) for attributes identified in Appendix 2A or 2B, be set in the terms specified in ~~that~~ **the relevant** Appendix; and
 - (c) for any other attribute, be set in any way appropriate to the attribute.
- (6) Timeframes for achieving target attribute states may be of any length or period but, if timeframes are long term:
- (a) they must include interim target attribute states (set for intervals of not more than 10 years) to be used to assess progress towards achieving the target attribute state in the long term; and
 - (b) if interim target attribute states are set, references in this National Policy Statement to achieving a target attribute state can be taken as referring to achieving the next interim target attribute state.
- (7) Every regional council must ensure that target attribute states are set in such a way that they will achieve the environmental outcomes for the relevant values, and the relevant long-term vision.
- (8) When setting target attribute states, every regional council must:
- (a) have regard to the following:
 - (i) the environmental outcomes and target attribute states of any receiving environments
 - (ii) the connections between water bodies
 - (iii) the connection of water bodies to receiving environments; and
 - ~~(b)~~ **use the best information available at the time; and**
 - ~~(a)~~ **(b)** take into account results or information from freshwater accounting systems (see clause 3.29).

3.12 How to achieve target attribute states and environmental outcomes

- (1) In order to achieve the target attribute states for the attributes in Appendix 2A **and any target attribute states adopted under clause 3.13**, every regional council:
- (a) ~~must~~ **must** identify limits on resource use that will achieve the target attribute state, **and any nitrogen and phosphorus exceedance criteria and instream concentrations set under clause 3.13,** and
 - ~~(a)~~ **(b)** ~~must~~ **must** include ~~the~~ **those** limits as rules in its regional plan ~~(s)~~; and
 - ~~(b)~~ **(c)** ~~may~~ **must** prepare an action plan; and
 - ~~(c)~~ **(d)** ~~may~~ **must** impose conditions on resource consents to achieve target attribute states.
- (2) In order to achieve the target attribute states for the attributes in Appendix 2B, every regional council:

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- (a) must prepare an action plan for achieving the target attribute state within a specified timeframe; and
 - (b) may identify limits on resource use, and any nitrogen and phosphorus exceedance criteria and instream concentrations set under clause 3.13, and include them as rules in its regional plan(s); and
 - (c) may impose conditions on resource consents to achieve target attribute states.
- (3) In order to achieve any other target attribute state or otherwise support the achievement of environmental outcomes, a regional council must do at least one of the following:
- (a) identify limits on resource use and include them as rules in its regional plan(s)
 - (b) prepare an action plan
 - (c) impose conditions on resource consents to achieve target attribute states.
- (4) Where the same attribute provides for more than one value, it is the most stringent target attribute state applying to those values that must be achieved.

3.13 Special provisions for attributes affected by nutrients

- (1) To achieve a target attribute state for periphyton, any other nutrient attribute, and any attribute that is affected by nutrients, every regional council must, at a minimum, set appropriate instream concentrations or instream loads, and temporal exceedance criteria, for dissolved inorganic nitrogen (DIN) and dissolved reactive phosphorus (DRP).
 - (2) Where there are nutrient-sensitive downstream receiving environments, the instream concentrations or instream loads, and the temporal exceedance criteria, for DIN and DRP must be set for the upstream contributing water bodies must be set so as to achieve the environmental outcomes sought for the nutrient-sensitive downstream receiving environments.
- (3) Every regional council must adopt the instream concentrations or instream loads, and the temporal exceedance criteria, set under subclauses (1) and (2) as target attribute states for DIN and DRP.**
- (3) In order to determine instream concentrations and exceedance criteria for DIN and DRP, for upstream contributing water bodies, every regional council must apply the following process, in the order given:**
- (a) either:
 - (i) if the FMU or part of an FMU supports, or could support, conspicuous periphyton, derive instream concentrations and exceedance criteria for DIN and DRP to achieve the periphyton target attribute state; or
 - (ii) if the FMU or part of an FMU does not support, or could not support, conspicuous periphyton, consider the instream concentrations (or instream loads) and exceedance criteria for nitrogen and phosphorus needed to achieve any other target attribute state
 - (b) if there are nutrient-sensitive receiving environments, derive the relevant instream concentrations (instream loads) and exceedance criteria for nitrogen and

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phosphorus needed to achieve the environmental outcomes sought for those receiving environments

~~(c)~~ compare instream concentrations and exceedance criteria for nitrogen and phosphorus derived in steps (a) and (b) and adopt those necessary to achieve the relevant target attribute state and the environmental outcomes sought for the nutrient sensitive receiving environments as instream concentrations and exceedance criteria for DIN and DRP for the upstream contributing water bodies.

- (4) Examples of attributes affected by nutrients include **periphyton**, dissolved oxygen (Appendix 2A, Tables **2 and 7** and Appendix 2B, Tables 17, 18, and 19), submerged plants (invasive species) (Appendix 2B, Table 12), fish (rivers) (Appendix 2B, Table 13), macroinvertebrates (Appendix 2B, Tables 14 and 15), and ecosystem metabolism (Appendix 2B, Table 21).

3.14 Setting limits on resource use

- (1) Limits on resource use may:
- (a) apply to any activity or land use; and
 - (b) apply at any scale (such as to all or any part of an FMU, or to a specific water body or individual property); and
 - (c) be expressed as any of the following:
 - (i) a land-use control (such as a control on the extent of an activity)
 - (ii) an input control (such as an amount of fertiliser that may be applied)
 - (iii) an output control (such as a volume or rate of discharge); and
 - (d) describe the circumstances in which the limit applies.
- (2) In setting limits on resource use, every regional council must:
- (a) have regard to the following:
 - (i) the long-term vision set under clause 3.3
 - (ii) the foreseeable impacts of climate change; and
 - ~~(b)~~ use the best information available at the time; and
 - ~~(c)~~ take into account results or information from freshwater accounting systems.
- (3) Limits on resource use must ensure that the instream concentrations **and/or** instream loads, and the **nitrogen and phosphorus temporal** exceedance criteria **determined adopted as target attribute states for DIN and DRP** under clause 3.13 are achieved.

3.15 Preparing action plans

- (1) Action plans prepared for the purpose of this National Policy Statement may:
- (a) be prepared for whole FMUs, parts of FMUs, or multiple FMUs; and
 - (b) set out a phased approach to achieving environmental outcomes; and
 - (c) be 'prepared' by adding to, amending, or replacing an existing action plan.

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- (2) An action plan may describe both regulatory measures (such as proposals to amend regional policy statements and plans, and actions taken under the Biosecurity Act 1993 or other legislation) and non-regulatory measures (such as work plans and partnership arrangements with tangata whenua and community groups).
- (3) If an action plan is prepared for the purpose of achieving a specific target attribute state or otherwise supporting the achievement of environmental outcomes it must:
 - (a) identify the environmental outcome that the target attribute state is aimed at achieving; and
 - (b) set out how the regional council will (or intends) to achieve the target attribute state.
- (4) Action plans:
 - (a) must be published as soon as practicable; and
 - (b) may be published either by appending them to a regional plan or by publishing them separately.
- (5) Before preparing an action plan, or amending an action plan other than in a minor way, the regional council must consult with communities and tangata whenua.
- (6) Every action plan, or part of an action plan, prepared for the purpose of this National Policy Statement must be reviewed within 5 years after the action plan or part of the action plan is published.

3.16 Setting environmental flows and levels

- (1) Every regional council must include rules in its regional plan^(s) that set environmental flows and levels for each FMU, and may set different flows and levels for different parts of an FMU.
- (2) Environmental flows and levels:
 - (a) must be set at a level that achieves the environmental outcomes for the values relating to the FMU or relevant part of the FMU and all relevant long-term visions; but
 - (b) may be set and adapted over time to take a phased approach to achieving those environmental outcomes and long-term visions.
- (3) Environmental flows and levels must be expressed in terms of the water level and flow rate, and may include variability of flow (as appropriate to the water body) at which:
 - (a) for flows and levels in rivers^(s), any taking, damming, diversion, or discharge of water meets the environmental outcomes for the river, any connected water body, and receiving environments
 - (b) for levels of lakes^(s), any taking, damming, diversion or discharge of water meets the environmental outcomes for the lake, any connected water body, and receiving environments
 - (c) for levels of groundwater^(s), any taking, damming, or diversion of water meets the environmental outcomes for the groundwater, any connected water body, and receiving environments.

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- (4) When setting environmental flows and levels, every regional council must:
- (a) have regard to the foreseeable impacts of climate change; and
 - ~~(b) use the best information available at the time; and~~
 - ~~(c)~~ take into account results or information from freshwater accounting systems.

3.17 Identifying take limits

- (1) In order to meet environmental flows and levels, every regional council:
- (a) must identify take limits for each FMU; and
 - (b) must include the take limits as rules in its regional plan~~(s)~~; and
 - (c) must state in its regional plan~~(s)~~ whether (and if so, when and which) existing water permits will be reviewed to comply with environmental flows and levels; and
 - (d) may impose conditions on resource consents.
- (2) Take limits must be expressed as a total volume, a total rate, or both a total volume and a total rate, at which water may be:
- (a) taken or diverted from an FMU or part of an FMU; or
 - (b) dammed in an FMU or part of an FMU.
- (3) Where a regional plan or any resource consent allows the taking, damming, diversion or discharge of water, the plan or resource consent must identify the flows and levels at which:
- (a) the allowed taking, damming, or diversion will be restricted or no longer allowed; or
 - (b) a discharge will be required.
- (4) Take limits must be identified that:
- (a) provide for flow or level variability that meets the needs of the relevant water body and connected water bodies, and their associated ecosystems; and
 - (b) safeguard ecosystem health from the effects of the take limit on the frequency and duration of lowered flows or levels; and
 - (c) provide for the life cycle needs of aquatic life; and
 - (d) take into account the environmental outcomes applying to relevant water bodies and any connected water bodies (such as aquifers and downstream surface water bodies), whether in the same or another region.

3.18 Monitoring

- (1) Every regional council must establish methods for monitoring progress towards achieving target attributes states and environmental outcomes.
- (2) The methods must include measures of:
- (a) mātauranga Māori; and

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- (b) the health of indigenous flora and fauna.
- (3) Monitoring methods must recognise the importance of long-term trends, and the relationship between results and their contribution to evaluating progress towards achieving long-term visions and environmental outcomes for FMUs and parts of FMUs.

3.19 Assessing trends

- (1) In order to assess trends in attribute states (that is, whether improving or deteriorating), every regional council must:
 - (a) determine the appropriate period for assessment (which must be the period specified in the relevant attribute table in Appendix 2A or 2B, if given); and
 - (b) determine the minimum sampling frequency and distribution of sampling dates (which must be the frequency and distribution specified in the relevant attribute table in Appendix 2A or 2B, if given); and
 - (c) specify the likelihood of any trend.
- (2) If a deteriorating trend is more likely than not, the regional council must:
 - (a) investigate the cause of the trend; and
 - (b) consider the likelihood of the deteriorating trend, the magnitude of the trend, and the risk of adverse effects on the environment.
- (3) If a deteriorating trend that is the result of something other than a naturally occurring process is detected, any part of an FMU to which the attribute applies is degrading and clause 3.20 applies.
- (4) If a trend assessment cannot identify a trend because of insufficient monitoring, the regional council must make any practicable changes to the monitoring regime that will or are likely to help detect trends in that attribute state.

3.20 Responding to degradation

- (1) If a regional council detects that an FMU or part of an FMU is degraded or degrading, it must, as soon as practicable, take action to halt or reverse the degradation (for example, by making or changing a regional plan, or preparing an action plan).
- (2) Any action taken in response to a deteriorating trend must be proportionate to the likelihood and magnitude of the trend, the risk of adverse effects on the environment, and the risk of not achieving target attribute states.
- (3) Every action plan prepared under this clause must include actions to identify the causes of the deterioration, methods to address those causes, and an evaluation of the effectiveness of the methods.

Subpart 3 Specific requirements

3.21 Definitions relating to wetlands and rivers beds

- (1) In clauses 3.21 to 3.24:

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biosecurity means eliminating or managing pests and unwanted organisms

effects management hierarchy, in relation to natural inland wetlands and rivers **beds**, means an approach to managing the adverse effects of an activity on the extent or values of a wetland or river **bed** (including cumulative effects and loss of potential value) that requires that:

- (a) adverse effects are avoided where practicable; and
- (b) where adverse effects cannot be avoided, they are minimised where practicable; and
- (c) where adverse effects cannot be minimised, they are remedied where practicable; and
- (d) where more than minor residual adverse effects cannot be avoided, minimised, or remedied, aquatic offsetting is provided where possible; and
- (e) if aquatic offsetting of more than minor residual adverse effects is not possible, aquatic compensation is provided; and
- (f) if aquatic compensation is not appropriate, the activity itself is avoided

functional need means the need for a proposal or activity to traverse, locate or operate in a particular environment because the activity can only occur in that environment

~~improved pasture means an area of land where exotic pasture species have been deliberately sown or maintained for the purpose of pasture production, and species composition and growth has been modified and is being managed for livestock grazing~~

loss of value, in relation to a natural inland wetland or river **bed**, means the wetland or river **bed** is less able to provide for the following existing or potential values:

- (a) any value identified for it under the NOF process; ~~or~~
- (b) any of the following **values**, whether or not they are identified under the NOF process:
 - (i) ecosystem health
 - (ii) indigenous biodiversity
 - (iii) hydrological functioning
 - (iv) Māori freshwater values
 - (v) amenity **values**

natural wetland means a wetland (as defined in the Act) that is not:

- (a) a **deliberately constructed** wetland, **constructed by artificial means (unless it was 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
- ~~(a)~~(b) **a wetland that has developed in or around a deliberately constructed water body, since the construction of the water body; or**
- ~~(b)~~(c) a geothermal wetland; or
- (d) **a wetland that:**
 - (i) **is within any an area of improved pasture that, at the commencement date, and**

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- (ii) is dominated by (that is more than 50% of) exotic pasture species and is subject to temporary rain-derived water pooling has ground cover comprising more than 50% exotic pasture species (as identified in the *National List of Exotic Pasture Species* (see clause 1.8)); and
- (iii) is not known to contain threatened species

natural inland wetland means a natural wetland that is not in the coastal marine area

specified infrastructure means any of the following:

- (a) infrastructure that delivers a service operated by a lifeline utility (as defined in the Civil Defence Emergency Management Act 2002)
- (b) regionally significant infrastructure identified as such in a regional policy statement or regional plan
- (b)(c) any water storage infrastructure
- (d) any public flood control, flood protection, or drainage works carried out:
 - (i) by or on behalf of a local authority, including works carried out for the purposes set out in section 133 of the Soil Conservation and Rivers Control Act 1941; or
 - (ii) for the purpose of drainage by drainage districts under the Land Drainage Act 1908

restoration, in relation to a natural inland wetland, means active intervention and management, appropriate to the type and location of the wetland, aimed at restoring its ecosystem health, indigenous biodiversity, or hydrological functioning;

wetland maintenance means activities, such as weed control, intended to prevent the deterioration of a wetland's condition.

(2) For the purpose of the definition of **effects management hierarchy**:

aquatic compensation means a measurable conservation outcome resulting from actions that are intended to compensate for any more than minor residual adverse effects on a wetland or river after all appropriate avoidance, minimisation, remediation, and aquatic offset measures have been sequentially applied

aquatic offset means a measurable conservation outcome resulting from actions that are intended to:

- (a) redress any more than minor residual adverse effects on a wetland or river **bed** after all appropriate avoidance, minimisation, and remediation, measures have been sequentially applied; and
- (b) achieve no net loss, and preferably a net gain, in the extent and values of the wetland or river **bed**, where:
 - (i) **no net loss** means that the measurable positive effects of actions match any loss of extent or values over space and time, taking into account the type and location of the wetland or river **bed**; and
 - (ii) **net gain** means that the measurable positive effects of actions exceed the point of no net loss;

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3.22 Natural inland wetlands

- (1) Every regional council must include the following policy (or words to the same effect) in its regional plan(s):

“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 **activities for** any of the following **purposes**:
- (i) the customary harvest of food or resources undertaken in accordance with tikanga Māori
 - (ii) **wetland maintenance**, restoration, **or biosecurity**
 - (iii) scientific research
 - (iv) the sustainable harvest of sphagnum moss
 - (v) the construction or maintenance of wetland utility structures (as defined in the Resource Management (National Environmental Standards for Freshwater) Regulations 2020)
 - (vi) the maintenance or operation of specified infrastructure, or other infrastructure (as defined in the Resource Management (National Environmental Standards for Freshwater) Regulations 2020)
 - (vii) natural hazard works (as defined in the Resource Management (National Environmental Standards for Freshwater) Regulations 2020); or
- (b) the regional council is satisfied that:
- (i) the activity is necessary for the **purpose of the** construction or upgrade of specified infrastructure; and
 - (ii) the specified infrastructure will provide significant national or regional benefits; and
 - (iii) there is a functional need for the specified infrastructure in that location; and
 - (iv) the effects of the activity are managed through applying the effects management hierarchy **“; or**
- (c) the regional council is satisfied that:**
- (i) the activity is necessary for the purpose of urban development that contributes to a well-functioning urban environment (as defined in the National Policy Statement on Urban Development); and**
 - (ii) the activity occurs on land identified for urban development in an operative regional or district plan; and**
 - (iii) the activity does not occur on land that is zoned in a district plan as general rural, rural production, or rural lifestyle; and**
 - (iv) there is either no practicable alternative location for the activity, or every other practicable location would have equal or greater adverse effects on a natural inland wetland; and**
 - (v) the effects of the activity are managed through applying the effects management hierarchy and, if aquatic offsetting or aquatic compensation is applied, the offsetting or compensation will be maintained and managed over time; or**
- (d) the regional council is satisfied that:**
- (i) the activity is for the purpose of expanding an existing, or developing a new, quarry for the extraction of aggregate; and**
 - (ii) extraction of the aggregate will provide significant national or regional benefits; and**
 - (iii) there is a functional need for the extraction to be done in that location; and**

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- (iv) the effects of the activity are managed through applying the effects management hierarchy; or
 - (e) the regional council is satisfied that:
 - (i) the activity is for the purpose of extracting any mineral in its natural state from the land; and
 - (ii) extraction of the mineral will provide significant national or regional benefits; and
 - (iii) there is a functional need for the activity to be done in that location; and
 - (iv) the effects of the activity are managed through applying the effects management hierarchy; or
 - (f) the regional council is satisfied that:
 - (i) the activity is necessary for the purpose of expanding an existing, or developing a new, landfill or cleanfill; and
 - (ii) the new or expanded landfill or cleanfill will provide significant national or regional benefits; and
 - (iii) there is either no practicable alternative location, or every other practicable alternative location would have equal or greater adverse effects on a natural inland wetland; and
 - (iv) the effects of the activity will be managed through applying the effects management hierarchy.”
- (2) Subclause (3) applies to an application for a consent for an activity that:
- (a) is for a purpose that falls within any exception referred to in subclause (1)(a) to (f), other than the exception in paragraph (a)(i)(ii) to (vii) or (b) of the policy in subclause (1); and
 - (b) would result (directly or indirectly) in the loss of extent or values of a natural inland wetland.
- (3) Every regional council must make or change its regional plan(s) to ensure that an application referred to in subclause (2) is not granted unless:
- (a) the council is satisfied that the applicant has demonstrated how each step of the effects management hierarchy will be applied to any loss of extent or values of the wetland (including cumulative effects and loss of potential value), particularly (without limitation) in relation to the values of: ecosystem health, indigenous biodiversity, hydrological functioning, Māori freshwater values, and amenity values; and
 - (b) the council is satisfied that, if aquatic offsetting or aquatic compensation is applied, the applicant has had regard to the principles in Appendix 6 or 7, as appropriate; and
- (b)(c) any consent is granted is subject to:
- (i) conditions that apply the effects management hierarchy; and
 - (ii) a condition requiring monitoring of the wetland at a scale commensurate with the risk of the loss of extent or values of the wetland; and
 - (iii) if the consent is granted in relation to urban development, the conditions specify who will monitor the condition of the wetland over time, and how.

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- (4) Every regional council must make or change its regional plan^(s) to include objectives, policies, and methods that provide for and promote the restoration of natural inland wetlands in its region, with a particular focus on restoring the values of ecosystem health, indigenous biodiversity, hydrological functioning, Māori freshwater values, and amenity values.

3.23 Mapping and monitoring natural inland wetlands

- (1) Every regional council must identify and map every natural inland wetland in its region that is:
 - (a) 0.05 hectares or greater in extent; or
 - (b) of a type that is naturally less than 0.05 hectares in extent (such as an ephemeral wetland) and known to contain threatened species.
- (2) However, a regional council need not identify and map natural inland wetlands located in public conservation lands or waters (as that term is defined in the Conservation General Policy 2005 issued under the Conservation Act 1987).
- (3) In case of uncertainty or dispute about the existence or extent of a natural inland wetland, a regional council must have regard to the *Wetland Delineation Protocols* (see clause 1.8).
- (4) The mapping of natural inland wetlands must be completed within 10 years of the commencement date, and the regional council must prioritise its mapping, for example by:
 - (a) first, mapping any wetland at risk of loss of extent or values; then
 - (b) mapping any wetland identified in a farm environment plan, or that may be affected by an application for, or review of, a resource consent; then
 - (c) mapping all other natural inland wetlands.
- (5) Every regional council must establish and maintain an inventory of all natural inland wetlands mapped under this clause, and the inventory:
 - (a) must include, at a minimum, the following information about each wetland:
 - (i) identifier and location
 - (ii) area and GIS polygon
 - (iii) classification of wetland type
 - (iv) any existing monitoring information; and
 - (b) may include any other information (such as an assessment of the values applying to the wetland and any new information obtained from monitoring).
- (6) Every regional council must:
 - (a) develop and undertake a monitoring plan that:
 - (i) monitors the condition of its natural inland wetlands (including, if the council chooses, wetlands referred to in subclause (2)); and

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- (ii) contains sufficient information to enable the council to assess whether its policies, rules, and methods are ensuring no loss of extent or values of those wetlands; and
- (b) have methods to respond if loss of extent or values is detected.

3.24 Rivers beds

- (1) Every regional council must include the following policy (or words to the same effect) in its regional plan(s):

“The loss of river bed extent and values is avoided, unless the council is satisfied that:

 - (a) ~~that~~ there is a functional need for the activity in that location; and
 - (b) the effects of the activity are managed by applying the effects management hierarchy.”
- (2) Subclause (3) applies to an application for a consent for an activity:
 - (a) that falls within the exception to the policy described in subclause (1); and
 - (b) would result (directly or indirectly) in the loss of extent or values of a river bed.
- (3) Every regional council must make or change its regional plan(s) to ensure that an application referred to in subclause (2) is not granted unless:
 - (a) the council is satisfied that the applicant has demonstrated how each step in the effects management hierarchy will be applied to any loss of extent or values of the river bed (including cumulative effects and loss of potential value), particularly (without limitation) in relation to the values of: ecosystem health, indigenous biodiversity, hydrological functioning, Māori freshwater values, and amenity; and
 - (b) any consent granted is subject to conditions that apply the effects management hierarchy.
- (4) Every regional council must:
 - (a) develop and undertake a monitoring plan ~~that~~:
 - (i) to monitor the condition of its rivers beds; and
 - (ii) that contains sufficient information to enable the council to assess whether its policies, rules, and methods are ensuring no loss of extent or values of the rivers beds; and
 - (b) have methods to respond if loss of extent or values is detected.

3.25 Deposited sediment in rivers

- (1) If a site to which a target attribute state for deposited fine sediment applies (see Table 16 in Appendix 2B) is soft-bottomed, the regional council must determine whether the site is naturally soft-bottomed or is naturally hard-bottomed.
- (2) If a regional council determines that a site that is currently soft-bottomed is naturally hard-bottomed, the council must:
 - (a) monitor deposited sediment at the site using the SAM2 method at least once a year (instead of at the frequency required by Table 16 in Appendix 2B); and

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- (b) monitor freshwater habitat in a manner suitable to the current state of the site (that is, as soft-bottomed); and
- (c) determine whether, having regard to the relevant long-term vision, it is appropriate to return the site to a hard-bottomed state; and
- (d) if it is appropriate to return the site to a hard-bottomed state, prepare an action plan for how to do that.

(3) In this clause:

soft-bottomed means a site where the **river** bed has a greater than 50% coverage of deposited fine sediment (grain size less than 2 mm in diameter) as determined using the SAM2 method

hard-bottomed means a site that is not soft-bottomed

naturally, in relation to a site, means its state before the arrival of humans in New Zealand

SAM2 method means the method described at p 17 – 20 of Clapcott JE, Young RG, Harding JS, Matthaei CD, Quinn JM, and Death RG. 2011. *Sediment Assessment Methods: Protocols and guidelines for assessing the effects of deposited fine sediment on in-stream values*. Cawthron Institute: Nelson, New Zealand (see clause 1.8).

3.26 Fish passage

(1) Every regional council must include the following fish passage objective (or words to the same effect) in its regional plan(s):

“The passage of fish is maintained, or is improved, by instream structures, except where it is desirable to prevent the passage of some fish species in order to protect desired fish species, their life stages, or their habitats.”

(2) Every regional council must make or change its regional plan(s) to include policies that:

- (a) identify the desired fish species, and their relevant life stages, for which instream structures must provide passage; and
- (b) identify the undesirable fish species whose passage can or should be prevented; and
- (c) identify rivers and receiving environments where desired fish species have been identified; and
- (d) identify rivers and receiving environments where fish passage for undesirable fish species is to be impeded in order to manage their adverse effects on fish populations upstream or downstream of any barrier.

(3) When developing the policies required by subclause (2) a regional council must:

- (a) take into account any Freshwater Fisheries Management Plans and Sports Fish and Game Management Plans approved by the Minister of Conservation under the Conservation Act 1987; and
- (b) seek advice from the Department of Conservation and statutory fisheries managers regarding fish habitat and population management.

(4) Every regional council must make or change its regional plan(s) to require that regard is had to at least the following when considering an application for a consent relating to an instream structure:

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- (a) the extent to which it provides, and will continue to provide for the foreseeable life of the structure, for the fish passage objective in subclause (1)
 - (b) the extent to which it does not cause a greater impediment to fish movements than occurs in adjoining river reaches and receiving environments
 - (c) the extent to which it provides efficient and safe passage for fish, other than undesirable fish species, at all their life stages
 - (d) the extent to which it provides the physical and hydraulic conditions necessary for the passage of fish
 - (e) any proposed monitoring and maintenance plan for ensuring that the structure meets the fish passage objective in subclause (1) ~~for fish~~ now and in the future.
- (5) Every regional council must make or change its regional plan~~(s)~~ to promote the remediation of existing structures and the provision of fish passage (other than for undesirable fish species) where practicable.
- (6) Every regional council must prepare an action plan to support the achievement of the fish passage objective in subclause (1), and the action plan must, at a minimum:
- (a) set out a work programme to improve the extent to which existing instream structures achieve the fish passage objective; and
 - (b) set targets for remediation of existing instream structures; and
 - (c) achieve any environmental outcomes and target attribute states relating to the abundance and diversity of fish.
- (7) The work programme in an action plan must, at a minimum:
- (a) identify instream structures in the region by recording, for each structure:
 - (i) all the information in Part 1 of Appendix 4; and
 - (ii) any other information about the structure, such as the information in Part 2 of Appendix 4; and
 - (b) evaluate the risks that instream structures present as an undesirable barrier to fish passage; and
 - (c) prioritise structures for remediation, applying the ecological criteria described in table 5.1, of the *New Zealand Fish Passage Guidelines* (see clause 1.8); and
 - (d) document the structures or locations that have been prioritised, the remediation that is required to achieve the desired outcome, and how and when this will be achieved; and
 - (e) identify the structures that have been remediated since the commencement date; and
 - (f) specify how the ongoing performance of remediated structures will be monitored and evaluated, including the effects of the structure on the abundance and diversity of desired fish species.
- (8) An action plan for fish passage may be part of, or separate from, an action plan prepared for any purpose under this Part, but clause 3.15, about preparing action plans, applies in either case.

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3.27 Primary contact sites

- (1) Every regional council must monitor primary contact sites for:
 - (a) their risk to human health; and
 - (b) their suitability for the activities that take place in them (for example, by monitoring whether there is slippery or unpleasant weed growth, and the visual clarity of the water).
- (2) For every primary contact site in an FMU, the regional council must identify one or more monitoring sites representative of the primary contact site or a number of primary contact sites.
- (3) Every regional council must identify, for each primary contact site in its region, a time period (a **bathing season**) during the year when the regional council considers that the site is regularly used, or would be regularly used but for existing freshwater quality, for recreational activities.
- (4) During the bathing season for primary contact sites, every regional council must undertake weekly sampling for *E. coli* at each relevant monitoring site.
- (5) However, if a single sample taken during the bathing season from a monitoring site is greater than 260 *E. coli* per 100 mL, the regional council must (unless the council is satisfied that the elevated result is temporary or the cause is being addressed):
 - (a) increase sampling frequency to daily, where practicable; and
 - (b) take all practicable steps to identify potential causes of microbial contamination.
- (6) If a single sample from a monitoring site is greater than 540 *E. coli* per 100 mL, the regional council must, as soon as practicable, take all practicable steps to notify the public and keep the public informed that the site is unsuitable for primary contact, until further sampling shows a result of 540 *E. coli* per 100 mL or less.
- (7) A regional council may comply with subclause (6) by, for example, erecting signs and publicising the situation, or liaising with an environmental health officer or other relevant body or person to co-ordinate how to inform the public about the situation.

3.28 Water allocation

- (1) Every regional council must make or change its regional plan(s) to include criteria for:
 - (a) deciding applications to approve transfers of water take permits; and
 - (b) deciding how to improve and maximise the efficient allocation of water (which includes economic, technical, and dynamic efficiency).
- (2) Every regional council must include methods in its regional plan(s) to encourage the efficient use of water.

3.29 Freshwater accounting systems

- (1) Every regional council must operate and maintain, for every FMU:
 - (a) a freshwater quality accounting system; and

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- (b) a freshwater quantity accounting system.
- (2) The purpose of the accounting systems is to provide the baseline information required:
 - (a) for setting target attribute states, environmental flows and levels, and limits; and
 - (b) to assess whether an FMU is, or is expected to be, over-allocated; and
 - (c) to track over time the cumulative effects of activities (such as increases in discharges and changes in land use).
 - (3) The accounting systems must be maintained at a level of detail commensurate with the significance of the water quality or quantity issues applicable to each FMU or part of an FMU.
 - (4) Every regional council must publish information from those systems regularly and in a suitable form.
 - (5) The freshwater quality accounting system must (where practicable) record, aggregate, and regularly update, for each FMU, information on the measured, modelled, or estimated:
 - (a) loads and concentrations of relevant contaminants; and
 - (b) where a **desired** contaminant load has been set as part of a limit on resource use, or identified as necessary to achieve a target attribute state, the proportion of the contaminant load that has been allocated; and
 - (c) sources of relevant contaminants; and
 - (d) the amount of each contaminant attributable to each source.
 - (6) The freshwater quantity accounting system must record, aggregate, and regularly update, for each FMU, information on the measured, modelled, or estimated:
 - (a) amount of freshwater take; and
 - (b) the proportion of freshwater taken by each major category of use; and
 - (c) where a take limit has been set, the proportion of the take limit that has been allocated.
 - (7) In this clause, **freshwater take** refers to all takes and forms of water consumption, whether metered or not, whether subject to a consent or not, and whether authorised or not.

3.30 Assessing and reporting

- (1) Every regional council must publish the following annually:
 - (a) actual data, or a link to those data, about each component of the value ecosystem health and the value human contact, as obtained from monitoring sites for the relevant attributes; and if no data has been collected in relation to any attribute, this must be identified
 - (b) actual data, or a link to those data, from any other monitoring done for the purpose of freshwater management
 - (c) a description of any uncertainties associated with the data.

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- (2) As part of each review required by section 35(2A) of the Act (which is required at least every 5 years), every regional council must prepare and publish the following:
 - (a) an assessment of the extent to which, in the region:
 - (i) the long-term visions, as identified under clause 3.3, are being achieved;
and
 - (ii) this National Policy Statement is being given effect to
 - (b) a comparison of the current state of attributes as compared with target attribute states
 - (c) an assessment of whether the target attribute states and environmental outcomes for each FMU or part of an FMU in the region are being achieved and, if not, whether and when they are likely to be
 - (d) if monitoring shows that an FMU or part of an FMU is degraded or degrading, information on the known or likely causes
 - (e) a description of the environmental pressures on each FMU (such as water takes, sources of contaminants, or water body modification) as indicated by information from the freshwater accounting systems referred to in clause 3.29
 - (f) an assessment of the cumulative effect of changes across multiple sites within an FMU and multiple attributes during the period covered by the assessment
 - (g) predictions of changes, including the foreseeable effects of climate change, that are likely to affect water bodies and freshwater ecosystems in the region
 - (h) an assessment of the actions taken over the past 5 years in the region, whether regulatory or non-regulatory and whether by local authorities or others, that contribute to the implementation of this National Policy Statement.
- (3) At the same time that a regional council publishes the review required by section 35(2A) of the Act, the regional council must publish an ecosystem health scorecard that:
 - (a) reports on and gives a score for the state of each component of the value ecosystem health (as described in Appendix 1A) in each FMU in the region; and
 - (b) identifies where any data or information is missing; and
 - (c) provides a single overall score for ecosystem health for each FMU in the region.
- (4) The ecosystem health scorecard must:
 - (a) be written and presented in a way that members of the public are likely to understand easily; and
 - (b) include specific data, or a link to where those data may be viewed.

3.31 Large hydro-electric generation schemes

- (1) This clause applies to the following 5 hydro-electricity generation schemes (referred to as **Schemes**):
 - (a) Waikato Scheme
 - (b) Tongariro Scheme
 - (c) Waitaki Scheme

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- (d) Manapouri Scheme
 - (e) Clutha Scheme.
- (2) When implementing any part of this National Policy Statement as it applies to an FMU or part of an FMU affected by a Scheme, a regional council must have regard to the importance of the Scheme's:
- (a) contribution to meeting New Zealand's greenhouse gas emission targets; and
 - (b) contribution to maintaining the security of New Zealand's electricity supply; and
 - (c) generation capacity, storage, and operational flexibility.
- (3) Subclause (4) applies if:
- (a) an FMU or part of an FMU is adversely affected by an existing structure that forms part of a Scheme; and
 - (b) the baseline state of an attribute in the FMU or part of the FMU is below the national bottom line for the attribute; and
 - (c) achieving the national bottom line for the attribute would have a significant adverse effect on the Scheme, having regard to the matters in subclause (2).
- (4) When this subclause applies, the regional council:
- (a) may set a target attribute state that is below the national bottom line for the attribute, despite clause 3.11(4); but
 - (b) must still, as required by clause 3.11(2) and (3), set the target attribute state to achieve an improved attribute state to the extent practicable without having a significant adverse effect on the Scheme, having regard to the matters in subclause (2) ~~of this clause~~.
- (5) In this clause, **existing structure** means a structure that was operational on or before 1 August 2019, and includes any structure that replaces it, provided the effects of the replacement are the same or similar in character, intensity and scale, or have a lesser impact.

3.32 Naturally occurring processes

- (1) If all or part of a water body is affected by naturally occurring processes that mean that the current state is below the national bottom line, and a target attribute state at or above the national bottom line cannot be achieved, the regional council:
- (a) may set a target attribute state that is below the national bottom line for the attribute, despite clause 3.11(4); but
 - (b) must still, as required by clause 3.11(2) and (3), set the target attribute state to achieve an improved attribute state, to the extent practicable given the naturally occurring processes.
- (2) In any dispute about whether this exception should apply, the onus is on the relevant regional council to demonstrate that it is naturally occurring processes that prevents the national bottom line being achieved.

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3.33 Specified vegetable growing areas

- (1) This clause applies only to the 2 **specified vegetable growing areas** identified in Part 1 of Appendix 5.
- (2) When implementing any part of this National Policy Statement as it applies to an FMU or part of an FMU that is in, or includes, all or part of a specified vegetable growing area, a regional council must have regard to the importance of the contribution of the specified growing area to:
 - (a) the domestic supply of fresh vegetables; and
 - (b) maintaining food security for New Zealanders.
- (3) Subclause (4) applies if:
 - (a) an FMU or part of an FMU is adversely affected by vegetable growing in a specified vegetable growing area; and
 - (b) the baseline state of an attribute specified in Part 2 of Appendix 5 in the FMU or part of the FMU where all or part of the specified vegetable growing area is located is below the national bottom line for the attribute; and
 - (c) achieving the national bottom line for the attribute would compromise the matters in subclause (2).
- (4) When this subclause applies, the regional council:
 - (a) may set a target attribute state that is below the national bottom line for the attribute, despite clause 3.11(4); but
 - (b) must still, as required by clause 3.11(2) and (3), set the target attribute state to achieve an improved attribute state without compromising the matters in subclause (2) ~~of this clause~~.
- (5) When implementing clauses 3.12 to 3.14 in relation to FMUs that include all or part of a specified vegetable growing area, a regional council must ensure that vegetable growers in the area are not exempt from any requirements (such as in limits, action plans, and conditions on resource consents) aimed at achieving target attribute states.
- (6) This clause ceases to apply to a specified vegetable growing area on the earlier of the following dates:
 - (a) 10 years after the commencement date; or
 - (b) the date National Environmental Standards (or other regulations under the Act) come into force that:
 - (i) apply to the specified vegetable growing area; and
 - (ii) are made for the purpose of avoiding, remedying, or mitigating the adverse effects of vegetable growing on freshwater.

3.34 Urban development in Tauranga

- (1) When inserting the policy described in clause 3.22(1) into its regional plan, the Bay of Plenty Regional Council may include the following additional exception:
 - (a) “the regional council is satisfied that:

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(i) the activity is necessary for the purpose of urban development specifically identified in the SmartGrowth Urban Form and Transport Initiative Connected Centres Programme; and

(ii) the effects of the activity are managed through applying the effects management hierarchy.”

(2) The policy described in subclause (1) must no longer be applied on the date that is 5 years after the date on which the National Policy Statement for Freshwater Management 2020 Amendment No. 1 comes into effect.

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Part 4: Timing and transitionals

4.1 Timing

- (1) Every local authority must give effect to this National Policy Statement as soon as reasonably practicable.
- (2) Local authorities must publicly notify any changes to their regional policy statements, regional plans, and district plans that are necessary to give effect to this National Policy Statement as required under the Act.

4.2 Keeping policy statements and plans up to date

- (1) Once a local authority has made the changes required by clause 4.1, it must continue to make whatever changes to its regional policy statement, regional plan, or district plan are necessary to respond to changes over time in the state of water bodies and freshwater ecosystems in its region or district.

4.3 Existing policy statements and plans

- (1) To the extent that regional policy statements and regional and district plans already (at the commencement date) give effect to this National Policy Statement, local authorities are not obliged to make changes to wording or terminology merely for consistency with it.
- (2) In case of dispute, the onus is on the local authority to show that, despite the different wording or terminology used, their policy statement or plan does implement this National Policy Statement.
- (3) However, if a local authority chooses to amend an operative policy statement or plan by merely changing wording or terminology for consistency with this National Policy Statement, the amendment is to be treated as the correction of a minor error (and therefore, under clause 20A of Schedule 1 of the Act, the amendment can be made without using a process in that Schedule).

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Appendices

Appendix 1A – Compulsory values

1 Ecosystem health

This refers to the extent to which an FMU or part of an FMU supports an ecosystem appropriate to the type of water body (for example, river, lake, wetland, or aquifer).

There are 5 biophysical components that contribute to freshwater ecosystem health, and it is necessary that all of them are managed. They are:

Water quality – the physical and chemical measures of the water, such as temperature, dissolved oxygen, pH, suspended sediment, nutrients and toxicants

Water quantity – the extent and variability in the level or flow of water

Habitat – the physical form, structure, and extent of the water body, its bed, banks and margins; its riparian vegetation; and its connections to the floodplain and to groundwater

Aquatic life – the abundance and diversity of biota including microbes, invertebrates, plants, fish and birds

Ecological processes – the interactions among biota and their physical and chemical environment such as primary production, decomposition, nutrient cycling and trophic connectivity.

In a healthy freshwater ecosystem, all 5 biophysical components are suitable to sustain the indigenous aquatic life expected in the absence of human disturbance or alteration (before providing for other values).

2 Human contact

This refers to the extent to which an FMU or part of an FMU supports people being able to connect with the water through a range of activities such as swimming, waka, boating, fishing, mahinga kai, and water skiing, in a range of different flows or levels.

Matters to take into account include pathogens, water clarity, deposited sediment, plant growth (from macrophytes to periphyton to phytoplankton), cyanobacteria, other toxicants, and litter.

3 Threatened species

This refers to the extent to which an FMU or part of an FMU that supports a population of threatened species has the critical habitats and conditions necessary to support the presence, abundance, survival, and recovery of the threatened species. All the components of ecosystem health must be managed, as well as (if appropriate) specialised habitat or conditions needed for only part of the life cycle of the threatened species.

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4 Mahinga kai

Mahinga kai – kai is safe to harvest and eat.

Mahinga kai generally refers to freshwater species that have traditionally been used as food, tools, or other resources. It also refers to the places those species are found and to the act of catching or harvesting them. Mahinga kai provide food for the people of the rohe and these sites give an indication of the overall health of the water. For this value, kai would be safe to harvest and eat. Transfer of knowledge is able to occur about the preparation, storage and cooking of kai. In FMUs or parts of FMUs that are used for providing mahinga kai, the desired species are plentiful enough for long-term harvest and the range of desired species is present across all life stages.

Mahinga kai – Kei te ora te mauri (the mauri of the place is intact).

In FMUs or parts of FMUs that are valued for providing mahinga kai, customary resources are available for use, customary practices are able to be exercised to the extent desired, and tikanga and preferred methods are able to be practised.

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Appendix 1B – Other values that must be considered

1 Natural form and character

The FMU or part of the FMU has particular natural qualities that people value. Natural qualities may include exceptional, natural, or iconic aesthetic features.

Matters contributing to the natural form and character of an FMU are its biological, visual and physical characteristics that are valued by the community, including:

- a) its biophysical, ecological, geological, geomorphological and morphological aspects
- b) the natural movement of water and sediment including hydrological and fluvial processes
- c) the natural location of a water body and course of a river
- d) the relative dominance of indigenous flora and fauna
- e) the presence of culturally significant species
- f) the colour of the water
- g) the clarity of the water.

2 Drinking water supply

The FMU or part of the FMU can meet people's drinking water needs. Water quality and quantity is sufficient for water to be taken and used for drinking water supply.

Matters affecting the suitability of water for drinking include:

- a) physical, chemical, and microbiological contamination (for example, bacteria and cyanotoxins, viruses, protozoa and other pathogens)
- b) any other contaminants identified in drinking water standards issued under the Health Act 1956 or any other legislation
- c) the effects of contamination on drinking water treatment processes and the safety of drinking water, and its aesthetic value (that is, appearance, taste, and smell).

3 Wai tapu

Wai tapu represent the places in an FMU or part of an FMU where rituals and ceremonies are performed, or where there is special significance to tangata whenua.

Rituals and ceremonies include, but are not limited to, tohi (baptism), karakia (prayer), waerea (protective incantation), whakatapu (placing of rāhui), whakanoa (removal of rāhui), and tuku iho (gifting of knowledge and resources to future generations).

In providing for this value, the wai tapu are free from human and animal waste, contaminants and excess sediment, with valued features and unique properties of the wai protected. Other matters that may be important are that there is no artificial mixing of the wai tapu and identified taonga in the wai are protected.

4 Transport and tauranga waka

The FMU or part of the FMU is navigable for identified means of transport.

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Transport and tauranga waka generally refers to places to launch waka and water craft, and appropriate places for waka to land (tauranga waka).

5 Fishing

The FMU or part of the FMU supports fisheries of species allowed to be caught and eaten.

For FMUs or parts of FMUs valued for fishing, the numbers of fish are sufficient and suitable for human consumption. In some areas, fish abundance and diversity provide a range in species and size of fish, and algal growth, water clarity and safety are satisfactory for fishers. Attributes will need to be specific to fish species such as salmon, trout, tuna, lamprey, or whitebait.

6 Hydro-electric power generation

The FMU or part of the FMU is suitable for hydro-electric power generation.

Water quality and quantity and the physical qualities of the FMU or part of the FMU, including hydraulic gradient and flow rate, can provide for hydro-electric power generation.

7 Animal drinking water

The FMU or part of the FMU meets the needs of farmed animals.

Water quality and quantity meets the needs of farmed animals, including whether it is palatable and safe.

8 Irrigation, cultivation, and production of food and beverages

The FMU or part of the FMU meets irrigation needs for any purpose.

Water quality and quantity is suitable for irrigation needs, including supporting the cultivation of food crops, the production of food from farmed animals, non-food crops such as fibre and timber, pasture, sports fields and recreational areas. Attributes will need to be specific to irrigation and food production requirements.

9 Commercial and industrial use

The FMU or part of the FMU provides economic opportunities for people, businesses and industries.

Water quality and quantity can provide for commercial and industrial activities. Attributes will need to be specific to commercial or industrial requirements.

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Appendix 2A – Attributes requiring limits on resource use

Table 1 – Phytoplankton (trophic state)

Value (and component)	Ecosystem health (Aquatic Life)	
Freshwater body type	Lakes	
Attribute unit	mg chl- <i>a</i> / m ³ (milligrams chlorophyll- <i>a</i> per cubic metre)	
Attribute band and description	Numeric attribute state	
	Annual median	Annual maximum
<p>A</p> <p>Lake ecological communities are healthy and resilient, similar to natural reference conditions.</p>	≤2	≤10
<p>B</p> <p>Lake ecological communities are slightly impacted by additional algal and/or plant growth arising from nutrient levels that are elevated above natural reference conditions.</p>	>2 and ≤5	>10 and ≤25
<p>C</p> <p>Lake ecological communities are moderately impacted by additional algal and plant growth arising from nutrient levels that are elevated well above natural reference conditions. Reduced water clarity is likely to affect habitat available for native macrophytes.</p>	>5 and ≤12	>25 and ≤60
National bottom line	12	60
<p>D</p> <p>Lake ecological communities have undergone or are at high risk of a regime shift to a persistent, degraded state (without native macrophyte/seagrass cover), due to impacts of elevated nutrients leading to excessive algal and/or plant growth, as well as from losing oxygen in bottom waters of deep lakes.</p>	>12	>60

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

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Table 2 – Periphyton (trophic state)

Value (and component)	Ecosystem health (Aquatic Life)	
Freshwater body type	Rivers	
Attribute unit	mg chl- <i>a</i> /m ² (milligrams chlorophyll- <i>a</i> per square metre)	
Attribute band and description	Numeric attribute state (default class)	Numeric attribute state (productive class)
	Exceeded no more than 8% of samples	Exceeded no more than 17% of samples
A Rare blooms reflecting negligible nutrient enrichment and/or alteration of the natural flow regime or habitat.	≤50	≤50
B Occasional blooms reflecting low nutrient enrichment and/or alteration of the natural flow regime or habitat.	>50 and ≤120	>50 and ≤120
C Periodic short-duration nuisance blooms reflecting moderate nutrient enrichment and/or moderate alteration of the natural flow regime or habitat.	>120 and ≤200	>120 and ≤200
National bottom line	200	200
D Regular and/or extended-duration nuisance blooms reflecting high nutrient enrichment and/or significant alteration of the natural flow regime or habitat.	>200	>200

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

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

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

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Table 3 – Total nitrogen (trophic state)

Value (and component)	Ecosystem health (Water quality)	
Freshwater body type	Lakes	
Attribute unit	mg/m ³ (milligrams per cubic metre)	
Attribute band and description	Numeric attribute state	
	Annual median	Annual median
	Seasonally stratified and brackish	Polymictic
A Lake ecological communities are healthy and resilient, similar to natural reference conditions.	≤160	≤300
B Lake ecological communities are slightly impacted by additional algal and/or plant growth arising from nutrient levels that are elevated above natural reference conditions.	>160 and ≤350	>300 and ≤500
C Lake ecological communities are moderately impacted by additional algal and plant growth arising from nutrient levels that are elevated well above natural reference conditions.	>350 and ≤750	>500 and ≤800
National bottom line	750	800
D Lake ecological communities have undergone or are at high risk of a regime shift to a persistent, degraded state (without native macrophyte/seagrass cover), due to impacts of elevated nutrients leading to excessive algal and/or plant growth, as well as from losing oxygen in bottom waters of deep lakes.	>750	>800
For lakes and lagoons that are intermittently open to the sea, monitoring data should be analysed separately for closed periods and open periods.		

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Table 4 – Total phosphorus (trophic state)

Value (and component)	Ecosystem health (Water quality)
Freshwater body type	Lakes
Attribute unit	mg/m ³ (milligrams per cubic metre)
Attribute band and description	Numeric attribute state
	Annual median
A Lake ecological communities are healthy and resilient, similar to natural reference conditions.	≤10
B Lake ecological communities are slightly impacted by additional algal and plant growth arising from nutrient levels that are elevated above natural reference conditions.	>10 and ≤20
C Lake ecological communities are moderately impacted by additional algal and plant growth arising from nutrient levels that are elevated well above natural reference conditions.	>20 and ≤50
National bottom line	50
D Lake ecological communities have undergone or are at high risk of a regime shift to a persistent, degraded state (without native macrophyte/seagrass cover), due to impacts of elevated nutrients leading to excessive algal and/or plant growth, as well as from losing oxygen in bottom waters of deep lakes.	>50
For lakes and lagoons that are intermittently open to the sea, monitoring data should be analysed separately for closed periods and open periods.	

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Table 5 – Ammonia (toxicity)

Value (and component)	Ecosystem health (Water quality)	
Freshwater body type	Rivers and lakes	
Attribute unit	mg NH ₄ -N/L (milligrams ammoniacal-nitrogen per litre)	
Attribute band and description	Numeric attribute state	
	Annual median	Annual maximum
A 99% species protection level: No observed effect on any species tested.	≤0.03	≤0.05
B 95% species protection level: Starts impacting occasionally on the 5% most sensitive species.	>0.03 and ≤0.24	>0.05 and ≤0.40
National bottom line	0.24	0.40
C 80% species protection level: Starts impacting regularly on the 20% most sensitive species (reduced survival of most sensitive species).	>0.24 and ≤1.30	>0.40 and ≤2.20
D Starts approaching acute impact level (that is, risk of death) for sensitive species.	>1.30	>2.20

Numeric attribute state is based on pH 8 and temperature of 20°C. Compliance with the numeric attribute states should be undertaken after pH adjustment.

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Table 6 – Nitrate (toxicity)

Value (and component)	Ecosystem health (Water quality)	
Freshwater body type	Rivers	
Attribute unit	mg NO ₃ – N/L (milligrams nitrate-nitrogen per litre)	
Attribute band and description	Numeric attribute state	
	Annual median	Annual 95th percentile
A High conservation value system. Unlikely to be effects even on sensitive species.	≤1.0	≤1.5
B Some growth effect on up to 5% of species.	>1.0 and ≤2.4	>1.5 and ≤3.5
National bottom line	2.4	3.5
C Growth effects on up to 20% of species (mainly sensitive species such as fish). No acute effects.	>2.4 and ≤6.9	>3.5 and ≤9.8
D Impacts on growth of multiple species, and starts approaching acute impact level (that is, risk of death) for sensitive species at higher concentrations (>20 mg/L).	>6.9	>9.8
This attribute measures the toxic effects of nitrate, not the trophic state. Where other attributes measure trophic state, for example periphyton, freshwater objectives, limits and/or methods for those attributes may be more stringent.		

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Table 7 – Dissolved oxygen

Value (and component)	Ecosystem health (Water quality)	
Freshwater body type	Rivers (below point sources only)	
Attribute unit	mg/L (milligrams per litre)	
Attribute band and description	Numeric attribute state	
	7-day mean minimum (summer period: 1 November to 30th April)	1-day minimum (summer period: 1 November to 30th April)
A No stress caused by low dissolved oxygen on any aquatic organisms that are present at matched reference (near-pristine) sites.	≥8.0	≥7.5
B Occasional minor stress on sensitive organisms caused by short periods (a few hours each day) of lower dissolved oxygen. Risk of reduced abundance of sensitive fish and macroinvertebrate species.	≥7.0 and <8.0	≥5.0 and <7.5
C Moderate stress on a number of aquatic organisms caused by dissolved oxygen levels exceeding preference levels for periods of several hours each day. Risk of sensitive fish and macroinvertebrate species being lost.	≥5.0 and <7.0	≥4.0 and <5.0
National bottom line	5.0	4.0
D Significant, persistent stress on a range of aquatic organisms caused by dissolved oxygen exceeding tolerance levels. Likelihood of local extinctions of keystone species and loss of ecological integrity.	<5.0	<4.0

The 7-day mean minimum is the mean value of seven consecutive daily minimum values.

The 1-day minimum is the lowest daily minimum across the whole summer period.

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Table 8 – Suspended fine sediment

Value (and component)	Ecosystem health (Water quality)			
Freshwater body type	Rivers			
Attribute unit	Visual clarity (metres)			
Attribute band and description	Numeric attribute state by suspended sediment class			
	1	2	3	4
A Minimal impact of suspended sediment on instream biota. Ecological communities are similar to those observed in natural reference conditions.	≥1.78	≥0.93	≥2.95	≥1.38
B Low to moderate impact of suspended sediment on instream biota. Abundance of sensitive fish species may be reduced.	<1.78 and ≥1.55	<0.93 and ≥0.76	<2.95 and ≥2.57	<1.38 and ≥1.17
C Moderate to high impact of suspended sediment on instream biota. Sensitive fish species may be lost.	<1.55 and >1.34	<0.76 and >0.61	<2.57 and >2.22	<1.17 and >0.98
National bottom line	1.34	0.61	2.22	0.98
D High impact of suspended sediment on instream biota. Ecological communities are significantly altered and sensitive fish and macroinvertebrate species are lost or at high risk of being lost.	<1.34	<0.61	<2.22	<0.98

The minimum record length for grading a site is the median of 5 years of at least monthly samples (at least 60 samples).

Councils may monitor turbidity and convert the measures to visual clarity.

See Appendix 2C Tables 23 and 26 for the definition of suspended sediment classes and their composition.

The following are examples of **naturally occurring processes** relevant for suspended sediment:

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

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Table 9 – *Escherichia coli* (*E. coli*)

Value	Human contact			
Freshwater body type	Lakes and rivers			
Attribute unit	<i>E. coli</i> /100 mL (number of <i>E. coli</i> per hundred millilitres)			
Attribute band and description	Numeric attribute state			
Description of risk of <i>Campylobacter</i> infection (based on <i>E. coli</i> indicator)	% exceedances over 540/100 mL	% exceedances over 260/100 mL	Median concentration /100 mL	95th percentile of <i>E. coli</i> /100 mL
<p>A (Blue)</p> <p>For at least half the time, the estimated risk is <1 in 1,000 (0.1% risk).</p> <p>The predicted average infection risk is 1%.</p>	<5%	<20%	≤130	≤540
<p>B (Green)</p> <p>For at least half the time, the estimated risk is <1 in 1,000 (0.1% risk).</p> <p>The predicted average infection risk is 2%.</p>	5-10%	20-30%	≤130	≤1000
<p>C (Yellow)</p> <p>For at least half the time, the estimated risk is <1 in 1,000 (0.1% risk).</p> <p>The predicted average infection risk is 3%.</p>	10-20%	20-34%	≤130	≤1200
<p>D (Orange)</p> <p>20-30% of the time the estimated risk is ≥50 in 1,000 (>5% risk).</p> <p>The predicted average infection risk is >3%.</p>	20-30%	>34%	>130	>1200
<p>E (Red)</p> <p>For more than 30% of the time the estimated risk is ≥50 in 1,000 (>5% risk).</p> <p>The predicted average infection risk is >7%.</p>	>30%	>50%	>260	>1200

Attribute state should be determined by using a minimum of 60 samples over a maximum of 5 years, collected on a regular basis regardless of weather and flow conditions. However, where a sample has been missed due to adverse weather or error, attribute state may be determined using samples over a longer timeframe.

Attribute **state band** must be determined by satisfying all **four** numeric attribute states, **or if that is not possible, according to the worst numeric attribute state.**

The predicted average infection risk is the overall average infection to swimmers based on a random exposure on a random day, ignoring any possibility of not swimming during high flows or when a surveillance advisory is in place (assuming that the *E. coli* concentration follows a lognormal distribution). Actual risk will generally be less if a person does not swim during high flows.

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Table 10 – Cyanobacteria (planktonic)

Value	Human contact
Freshwater body type	Lakes and lake fed rivers
Attribute unit	Biovolume mm ³ /L (cubic millimetres per litre)
Attribute band and description	Numeric attribute state
	80th percentile
A (Blue) Risk exposure from cyanobacteria is no different to that in natural conditions (from any contact with freshwater).	≤0.5 mm ³ /L biovolume equivalent for the combined total of all cyanobacteria
B (Green) Low risk of health effects from exposure to cyanobacteria (from any contact with freshwater).	>0.5 and ≤1.0 mm ³ /L biovolume equivalent for the combined total of all cyanobacteria
C (Yellow) Moderate risk of health effects from exposure to cyanobacteria (from any contact with freshwater).	>1.0 and ≤1.8 mm ³ /L biovolume equivalent of potentially toxic cyanobacteria OR >1.0 and ≤10 mm ³ /L total biovolume of all cyanobacteria
National bottom line	1.8 mm³/L biovolume equivalent of potentially toxic cyanobacteria OR 10 mm³/L total biovolume of all cyanobacteria
D (Orange/Red) High health risks (for example, respiratory, irritation and allergy symptoms) exist from exposure to cyanobacteria (from any contact with freshwater).	>1.8 mm ³ /L biovolume equivalent of potentially toxic cyanobacteria OR >10 mm ³ /L total biovolume of all cyanobacteria
The 80th percentile must be calculated using a minimum of 12 samples collected over 3 years. Thirty samples collected over 3 years is recommended.	

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Appendix 2B – Attributes requiring action plans

Table 11 – Submerged plants (natives)

Value (and component)	Ecosystem health (Aquatic life)
Freshwater body type	Lakes
Attribute unit	Lake Submerged Plant (Native Condition Index)
Attribute band and description	Numeric attribute state (% of maximum potential score)
<p>A</p> <p>Excellent ecological condition. Native submerged plant communities are almost completely intact.</p>	>75%
<p>B</p> <p>High ecological condition. Native submerged plant communities are largely intact.</p>	>50 and ≤75%
<p>C</p> <p>Moderate ecological condition. Native submerged plant communities are moderately impacted.</p>	≥20 and ≤50%
National bottom line	20%
<p>D</p> <p>Poor ecological condition. Native submerged plant communities are largely degraded or absent.</p>	<20%

Monitoring to be conducted at least once every three years, following the method described in Clayton J, and Edwards T. 2006. *LakeSPI: A method for monitoring ecological condition in New Zealand lakes. User Manual Version 2*. National Institute of Water & Atmospheric Research: Hamilton, New Zealand. (see clause 1.8)

Scores are reported as a percentage of maximum potential score (%) of the Native Condition Index, and lakes in a devegetated state receive scores of 0.

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Table 12 – Submerged plants (invasive species)

Value (and component)	Ecosystem health (Aquatic life)
Freshwater body type	Lakes
Attribute unit	Lake Submerged Plant (Invasive Impact Index)
Attribute band and description	Numeric attribute state (% of maximum potential score)
<p>A</p> <p>No invasive plants present in the lake. Native plant communities remain intact.</p>	0%
<p>B</p> <p>Invasive plants having only a minor impact on native vegetation. Invasive plants will be patchy in nature co-existing with native vegetation. Often major weed species not present or in early stages of invasion.</p>	>1 and ≤25%
<p>C</p> <p>Invasive plants having a moderate to high impact on native vegetation. Native plant communities likely displaced by invasive weed beds particularly in the 2 – 8 m depth range.</p>	>25 and ≤90%
National bottom line	90%
<p>D</p> <p>Tall dense weed beds exclude native vegetation and dominate entire depth range of plant growth. The species concerned are likely hornwort and Egeria.</p>	>90%

Numeric attribute state to be calculated **annually at least once every 3 years** following the method described in Clayton J, and Edwards T. 2006. *LakeSPI: A method for monitoring ecological condition in New Zealand lakes. User Manual Version 2*. National Institute of Water & Atmospheric Research: Hamilton, New Zealand. (see clause 1.8)

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Table 13 – Fish (rivers)

Value (and component)	Ecosystem health (Aquatic life)
Freshwater body type	Wadeable rivers
Attribute unit	Fish Index of Biotic Integrity (F-IBI)
Attribute band and description	Numeric attribute state (average)
<p>A</p> <p>High integrity of fish community. Habitat and migratory access have minimal degradation.</p>	≥34
<p>B</p> <p>Moderate integrity of fish community. Habitat and/or migratory access are reduced and show some signs of stress.</p>	<34 and ≥28
<p>C</p> <p>Low integrity of fish community. Habitat and/or migratory access is considerably impairing and stressing the community.</p>	<28 and ≥18
<p>D</p> <p>Severe loss of fish community integrity. There is substantial loss of habitat and/or migratory access, causing a high level of stress on the community.</p>	<18

Sampling is to occur at least annually between December and March (inclusive) following the protocols for at least one of the backpack electrofishing method, spotlighting method, or trapping method in Joy M, David B, and Lake M. 2013. *New Zealand Freshwater Fish Sampling Protocols (Part 1): Wadeable rivers and streams*. Massey University: Palmerston North, New Zealand. (see clause 1.8)

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

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Table 14 – Macroinvertebrates (1 of 2)

Value (and component)	Ecosystem health (Aquatic life)	
Freshwater body type	Wadeable rivers	
Attribute unit	Macroinvertebrate Community Index (MCI) score; Quantitative Macroinvertebrate Community Index (QMCI) score	
Attribute band and description	Numeric attribute states	
	QMCI	MCI
A Macroinvertebrate community, indicative of pristine conditions with almost no organic pollution or nutrient enrichment.	≥6.5	≥130
B Macroinvertebrate community indicative of mild organic pollution or nutrient enrichment. Largely composed of taxa sensitive to organic pollution/nutrient enrichment.	≥5.5 and <6.5	≥110 and <130
C Macroinvertebrate community indicative of moderate organic pollution or nutrient enrichment. There is a mix of taxa sensitive and insensitive to organic pollution/nutrient enrichment.	≥4.5 and <5.5	≥90 and <110
National bottom line	4.5	90
D Macroinvertebrate community indicative of severe organic pollution or nutrient enrichment. Communities are largely composed of taxa insensitive to inorganic pollution/nutrient enrichment.	<4.5	<90

MCI and QMCI scores to be determined using annual samples taken between December and March (inclusive) with either fixed counts with at least 200 individuals, or full counts, and with current state calculated as the five-year median score. All sites for which the deposited sediment attribute does not apply, whether because they are in river environment classes shown in Table 25 in Appendix 2C or because they require alternate habitat monitoring under clause 3.25 are to use soft sediment sensitivity scores and taxonomic resolution as defined in table A1.1 in Clapcott et al. 2017 *Macroinvertebrate metrics for the National Policy Statement for Freshwater Management*. Cawthron Institute: Nelson, New Zealand. (see clause 1.8)

MCI and QMCI to be assessed using the method defined in Stark JD, and Maxted, JR. 2007 *A user guide for the Macroinvertebrate Community Index*. Cawthron Institute: Nelson, New Zealand (See Clause 1.8), except for sites for which the deposited sediment attribute does not apply, which require use of the soft-sediment sensitivity scores and taxonomic resolution defined in table A1.1 in Clapcott et al. 2017 *Macroinvertebrate metrics for the National Policy Statement for Freshwater Management*. Cawthron Institute: Nelson, New Zealand. (see clause 1.8)

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Table 15 – Macroinvertebrates (2 of 2)

Value (and component)	Ecosystem health (Aquatic life)
Freshwater body type	Wadeable rivers
Attribute unit	Macroinvertebrate Average Score Per Metric (ASPM)
Attribute band and description	Numeric attribute states ASPM score
A Macroinvertebrate communities have high ecological integrity, similar to that expected in reference conditions.	≥0.6
B Macroinvertebrate communities have mild-to-moderate loss of ecological integrity.	<0.6 and ≥0.4
C Macroinvertebrate communities have moderate-to-severe loss of ecological integrity.	<0.4 and ≥0.3
National bottom line	0.3
D Macroinvertebrate communities have severe loss of ecological integrity.	<0.3

ASPM scores to be determined using annual samples taken between December and March (inclusive) with either fixed counts with at least 200 individuals, or full counts, and with current state calculated as the five-year median score. All sites for which the deposited sediment attribute does not apply, whether because they are in river environment classes shown in Table 25 in Appendix 2C or because they require alternate habitat monitoring under clause 3.25, are to use soft-sediment sensitivity scores and taxonomic resolution as defined in table A1.1 in Clapcott et al. 2017. *Macroinvertebrate metrics for the National Policy Statement for Freshwater Management*. Cawthron Institute: Nelson, New Zealand. (see clause 1.8)

When normalising scores for the ASPM, use the following minimums and maximums: %EPT-abundance (0-100), EPT-richness (0-29), MCI (0-200) using the method of Kevin J Collier (2008). Average score per metric: An alternative metric aggregation method for assessing wadeable stream health. *New Zealand Journal of Marine and Freshwater Research*, 42:4, 367-378, DOI: 10.1080/00288330809509965. (see clause 1.8)

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Table 16 – Deposited fine sediment

Value (and component)	Ecosystem health (Physical habitat)			
Freshwater body type	Wadeable rivers			
Attribute unit	% fine sediment cover			
Attribute band and description	Numeric attribute state by deposited sediment class			
	1	2	3	4
<p>A</p> <p>Minimal impact of deposited fine sediment on instream biota. Ecological communities are similar to those observed in natural reference conditions.</p>	≤7	≤10	≤9	≤13
<p>B</p> <p>Low to moderate impact of deposited fine sediment on instream biota. Abundance of sensitive macroinvertebrate species may be reduced.</p>	>7 and ≤14	>10 and ≤19	>9 and ≤18	>13 and ≤19
<p>C</p> <p>Moderate to high impact of deposited fine sediment on instream biota. Sensitive macroinvertebrate species may be lost.</p>	>14 and <21	>19 and <29	>18 and <27	>19 and <27
National bottom line	21	29	27	27
<p>D</p> <p>High impact of deposited fine sediment on instream biota. Ecological communities are significantly altered and sensitive fish and macroinvertebrate species are lost or at high risk of being lost.</p>	>21	>29	>27	>27

The indicator score is percentage cover of the streambed in a run habitat determined by the instream visual method, SAM2 as defined in p. 17-20 of Clapcott JE, Young RG, Harding JS., Matthaei CD, Quinn JM. and Death RG. 2011. *Sediment Assessment Methods: Protocols and guidelines for assessing the effects of deposited fine sediment on in-stream values*. Cawthron Institute: Nelson, New Zealand. (see clause 1.8)

The minimum record length for grading a site is the median of 60 samples taken over 5 years of monthly monitoring, or longer for sites where flow conditions only permit monthly monitoring seasonally.

See Tables 24 and 26 in Appendix 2C for deposited sediment classes and their composition.

This attribute does not apply in river environment classes shown in Table 25 in Appendix 2C, or where clause 3.25 requires freshwater habitat monitoring.

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Table 17 – Dissolved oxygen

Value (and component)	Ecosystem health (Water quality)	
Freshwater body type	Rivers	
Attribute unit	mg/L (milligrams per litre)	
Attribute description band and description	Numeric attribute state	
	7-day mean minimum	1-day minimum
A No stress caused by low dissolved oxygen on any aquatic organisms that are present at matched reference (near-pristine) sites.	≥8.0	≥7.5
B Occasional minor stress on sensitive organisms caused by short periods (a few hours each day) of lower dissolved oxygen. Risk of reduced abundance of sensitive fish and macroinvertebrate species.	≥7.0 and <8.0	≥5.0 and <7.5
C Moderate stress on a number of aquatic organisms caused by dissolved oxygen levels exceeding preference levels for periods of several hours each day. Risk of sensitive fish and macroinvertebrate species being lost.	≥5.0 and <7.0	≥4.0 and <5.0
National bottom line	5.0	4.0
D Significant, persistent stress on a range of aquatic organisms caused by dissolved oxygen exceeding tolerance levels. Likelihood of local extinctions of keystone species and loss of ecological integrity.	<5.0	<4.0

The 7-day mean minimum is the mean value of 7 consecutive daily minimum values.

The 1-day minimum is the lowest daily minimum across the whole summer period.

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Table 18 – Lake-bottom dissolved oxygen

Value (and component)	Ecosystem health (Water quality)
Freshwater body type	Lakes
Attribute unit	mg/L (milligrams per litre)
Attribute description band and description	Numeric attribute state
	Measured or estimated annual minimum
A No risk from lake-bottom dissolved oxygen of biogeochemical conditions causing nutrient release from sediments.	≥7.5
B Minimal risk from lake-bottom dissolved oxygen of biogeochemical conditions causing nutrient release from sediments.	≥2.0 and < 7.5
C Risk from lake-bottom dissolved oxygen of biogeochemical conditions causing nutrient release from sediments.	≥0.5 and < 2.0
National bottom line	0.5
D Likelihood from lake-bottom dissolved oxygen of biogeochemical conditions resulting in nutrient release from sediments.	<0.5
To be measured less than 1 metre above sediment surface at the deepest part of the lake using either continuous monitoring sensors or discrete dissolved oxygen profiles.	

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Table 19 – Mid-hypolimnetic dissolved oxygen

Value (and component)	Ecosystem health (Water quality)
Freshwater body type	Seasonally stratifying lakes
Attribute unit	mg/L (milligrams per litre)
Attribute description band and description	Numeric attribute state
	Measured or estimated annual minimum
A No stress caused to any fish species by low dissolved oxygen.	≥7.5
B Minor stress on sensitive fish seeking thermal refuge in the hypolimnion. Minor risk of reduced abundance of sensitive fish and macro-invertebrate species.	≥ 5.0 and <7.5
C Moderate stress on sensitive fish seeking thermal refuge in the hypolimnion. Risk of sensitive fish species being lost.	≥ 4.0 and <5 .0
National bottom line	4.0
D Significant stress on a range of fish species seeking thermal refuge in the hypolimnion. Likelihood of local extinctions of fish species and loss of ecological integrity.	< 4.0
To be measured using either continuous monitoring sensors or discrete dissolved oxygen profiles.	

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Table 20 – Dissolved reactive phosphorus

Value (and component)	Ecosystem health (Water quality)	
Freshwater body type	Rivers	
Attribute unit	DRP mg/L (milligrams per litre)	
Attribute band and description	Numeric attribute state	
	Median	95th percentile
<p>A</p> <p>Ecological communities and ecosystem processes are similar to those of natural reference conditions. No adverse effects attributable to dissolved reactive phosphorus (DRP) enrichment are expected.</p>	≤ 0.006	≤ 0.021
<p>B</p> <p>Ecological communities are slightly impacted by minor DRP elevation above natural reference conditions. If other conditions also favour eutrophication, sensitive ecosystems may experience additional algal and plant growth, loss of sensitive macroinvertebrate taxa, and higher respiration and decay rates.</p>	> 0.006 and ≤ 0.010	> 0.021 and ≤ 0.030
<p>C</p> <p>Ecological communities are impacted by moderate DRP elevation above natural reference conditions. If other conditions also favour eutrophication, DRP enrichment may cause increased algal and plant growth, loss of sensitive macro-invertebrate and fish taxa, and high rates of respiration and decay.</p>	> 0.010 and ≤ 0.018	> 0.030 and ≤ 0.054
<p>D</p> <p>Ecological communities impacted by substantial DRP elevation above natural reference conditions. In combination with other conditions favouring eutrophication, DRP enrichment drives excessive primary production and significant changes in macroinvertebrate and fish communities, as taxa sensitive to hypoxia are lost.</p>	>0.018	>0.054

Numeric attribute state must be derived from the median of monthly monitoring over 5 years.

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Table 21 – Ecosystem metabolism (both gross primary production and ecosystem respiration)

Value (and component)	Ecosystem health (Ecosystem processes)
Freshwater body type	Rivers
Attribute unit	g O ₂ m ⁻² d ⁻¹ (grams of dissolved oxygen per square metre per day)

Derived from at least 7 days of continuous dissolved oxygen monitoring to be collected at least once during summer (December to March inclusive), using the method of Young RG, Clapcott JE, Simon K. 2016. Ecosystem functions and stream health. *Advances in New Zealand Freshwater Science*. NZ Freshwater Sciences Society, NZ Hydrological Society. (see clause 1.8)

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Table 22 – *Escherichia coli* (*E. coli*) (primary contact sites)

Value	Human contact
Freshwater body Type	Primary contact sites in lakes and rivers (during the bathing season)
Attribute unit	95th percentile of <i>E. coli</i> /100 mL (number of <i>E. coli</i> per hundred millilitres)
Attribute band and description	Numeric attribute state
<p>Excellent</p> <p>Estimated risk of <i>Campylobacter</i> infection has a < 0.1% occurrence, 95% of the time.</p>	≤ 130
<p>Good</p> <p>Estimated risk of <i>Campylobacter</i> infection has a 0.1 – 1.0% occurrence, 95% of the time.</p>	> 130 and ≤ 260
<p>Fair</p> <p>Estimated risk of <i>Campylobacter</i> infection has a 1 – 5% occurrence, 95% of the time.</p>	> 260 and ≤ 540
National bottom line	540
<p>Poor</p> <p>Estimated risk of <i>Campylobacter</i> infection has a > 5% occurrence, at least 5% of the time.</p>	> 540
The narrative attribute state description assumes “% of time” equals “% of samples”.	

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Appendix 2C – Sediment classification tables

In this Appendix, **REC groups** refers to the classes and categories described in the New Zealand River Environment Classification User Guide (see clause 1.8), except where those REC groups are further clustered according to table 26.

Table 23 Suspended sediment class composition

Suspended sediment class	Suspended sediment clustered River Environment Classification groups
1	CD_Low_HS; WW_Low_VA; WW_Hill_VA; CD_Low_AI; CW_Hill_SS; CW_Mount_SS; CW_Hill_VA; CD_Hill_SS; CD_Hill_VA; CD_Low_VA; CW_Low_VA; CW_Mount_VA; CW_Mount_HS; CD_Mount_AI; CW_Hill_AI; CW_Mount_AI; WD_Low_AI
2	CD_Low_SS; WW_Low_HS; WW_Low_SS; WW_Hill_HS; WW_Hill_SS; WW_Low_AI; WD_Low_SS; WD_Lake_Any; WD_Low_HS; WD_Low_VA
3	CW_Hill_HS; CW_Lake_Any; CD_Lake_Any; WW_Lake_Any; CW_Low_HS; CW_Low_AI; CD_Hill_HS; CD_Hill_AI; CD_Mount_HS; CD_Mount_SS; CD_Mount_VA
4	CW_Low_SS

Table 24 – Deposited sediment class composition

Deposited sediment class	Deposited sediment clustered River Environment Classification groups
1	WD_Low_HS; WW_Lake_Any
2	CD_Hill_AI; CD_Low_HS; CD_Low_VA; WW_Low_HS; WW_Low_VA; CD_Hill_SS; CD_Lake_Any; CW_Lake_Any; CW_Low_AI; CD_Hill_HS; CW_Hill_VA; CW_Low_SS; CW_Low_VA
3	CD_Low_AI; CD_Low_SS; WW_Hill_SS; WW_Low_SS
4	CD_Hill_VA; CW_Mount_VA; WW_Hill_HS; CW_Mount_SS; CD_Mount_AI; CD_Mount_HS; CD_Mount_SS; CD_Mount_VA; CW_Hill_AI; CW_Hill_HS; CW_Hill_SS; CW_Low_HS; CW_Mount_AI; CW_Mount_HS; WW_Hill_VA

Table 25 – Clustered River Environment Classification groups that are naturally soft-bottomed

WD_Low_AI; WD_Low_VA; WD_Lake_Any; WD_Low_SS; WW_Low_AI

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Table 26 – Further clustering of River Environment Classification groups specific to this appendix

REC variable	REC groups	Clustered REC groups
Climate	Warm-Wet	Warm-Wet (WW)
	Warm-Extremely Wet	
	Warm-Dry	Warm-Dry (WD)
	Cold-Wet	Cold-Wet (CW)
	Cold-Extremely Wet	
	Cold-Dry	Cold-Dry (CD)
Topography (Source of flow)	Lowland	Lowland (Low)
	Lakefed	Lakefed (Lake)
	Hill	Hill (Hill)
	Mountain	Mountain (Mount)
	Glacial Mountain	
Geology	Soft Sedimentary	Soft Sedimentary (SS)
	Plutonic Volcanic	
	Miscellaneous	
	Hard Sedimentary	Hard Sedimentary (HS)
	Alluvium	Alluvium (AI)
	Volcanic Basic	Volcanic (VA)
	Volcanic Acidic	

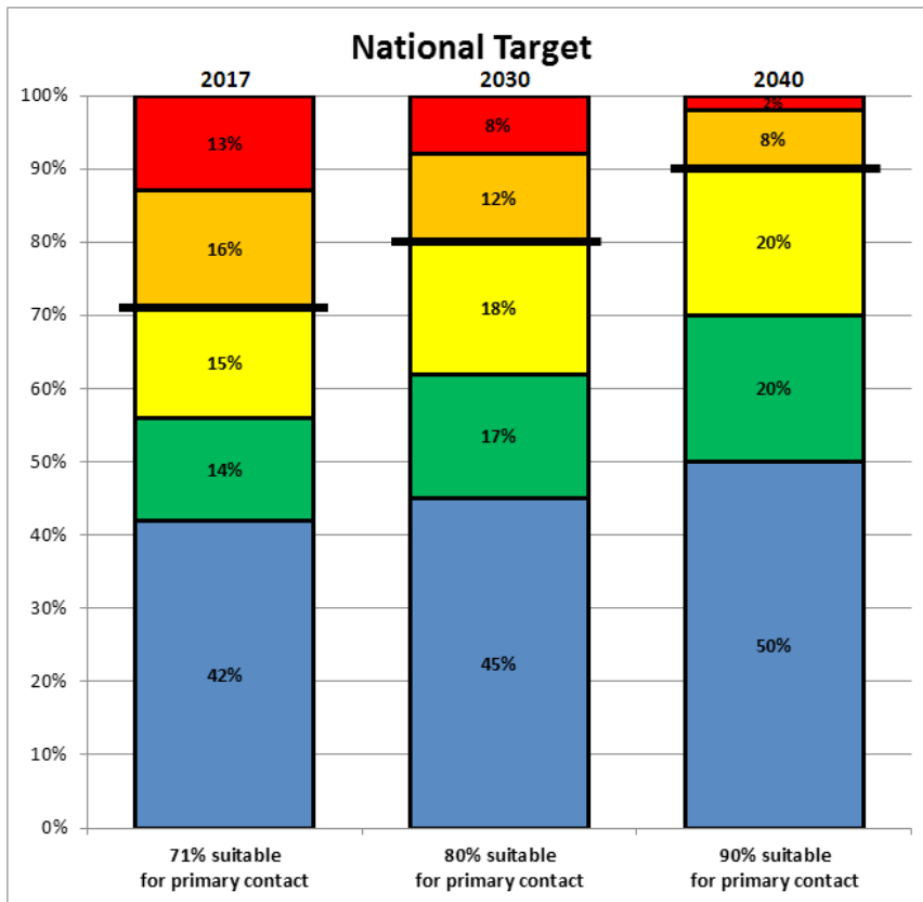
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Appendix 3 – National target for primary contact

The national target is to increase proportions of specified rivers and lakes that are suitable for primary contact (that is, that are in the blue, green and yellow categories) to at least 80% by 2030, and 90% no later than 2040, but also to improve water quality across all categories.

In this Appendix, **specified rivers and lakes** means:

- a) rivers that are fourth order or greater, using the methods outlined in the River Environment Classification System, National Institute of Water and Atmospheric Research, Version 1 (see clause 1.8); and
- b) lakes with a perimeter of 1.5 km or more.



The categories above represent combined improvements in all regions. For each region, this means reducing the length of specified rivers and lakes in the red and orange categories, and increasing the length of specified rivers and lakes in the yellow, green and blue categories.

The categories are based on water quality in terms of the 2 human contact attributes, *E. coli* and *cyanobacteria* (planktonic), in tables 9 and 10 in Appendix 2A.

For rivers and lakes, the target categories are same as the *E. coli* table attribute states. However, the categories do not include the 95th percentile of *E. coli*/100 mL numeric attribute state if there is insufficient monitoring data to establish the 95th percentile.

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For lakes, the categories are also based on the cyanobacteria (planktonic) attribute states. However, to provide additional granularity for tracking improvements over time, the D band has been split into 2 categories (orange and red) as follows:

- a) **orange** means the lake has between 1.8 and 3.0 mm³/L biovolume of cyanobacteria (planktonic), using an 80th percentile
- b) **red** means the lake has more than 3.0 mm³/L biovolume of cyanobacteria (planktonic), using an 80th percentile.

For lakes, the lowest category for either *E. coli* or cyanobacteria (planktonic) applies.

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Appendix 4 – Details for instream structures

Part 1: Required information

For all structures

- a) geographical co-ordinates of the structure
- b) date and time of survey
- c) flow when survey was completed (no flow, low, normal, high, unknown)
- d) whether the stream is tidal where structure is located (yes, no, unknown)
- e) the width of the river at the water's surface and the width of the bed of the river
- f) structure type
- g) photos viewed upstream and downstream at both ends of the structure

For all culverts

- a) number of culvert barrels
- b) culvert shape, length, width and height or diameter
- c) mean water velocity through the culvert
- d) whether low velocity recirculation zones are present (yes, no, unknown)
- e) culvert water depth
- f) culvert substrate
- g) whether wetted margins present in the culvert
- h) structure outlet drop height
- i) structure outlet undercut length (if applicable)
- j) whether add-ons present and add-on type

For all weirs

- a) weir type
- b) weir crest shape
- c) weir height
- d) weir substrate
- e) whether wetted margins present
- f) weir slope (degrees)
- g) whether add-ons present and add-on type

For all fords

- a) ford drop height
- b) ford substrate
- c) whether add-ons present and add-on type

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For all dams

- a) dam height
- b) whether spillway present
- c) whether add-ons present and add-on type

For all aprons

- a) apron drop height
- b) apron water depth
- c) apron substrate type

For all ramps

- a) ramp surface
- b) ramp length
- c) ramp slope (degrees)
- d) whether wetted margins present on the ramp

For all flap gates

- a) gate type
- b) number of flap gates on the structure
- c) whether add-ons present and add-on type

Part 2: Additional optional information

For all structures

- a) owner of the structure (NZTA, KiwiRail, Department of Conservation, regional council, territorial authority, private, other, or unknown)
- b) asset ID (if known)
- c) any fish passage observations (for example, does the structure protect desired species or their habitats)
- d) effectiveness of fish passage remediation if fish passage improvement present (for example, rock ramp, artificial ramp, fish passage)
- e) risk of structure to fish passage class (if known) (very low, low, medium, high risk, very high risk, not assessed)

For all culverts

- a) structure slope
- b) structure alignment with the stream
- c) structure material
- d) number of flap gates (if present)
- e) flap gate type and material

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For all weirs

- a) weir width
- b) backwater distance
- c) weir material

For all fords

- a) ford width
- b) ford length
- c) ford material

For all aprons

- a) apron material
- b) apron length
- c) apron water velocity

For all flap gates

- a) gate height and width
- b) gate material

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Appendix 5 – Specified vegetable growing areas

Part 1 – Description of specified vegetable growing areas

Pukekohe specified vegetable growing area:

Western boundary

From the point that the Waiuku River meets the Waiuku Stream at NZTM2000 1753472 5876259, up the Waiuku Stream to Waiuku Road to the boundary at NZTM2000 1755854 5875779.

Southern boundary

The north bank of the Waikato River, from the end of Crouch Road at NZTM2000 1756420 5868522 to the end of Bluff Road at NZTM2000 1778986 5871955.

Eastern boundary

From the arm of the Pahurehure inlet at NZTM2000 1771949 5896064, eastwards along Elliot Street until it becomes Broadway, along Clevedon Road which becomes Papakura-Clevedon Road until the point at which the national grid transmission lines cross the road at NZTM2000 1778853, 5900012. Following in a southward direction the transmission line to the Auckland Council and Waikato Regional Council regional boundary at NZTM2000 1788858, 5882363.

Northern boundary

From the mouth of the Waiuku river NZTM2000 1753472 5876259 to the north following the coastline of the Manukau Harbour to the eastern most arm of Pahurehure Inlet at NZTM2000 1771949 5896064.

Horowhenua specified vegetable growing area:

Lake Horowhenua (Hoki_1a) Water Management Subzone

Whole lake catchment above Lake Horowhenua outlet (at approx. NZTM2000 1789400 5502450). From the lake outlet, crossing Moutere Road to the north-west, and as far west as the eastern edge of the Waitarere Forest, and as far north as Waitarere Beach Road. As far east as Gladstone Road, near Gladstone Reserve, crossing Roslyn Road, Denton Road. To the south as far as Tararua Road, and crossing Kimberley Road, Buller Road, Hokio Sand Road, then north to Lake Horowhenua outlet.

Hoki (Hoki_1b) Water Management Subzone

Hokio Stream catchment downstream of Lake Horowhenua outlet (approx. NZTM2000 1789400 5502450). Extending north to cross the Moutere Road, north of the bridge that crosses the Hokio Stream, and extending south to south of the landfill off Hokio Beach Road. Excluding the mainstem of the Hokio Stream from the cross-river Coastal Marine Area boundary at NZTM2000 1784949 5504086, at the western end of Muaupoko Street, and seawards.

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Part 2 – Attributes

Attributes for the purpose of clause 3.33:

- (a) phytoplankton (Appendix 2A, Table 1)
- (b) periphyton (Appendix 2A, Table 2)
- (c) total nitrogen (trophic state) (Appendix 2A, Table 3)
- (d) ammonia (toxicity) (Appendix 2A, Table 5)
- (e) nitrate (toxicity) (Appendix 2A, Table 6)
- (f) dissolved oxygen (Appendix 2A, Table 7, Appendix 2B, Tables 17, 18 and 19)
- (g) cyanobacteria (Appendix 2A, Table 10)
- (h) macroinvertebrates (Appendix 2B, Tables 14 and 15)

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Appendix 6: Principles for aquatic offsetting

These principles apply to the use of aquatic offsets for the loss of extent or values of natural inland wetlands and river beds (“extent or values” below).

1. **Adherence to effects management hierarchy:** An aquatic offset is a commitment to redress more than minor residual adverse effects and should be contemplated only after steps to avoid, minimise, and remedy adverse effects are demonstrated to have been sequentially exhausted.
2. **When aquatic offsetting is not appropriate:** Aquatic offsets are not appropriate in situations where, in terms of conservation outcomes, the extent or values cannot be offset to achieve no net loss, and preferably a net gain, in the extent and values. Examples of an offset not being appropriate would include where:
 - (a) residual adverse effects cannot be offset because of the irreplaceability or vulnerability of the extent or values affected:
 - (b) effects on extent or values are uncertain, unknown, or little understood, but potential effects are significantly adverse:
 - (c) there are no technically feasible options by which to secure gains within an acceptable timeframe.
3. **No net loss and preferably a net gain:** This is demonstrated by a like-for-like quantitative loss/gain calculation, and is achieved when the extent or values gained at the offset site (measured by type, amount and condition) are equivalent to or exceed those being lost at the impact site.
4. **Additionality:** An aquatic offset achieves gains in extent or values above and beyond gains that would have occurred in the absence of the offset, such as gains that are additional to any minimisation and remediation undertaken in relation to the adverse effects of the activity.
5. **Leakage:** Aquatic offset design and implementation avoids displacing harm to other locations (including harm to existing biodiversity at the offset site).
6. **Landscape context:** An aquatic offset action is undertaken where this will result in the best ecological outcome, preferably close to the impact site or within the same ecological district. The action considers the landscape context of both the impact site and the offset site, taking into account interactions between species, habitats and ecosystems, spatial and hydrological connections, and ecosystem function.
7. **Long-term outcomes:** An aquatic offset is managed to secure outcomes of the activity that last at least as long as the impacts, and preferably in perpetuity. Consideration must be given to long-term issues around funding, location, management and monitoring.
8. **Time lags:** The delay between loss of extent or values at the impact site and the gain of extent or values at the offset site is minimised so that the calculated gains are achieved within the consent period consent period or, as appropriate, a longer period (but not more than 35 years).
9. **Science and mātauranga Māori:** The design and implementation of an aquatic offset is a documented process informed by science and mātauranga Māori, where available.
10. **Stakeholder participation:** Opportunity for the effective and early participation of stakeholders is demonstrated when planning aquatic offsets, including their evaluation, selection, design, implementation, and monitoring.

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11. Transparency: The design and implementation of an aquatic offset, and communication of its results to the public, is undertaken in a transparent and timely manner.

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Appendix 7: Principles for aquatic compensation

These principles apply to the use of aquatic compensation for the loss of extent or values of natural inland wetlands and river beds (“extent or values” below).

1. **Adherence to effects management hierarchy:** Aquatic compensation is a commitment to redress more than minor residual adverse impacts, and should be contemplated only after steps to avoid, minimise, remedy, and offset adverse effects are demonstrated to have been sequentially exhausted.
2. **When aquatic compensation is not appropriate:** Aquatic compensation is not appropriate where, in terms of conservation outcomes, the extent or values are not able to be compensated for. Examples of aquatic compensation not being appropriate would include where:
 - (a) the affected part of the natural inland wetland or river bed, or its values, including species, are irreplaceable or vulnerable; or
 - (a) effects on the extent or values are uncertain, unknown, or little understood, but potential effects are significantly adverse; or
 - (b) there are no technically feasible options by which to secure proposed no net loss and preferably a net gain outcome within an acceptable timeframe.
3. **Scale of aquatic compensation:** The extent or values to be lost through the activity to which the aquatic compensation applies are addressed by positive effects that outweigh the adverse effects.
4. **Additionality:** Aquatic compensation achieves gains in extent or values above and beyond gains that would have occurred in the absence of the compensation, such as gains that are additional to any minimisation and remediation or offsetting undertaken in relation to the adverse effects of the activity.
5. **Leakage:** Aquatic compensation design and implementation avoids displacing harmful activities or environmental factors to other locations (including harm to existing biodiversity at the compensation site).
6. **Landscape context:** An aquatic compensation action is undertaken where this will result in the best ecological outcome, preferably close to the impact site or within the same ecological district. The action considers the context of both the impact site and the compensation site, taking into account interactions between species, habitats and ecosystems, spatial and hydrological connections, and ecosystem function.
7. **Long-term outcomes:** Aquatic compensation is managed to secure outcomes of the activity that last as long as the impacts, and preferably in perpetuity. Consideration must be given to long-term issues around funding, location, management, and monitoring.
8. **Time lags:** The delay between loss of extent or values at the impact site and the gain or maturity of the extent or values at the compensation site is minimised so that the calculated gains are achieved within the consent period or, as appropriate, a longer period (but not more than 35 years).
9. **Trading up:** When trading up forms part of aquatic compensation, the proposal demonstrates that the aquatic extent or values gained are demonstrably of greater or higher value than those lost. The proposal also shows the values lost are not to Threatened or At Risk species or to species considered vulnerable or irreplaceable.

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- 10. Financial contribution:** A financial contribution is only considered if it directly funds an intended aquatic gain or benefit that complies with the rest of these principles.
- 11. Science and mātauranga Māori:** The design and implementation of aquatic compensation is a documented process informed by science and mātauranga Māori, where available.
- 12. Stakeholder participation:** Opportunity for the effective and early participation of stakeholders is demonstrated when planning for aquatic compensation, including its evaluation, selection, design, implementation, and monitoring.
- 13. Transparency:** The design and implementation of aquatic compensation, and communication of its results to the public, is undertaken in a transparent and timely manner.



Ministry for the
Environment
Manatū Mō Te Taiao

New Zealand Government

Exposure draft of changes to the National Environmental Standards for Freshwater 2020

This is one of two documents that set out the proposed drafting of 2022 amendments to the *Essential Freshwater* package. This document shows changes to the **Resource Management (National Environmental Standards for Freshwater) Regulations 2020 (NES-F)**.

Reading this document

This document sets out, in draft, proposed amendments to the Resource Management (National Environmental Standards for Freshwater) Regulations 2020 (NES-F) for consultation. These proposals fall into two categories:

- amendments to wetlands provisions
- technical amendments or clarifications to other provisions.

We are now providing an opportunity for people to make submissions on the draft proposals.

Amendments to the wetland provisions

These changes are highlighted in **blue** in this document and were developed in response to feedback on the managing our wetlands consultation process, which occurred throughout September and October 2021.

For background and further detail refer to [Managing our Wetlands: Policy rationale for exposure draft amendments 2022](#).

Amendments to other provisions

These changes are highlighted in **yellow** in this document. Since the NES-F was gazetted in August 2020, officials have maintained a record of technical issues and provisions that could require clarification. These changes aim to improve clarity, reduce complexity of drafting, and in some cases correct errors, without changing policy intent.

[Exposure Draft – For Consultation Purposes Only]

**Version
as at 1 May 2022**



**Resource Management (National Environmental
Standards for Freshwater) Regulations 2020**
(LI 2020/174)

Patsy Reddy, Governor-General

Order in Council

At Wellington this 3rd day of August 2020

Present:

The Right Hon Jacinda Ardern presiding in Council

These regulations are made under section 43 of the Resource Management Act 1991—

- (a) on the advice and with the consent of the Executive Council; and
- (b) on the recommendation of the Minister for the Environment made in accordance with section 44 of that Act.

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Note

The Parliamentary Counsel Office has made editorial and format changes to this version using the powers under subpart 2 of Part 3 of the Legislation Act 2019.

Note 4 at the end of this version provides a list of the amendments included in it.

These regulations are administered by the Ministry for the Environment.

[Exposure Draft – For Consultation Purposes Only]

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Standards for Freshwater) Regulations 2020**Version as at
1 May 2022**Part 1
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Version as at
1 May 2022

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**Resource Management (National Environmental
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Regulations

1 Title

These regulations are the Resource Management (National Environmental Standards for Freshwater) Regulations 2020.

2 Commencement

- (1) These regulations come into force on 3 September 2020.
- (2) However,—
 - (a) regulations 28 to 31 (temporary standards for intensification of intensive winter grazing) come into force on 1 May 2021:
 - (b) regulations 12 to 14 (stockholding areas other than feedlots) and subpart 4 of Part 2 (application of synthetic nitrogen fertiliser to pastoral land) come into force on 1 July 2021:
 - (c) regulations 26 and 27 (general standards for intensive winter grazing) come into force on 1 November 2022.

Regulation 2(2)(a): replaced, on 30 April 2021, by regulation 4(1) of the Resource Management (National Environmental Standards for Freshwater) Amendment Regulations 2021 (LI 2021/77).

Regulation 2(2)(c): inserted, on 30 April 2021, by regulation 4(2) of the Resource Management (National Environmental Standards for Freshwater) Amendment Regulations 2021 (LI 2021/77).

Regulation 2(2)(c): amended, on 1 May 2022, by regulation 4 of the Resource Management (National Environmental Standards for Freshwater) Amendment Regulations 2022 (SL 2022/119).

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Part 1

Preliminary provisions

3 Interpretation

In these regulations, unless the context otherwise requires,—

Act means the Resource Management Act 1991

annual forage crop means a crop that is grazed in the place where it is grown, but does not include—

- (a) pasture; or
- (b) a crop that is grown for arable land use or horticultural land use (as those terms are defined in section 217B of the Act)

apron means a hard (generally concrete) surface layer constructed at the entrance or outlet of a structure to protect the structure from erosion

arable land use has the meaning given by section 217B of the Act

bed substrate means the material that makes up the bed of any river or connected area (for example, sand, silt, gravel, cobbles, boulders, or bedrock)

biosecurity has the meaning given by the National Policy Statement for Freshwater Management

certified freshwater farm plan has the meaning given by section 217B of the Act

certifier has the meaning given by section 217B of the Act

cleanfill area has the meaning given by the National Planning Standards 2019

critical source area means a landscape feature such as a gully, swale, or depression that—

- (a) accumulates runoff from adjacent land; and
- (b) delivers, or has the potential to deliver, 1 or more contaminants to 1 or more rivers, lakes, wetlands, or drains, or their beds (regardless of whether there is any water in them at the time)

culvert means a pipe, box structure, or covered or arched channel that has an inlet and outlet that is in, and that connects the water or bed of, the same river or connected area

dairy cattle—

- (a) means cattle farmed for producing milk; and
- (b) includes—
 - (i) any bull on the farm whose purpose is mating with those cattle; and
 - (ii) unweaned calves of those cattle; but
- (c) does not include dairy support cattle

dairy farm land means land on a farm that is used for grazing dairy cattle

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dairy support cattle means cattle that—

- (a) are farmed for producing milk, but are not being milked (for example, because they are heifers or have been dried off); and
- (b) are grazed on land that is not grazed by dairy cattle

dairy support land means land on a farm that is used for grazing dairy support cattle

dam, in subpart 3 of Part 3 (passage of fish affected by structures), means a structure—

- (a) whose purpose is to impound water behind a wall across the full width of any river or connected area; and
- (b) that is not a weir

distribution network—

- (a) means lines and associated equipment that are used for conveying electricity and are operated by a business engaged in the distribution of electricity; but
- (b) does not include lines and associated equipment that are part of the national grid

drain—

- (a) has the meaning given by the National Planning Standards 2019; but
- (b) in regulation 26, excludes any subsurface drain

earthworks has the meaning given by the National Planning Standards 2019

ecosystem health has the meaning given by the National Policy Statement for Freshwater Management

farm means a landholding whose activities include agriculture

feedlot means a stockholding area where cattle—

- (a) are kept for at least 80 days in any 6-month period; and
- (b) are fed exclusively by hand or machine

flap gate means a hinged gate that controls fluctuations in tidal or flood water, such as a tide gate or flood gate

ford means a structure that—

- (a) is artificial, shallow, and designed for crossing any river or connected area; and
- (b) is in contact with most of the width of the bed of the river or connected area

harvest operator, in relation to a harvest of sphagnum moss, means the person who is responsible for the organisation and operation of the harvest

horticultural land use has the meaning given by section 217B of the Act

hydro-electricity infrastructure means infrastructure for generating hydro-electricity that is to be transmitted through the national grid or a distribution network

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hydrological regime means the characteristic changes in hydrological variables over time, including changes to water levels, water flows, and discharges of water

~~**improved pasture** has the meaning given by the National Policy Statement for Freshwater Management~~

intensive winter grazing—

- (a) means the grazing of livestock on an annual forage crop at any time in the period that begins on 1 May and ends with the close of 30 September of the same year; and
- (b) for the purpose of determining whether and how section 20A(2) of the Act applies to any requirement to obtain a resource consent under subpart 3 of Part 2 of these regulations, includes activities on a farm that support intensive winter grazing and may occur year-round, such as the preparation and sowing of land for grazing and the cultivation of annual forage crops

irrigation means the activity of applying water to land by means of a constructed system for the purpose of assisting production of vegetation or stock on that land

land disturbance has the meaning given by the National Planning Standards 2019

~~**landfill** has the meaning given by the National Planning Standards 2019~~

landholding means 1 or more parcels of land (whether or not they are contiguous) that are managed as a single operation

Māori freshwater values has the meaning given by the National Policy Statement for Freshwater Management

national grid has the meaning given by regulation 3(1) of the Resource Management (National Environmental Standards for Electricity Transmission Activities) Regulations 2009

National Planning Standards 2019 means the National Planning Standards whose approval under section 58E of the Act was notified on 5 April 2019 (as amended or replaced from time to time)

National Policy Statement for Freshwater Management means the National Policy Statement for Freshwater Management whose approval under section 52 of the Act was notified in August 2020 (as amended or replaced from time to time)

~~**natural inland wetland** has the meaning given by the National Policy Statement for Freshwater Management~~

natural wetland has the meaning given by the National Policy Statement for Freshwater Management

non-passive flap gate means a flap gate whose opening and closing is controlled by an automated and powered system (for example, electric or hydraulic) when the water reaches certain levels

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other infrastructure means infrastructure, other than specified infrastructure, that was lawfully established before, and in place at, the close of 2 September 2020

passive flap gate means a flap gate whose opening or closing—

- (a) is caused by a positive head differential on the upstream or downstream side, respectively; and
- (b) is not controlled by an automated and powered system (for example, electric or hydraulic) when the water reaches certain levels

pastoral land use has the meaning given by section 217B of the Act

pest has the meaning given by section 2(1) of the Biosecurity Act 1993

plantation forestry has the meaning given by regulation 3(1) of the Resource Management (National Environmental Standards for Plantation Forestry) Regulations 2017

pugging means the penetration of soil to a depth of 5 cm or more by the hooves of grazing livestock

reclamation has the meaning given by the National Planning Standards 2019

reference period means the period that started on 1 July 2014 and ended with the close of 30 June 2019

restoration has the meaning given by the National Policy Statement for Freshwater Management

river or connected area means—

- (a) a river; or
- (b) any part of the coastal marine area that is upstream from the mouth of a river

sacrifice paddock means an area on which—

- (a) cattle are repeatedly, but temporarily, contained (typically during extended periods of wet weather); and
- (b) the resulting damage caused to the soil by pugging is so severe as to require resowing with pasture species

sediment control measures means measures or structures that do 1 or more of the following:

- (a) stop sediment from being washed away from its source;
- (b) slow or stop water with sediment in it so that the sediment drops out of suspension before the water reaches a water body;
- (c) divert the flow of water so that it does not become contaminated with sediment

setback, in relation to an activity in the vicinity of a natural wetland, means the distance measured horizontally from the boundary of the natural wetland that creates a buffer within which the activity cannot take place except in accordance with these regulations

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shelter belt has the meaning given by regulation 3(1) of the Resource Management (National Environmental Standards for Plantation Forestry) Regulations 2017

specified infrastructure has the meaning given by the National Policy Statement for Freshwater Management

stockholding area—

- (a) means an area for holding cattle at a density that means pasture or other vegetative ground cover cannot be maintained (for example, feed pads, winter pads, standoff pads, and loafing pads); but
- (b) does not include an area used for pastoral purposes that is in the nature of a stockyard, milking shed, wintering barn, or sacrifice paddock

unwanted organism has the meaning given by section 2(1) of the Biosecurity Act 1993

values, in relation to a natural wetland, means the ability of the wetland to provide for any of the following:

- (a) ecosystem health:
- (b) Māori freshwater values:
- (c) hydrological functioning:
- (d) indigenous biodiversity:
- (e) amenity

vegetation clearance—

- (a) means the disturbance, damage, destruction, or removal of vegetation by any means (for example, by cutting, crushing, application of chemicals, or burning); and
- (b) includes activities that result in the disturbance, damage, destruction, or removal of vegetation (for example, over-planting, applying the seed of exotic pasture species, mob-stocking, or draining away water); but
- (c) does not include—
 - (i) the removal of sphagnum moss for the purpose of a harvest in accordance with regulation 48 or 49; or
 - (ii) the crushing of other vegetation for the purpose of maintaining the dominance of sphagnum moss, if the crushing is carried out during a harvest of sphagnum moss or to rehabilitate the moss after it is harvested; or
 - (iii) an activity described in paragraph (a) or (b) that is for the maintenance or construction of fencing for the purpose of excluding stock or marking property boundaries; or
 - (iv) an activity described in paragraph (a) or (b) that is for the maintenance of shelter belts; or
 - (v) the grazing of improved pasture within the relevant setback from a natural wetland

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weir means an open-topped structure across the full width of any river or connected area that—

- (a) alters the water level and the flow characteristics of the water; and
- (b) allows water to flow passively through or over the top

wetland maintenance has the meaning given by the National Policy Statement for Freshwater Management

wetland utility structure—

- (a) means a structure placed in or adjacent to a wetland whose purpose, in relation to the wetland, is recreation, education, conservation, restoration, or monitoring; and
- (b) for example, includes the following structures that are placed in or adjacent to a wetland for a purpose described in paragraph (a):
 - (i) jetties:
 - (ii) boardwalks and bridges connecting them:
 - (iii) walking tracks and bridges connecting them:
 - (iv) signs:
 - (v) bird-watching hides:
 - (vi) monitoring devices:
 - (vii) maimai

wetted margin, for a structure in any river or connected area, means an area that—

- (a) has shallow water that flows at low velocity; and
- (b) is at the edges of the water flow; and
- (c) is continuous over the length of the structure; and
- (d) is suitable for the passage of climbing species of fish.

Regulation 3 **annual forage crop**: replaced, on 1 May 2022, by regulation 5(1) of the Resource Management (National Environmental Standards for Freshwater) Amendment Regulations 2022 (SL 2022/119).

Regulation 3 **critical source area**: inserted, on 1 May 2022, by regulation 5(4) of the Resource Management (National Environmental Standards for Freshwater) Amendment Regulations 2022 (SL 2022/119).

Regulation 3 **drain**: replaced, on 1 May 2022, by regulation 5(2) of the Resource Management (National Environmental Standards for Freshwater) Amendment Regulations 2022 (SL 2022/119).

Regulation 3 **intensive winter grazing**: replaced, on 1 May 2022, by regulation 5(3) of the Resource Management (National Environmental Standards for Freshwater) Amendment Regulations 2022 (SL 2022/119).

Regulation 3 **pugging**: replaced, on 28 August 2020, by regulation 4 of the Resource Management (National Environmental Standards for Freshwater) Amendment Regulations 2020 (LI 2020/228).

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4 Transitional, savings, and related provisions

The transitional, savings, and related provisions (if any) set out in Schedule 1 have effect according to their terms.

5 Regulations deal with functions of regional councils

These regulations—

- (a) deal with the functions of regional councils under section 30 of the Act;
- (b) do not deal with the functions of territorial authorities under section 31 of the Act.

6 Relationship between regulations and plan rules and resource consents

- (1) A district rule, regional rule, or resource consent may be more stringent than these regulations.
- (2) A district rule, regional rule, or resource consent may be more lenient than any of regulations 70 to 74 (culverts, weirs, and passive flap gates) if the rule is made, or the resource consent is granted, for the purpose of preventing the passage of fish in order to protect particular fish species, their life stages, or their habitats.

7 Regulations are subject to Resource Management (National Environmental Standards for Plantation Forestry) Regulations 2017

These regulations are subject to the Resource Management (National Environmental Standards for Plantation Forestry) Regulations 2017.

Part 2

Standards for farming activities

8 This Part applies to farms of certain size

- (1) This Part applies only to farms on which—
 - (a) 20 ha or more is in arable land use; or
 - (b) 5 ha or more is in horticultural land use; or
 - (c) 20 ha or more is in pastoral land use; or
 - (d) 20 ha or more is in a combination of any 2 or more of the land uses described above.
- (2) However, subclause (1) does not limit the application of regulations 16 to 19 (conversions of plantation forestry to pastoral land use and conversions of land on farm to dairy farm land).

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Subpart 1—Feedlots and other stockholding areas

Feedlots

9 Permitted activities

- (1) The use of land on a farm for holding cattle in a feedlot is a permitted activity if it complies with the condition.
- (2) The following discharge of a contaminant is a permitted activity if it complies with the condition:
 - (a) the discharge is associated with the use of land on a farm for holding cattle in a feedlot; and
 - (b) the discharge is into or onto land, including in circumstances that may result in the contaminant (or any other contaminant emanating as a result of natural processes from the contaminant) entering water.

Condition

- (3) The condition is that 90% or more of the cattle held in the feedlot must—
 - (a) be no more than 4 months old; or
 - (b) weigh no more than 120 kg.

10 Discretionary activities

- (1) The use of land on a farm for holding cattle in a feedlot is a discretionary activity if it—
 - (a) does not comply with the condition in regulation 9(3); but
 - (b) complies with the conditions in subclause (3) of this regulation.
- (2) The following discharge of a contaminant is a discretionary activity if it does not comply with the condition in regulation 9(3) but complies with the conditions in subclause (3) of this regulation:
 - (a) the discharge is associated with the use of land on a farm for holding cattle in a feedlot; and
 - (b) the discharge is into or onto land, including in circumstances that may result in the contaminant (or any other contaminant emanating as a result of natural processes from the contaminant) entering water.

Conditions

- (3) The conditions are that—
 - ~~(a) the base area of the feedlot must be sealed to a minimum permeability standard of 10^{-9} m/s; and~~
 - (a) the base area of the feedlot must be sealed so that water cannot permeate at a rate greater than 10^{-9} m/s; and
 - (b) effluent expelled in the feedlot must be collected, stored, and disposed of in accordance with a rule in a regional or district plan, or a resource consent; and

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- (c) the feedlot must be at least 50 m away from any water body, any water abstraction bore, any drain, and the coastal marine area.

11 Non-complying activities

- (1) The use of land on a farm for holding cattle in a feedlot is a non-complying activity if it does not comply with—
- (a) the condition in regulation 9(3); and
 - (b) any condition in regulation 10(3).
- (2) The following discharge of a contaminant is a non-complying activity if it does not comply with the condition in regulation 9(3) and any condition in regulation 10(3):
- (a) the discharge is associated with the use of land on a farm for holding cattle in a feedlot; and
 - (b) the discharge is into or onto land, including in circumstances that may result in the contaminant (or any other contaminant emanating as a result of natural processes from the contaminant) entering water.

Stockholding areas other than feedlots

12 Permitted activities: stockholding areas for small and young cattle

- (1) The use of land on a farm for holding cattle in a stockholding area (other than a feedlot) is a permitted activity if it complies with the condition.
- (2) The following discharge of a contaminant is a permitted activity if it complies with the condition:
- (a) the discharge is associated with the use of land on a farm for holding cattle in a stockholding area (other than a feedlot); and
 - (b) the discharge is into or onto land, including in circumstances that may result in the contaminant (or any other contaminant emanating as a result of natural processes from the contaminant) entering water.

Condition

- (3) The condition is that 90% or more of the cattle held in the stockholding area must—
- (a) be no more than 4 months old; or
 - (b) weigh no more than 120 kg.

13 Permitted activities: stockholding areas for larger and older cattle

- (1) The use of land on a farm for holding cattle in a stockholding area (other than a feedlot) is a permitted activity if it—
- (a) does not comply with the condition in regulation 12(3); but
 - (b) complies with the applicable condition or conditions in subclause (3) or (4) of this regulation.

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- (2) The following discharge of a contaminant is a permitted activity if it does not comply with the condition in regulation 12(3) but complies with the applicable condition or conditions in subclause (3) or (4) of this regulation:
- (a) the discharge is associated with the use of land on a farm for holding cattle in a stockholding area (other than a feedlot); and
 - (b) the discharge is into or onto land, including in circumstances that may result in the contaminant (or any other contaminant emanating as a result of natural processes from the contaminant) entering water.

Conditions

- (3) The condition is that the holding of cattle in the stockholding area must be undertaken in accordance with the farm’s certified freshwater farm plan if—
- (a) the farm has a certified freshwater farm plan that applies to the holding of cattle in the stockholding area; and
 - (b) a certifier has certified that the adverse effects (if any) allowed for by the plan in relation to the holding of cattle in the stockholding area are no greater than those allowed for by the conditions in subclause (4).

- (4) In any other case, the conditions are that—

~~(a) the base area of the stockholding area must be sealed to a minimum permeability standard of 10^{-9} m/s; and~~

(a) the base area of the stockholding area must be sealed so that water cannot permeate at a rate greater than 10^{-9} m/s; and

- (b) effluent expelled in the stockholding area must be collected, stored, and disposed of in accordance with a rule in a regional or district plan, or a resource consent; and
- (c) the stockholding area must be at least 50 m away from any water body, any water abstraction bore, any drain, and the coastal marine area.

Enforcement officer may require information

- (5) A person undertaking a permitted activity under this regulation must provide any information reasonably required by a regional council enforcement officer for the purpose of monitoring compliance with any of the conditions in subclause (4)(a) to (c).

14 Discretionary activities: stockholding areas for larger and older cattle

- (1) The use of land on a farm for holding cattle in a stockholding area (other than a feedlot) is a discretionary activity if it does not comply with—
- (a) the condition in regulation 12(3); and
 - (b) the applicable condition, or any of the applicable conditions, in regulation 13(3) or (4).
- (2) The following discharge of a contaminant is a discretionary activity if it does not comply with the condition in regulation 12(3) and the applicable condition, or any of the applicable conditions, in regulation 13(3) or (4):

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- (a) the discharge is associated with the use of land on a farm for holding cattle in a stockholding area (other than a feedlot); and
- (b) the discharge is into or onto land, including in circumstances that may result in the contaminant (or any other contaminant emanating as a result of natural processes from the contaminant) entering water.

Subpart 2—Agricultural intensification: temporary standards

15 Application of this subpart

- (1) Except as provided in subclause (2), this subpart applies to—
 - (a) farms; and
 - (b) for the purposes of regulations 16 and 17, other landholdings in which land used for plantation forestry is being converted to pastoral land use.
- (2) This subpart does not apply to a farm or other landholding if the relevant regional council has publicly notified the amendments required by section 55(2B) of the Act to give effect to the National Policy Statement for Freshwater Management.
- (3) In subclause (2), **publicly notified the amendments** means that the proposed policy statement or plan containing the amendments has been publicly notified in accordance with clause 5 of Schedule 1 of the Act.

Regulation 15(2): replaced, on 28 August 2020, by regulation 5 of the Resource Management (National Environmental Standards for Freshwater) Amendment Regulations 2020 (LI 2020/228).

Regulation 15(3): inserted, on 28 August 2020, by regulation 5 of the Resource Management (National Environmental Standards for Freshwater) Amendment Regulations 2020 (LI 2020/228).

Conversions of plantation forestry to pastoral land use

16 Permitted activities

- (1) The conversion of land used for plantation forestry to pastoral land use is a permitted activity if it complies with the applicable condition.
- (2) The following discharge of a contaminant is a permitted activity if it complies with the applicable condition:
 - (a) the discharge is associated with the conversion of land used for plantation forestry to pastoral land use; and
 - (b) the discharge is into or onto land, including in circumstances that may result in the contaminant (or any other contaminant emanating as a result of natural processes from the contaminant) entering water.

Condition

- (3) If the land is part of a farm that included pastoral land use at the close of 2 September 2020, the condition is that, at all times, the area of the farm that is in pastoral land use must be no greater than—
 - (a) the area that was in pastoral land use at the close of 2 September 2020; plus
 - (b) 10 ha.

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- (4) In any other case, the condition is that, at all times, the area of the farm that is in pastoral land use must be no greater than 10 ha.

17 Discretionary activities

- (1) The conversion of land used for plantation forestry to pastoral land use is a discretionary activity if it does not comply with the applicable condition in regulation 16(3) or (4).
- (2) The following discharge of a contaminant is a discretionary activity if it does not comply with the applicable condition in regulation 16(3) or (4):
- (a) the discharge is associated with the conversion of land used for plantation forestry to pastoral land use; and
 - (b) the discharge is into or onto land, including in circumstances that may result in the contaminant (or any other contaminant emanating as a result of natural processes from the contaminant) entering water.
- (3) See regulation 24 (discretionary activities: conditions on granting resource consents).

Conversions of land on farm to dairy farm land

18 Permitted activities

- (1) The conversion of land on a farm to dairy farm land is a permitted activity if it complies with the applicable condition.
- (2) The following discharge of a contaminant is a permitted activity if it complies with the applicable condition:
- (a) the discharge is associated with the conversion of land on a farm to dairy farm land; and
 - (b) the discharge is into or onto land, including in circumstances that may result in the contaminant (or any other contaminant emanating as a result of natural processes from the contaminant) entering water.

Condition

- (3) If the farm included dairy farm land at the close of 2 September 2020, the condition is that, at all times, the area of the farm that is dairy farm land must be no greater than—
- (a) the area of dairy farm land at the close of 2 September 2020; plus
 - (b) 10 ha.
- (4) In any other case, the condition is that, at all times, the area of the farm that is dairy farm land must be no greater than 10 ha.

19 Discretionary activities

- (1) The conversion of land on a farm to dairy farm land is a discretionary activity if it does not comply with the applicable condition in regulation 18(3) or (4).
- (2) The following discharge of a contaminant is a discretionary activity if it does not comply with the applicable condition in regulation 18(3) or (4):

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- (a) the discharge is associated with the conversion of land on a farm to dairy farm land; and
- (b) the discharge is into or onto land, including in circumstances that may result in the contaminant (or any other contaminant emanating as a result of natural processes from the contaminant) entering water.
- (3) *See* regulation 24 (discretionary activities: conditions on granting resource consents).

Irrigation of dairy farm land

20 Permitted activities

- (1) The irrigation of a farm’s dairy farm land is a permitted activity if it complies with the applicable condition.
- (2) The following discharge of a contaminant is a permitted activity if it complies with the applicable condition:
 - (a) the discharge is associated with the irrigation of a farm’s dairy farm land; and
 - (b) the discharge is into or onto land, including in circumstances that may result in the contaminant (or any other contaminant emanating as a result of natural processes from the contaminant) entering water.

Condition

- (3) If the farm included dairy farm land that was irrigated at any time in the 12 months before the close of 2 September 2020, the condition is that, at all times, the area of the farm’s dairy farm land that is irrigated must be no greater than—
 - (a) the maximum area of the farm’s dairy farm land that was irrigated in that 12-month period; plus
 - (b) 10 ha.
- (4) In any other case, the condition is that, at all times, the area of the farm’s dairy farm land that is irrigated must be no greater than 10 ha.

21 Discretionary activities

- (1) The irrigation of a farm’s dairy farm land is a discretionary activity if it does not comply with the applicable condition in regulation 20(3) or (4).
- (2) The following discharge of a contaminant is a discretionary activity if it does not comply with the applicable condition in regulation 20(3) or (4):
 - (a) the discharge is associated with the irrigation of a farm’s dairy farm land; and
 - (b) the discharge is into or onto land, including in circumstances that may result in the contaminant (or any other contaminant emanating as a result of natural processes from the contaminant) entering water.
- (3) *See* regulation 24 (discretionary activities: conditions on granting resource consents).

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Use of land as dairy support land

22 Permitted activities

- (1) The use of land on a farm as dairy support land is a permitted activity if it complies with the conditions.
- (2) The following discharge of a contaminant is a permitted activity if it complies with the conditions:
 - (a) the discharge is associated with the use of land on a farm as dairy support land; and
 - (b) the discharge is into or onto land, including in circumstances that may result in the contaminant (or any other contaminant emanating as a result of natural processes from the contaminant) entering water.

Conditions

- (3) The conditions are that—
 - (a) land on the farm must have been used as dairy support land in the reference period; and
 - (b) at all times, the area of the farm that is used as dairy support land must be no greater than the maximum area of the farm that was used as dairy support land in the reference period.

23 Discretionary activities

- (1) The use of land on a farm as dairy support land is a discretionary activity if it does not comply with either of the conditions in regulation 22(3).
- (2) The following discharge of a contaminant is a discretionary activity if it does not comply with either of the conditions in regulation 22(3):
 - (a) the discharge is associated with the use of land on a farm as dairy support land; and
 - (b) the discharge is into or onto land, including in circumstances that may result in the contaminant (or any other contaminant emanating as a result of natural processes from the contaminant) entering water.
- (3) See regulation 24 (discretionary activities: conditions on granting resource consents).

Resource consents for discretionary activities

24 Discretionary activities: conditions on granting resource consents

- ~~(1) A resource consent for an activity that is a discretionary activity under this subpart may be granted only if the consent authority is satisfied that granting the consent will not result in an increase in—
 - ~~(a) contaminant loads in the catchment, compared with the loads as at the close of 2 September 2020; or~~
 - ~~(b) concentrations of contaminants in freshwater or other receiving environments (including the coastal marine area and geothermal water);~~~~

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~~compared with the concentrations as at the close of 2 September 2020.~~

- (1) ~~A resource consent for an activity that is a discretionary activity under this subpart must not be granted unless the consent authority is satisfied that granting the consent will not result in an increase in either of the following:~~
- ~~(a) contaminant loads in the catchment, compared with the loads as at the close of 2 September 2020;~~
 - ~~(b) concentrations of contaminants in freshwater or other receiving environments (including the coastal marine area and geothermal water), compared with the concentrations as at the close of 2 September 2020.~~

Term of resource consent

- (2) A resource consent granted for the discretionary activity must be for a term that ends before 1 January 2031.

Revocation

25 Revocation of this subpart

This subpart is revoked on 1 January 2025.

Subpart 3—Intensive winter grazing

26 Permitted activities

- (1) The use of land on a farm for intensive winter grazing is a permitted activity if it complies with the applicable condition or conditions.
- (2) The following discharge of a contaminant is a permitted activity if it complies with the applicable condition or conditions:
- (a) the discharge is associated with the use of land on a farm for intensive winter grazing; and
 - (b) the discharge is into or onto land, including in circumstances that may result in the contaminant (or any other contaminant emanating as a result of natural processes from the contaminant) entering water.

Conditions

- (3) The condition is that the intensive winter grazing must be undertaken in accordance with the farm's certified freshwater farm plan if—
- (a) the farm has a certified freshwater farm plan that applies to the intensive winter grazing; and
 - (b) a certifier has certified that the adverse effects (if any) allowed for by the plan in relation to the intensive winter grazing are no greater than those allowed for by the conditions in subclause (4).
- (4) In any other case, the conditions are that,—
- (a) at all times, the area of the farm that is used for intensive winter grazing must be no greater than 50 ha or 10% of the area of the farm, whichever is greater; and

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- (b) the slope of any land under an annual forage crop that is used for intensive winter grazing must be 10 degrees or less, determined by measuring the slope over any 20 m distance of the land; and
 - (c) *[Revoked]*
 - (d) livestock must be kept at least 5 m away from the bed of any river, lake, wetland, or drain (regardless of whether there is any water in it at the time); and
 - (e) on and from 1 May to 30 September of any year, in relation to any critical source area that is within, or adjacent to, any area of land that is used for intensive winter grazing on a farm,—
 - (i) the critical source area must not be grazed; and
 - (ii) vegetation must be maintained as ground cover over all of the critical source area; and
 - (iii) maintaining that vegetation must not include any cultivation or harvesting of annual forage crops.
 - (5) But *see* regulation 29 (permitted activities and restricted discretionary activities: temporary further conditions).

Enforcement officer may require information

- (6) A person undertaking a permitted activity under this regulation must provide any information reasonably required by a regional council enforcement officer for the purpose of monitoring compliance with this regulation.
- (7) *[Revoked]*
- (8) *[Revoked]*

Regulation 26(4)(b): replaced, on 1 May 2022, by regulation 6(1) of the Resource Management (National Environmental Standards for Freshwater) Amendment Regulations 2022 (SL 2022/119).

Regulation 26(4)(c): revoked, on 1 May 2022, by regulation 6(2) of the Resource Management (National Environmental Standards for Freshwater) Amendment Regulations 2022 (SL 2022/119).

Regulation 26(4)(e): replaced, on 1 May 2022, by regulation 6(3) of the Resource Management (National Environmental Standards for Freshwater) Amendment Regulations 2022 (SL 2022/119).

Regulation 26(6): amended, on 1 May 2022, by regulation 6(4) of the Resource Management (National Environmental Standards for Freshwater) Amendment Regulations 2022 (SL 2022/119).

Regulation 26(7) heading: revoked, on 1 May 2022, by regulation 6(5) of the Resource Management (National Environmental Standards for Freshwater) Amendment Regulations 2022 (SL 2022/119).

Regulation 26(7): revoked, on 1 May 2022, by regulation 6(5) of the Resource Management (National Environmental Standards for Freshwater) Amendment Regulations 2022 (SL 2022/119).

Regulation 26(8): revoked, on 1 May 2022, by regulation 6(5) of the Resource Management (National Environmental Standards for Freshwater) Amendment Regulations 2022 (SL 2022/119).

26A Pugging standard

- (1) A person using land on a farm for intensive winter grazing in accordance with regulation 26 must take all reasonably practicable steps to minimise adverse effects on freshwater of any pugging that occurs on that land.

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- (2) A person using land under this regulation must provide any information reasonably required by a regional council enforcement officer for the purpose of monitoring compliance with this regulation.

Regulation 26A: inserted, on 1 May 2022, by regulation 7 of the Resource Management (National Environmental Standards for Freshwater) Amendment Regulations 2022 (SL 2022/119).

26B Ground cover standard

- (1) A person using land on a farm for intensive winter grazing in accordance with regulation 26 must ensure that vegetation is established as ground cover over the whole area of that land as soon as practicable after livestock have finished grazing the land.
- (2) A person using land under this regulation must provide any information reasonably required by a regional council enforcement officer for the purpose of monitoring compliance with this regulation.

Regulation 26B: inserted, on 1 May 2022, by regulation 7 of the Resource Management (National Environmental Standards for Freshwater) Amendment Regulations 2022 (SL 2022/119).

27 Restricted discretionary activities

- (1) The use of land on a farm for intensive winter grazing is a restricted discretionary activity if the use does not comply with the applicable condition, or any of the applicable conditions, in regulation 26(3) or (4).
- (2) The following discharge of a contaminant is a restricted discretionary activity if it does not comply with the applicable condition, or any of the applicable conditions, in regulation 26(3) or (4):
- (a) the discharge is associated with the use of land on a farm for intensive winter grazing; and
 - (b) the discharge is into or onto land, including in circumstances that may result in the contaminant (or any other contaminant emanating as a result of natural processes from the contaminant) entering water.
- (3) But *see* regulation 29 (permitted activities and restricted discretionary activities: temporary further conditions).

Matters to which discretion is restricted

- (4) The discretion of a consent authority is restricted to the following matters:
- (a) the adverse effects of the activity on ecosystems, freshwater, and water bodies;
 - (b) the adverse effects of the activity on the water that affect the ability of people to come into contact with the water safely;
 - (c) the adverse effects of the activity on Māori cultural values;
 - (d) the susceptibility of the land to erosion, and the extent to which the activity may exacerbate or accelerate losses of sediment and other contaminants to water;
 - (e) the timing and appropriateness of the methods (if any) proposed to avoid, remedy, or mitigate the loss of contaminants to water.

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Intensification: temporary standards

28 When regulations 29 and 30 do not apply

- (1) Regulations 29 and 30 do not apply if the relevant regional council has publicly notified the amendments required by section 55(2B) of the Act to give effect to the National Policy Statement for Freshwater Management.
- (2) In subclause (1), **publicly notified the amendments** means that the proposed policy statement or plan containing the amendments has been publicly notified in accordance with clause 5 of Schedule 1 of the Act.

Regulation 28: replaced, on 28 August 2020, by regulation 7 of the Resource Management (National Environmental Standards for Freshwater) Amendment Regulations 2020 (LI 2020/228).

29 Permitted activities and restricted discretionary activities: temporary further conditions

- (1) To be a permitted activity, an activity described in regulation 26(1) or (2) must also comply with the conditions in subclause (3) of this regulation (in addition to the applicable condition, or applicable conditions, in regulation 26(3) or (4)).
- (2) To be a restricted discretionary activity, an activity described in regulation 27(1) or (2) must comply with the conditions in subclause (3) of this regulation.

Further conditions

- (3) The conditions are that—
 - (a) land on the farm must have been used for intensive winter grazing in the reference period; and
 - (b) at all times, the area of the farm that is used for intensive winter grazing must be no greater than the maximum area of the farm that was used for intensive winter grazing in the reference period.
- (4) To avoid doubt, the activity must comply with the conditions in subclause (3) of this regulation even if the maximum area used in the reference period was less than the applicable area under regulation 26(4)(a).

Enforcement officer may require information

- (5) A person undertaking a permitted activity under regulation 26 must provide any information reasonably required by a regional council enforcement officer for the purpose of monitoring compliance with the conditions in subclause (3) of this regulation.

How this regulation applies until regulations 26 and 27 come into force

- (6) Until regulations 26 and 27 come into force, this regulation applies as follows:
 - (a) despite subclause (1) of this regulation, an activity described in regulation 26(1) or (2)—
 - (i) must comply with the conditions in subclause (3) of this regulation to be a permitted activity; but

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- (ii) does not need to comply with the applicable condition, or applicable conditions, in regulation 26(3) or (4) to be a permitted activity; and
- (b) subclauses (2) and (4) of this regulation have no effect; and
- (c) subclause (5) of this regulation applies as if it referred to a person undertaking a permitted activity under this regulation (rather than under regulation 26).
- (7) This subclause, subclause (6), and the heading above subclause (6) are revoked on 1 November 2022.

Regulation 29(6) heading: inserted, on 30 April 2021, by regulation 5 of the Resource Management (National Environmental Standards for Freshwater) Amendment Regulations 2021 (LI 2021/77).

Regulation 29(6): inserted, on 30 April 2021, by regulation 5 of the Resource Management (National Environmental Standards for Freshwater) Amendment Regulations 2021 (LI 2021/77).

Regulation 29(7): inserted, on 30 April 2021, by regulation 5 of the Resource Management (National Environmental Standards for Freshwater) Amendment Regulations 2021 (LI 2021/77).

Regulation 29(7): amended, on 1 May 2022, by regulation 8 of the Resource Management (National Environmental Standards for Freshwater) Amendment Regulations 2022 (SL 2022/119).

30 Discretionary activities

- (1) The use of land on a farm for intensive winter grazing is a discretionary activity if it does not comply with either of the conditions in regulation 29(3).
- (2) The following discharge of a contaminant is a discretionary activity if it does not comply with either of the conditions in regulation 29(3):
- (a) the discharge is associated with the use of land on a farm for intensive winter grazing; and
- (b) the discharge is into or onto land, including in circumstances that may result in the contaminant (or any other contaminant emanating as a result of natural processes from the contaminant) entering water.

Conditions on granting resource consent

- (3) A resource consent for the discretionary activity may be granted only if the consent authority is satisfied that granting the consent will not result in an increase in—
- (a) contaminant loads in the catchment, compared with the loads as at the close of 2 September 2020; or
- (b) concentrations of contaminants in freshwater or other receiving environments (including the coastal marine area and geothermal water), compared with the concentrations as at the close of 2 September 2020.

Term of resource consent

- (4) A resource consent granted for the discretionary activity must be for a term that ends before 1 January 2031.

31 Revocations

The following are revoked on 1 January 2025:

- (a) regulation 26(5):

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- (b) regulation 27(3):
- (c) the cross-heading above regulation 28:
- (d) regulations 28 to 30:
- (e) this regulation.

Subpart 4—Application of synthetic nitrogen fertiliser to pastoral land

32 Interpretation of this subpart

In this subpart,—

contiguous landholding means each area of 1 or more contiguous parcels of land within a farm

Example

A farm is managed as a single operation on 50 ha of land, comprising 2 parts: 20 ha of contiguous parcels and a separate 30 ha of contiguous parcels. Each of those parts is a contiguous landholding.

nitrogen cap, for the land in pastoral land use in a contiguous landholding, means the application of nitrogen at a rate of no more than 190 kg/ha/year—

- (a) to all of that land, as averaged over that land; and
- (b) to each hectare of that land that is not used to grow annual forage crops

pastoral land use does not include the use of land for the grazing of livestock on the stubble of a crop that has been harvested after arable land use

synthetic nitrogen fertiliser—

- (a) means any substance (whether solid or liquid) that—
 - (i) is more than 5% nitrogen by weight; and
 - (ii) is applied to any plant or soil as a source of nitrogen nutrition for plants; and
- (b) includes any manufactured urea, diammonium phosphate, or sulphate of ammonia to which paragraph (a) applies; but
- (c) does not include a compost, soil treatment, or fertiliser that—
 - (i) is wholly derived from plant or animal waste or residue; and
 - (ii) is minimally processed (for example, by being composted, mixed, dried, and pelleted).

33 Permitted activity

- (1) The following discharge of synthetic nitrogen fertiliser is a permitted activity if it complies with the condition:
 - (a) the discharge is for the purpose of applying nitrogen to land in pastoral land use; and

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- (b) the discharge is into the air, or into or onto land, including in circumstances that may result in the synthetic nitrogen fertiliser (or any other contaminant emanating as a result of natural processes from the fertiliser) entering water.

Condition

- (2) The condition is that the application of nitrogen, as a component of the synthetic nitrogen fertiliser, to the land in pastoral land use in a contiguous landholding must not exceed the nitrogen cap.

34 Non-complying activity

- (1) The following discharge of synthetic nitrogen fertiliser is a non-complying activity if it does not comply with the condition in regulation 33(2):
 - (a) the discharge is for the purpose of applying nitrogen to land in pastoral land use; and
 - (b) the discharge is into the air, or into or onto land, including in circumstances that may result in the synthetic nitrogen fertiliser (or any other contaminant emanating as a result of natural processes from the fertiliser) entering water.

Requirements for granting resource consent

- (2) A resource consent may be granted for the non-complying activity only if (in addition to section 104D of the Act being satisfied)—
 - (a) the applicant provides the consent authority with a report by a suitably qualified and experienced practitioner that—
 - (i) sets out good practices for applying synthetic nitrogen fertiliser to the land in pastoral land use in each relevant contiguous landholding; and
 - (ii) states that granting the consent would not result in the rate at which nitrogen may enter water exceeding the baseline rate for each contiguous landholding; and
 - (b) the consent authority is satisfied as to the matters in the practitioner’s report.

Conditions required in resource consent

- (3) A resource consent granted for a non-complying activity under subclause (2) must impose conditions requiring its holder to—
 - (a) ensure that the rate at which nitrogen may enter water as a result of their application of synthetic nitrogen fertiliser to the land in pastoral land use in a contiguous landholding does not exceed the baseline rate for that contiguous landholding; and
 - (b) report their use of synthetic nitrogen fertiliser to the consent authority each year.

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Term of resource consent

- (4) A resource consent granted for a non-complying activity under subclause (2) must be for a term of no more than 5 years.

Meaning of baseline rate

- (5) In this regulation, **baseline rate** means the rate at which nitrogen may enter water if—
- (a) nitrogen, as a component of the synthetic nitrogen fertiliser, were applied to the land in pastoral land use in a contiguous landholding at the highest rate that does not exceed the nitrogen cap; and
 - (b) the synthetic nitrogen fertiliser were applied to the land in pastoral land use in the contiguous landholding using the good practices set out in the practitioner’s report.

Alternative requirement for granting resource consent

- (6) As an alternative to subclause (2), a resource consent may be granted for the non-complying activity if (in addition to section 104D of the Act being satisfied) the consent authority is satisfied that the applicant has provided it with a synthetic nitrogen reduction plan.
- (7) A **synthetic nitrogen reduction plan** must demonstrate how the applicant will reduce their use of synthetic nitrogen fertiliser (year by year) so that, on and from 1 July 2023, their application of nitrogen, as a component of the fertiliser, to the land in pastoral land use in each relevant contiguous landholding does not exceed the nitrogen cap.

Conditions required in resource consent

- (8) A resource consent granted for a non-complying activity under subclause (6) must impose conditions requiring its holder to—
- (a) comply with their synthetic nitrogen reduction plan; and
 - (b) report their use of synthetic nitrogen fertiliser to the consent authority each year.

Term of resource consent

- (9) A resource consent granted for a non-complying activity under subclause (6) must be for a term that ends before 1 July 2023.

Revocation of alternative

- (10) Subclauses (6) to (10), and the headings above those subclauses, are revoked on 1 July 2023.

35 Compliance with regional rules

To avoid doubt, a discharge to which regulation 33(1) or 34(1) applies must comply with any applicable regional rule that relates to the discharge of nitrogen or its compounds (including synthetic nitrogen fertiliser) for agricultural purposes.

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36 Operating dairy farm: monitoring and information required

A person who is responsible for operating a contiguous landholding that includes any dairy farm land must provide to the relevant regional council, no later than 31 July of each year, the following information relating to the previous 12-month period ending on 30 June of that year:

- (a) the area of land in pastoral land use in the contiguous landholding and, within that land, the areas of the following (all in hectares):
 - (i) the land used to grow annual forage crops:
 - (ii) the other land:
- (b) the area of land in other uses in the contiguous landholding (in hectares):
- (c) the receipts for the synthetic nitrogen fertiliser purchased for the contiguous landholding:
- (d) the types of synthetic nitrogen fertiliser applied to the contiguous landholding and, for each type, the percentage of the nitrogen component by weight:
- (e) the rate at which each type of synthetic nitrogen fertiliser was applied (in kg/ha/year)—
 - (i) to the land in pastoral land use in the contiguous landholding and, within that land, to—
 - (A) the land used to grow annual forage crops:
 - (B) the other land:
 - (ii) to the land in other uses in the contiguous landholding:
- (f) the dates on which the synthetic nitrogen fertiliser was applied.

Part 3

Standards for other activities that relate to freshwater

Subpart 1—Natural wetlands

37 When this subpart does not apply

This subpart does not apply to the customary harvest of food or resources undertaken in accordance with tikanga Māori.

*Restoration, **wetland maintenance, and biosecurity** of natural wetlands*

38 Permitted activities

- (1) Vegetation clearance within, or within a 10 m setback from, a natural wetland is a permitted activity if it—
 - (a) is for the purpose of natural wetland restoration, **wetland maintenance, or biosecurity**; and

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- (b) complies with the conditions.
- (2) Earthworks or land disturbance within, or within a 10 m setback from, a natural wetland is a permitted activity if it—
 - (a) is for the purpose of natural wetland restoration, wetland maintenance, or biosecurity; and
 - (b) complies with the conditions.

~~(3) The taking, use, damming, diversion, or discharge of water within, or within a 100 m setback from, a natural wetland is a permitted activity if it—~~
~~(a) is for the purpose of natural wetland restoration; and~~
~~(b) complies with the conditions.~~

(3) The taking, use, damming, diversion, or discharge of water within, or within a 100 m setback from, a natural wetland is a permitted activity if it—
(a) is for the purpose of natural wetland restoration, wetland maintenance, or biosecurity; and
(b) complies with the conditions.

Conditions

- (4) The conditions are that—
 - (a) the activity must comply with the general conditions on natural wetland activities in regulation 55; and
 - (b) if the activity is vegetation clearance, earthworks, or land disturbance, the activity must not occur overaffect more than 500 m² or 10% of the area of the natural wetland, whichever is smaller.

(c) if the activity is a discharge of water, it must not be a restricted discretionary activity as described in regulation 39(3A).

~~(5) However, the condition in subclause (4)(b) does not apply if the earthworks or land disturbance is for planting.~~

(5) However,—

(a) the condition in subclause (4)(b) does not apply if the earthworks or land disturbance is for planting for restoration or wetland maintenance purposes; and

(b) the condition in subclause (4)(b) does not apply if the clearance of vegetation, the earthworks, or the land disturbance is for clearance,—

(i) for biosecurity purposes, of non-indigenous vegetation; or

(ii) that is demonstrably necessary for biosecurity purposes, of indigenous vegetation; or

(+)(iii) using hand-held tools, for restoration or wetland maintenance, of non-indigenous vegetation; and

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(c) the area limit in the condition in subclause (4)(b) does not apply to the clearance of non-indigenous vegetation (other than clearance to which paragraph (b)(iii) of this subclause applies) for restoration or wetland maintenance in accordance with a restoration plan provided to the council at least 10 working days before the clearance begins.

(6) The restoration plan referred to in subclause (5)(c) must—

(a) assess any restoration or wetland maintenance activities against the relevant general conditions in regulation 55; and

(b) address the matters in Schedule 2 that are relevant to the activity proposed.

39 Restricted discretionary activities

(1) Vegetation clearance within, or within a 10 m setback from, a natural wetland is a restricted discretionary activity if it—

(a) is for the purpose of natural wetland restoration, wetland maintenance, or biosecurity; and

(b) does not comply with either of the conditions in regulation 38(4).

(2) Earthworks or land disturbance within, or within a 10 m setback from, a natural wetland is a restricted discretionary activity if it—

(a) is for the purpose of natural wetland restoration, wetland maintenance, or biosecurity; and

(b) does not comply with either of the conditions in regulation 38(4).

(3) The taking, use, damming, diversion, or discharge or diversion of water within, or within a 100 m setback from, a natural wetland is a restricted discretionary activity if it—

(a) is for the purpose of natural wetland restoration; and

(b) does not comply with the condition in regulation 38(4)(a).

(3A) The discharge of water within, or within a 100 m setback from, a natural wetland is a restricted discretionary activity if—

(a) it is for the purpose of natural wetland restoration, wetland maintenance, or biosecurity; and

(b) there is a hydrological connection between the discharge and a natural wetland; and

(c) there are likely to be adverse effects from the discharge on the hydrological functioning or the habitat or the biodiversity values of a natural wetland; and

(d) it does not comply with the condition in regulation 38(4)(a).

Matters to which discretion restricted

(4) The discretion of a consent authority is restricted to the matters set out in regulation 56.

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Requirement when applying for resource consent

- (5) An application for a resource consent for the restricted discretionary activity must include a restoration plan that includes the information set out in Schedule 2.

Condition required in resource consent

- (6) A resource consent granted for the restricted discretionary activity must impose a condition that requires compliance with the restoration plan.

Regulation 39(3): replaced, on 28 August 2020, by regulation 8 of the Resource Management (National Environmental Standards for Freshwater) Amendment Regulations 2020 (LI 2020/228).

Scientific research

40 Permitted activities

- (1) Vegetation clearance within, or within a 10 m setback from, a natural wetland is a permitted activity if it—
- (a) is for the purpose of scientific research; and
 - (b) complies with the conditions.
- (2) Earthworks or land disturbance within, or within a 10 m setback from, a natural wetland is a permitted activity if it—
- (a) is for the purpose of scientific research; and
 - (b) complies with the conditions.
- (3) The taking, use, damming, diversion, or discharge of water within, or within a 100 m setback from, a natural wetland is a permitted activity if it—
- (a) is for the purpose of scientific research; and
 - (b) complies with the conditions.

Conditions

- (4) The conditions are that—
- (a) the activity must comply with the general conditions on natural wetland activities in regulation 55; and
 - (b) the activity must not result in the formation of new pathways, boardwalks, or other accessways; and
 - (c) if the activity is vegetation clearance, earthworks, or land disturbance, the activity must not—
 - (i) occur over a single area within the natural wetland that is more than 10 m²; or
 - (ii) occur over a total area within the natural wetland that is more than 100 m².

(d) if the activity is a discharge of water, it must not be a restricted discretionary activity as described in regulation 41(3A).

- (5) However, the conditions in subclause (4)(c) do not apply if the earthworks or land disturbance is for planting.

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Regulation 40(3): amended, on 28 August 2020, by regulation 9 of the Resource Management (National Environmental Standards for Freshwater) Amendment Regulations 2020 (LI 2020/228).

41 Restricted discretionary activities

- (1) Vegetation clearance within, or within a 10 m setback from, a natural wetland is a restricted discretionary activity if it—
 - (a) is for the purpose of scientific research; and
 - (b) does not comply with any of the conditions in regulation 40(4).
- (2) Earthworks or land disturbance within, or within a 10 m setback from, a natural wetland is a restricted discretionary activity if it—
 - (a) is for the purpose of scientific research; and
 - (b) does not comply with any of the conditions in regulation 40(4).
- (3) The taking, use, damming, ~~diversion, or discharge or diversion~~ of water within, or within a 100 m setback from, a natural wetland is a restricted discretionary activity if it—
 - (a) is for the purpose of scientific research; and
 - (b) does not comply with any of the conditions in regulation 40(4), but does comply with the conditions in subclause (4) of this regulation.

~~(3A) The discharge of water within, or within a 100 m setback from, a natural wetland is a restricted discretionary activity if—~~

- ~~(a) it is for the purpose of scientific research; and~~
- ~~(b) there is a hydrological connection between the discharge and a natural wetland; and~~
- ~~(c) there are likely to be adverse effects from the discharge on the hydrological functioning or the habitat or the biodiversity values of a natural wetland; and~~
- ~~(d) it does not comply with the condition in regulation 40(4)(a), but does comply with the conditions in subclause (4) of this regulation.~~

Conditions

- (4) The conditions are that—
 - (a) the activity must be undertaken only for as long as necessary to achieve its purpose; and
 - (b) before the activity starts, a record must be made (for example, by taking photographs) of the original condition of the natural wetland's bed profile and hydrological regime that is sufficiently detailed to enable compliance with paragraph (c) to be verified; and
 - (c) the bed profile and hydrological regime of the natural wetland must be returned to their original condition no later than 30 days after the start of the activity.
- (5) However, the condition in subclause (4)(c) does not apply to any part of the bed that is in direct contact with scientific research equipment.

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Matters to which discretion restricted

- (6) The discretion of a consent authority is restricted to the matters set out in regulation 56.

Regulation 41(3)(b): replaced, on 28 August 2020, by regulation 10 of the Resource Management (National Environmental Standards for Freshwater) Amendment Regulations 2020 (LI 2020/228).

Construction of wetland utility structures

42 Restricted discretionary activities

- (1) Vegetation clearance within, or within a 10 m setback from, a natural wetland is a restricted discretionary activity if it is for the purpose of constructing a wetland utility structure.
- (2) Earthworks or land disturbance within, or within a 10 m setback from, a natural wetland is a restricted discretionary activity if it is for the purpose of constructing a wetland utility structure.
- (3) The taking, use, damming, ~~diversion, or discharge or diversion~~ of water within, or within a 100 m setback from, a natural wetland is a restricted discretionary activity if it—
- (a) is for the purpose of constructing a wetland utility structure; and
- (b) complies with the conditions.

~~(3A) The discharge of water within, or within a 100 m setback from, a natural wetland is a restricted discretionary activity if—~~

~~(a) it is for the purpose of constructing a wetland utility structure; and~~

~~(b) there is a hydrological connection between the discharge and a natural wetland; and~~

~~(c) there are likely to be adverse effects from the discharge on the hydrological functioning or the habitat or the biodiversity values of a natural wetland; and~~

~~(d) it complies with the conditions.~~

Conditions

- (4) The conditions are that—
- (a) the activity must be undertaken only for as long as necessary to achieve its purpose; and
- (b) before the activity starts, a record must be made (for example, by taking photographs) of the original condition of the natural wetland's bed profile and hydrological regime that is sufficiently detailed to enable compliance with paragraph (c) to be verified; and
- (c) the bed profile and hydrological regime of the natural wetland must be returned to their original condition no later than 30 days after the start of the activity.
- (5) However, the condition in subclause (4)(c) does not apply to any part of the bed that is in direct contact with the wetland utility structure.

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Matters to which discretion restricted

- (6) The discretion of a consent authority is restricted to the matters set out in regulation 56.

Maintenance of wetland utility structures

43 Permitted activities

- (1) Vegetation clearance within, or within a 10 m setback from, a natural wetland is a permitted activity if it—
- (a) is for the purpose of maintaining a wetland utility structure; and
 - (b) complies with the conditions.
- (2) Earthworks or land disturbance within, or within a 10 m setback from, a natural wetland is a permitted activity if it—
- (a) is for the purpose of maintaining a wetland utility structure; and
 - (b) complies with the conditions.
- (3) The taking, use, damming, diversion, or discharge of water within, or within a 100 m setback from, a natural wetland is a permitted activity if it—
- (a) is for the purpose of maintaining a wetland utility structure; and
 - (b) complies with the conditions.

Conditions

- (4) The conditions are that—
- (a) the activity must comply with the general conditions on natural wetland activities in regulation 55; and
 - (b) the activity must not be for the purpose of increasing the size of the wetland utility structure; and
 - (c) the activity must not result in the formation of new pathways, boardwalks, or other accessways; and
 - (d) if the activity is vegetation clearance, earthworks, or land disturbance, the activity must not—
 - (i) occur over more than 2 m² around the base of each pile or post of the wetland utility structure, or 10% of the area of the natural wetland, whichever is a smaller area in total; or
 - (ii) occur more than 1 m away from the structure, if the activity is vegetation clearance.

(e) if the activity is a discharge of water, it must not be a restricted discretionary activity as described in regulation 44(3A).

- (5) However, the conditions in subclause (4)(d) do not apply if the earthworks or land disturbance is for planting.

44 Restricted discretionary activities

- (1) Vegetation clearance within, or within a 10 m setback from, a natural wetland is a restricted discretionary activity if it—

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- (a) is for the purpose of maintaining a wetland utility structure; and
- (b) does not comply with any of the conditions in regulation 43(4).
- (2) Earthworks or land disturbance within, or within a 10 m setback from, a natural wetland is a restricted discretionary activity if it—
 - (a) is for the purpose of maintaining a wetland utility structure; and
 - (b) does not comply with any of the conditions in regulation 43(4).
- (3) The taking, use, damming, ~~diversion, or discharge or diversion~~ of water within, or within a 100 m setback from, a natural wetland is a restricted discretionary activity if it—
 - (a) is done for the purpose of maintaining a wetland utility structure; and
 - (b) does not comply with any of the conditions in regulation 43(4), but does comply with the conditions in subclause (4) of this regulation.
- (3A) The discharge of water within, or within a 100 m setback from, a natural wetland is a restricted discretionary activity if—
 - (c) it is for the purpose of maintaining a wetland utility structure; and
 - (d) there is a hydrological connection between the discharge and a natural wetland; and
 - (e) there are likely to be adverse effects from the discharge on the hydrological functioning or the habitat or the biodiversity values of a natural wetland; and
 - (f) it does not comply with any of the conditions in regulation 43(4), but does comply with the conditions in subclause (4) of this regulation.

Conditions

- (4) The conditions are that—
 - (a) the activity must be undertaken only for as long as necessary to achieve its purpose; and
 - (b) before the activity starts, a record must be made (for example, by taking photographs) of the original condition of the natural wetland’s bed profile and hydrological regime that is sufficiently detailed to enable compliance with paragraph (c) to be verified; and
 - (c) the bed profile and hydrological regime of the natural wetland must be returned to their original condition no later than 30 days after the start of the activity.
- (5) However, the condition in subclause (4)(c) does not apply to any part of the bed that is in direct contact with a part of the wetland utility structure that was constructed for maintenance purposes.

Matters to which discretion restricted

- (6) The discretion of a consent authority is restricted to the matters set out in regulation 56.

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Construction of specified infrastructure

45 Discretionary activities

- (1) Vegetation clearance within, or within a 10 m setback from, a natural wetland is a discretionary activity if it is for the purpose of constructing specified infrastructure.
- (2) Earthworks or land disturbance within, or within a 10 m setback from, a natural wetland is a discretionary activity if it is for the purpose of constructing specified infrastructure.
- (3) Earthworks or land disturbance outside a 10 m, but within a 100 m, setback from a natural wetland is a discretionary activity if it—
 - (a) is for the purpose of constructing specified infrastructure; and
 - (b) results, or is likely to result, in the complete or partial drainage of all or part of the natural wetland.
- (4) The taking, use, damming, ~~diversion, or discharge or diversion~~ of water within, or within a 100 m setback from, a natural wetland is a discretionary activity if it is for the purpose of constructing specified infrastructure.

- (5) The discharge of water within, or within a 100 m setback from, a natural wetland is a discretionary activity if—
 - (a) it is for the purpose of constructing specified infrastructure; and
 - (b) there is a hydrological connection between the discharge and a natural wetland; and
 - (c) there are likely to be adverse effects from the discharge on the hydrological functioning or the habitat or the biodiversity values of a natural wetland.

Quarrying

45A Discretionary activities

- (1) Vegetation clearance within, or within a 10 m setback from, a natural inland wetland is a discretionary activity if it is for the purpose of quarrying.
- (2) Earthworks or land disturbance within, or within a 10 m setback from, a natural inland wetland is a discretionary activity if it is for the purpose of quarrying.
- (3) Earthworks or land disturbance outside a 10 m, but within a 100 m, setback from a natural inland wetland is a discretionary activity if it—
 - (a) is for the purpose of quarrying; and
 - (b) results, or is likely to result, in the complete or partial drainage of all or part of the natural inland wetland.
- ~~(4)~~(4) The taking, use, damming, or diversion of water within, or within a 100 m setback from, a natural inland wetland is a discretionary activity if it is for the purpose of quarrying.

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- (5) The discharge of water within, or within a 100 m setback from, a natural inland wetland is a discretionary activity if—
- (a) it is for the purpose of quarrying; and
 - (b) there is a hydrological connection between the discharge and a natural inland wetland; and
 - (c) there are likely to be adverse effects from the discharge on the hydrological functioning or the habitat or the biodiversity values of a natural wetland.

Landfills and cleanfill areas

45B Discretionary activities

- (1) Vegetation clearance within, or within a 10 m setback from, a natural inland wetland is a discretionary activity if it is for the purpose of constructing or operating a landfill or a cleanfill area.
- (2) Earthworks or land disturbance within, or within a 10 m setback from, a natural inland wetland is a discretionary activity if it is for the purpose of constructing or operating a landfill or a cleanfill area.
- (3) Earthworks or land disturbance outside a 10 m, but within a 100 m, setback from a natural inland wetland is a discretionary activity if it—
- (a) is for the purpose of constructing or operating a landfill or a cleanfill area; and
 - (b) results, or is likely to result, in the complete or partial drainage of all or part of the natural inland wetland.
- (4) The taking, use, damming, or diversion of water within, or within a 100 m setback from, a natural inland wetland is a discretionary activity if it is for the purpose of constructing or operating a landfill or a cleanfill area.
- (5) The discharge of water within, or within a 100 m setback from, a natural inland wetland is a discretionary activity if—
- (a) it is for the purpose of constructing or operating a landfill or a cleanfill area and
 - (b) there is a hydrological connection between the discharge and a natural inland wetland; and
 - (c) there are likely to be adverse effects from the discharge on the hydrological functioning or the habitat or the biodiversity values of a natural wetland.

Urban development

45C Restricted discretionary activities

- (1) Vegetation clearance within, or within a 10 m setback from, a natural inland wetland is a restricted discretionary activity if it is for the purpose of constructing urban development.

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(2) Earthworks or land disturbance within, or within a 10 m setback from, a natural inland wetland is a restricted discretionary activity if it is for the purpose of constructing urban development.

(3) The taking, use, damming, or diversion of water within, or within a 100 m setback from, a natural inland wetland is a restricted discretionary activity if it is for the purpose of constructing urban development.

(4) The discharge of water within, or within a 100 m setback from, a natural inland wetland is a restricted discretionary activity if—

(a) it is for the purpose of constructing urban development; and

(b) there is a hydrological connection between the discharge and a natural inland wetland; and

(c) there are likely to be adverse effects from the discharge on the hydrological functioning or the habitat or the biodiversity values of a natural wetland.

Matters to which discretion restricted

(5) The discretion of a consent authority is restricted to the matters set out in regulation 56.

Mining

45D Discretionary activities

(1) Vegetation clearance within, or within a 10 m setback from, a natural inland wetland is a discretionary activity if it is for the purpose of mining.

(2) Earthworks or land disturbance within, or within a 10 m setback from, a natural inland wetland is a discretionary activity if it is for the purpose of mining.

(3) Earthworks or land disturbance outside a 10 m, but within a 100 m, setback from a natural inland wetland is a discretionary activity if it—

(a) is for the purpose of mining; and

(b) results, or is likely to result, in the complete or partial drainage of all or part of the natural inland wetland.

(4) The taking, use, damming, or diversion of water within, or within a 100 m setback from, a natural inland wetland is a discretionary activity if it is for the purpose of mining.

(5) The discharge of water within, or within a 100 m setback from, a natural inland wetland is a discretionary activity if—

(a) it is for the purpose of mining; and

(b) there is a hydrological connection between the discharge and a natural inland wetland; and

(c) there are likely to be adverse effects from the discharge on the hydrological functioning or the habitat or the biodiversity values of a natural inland wetland.

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~~(4)(6) On and from 1 January 2030, mining for coal, other than coking coal, is excluded from the purposes for which consent may be obtained under this regulation.~~

Maintenance and operation of specified infrastructure and other infrastructure

46 Permitted activities

- (1) Vegetation clearance within, or within a 10 m setback from, a natural wetland is a permitted activity if it—
 - (a) is for the purpose of maintaining or operating specified infrastructure or other infrastructure; and
 - (b) complies with the conditions.
- (2) Earthworks or land disturbance within, or within a 10 m setback from, a natural wetland is a permitted activity if it—
 - (a) is for the purpose of maintaining or operating specified infrastructure or other infrastructure; and
 - (b) complies with the conditions.
- (3) The taking, use, damming, diversion, or discharge of water within, or within a 100 m setback from, a natural wetland is a permitted activity if it—
 - (a) is for the purpose of maintaining or operating specified infrastructure or other infrastructure; and
 - (b) complies with the conditions.

Conditions

- (4) The conditions are that—
 - ~~(a) the activity must comply with the general conditions on natural wetland activities in regulation 55 (but regulation 55(2), (3)(b) to (d), and (5) do not apply if the activity is for the purpose of maintaining or operating hydro-electricity infrastructure); and~~
 - ~~(a) the activity must comply with the general conditions on natural wetland activities in regulation 55, but regulation 55(2), (3)(b) to (d), and (5) do not apply—~~
 - ~~(i) if the activity is for the purpose of maintaining or operating hydro-electricity infrastructure; or~~
 - ~~(ii) as conditions on the activity as it relates to the maintenance and operation of public flood control, flood protection, or drainage works; and~~
 - ~~(b) the activity must not be for the purpose of increasing the size of the specified infrastructure or other infrastructure; and~~
 - ~~(b) the activity must not be for the purpose of increasing the size of the specified infrastructure or other infrastructure unless the increase is to provide for the passage of fish in accordance with these regulations; and~~
 - (c) the activity must not result in the formation of new pathways, boardwalks, or other accessways; and

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- (d) if the activity is vegetation clearance, earthworks, or land disturbance, the activity must not occur over more than 500 m² or 10% of the area of the natural wetland, whichever is smaller; and
- (e) if the activity is earthworks or land disturbance,—
 - (i) trenches dug (for example, to maintain pipes) must be backfilled and compacted no later than 48 hours after being dug; and
 - (ii) the activity must not result in drains being deeper, relative to the natural wetland’s water level, than they were before the activity.

(f) if the activity is a discharge of water, it must not be a restricted discretionary activity as described in regulation 47(3A).

- (5) However, the condition in subclause (4)(d) does not apply if the earthworks or land disturbance is for planting.

47 Restricted discretionary activities

- (1) Vegetation clearance within, or within a 10 m setback from, a natural wetland is a restricted discretionary activity if it—
 - (a) is for the purpose of maintaining or operating specified infrastructure or other infrastructure; and
 - (b) does not comply with any of the conditions in regulation 46(4).
- (2) Earthworks or land disturbance within, or within a 10 m setback from, a natural wetland is a restricted discretionary activity if it—
 - (a) is for the purpose of maintaining or operating specified infrastructure or other infrastructure; and
 - (b) does not comply with any of the conditions in regulation 46(4).
- (3) The taking, use, damming, diversion, or discharge or diversion of water within, or within a 100 m setback from, a natural wetland is a restricted discretionary activity if it—
 - (a) is for the purpose of maintaining or operating specified infrastructure or other infrastructure; and
 - (b) does not comply with any of the conditions in regulation 46(4), but does comply with the conditions in subclause (5) of this regulation.

(3A) The discharge of water within, or within a 100 m setback from, a natural wetland is a restricted discretionary activity if—

(c) it is for the purpose of maintaining or operating specified infrastructure or other infrastructure; and

(d) there is a hydrological connection between the discharge and a natural wetland; and

(e) there are likely to be adverse effects from the discharge on the hydrological functioning or the habitat or the biodiversity values of a natural wetland; and

(f) it does not comply with any of the conditions in regulation 46(4), but does comply with the conditions in subclause (5) of this regulation.

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- (4) However, the conditions in subclause (5) of this regulation do not apply if the activity is for the purpose of maintaining or operating hydro-electricity infrastructure.

Conditions

- (5) The conditions are that—
- (a) the activity must be undertaken only for as long as necessary to achieve its purpose; and
 - (b) before the activity starts, a record must be made (for example, by taking photographs) of the original condition of the natural wetland's bed profile and hydrological regime that is sufficiently detailed to enable compliance with paragraph (c) to be verified; and
 - (c) the bed profile and hydrological regime of the natural wetland must be returned to their original condition no later than 30 days after the start of the activity.

~~(6) However, the condition in subclause (5)(c) does not apply to any part of the bed that is in direct contact with a part of the specified infrastructure or other infrastructure that was constructed for maintenance purposes;~~

~~(6) However,—~~

- ~~(a) the condition in subclause (5)(c) does not apply to any part of the bed that is in direct contact with a part of the specified infrastructure or other infrastructure that was constructed for maintenance purposes; and~~
- ~~(b) the 30-day limit in the condition in subclause (5)(c) does not apply if the maintenance and operation of the infrastructure necessitates the ongoing taking, use, damming, diversion, or discharge of water.~~

Matters to which discretion restricted

- (7) The discretion of a consent authority is restricted to the matters set out in regulation 56.

Sphagnum moss harvesting

48 Permitted activity: existing sphagnum moss harvests

- (1) The harvest of sphagnum moss within a natural wetland is a permitted activity if—
- (a) sphagnum moss was harvested, or actively managed for harvest, in the area being harvested at any time between the start of 1 January 2010 and the close of 2 September 2020; and
 - (b) the harvest complies with the conditions.

Conditions

- (2) The conditions are that—
- (a) the harvest is carried out in accordance with a sphagnum moss harvesting plan that has been—
 - (i) provided to the relevant regional council at least 20 working days before the harvest is due to start; and

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- (ii) accepted by the relevant regional council on the basis that it has been prepared by a suitably qualified and experienced harvest operator and includes the information required by Schedule 3; and
- (b) the harvest operator—
 - (i) monitors the harvesting operation throughout the harvest; and
 - (ii) no later than 20 working days after the harvest ends, assesses the natural wetland by completing the form set out in Schedule 4 and provides the form to the relevant regional council.

49 Discretionary activity: new sphagnum moss harvests

- (1) The harvest of sphagnum moss within a natural wetland is a discretionary activity if sphagnum moss was not harvested, or actively managed for harvest, in the area being harvested at any time between the start of 1 January 2010 and the close of 2 September 2020.

Requirement when applying for resource consent

- (2) An application for a resource consent for the harvest must include a sphagnum moss harvesting plan that—
 - (a) has been prepared by a suitably qualified and experienced harvest operator; and
 - (b) includes the information required by Schedule 3.

Conditions required in resource consent

- (3) A resource consent granted for the harvest must impose conditions that require—
 - (a) the harvest to comply with the sphagnum moss harvesting plan; and
 - (b) the harvest operator to monitor the harvest operation throughout the harvest; and
 - (c) the harvest operator to assess the natural wetland after the harvest by completing the form set out in Schedule 4 and to provide the form to the consent authority no later than 20 workings days after the harvest ends.

Arable and horticultural land use

50 Permitted activities

- (1) Vegetation clearance outside, but within a 10 m setback from, a natural wetland is a permitted activity if it—
 - (a) is for the purpose of arable land use or horticultural land use in an area that was used for either of those uses at any time between the start of 1 January 2010 and the close of 2 September 2020; and
 - (b) complies with the general conditions on natural wetland activities in regulation 55 (but regulation 55(2) does not apply).
- (2) Earthworks or land disturbance outside, but within a 10 m setback from, a natural wetland is a permitted activity if it—

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- (a) is for the purpose of arable land use or horticultural land use in an area that was used for either of those uses at any time between the start of 1 January 2010 and the close of 2 September 2020; and
- (b) complies with the general conditions on natural wetland activities in regulation 55 (but regulation 55(2) does not apply).

Natural hazard works

51 Permitted activities

Meaning of natural hazard works

- (1) In this regulation, **natural hazard works** means works for the purpose of removing material, such as trees, debris, and sediment, that—
 - (a) is deposited as the result of a natural hazard; and
 - (b) is causing, or is likely to cause, an immediate hazard to people or property.

Permitted activities for purpose of natural hazard works

- (2) Vegetation clearance within, or within a 10 m setback from, a natural wetland is a permitted activity if it—
 - (a) is for the purpose of natural hazard works; and
 - (b) complies with the conditions.
- (3) Earthworks or land disturbance within, or within a 10 m setback from, a natural wetland is a permitted activity if it—
 - (a) is for the purpose of natural hazard works; and
 - (b) complies with the conditions.
- (4) The taking, use, damming, diversion, or discharge of water within, or within a 100 m setback from, a natural wetland is a permitted activity if it—
 - (a) is for the purpose of natural hazard works; and
 - (b) complies with the conditions.

Conditions

- (5) The conditions are that—
 - (a) the activity must not—
 - (i) result in land becoming unstable; or
 - (ii) result in, or involve, debris or other materials being deposited in the natural wetland; and
 - (b) the activity must be undertaken only to the extent necessary to achieve the purpose of the natural hazard works; and
 - (c) if the activity changes the profile of the bed of the natural wetland, the profile must be restored so that it does not inhibit the passage of fish; and
 - (d) if the activity is earthworks or land disturbance, erosion and sediment control measures must,—

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- (i) during and after the earthworks, be applied and maintained at the site of the activity to minimise adverse effects of sediment on the natural wetland; and
- (ii) include stabilising or containing soil that is exposed or disturbed by the activity as soon as practicable after the activity ends; and
- (e) as soon as practicable (but no later than 3 months) after the activity ends,—
 - (i) debris, materials, and equipment relating to the activity must be removed from the site; and
 - (ii) the site must be free from litter.

Drainage of natural wetlands

52 Non-complying activities

- (1) Earthworks outside, but within a 100 m setback from, a natural wetland is a non-complying activity if it—
 - (a) results, or is likely to result, in the complete or partial drainage of all or part of a natural wetland; and
 - (b) does not have another status under any of regulations 38 to 51.
- (2) The taking, use, damming, ~~diversion, or discharge~~ or diversion of water outside, but within a 100 m setback from, a natural wetland is a non-complying activity if it—
 - (a) results, or is likely to result, in the complete or partial drainage of all or part of a natural wetland; and
 - (b) does not have another status under any of regulations 38 to 51.

53 Prohibited activities

- (1) Earthworks within a natural wetland is a prohibited activity if it—
 - (a) results, or is likely to result, in the complete or partial drainage of all or part of a natural wetland; and
 - (b) does not have another status under any of regulations 38 to 51.
- (2) The taking, use, damming, ~~diversion, or discharge~~ or diversion of water within a natural wetland is a prohibited activity if it—
 - (a) results, or is likely to result, in the complete or partial drainage of all or part of a natural wetland; and
 - (b) does not have another status under any of regulations 38 to 51.

Other activities

54 Non-complying activities

The following activities are non-complying activities if they do not have another status under this subpart:

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- (a) vegetation clearance within, or within a 10 m setback from, a natural wetland:
- (b) earthworks within, or within a 10 m setback from, a natural wetland:
- (c) the taking, use, damming, ~~diversion, or discharge or diversion~~ of water within, or within a 100 m setback from, a natural wetland.
- ~~(d) the discharge of water within, or within a 100 m setback from, a natural wetland if—~~
 - ~~(i) there is a hydrological connection between the discharge and the natural wetland; and~~
 - ~~(ii) there are likely to be adverse effects from the discharge on the hydrological functioning or the habitat or the biodiversity values of a natural wetland.~~

General matters

55 General conditions on natural wetland activities

- (1) This regulation applies if a regulation in this subpart refers to the compliance of an activity with the general conditions in this regulation.

General condition for permitted activities: prior notice of activity

- (2) If this regulation applies in relation to a permitted activity, the 1 or more persons responsible for undertaking the activity must, at least 10 working days before starting the activity, provide the relevant regional council with the following information in writing:
 - (a) a description of the activity to be undertaken; and
 - (b) a description of, and map showing, where the activity will be undertaken; and
 - (c) a statement of when the activity will start and when it is expected to end; and
 - (d) a description of the extent of the activity; and
 - (e) their contact details.

General conditions: water quality and movement

- (3) The general conditions relating to water quality and movement are as follows:
 - (a) the activity must not result in the discharge of a contaminant if the receiving environment includes any natural wetland in which the contaminant, after reasonable mixing, causes, or may cause, 1 or more of the following effects:
 - (i) the production of conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
 - (ii) a conspicuous change in colour or visual clarity;
 - (iii) an emission of objectionable odour;

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- (iv) the contamination of freshwater to the extent that it is not suitable for farm animals to drink;
 - (v) adverse effects on aquatic life that are more than minor; and
 - (b) the activity must not increase the level of flood waters that would, in any flood event (regardless of probability), inundate all or any part of the 1% AEP floodplain (but *see* subclause (4)); and
 - (c) the activity must not alter the natural movement of water into, within, or from any natural wetland (but *see* subclause (5)); and
 - (d) the activity must not involve taking or discharging water to or from any natural wetland (but *see* subclause (5)); and
 - ~~(e) debris and sediment must not~~
 - ~~(i) be placed within a setback of 10 m from any natural wetland; or~~
 - ~~(ii) be allowed to enter any natural wetland.~~
 - ~~(e) debris and sediment must not be placed—~~
 - ~~(i) within a setback of 10 m from any natural wetland; or~~
 - ~~(ii) in a position where it may enter any natural wetland.~~
 - (4) Subclause (3)(b) does not apply if the person undertaking the activity—
 - (a) owns or controls the only land or structures that would be affected by a flood in all or any part of the 1% AEP floodplain; or
 - (b) has—
 - (i) obtained written consent to undertaking the activity from each person who owns or controls the land or structures that would be affected by a flood in all or part of the 1% AEP floodplain, after informing them of the expected increase in the level of flood waters; and
 - (ii) satisfied the relevant regional council that they have complied with subparagraph (i).
 - (5) Despite subclause (3)(c) and (d), the temporary taking, use, damming, or diversion of water around a work site, or discharges of water into the water around a work site, may be undertaken if the following conditions are complied with:
 - (a) the activity must be undertaken during a period when there is a low risk of flooding; and
 - (b) the activity must be undertaken only for as long as necessary to achieve its purpose; and
 - (c) before the activity starts, a record must be made (for example, by taking photographs) of the original condition of any affected natural wetland’s bed profile and hydrological regime that is sufficiently detailed to enable compliance with paragraph (d) to be verified; and

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- (d) the bed profile and hydrological regime of the natural wetland must be returned to their original condition no later than 14 days after the start of the activity; and
 - (e) if the activity is damming, the dam must be no higher than 600 mm; and
 - (f) if the activity is a diversion that uses a pump, a fish screen with mesh spacing no greater than 3 mm must be used on the intake.
- (6) In subclauses (3) and (4), **1% AEP floodplain** means the area that would be inundated in a flood event of a size that has a 1% or greater probability of occurring in any one year.
- General condition: earth stability and drainage*
- (7) The general condition relating to earth stability and drainage is that the activity must not create or contribute to—
- (a) the instability or subsidence of a slope or another land surface; or
 - (b) the erosion of the bed or bank of any natural wetland; or
 - (c) a change in the points at which water flows into or out of any natural wetland; or
 - (d) a constriction on the flow of water within, into, or out of any natural wetland; or
 - (e) the flooding or overland flow of water within, or flowing into or out of, any natural wetland.
- General conditions: earthworks, land disturbance, and vegetation clearance*
- (8) The general conditions on earthworks, land disturbance, and vegetation clearance are as follows:
- (a) during and after the activity, erosion and sediment control measures must be applied and maintained at the site of the activity to minimise adverse effects of sediment on natural wetlands; and
 - (b) the measures must include stabilising or containing soil that is exposed or disturbed by the activity as soon as practicable after the activity ends; and
 - (c) the measures referred to in paragraph (b) must remain in place until vegetation covers more than 80% of the site; and
 - (d) if the activity is vegetation clearance, it must not result in earth remaining bare for longer than 3 months.
- General conditions: vegetation and bird and fish habitats*
- (9) The general conditions relating to vegetation and bird and fish habitats are as follows:
- (a) only indigenous species that are appropriate to a natural wetland (given the location and type of the natural wetland) may be planted in it; and
 - (b) the activity must not result in the smothering of indigenous vegetation by debris and sediment; and

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- (c) the activity must not disturb the roosting or nesting of indigenous birds during their breeding season; and
- (d) the activity must not disturb an area that is listed in a regional plan or water conservation order as a habitat for threatened indigenous fish; and
- (e) the activity must not, during a spawning season, disturb an area that is listed in a regional plan or water conservation order as a fish spawning area.

General condition: historic heritage

- (10) The general condition relating to historic heritage is that the activity must not destroy, damage, or modify a site that is protected by an enactment because of the site's historic heritage (including, to avoid doubt, because of its significance to Māori), except in accordance with that enactment.
- (11) In subclause (10), **enactment** includes any kind of instrument made under an enactment.

General conditions: machinery, vehicles, equipment, and construction materials

- (12) The general conditions on the use of vehicles, machinery, equipment, and materials are as follows:
 - (a) machinery, vehicles, and equipment used for the activity must be cleaned before entering any natural wetland (to avoid introducing pests, unwanted organisms, or exotic plants); and
 - (b) machinery that is used for the activity must sit outside a natural wetland, unless it is necessary for the machinery to enter the natural wetland to achieve the purpose of the activity; and
 - (c) if machinery or vehicles enter any natural wetland, they must be modified or supported to prevent them from damaging the natural wetland
(for example, by widening the tracks of track-driven vehicles or using platforms for machinery to sit on); and
 - (d) the mixing of construction materials, and the refuelling and maintenance of vehicles, machinery, and equipment, must be done outside a 10 m setback from any natural wetland.

General conditions: miscellaneous

- (13) The other general conditions are as follows:
 - (a) the activity must be undertaken only to the extent necessary to achieve its purpose; and
 - (b) the activity must not involve the use of fire or explosives; and
 - (c) if there is existing public access to a natural wetland, the activity must not prevent the public from continuing to access the natural wetland (unless that is required to protect the health and safety of the public or the persons undertaking the activity); and
 - (d) no later than 5 days after the activity ends,—

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- (i) debris, materials, and equipment relating to the activity must be removed from the site; and
- (ii) the site must be free from litter.

56 Restricted discretionary activities: matters to which discretion is restricted

The discretion of a consent authority is restricted to the following matters if an activity is a restricted discretionary activity under this subpart:

- (a) the extent to which the nature, scale, timing, intensity, and location of the activity may have adverse effects on—
 - (i) the existing and potential values of the natural wetland, its catchment, and the coastal environment; and
 - (ii) the extent of the natural wetland; and
 - (iii) the seasonal and annual hydrological regime of the natural wetland; and
 - (iv) the passage of fish in the natural wetland or another water body:
- (b) whether there are practicable alternatives to undertaking the activity that would avoid those adverse effects:
- (c) the extent to which those adverse effects will be managed to avoid the loss of the extent of the natural wetland and its values:
- (d) other measures to minimise or remedy those adverse effects:
- (e) how any of those adverse effects that are more than minor may be offset or compensated for if they cannot be avoided, minimised, or remedied:
- (f) the risk of flooding upstream or downstream of the natural wetland, and the measures to avoid, minimise, or remedy that risk:
- (g) the social, economic, environmental, and cultural benefits (if any) that are likely to result from the proposed activity (including the extent to which the activity may protect, maintain, or enhance ecosystems).

Subpart 2—Reclamation of rivers

57 Discretionary activities

Reclamation of the bed of any river is a discretionary activity.

Subpart 3—Passage of fish affected by structures

How this subpart applies

58 Purpose of this subpart

The purpose of this subpart is to deal with the effects on the passage of fish of the placement, use, alteration, extension, or reconstruction of any of the following structures in, on, over, or under the bed of any river or connected area:

- (a) a culvert:

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- (b) a weir:
- (c) a flap gate (whether passive or non-passive):
- (d) a dam:
- (e) a ford.

59 When multiple provisions of this subpart apply

If an overall structure is made up of 2 or more structures to which different provisions of this subpart apply (for example, a culvert with a flap gate), those provisions apply to the respective parts of the overall structure.

60 When this subpart does not apply

This subpart does not apply to any of the following structures in, on, over, or under the bed of any river or connected area:

- (a) an existing structure, meaning a structure that was in the river or connected area at the close of 2 September 2020, and including any later alterations or extensions of that structure:
- (b) a customary weir, meaning a weir that is used for the purpose of practising tikanga Māori, including customary fishing practices.

Information requirements

61 Purpose of information requirements

The purpose of the regulations in this subpart that require information is to ensure that the relevant regional council obtains information on the design and performance of structures in relation to the passage of fish.

62 Requirement for all activities: information about structures and passage of fish

- (1) This regulation applies to any activity that—
 - (a) is the placement, alteration, extension, or reconstruction of any of the following structures in, on, over, or under the bed of any river or connected area:
 - (i) a culvert:
 - (ii) a weir:
 - (iii) a flap gate (whether passive or non-passive):
 - (iv) a dam:
 - (v) a ford; and
 - (b) is a permitted activity, or a class of activity that requires a resource consent, whether under this subpart or otherwise.
- (2) The information specified in this regulation must be collected and provided to the relevant regional council, together with the time and date of its collection, within 20 working days after the activity is finished,—
 - (a) for a permitted activity; or

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- (b) as a condition of a resource consent granted for the activity, for another class of activity.
 - (3) The information is—
 - (a) the type of structure:
 - (b) the geographical co-ordinates of the structure:
 - (c) the flow of the river or connected area (whether none, low, normal, or high):
 - (d) whether the water is tidal at the structure’s location:
 - (e) at the structure’s location,—
 - (i) the width of the river or connected area at the water’s surface; and
 - (ii) the width of the bed of the river or connected area:
 - (f) whether there are improvements to the structure to mitigate any effects the structure may have on the passage of fish:
 - (g) whether the structure protects particular species, or prevents access by particular species to protect other species:
 - (h) the likelihood that the structure will impede the passage of fish:
 - (i) visual evidence (for example, photographs) that shows both ends of the structure, viewed upstream and downstream.

63 Requirement for culvert activities: information about culverts

- (1) This regulation applies to any activity that—
 - (a) is the placement, alteration, extension, or reconstruction of a culvert in, on, over, or under the bed of any river or connected area; and
 - (b) is a permitted activity, or a class of activity that requires a resource consent, whether under this subpart or otherwise.
- (2) The information specified in this regulation must be collected and provided to the relevant regional council, together with the time and date of its collection, within 20 working days after the activity is finished,—
 - (a) for a permitted activity; or
 - (b) as a condition of a resource consent granted for the activity, for another class of activity.
- (3) The information is—
 - (a) the culvert’s asset identification number, if known:
 - (b) whether the culvert’s ownership is—
 - (i) held by the Crown (for example, the Department of Conservation), a regional council, a territorial authority, the New Zealand Transport Agency, or KiwiRail Holdings Limited; or
 - (ii) held publicly by another person or organisation; or
 - (iii) held privately; or
 - (iv) unknown:

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- (c) the number of barrels that make up the culvert:
 - (d) the culvert’s shape:
 - (e) the culvert’s length:
 - (f) the culvert’s diameter or its width and height:
 - (g) the height of the drop (if any) from the culvert’s outlet:
 - (h) the length of the undercut or erosion (if any) from the culvert’s outlet:
 - (i) the material from which the culvert is made:
 - (j) the mean depth of the water through the culvert:
 - (k) the mean water velocity in the culvert:
 - (l) whether there are low-velocity zones downstream of the culvert:
 - (m) the type of bed substrate that is in most of the culvert:
 - (n) whether there are any remediation features (for example, baffles or spat rope) in the culvert:
 - (o) whether the culvert has wetted margins:
 - (p) the slope of the culvert:
 - (q) the alignment of the culvert:
 - (r) the numbers of each other type of structure to which this subpart applies, or of wingwalls or screens, on the culvert:
 - (s) if there is any apron or ramp on the culvert, the information required by regulation 68 for each of them.

64 Requirement for weir activities: information about weirs

- (1) This regulation applies to any activity that—
 - (a) is the placement, alteration, extension, or reconstruction of a weir in, on, over, or under the bed of any river or connected area; and
 - (b) is a permitted activity, or a class of activity that requires a resource consent, whether under this subpart or otherwise.
- (2) The information specified in this regulation must be collected and provided to the relevant regional council, together with the time and date of its collection, within 20 working days after the activity is finished,—
 - (a) for a permitted activity; or
 - (b) as a condition of a resource consent granted for the activity, for another class of activity.
- (3) The information is—
 - (a) the weir’s asset identification number, if known:
 - (b) whether the weir’s ownership is—
 - (i) held by the Crown (for example, the Department of Conservation), a regional council, a territorial authority, the New Zealand Transport Agency, or KiwiRail Holdings Limited; or

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- (ii) held publicly by another person or organisation; or
 - (iii) held privately; or
 - (iv) unknown:
 - (c) the type of weir:
 - (d) the weir’s crest shape:
 - (e) the weir’s height:
 - (f) the weir’s width:
 - (g) the material from which the weir is made:
 - (h) the type of bed substrate that is present across most of the weir:
 - (i) whether there are any remediation features (for example, baffles or spat rope) in the weir:
 - (j) whether the weir has wetted margins:
 - (k) the slope of the weir:
 - (l) the backwater distance from the weir, meaning the distance furthest upstream where the water level is influenced by the weir:
 - (m) the numbers of each other type of structure to which this subpart applies, or of wingwalls or screens, on the weir:
 - (n) if there is any apron or ramp on the weir, the information required by regulation 68 for each of them.

65 Requirement for flap gate activities: information about flap gates

- (1) This regulation applies to any activity that—
 - (a) is the placement, alteration, extension, or reconstruction of a flap gate (whether passive or non-passive) in, on, over, or under the bed of any river or connected area; and
 - (b) is a permitted activity, or a class of activity that requires a resource consent, whether under this subpart or otherwise.
- (2) The information specified in this regulation must be collected and provided to the relevant regional council, together with the time and date of its collection, within 20 working days after the activity is finished,—
 - (a) for a permitted activity; or
 - (b) as a condition of a resource consent granted for the activity, for another class of activity.
- (3) The information is—
 - (a) the flap gate’s asset identification number, if known:
 - (b) whether the flap gate’s ownership is—
 - (i) held by the Crown (for example, the Department of Conservation), a regional council, a territorial authority, the New Zealand Transport Agency, or KiwiRail Holdings Limited; or
 - (ii) held publicly by another person or organisation; or

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- (iii) held privately; or
 - (iv) unknown:
 - (c) the type of flap gate:
 - (d) the flap gate's height:
 - (e) the flap gate's width:
 - (f) the material from which the flap gate is made:
 - (g) the numbers of each other type of structure to which this subpart applies, or of wingwalls or screens, on the flap gate:
 - (h) if there is any apron or ramp on the flap gate, the information required by regulation 68 for each of them.

66 Requirement for dam activities: information about dams

- (1) This regulation applies to any activity that—
 - (a) is the placement, alteration, extension, or reconstruction of a dam in, on, over, or under the bed of any river or connected area; and
 - (b) is a permitted activity, or a class of activity that requires a resource consent.
- (2) The information specified in this regulation must be collected and provided to the relevant regional council, together with the time and date of its collection, within 20 working days after the activity is finished,—
 - (a) for a permitted activity; or
 - (b) as a condition of a resource consent granted for the activity, for another class of activity.
- (3) The information is—
 - (a) the dam's asset identification number, if known:
 - (b) whether the dam's ownership is—
 - (i) held by the Crown (for example, the Department of Conservation), a regional council, a territorial authority, the New Zealand Transport Agency, or KiwiRail Holdings Limited; or
 - (ii) held publicly by another person or organisation; or
 - (iii) held privately; or
 - (iv) unknown:
 - (c) the dam's height:
 - (d) whether the dam has a spillway, meaning a structure used to control the release of flows from the dam into a downstream area:
 - (e) the numbers of each other type of structure to which this subpart applies, or of wingwalls or screens, on the dam:
 - (f) if there is any apron or ramp on the dam, the information required by regulation 68 for each of them.

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67 Requirement for ford activities: information about fords

- (1) This regulation applies to any activity that—
 - (a) is the placement, alteration, extension, or reconstruction of a ford in, on, over, or under the bed of any river or connected area; and
 - (b) is a permitted activity, or a class of activity that requires a resource consent.
- (2) The information specified in this regulation must be collected and provided to the relevant regional council, together with the time and date of its collection, within 20 working days after the activity is finished,—
 - (a) for a permitted activity; or
 - (b) as a condition of a resource consent granted for the activity, for another class of activity.
- (3) The information is—
 - (a) the ford’s asset identification number, if known:
 - (b) whether the ford’s ownership is—
 - (i) held by the Crown (for example, the Department of Conservation), a regional council, a territorial authority, the New Zealand Transport Agency, or KiwiRail Holdings Limited; or
 - (ii) held publicly by another person or organisation; or
 - (iii) held privately; or
 - (iv) unknown:
 - (c) the ford’s length:
 - (d) the ford’s width:
 - (e) the height of the drop (if any) from the ford’s downstream end:
 - (f) the material from which the ford is made:
 - (g) the type of bed substrate that is across most of the ford:
 - (h) the numbers of each other type of structure to which this subpart applies, or of wingwalls or screens, on the ford:
 - (i) if there is any apron or ramp on the ford, the information required by regulation 68 for each of them.

68 Requirement for certain structure activities: information about aprons and ramps

Apron

- (1) The following information relating to an apron is required:
 - (a) the apron’s length:
 - (b) the height of the drop (if any) from the apron’s downstream end:
 - (c) the material from which the apron is made:
 - (d) the mean depth of the water across the apron:

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- (e) the mean water velocity across the apron:
- (f) the type of bed substrate that is across most of the apron.

Ramp

- (2) The following information relating to a ramp is required:
 - (a) the ramp’s length:
 - (b) the slope of the ramp:
 - (c) the type of surface that the ramp has:
 - (d) whether the ramp has wetted margins.

Monitoring and maintenance requirements

69 Condition of resource consent for activities: monitoring and maintenance

- (1) This regulation applies to any activity that—
 - (a) is the placement, use, alteration, extension, or reconstruction of any of the following structures in, on, over, or under the bed of any river or connected area:
 - (i) a culvert:
 - (ii) a weir:
 - (iii) a flap gate (whether passive or non-passive):
 - (iv) a dam:
 - (v) a ford; and
 - (b) is a class of activity that requires a resource consent, whether under this subpart or otherwise.
- (2) A resource consent granted for the activity must impose conditions that—
 - (a) require monitoring and maintenance of the structure that is sufficient to ensure that its provision for the passage of fish does not reduce over its lifetime; and
 - (b) require a plan for that monitoring and maintenance that includes—
 - (i) how the monitoring and maintenance will be done; and
 - (ii) the steps to be taken to avoid any adverse effects on the passage of fish; and
 - (iii) the steps to be taken to ensure that the structure’s provision for the passage of fish does not reduce over its lifetime; and
 - (iv) how often, as specified by the consent authority, the information must be provided under paragraph (c) (for the purposes of reassessing the structure’s effect on the passage of fish); and
 - (v) a process for providing that information; and
 - (c) require an updated version of the information relating to the structure that was required for the original resource consent to be provided to the consent authority at the following times:
 - (i) at the intervals required by the plan; and

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- (ii) each time a significant natural hazard affects the structure.

Culverts

70 Permitted activities

- (1) The placement, use, alteration, extension, or reconstruction of a culvert in, on, over, or under the bed of any river or connected area is a permitted activity if it complies with the conditions.

Conditions

- (2) The conditions are that—
- (a) the culvert must provide for the same passage of fish upstream and downstream as would exist without the culvert, except as required to carry out the works to place, alter, extend, or reconstruct the culvert; and
 - (b) the culvert must be laid parallel to the slope of the bed of the river or connected area; and
 - (c) the mean cross-sectional water velocity in the culvert must be no greater than that in all immediately adjoining river reaches; and
 - (d) the culvert's width where it intersects with the bed of the river or connected area (**s**) and the width of the bed at that location (**w**), both measured in metres, must compare as follows:
 - (i) where $w \leq 3$, $s \geq 1.3 \times w$;
 - (ii) where $w > 3$, $s \geq (1.2 \times w) + 0.6$; and
 - (e) the culvert must be open-bottomed or its invert must be placed so that at least 25% of the culvert's diameter is below the level of the bed; and
 - (f) the bed substrate must be present over the full length of the culvert and stable at the flow rate at or below which the water flows for 80% of the time; and
 - (g) the culvert provides for continuity of geomorphic processes (such as the movement of sediment and debris).

Information requirements

- (3) *See also* regulations 62 and 63 for information requirements that apply to the permitted activity (unless the activity is use).

71 Discretionary activities

- (1) The placement, use, alteration, extension, or reconstruction of a culvert in, on, over, or under the bed of a river is a discretionary activity if it does not comply with any of the conditions in regulation 70(2).

Conditions required in resource consent

- (2) A resource consent granted for the discretionary activity must impose the conditions required by—
- (a) regulations 62 and 63 (information about structures and passage of fish and about culverts), unless the activity is use; and
 - (b) regulation 69 (monitoring and maintenance).

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Weirs

72 Permitted activities

- (1) The placement, use, alteration, extension, or reconstruction of a weir in, on, over, or under the bed of any river or connected area is a permitted activity if it complies with the conditions.

Conditions

- (2) The conditions are that—
- (a) the weir must provide for the same passage of fish upstream and downstream as would exist without the weir, except as required to carry out the works to place, alter, extend, or reconstruct the weir; and
 - (b) the fall height of the weir must be no more than 0.5 m; and
 - (c) the slope of the weir must be no steeper than 1:30; and
 - (d) the face of the weir must have roughness elements that are mixed grade rocks of 150 to 200 mm diameter and irregularly spaced no more than 90 mm apart to create a hydraulically diverse flow structure across the weir (including any wetted margins); and
 - (e) the weir’s lateral profile must be V-shaped, sloping up at the banks, and with a low-flow channel in the centre, with the lateral cross-section slope between 5° to 10°.

Information requirements

- (3) See also regulations 62 and 64 for information requirements that apply to the permitted activity (unless the activity is use).

73 Discretionary activities

- (1) The placement, use, alteration, extension, or reconstruction of a weir in, on, over, or under the bed of a river is a discretionary activity if it does not comply with any of the conditions in regulation 72(2).

Conditions required in resource consent

- (2) A resource consent granted for the discretionary activity must impose the conditions required by—
- (a) regulations 62 and 64 (information about structures and passage of fish and about weirs), unless the activity is use; and
 - (b) regulation 69 (monitoring and maintenance).

Passive flap gates

74 Non-complying activities

- (1) The placement, use, alteration, extension, or reconstruction of a passive flap gate in, on, over, or under the bed of any river or connected area is a non-complying activity.

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Conditions required in resource consent

- (2) A resource consent granted for the non-complying activity must impose the conditions required by—
- (a) regulations 62 and 65 (information about structures and passage of fish and about flap gates), unless the activity is use; and
 - (b) regulation 69 (monitoring and maintenance).

Part 4

Local authorities may charge for monitoring permitted activities

~~75 — Local authorities may charge for monitoring permitted activities~~

~~A local authority may charge for monitoring activities that are permitted activities under these regulations, if the authority is responsible for monitoring those activities.~~

~~75 — What local authorities may and must not charge for~~

~~(1) Subject to subclause (2), a local authority may charge for monitoring activities that are permitted activities under these regulations, if the authority is responsible for monitoring those activities.~~

~~(2) Despite subclause (1), a local authority must not charge to receive or review notifications of intended permitted activity work (including restoration plans, where required,) for wetland restoration, wetland maintenance, or biosecurity.~~

Schedule 1

Transitional, savings, and related provisions

r 4

Part 1

Provisions relating to these regulations as made

There are no transitional, savings, or related provisions relating to these regulations as made.

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Schedule 2

Restoration plans for natural wetlands

r 39

1 Details of activity site and natural wetland

The following information:

- (a) the physical address of the site of the activity:
- (b) the names of the owners of the site:
- (c) the contact details for the owners:
- (d) the legal description of the site, including the estate or interest held by the owners and any legal status or designation that applies to the site:
- (e) a map showing the location and boundaries of the natural wetland:
- (f) the details of the legal status of the natural wetland under any enactment or plan:
- (g) the details of any management partners or key stakeholders involved in the restoration plan.

2 Features and values of natural wetland

A description of the features and values of the natural wetland that are relevant to a restoration plan, including the following information:

- (a) the type of natural wetland:
- (b) the vegetation in the natural wetland, including the dominant types of vegetation and any species of note (for example, rare species, invasive weeds, or unusual plant communities):
- (c) the hydrology of the natural wetland, including—
 - (i) its water sources and flows (for example, streams, rivers, seeps, or solely rain):
 - (ii) its water levels (for example, permanent open water of more than 1 m depth, shallow water of 5 cm to 1 m depth, or conditions of being saturated with water of -5 to +5 cm depth, seasonally saturated, generally dry, or dry):
 - (iii) any modifications (for example, drains, weirs, culverts, canals, or stop banks):
- (d) the types of soil in the natural wetland:
- (e) any artificial features in the natural wetland (for example, roads, electricity lines, buildings, and access points):
- (f) any fauna known to use the natural wetland or its surrounding area:

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- (g) any special features of the natural wetland (for example, sites of cultural significance such as archaeological features, areas of cultural harvest, historic sites, or recreational areas).

3 Issues with natural wetland

The following information:

- (a) a description of the current state or condition of the features and values of the natural wetland:
- (b) a discussion of the threats to the natural wetland and the opportunities for restoring its features and values.

4 Management objectives for natural wetland

The specific objectives for managing the natural wetland based on its features, values, and issues, and taking into account—

- (a) its legal status under any enactment or plan; and
- (b) any existing or required resource consents or agreements with landowners or other relevant persons.

5 Operational details for achieving management objectives

An outline of the activities that will be carried out to achieve the objectives for managing the natural wetland, including the following:

- (a) the timelines for the activities and the persons responsible for resourcing and delivering them:
- (b) scale plans showing the operational areas:
- (c) the planting to be done, including—
 - (i) a diagram showing the general areas for planting:
 - (ii) the species to be used within specific areas (for example, areas of standing water, wetter margin areas, or drier areas):
 - (iii) the spacing of the plants:
 - (iv) the sources of the plants (for example, local native plant nurseries or locally-sourced seed):
 - (v) the approach to releasing the plants (including how often, for how many years, and by what method weeding will be done around the plants):
- (d) any vegetation to be removed, including species and methods of removal (for example, cutting, digging, or spraying):
- (e) any machinery to be used and the purpose of its use:
- (f) a description of the approach to water management, including—
 - (i) any changes to water levels or movement of water during and after the restoration works:

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- (ii) if water will be dammed or diverted,—
 - (A) how that will restore or enhance the natural wetland:
 - (B) any structures that will be installed:
 - (C) the time of year when the works will be carried out:
 - (D) the methods to be used to minimise effects on flora and fauna:
- (g) the approach to managing erosion and sediment to be used during all of the works:
- (h) any animal pest control to be carried out, including—
 - (i) which animal pests are present:
 - (ii) how often, and for how many years, the animal pest control will be carried out:
 - (iii) the method by which the animal pest control will be carried out:
- (i) a description of the actions to be taken to minimise any adverse effects on fauna or to enhance values for fauna.

6 Review and reporting

A description of the approach for assessing progress against the restoration plan and reporting that progress to the consent authority, including—

- (a) timelines for reporting progress; and
- (b) how any requirement to report under a resource consent will be met.

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Schedule 3

Sphagnum moss harvesting plans

rr 48, 49

1 Property and natural wetland details

The following information:

- (a) the physical address of the site of the activity:
- (b) the names of the owners of the site:
- (c) the contact details for the owners:
- (d) the name of the harvest operator:
- (e) the contact details for the harvest operator:
- (f) the legal description of the site, including the estate or interest held by the owners and any legal status or designation that applies to the site:
- (g) a map showing the location and boundaries of the natural wetland that is to be harvested:
- (h) photographs of the area to be harvested:
- (i) the details of the legal status of the natural wetland under any enactment or plan.

2 Operational details

An outline of the activities to occur in undertaking the sphagnum harvesting (including maps showing the operational areas), timelines for the harvesting, and confirmation that each requirement specified in the checklist of conditions for harvesting in Schedule 4 will be met.

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**Resource Management (National Environmental
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Schedule 4
Form for assessing natural wetlands after harvest of sphagnum moss

rr 48, 49

Form

Assessment of natural wetland after harvest of sphagnum moss

General information

- 1 Today’s date:
- 2 Name of harvesting organisation/company:
- 3 Name of harvest operator:
- 4 Name and identification number of natural wetland (if any):
- 5 Address/location of harvesting site:
- 6 Legal description of area that includes site:
- 7 Map reference for site:
- 8 Harvested area: *[attach map]*
- 9 Dates of harvesting:

Checklist of conditions for harvesting

- 1 Natural hydrological processes have been maintained because—
 - (a) the post-harvest moss surface is near but above the water level
 - (b) the hydrological regime of the area has not been altered in any way
 - (c) only existing formed accessways were used to access the harvested area *[attach map showing accessways]*
 - (d) drains and weirs were not used to manipulate water levels
- 2 Machinery or vehicles that entered the natural wetland were modified or supported to prevent them from damaging the natural wetland (for example, by widening the tracks of a track-driven vehicle or using platforms for the machinery to sit on)
- 3 Vegetation was crushed only for the purpose of maintaining sphagnum dominance and only during harvesting, as a component of the harvesting, or after harvesting to rehabilitate the sphagnum moss in the natural wetland area
- 4 Only the living portion (acrotelm) of the moss was removed
- 5 All machinery, vehicles, and equipment were cleaned before entering the natural wetland (to avoid introducing pests, unwanted organisms, or exotic plants)
- 6 No moss or plant was removed from the margins of a water body

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- | | | |
|----|---|--------------------------|
| 7 | Only containers of 20 litres or less were used to refuel machinery, vehicles, and equipment <u>outside a 10 m setback from the natural wetland within a natural wetland</u> | <input type="checkbox"/> |
| 8 | Fertiliser was not dispersed in the natural wetland | <input type="checkbox"/> |
| 9 | No breeding, roosting, or nesting site of an indigenous, a rare, or a threatened bird species was disturbed | <input type="checkbox"/> |
| 10 | Debris, materials, and equipment relating to the harvesting were removed from the site, and the site was free from litter, after the harvesting was finished | <input type="checkbox"/> |
| 11 | The harvested area and its accessways were disturbed only to the extent necessary to carry out harvesting | <input type="checkbox"/> |

Detailed information on particular conditions

- 1 Describe how the harvesting was undertaken:
- 2 Describe how any vehicle or machinery used for harvesting was modified or supported to prevent it from damaging the natural wetland: [*attach photos of vehicles or machinery*]
- 3 Provide any other information that you think is relevant:
- 4 Attach dated photos showing the site before, during, and after the harvesting.

Note about site visit

After compliance staff receive this form, they will organise a visit to the site to assess the information contained in the form.

Michael Webster,
Clerk of the Executive Council.

Issued under the authority of the Legislation Act 2019.
Date of notification in *Gazette*: 5 August 2020.

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Version as at
1 May 2022

**Resource Management (National Environmental
Standards for Freshwater) Regulations 2020**

Notes

Notes

1 General

This is a consolidation of the Resource Management (National Environmental Standards for Freshwater) Regulations 2020 that incorporates the amendments made to the legislation so that it shows the law as at its stated date.

2 Legal status

A consolidation is taken to correctly state, as at its stated date, the law enacted or made by the legislation consolidated and by the amendments. This presumption applies unless the contrary is shown.

Section 78 of the Legislation Act 2019 provides that this consolidation, published as an electronic version, is an official version. A printed version of legislation that is produced directly from this official electronic version is also an official version.

3 Editorial and format changes

The Parliamentary Counsel Office makes editorial and format changes to consolidations using the powers under subpart 2 of Part 3 of the Legislation Act 2019. See also PCO editorial conventions for consolidations.

4 Amendments incorporated in this consolidation

Resource Management (National Environmental Standards for Freshwater) Amendment Regulations 2022 (SL 2022/119)

Resource Management (National Environmental Standards for Freshwater) Amendment Regulations 2021 (LI 2021/77)

Resource Management (National Environmental Standards for Freshwater) Amendment Regulations 2020 (LI 2020/228)



Date: 26 July 2022

Subject: **Groundwater Quantity – State of Environment 2017-2020**

Approved by: Abby Matthews, Director – Environment Quality
S J Ruru, Chief Executive

Document: 3086102

Purpose

1. The purpose of this memorandum is provide the Committee with an overview of the findings and recommendations of the report *Groundwater Quantity - State of the Environment Monitoring Triennial Report 2017-2020*.
2. A copy of the technical report accompanies this memorandum, and is available via the Council's website. This item will be accompanied by a brief presentation.

Executive summary

3. Regional councils have responsibilities under the *Resource Management Act (1991)* to monitor the state of the environment within their region. The Council monitors the state and trends across the region's groundwater systems using a number of measures, including chemical and microbial water quality, groundwater levels and water usage.
4. The focus of this report is regional groundwater quantity. The report incorporates an assessment of the volume of groundwater currently allocated for use, which is compared against the estimated sustainable yields from the region's aquifers. Water level data collected from a 15 site regional monitoring network were analysed to assess the range of groundwater level fluctuations within different aquifers, and assess possible drivers of observed fluctuations. An analysis of current state and changes (trends) in groundwater levels is also presented.
5. With low demand for groundwater in Taranaki, none of the region's aquifers are presently under significant pressure. The highest level of allocation is in the Whenuakura and Matemateaonga aquifers (10.6% and 2.7% of sustainable yield respectively). All other aquifers have insignificant volumes of water allocated (<1 % of estimated sustainable yield).
6. While there may be an increase in demand as people look to move away from less secure surface water sources, this is not expected to place groundwater under significant pressure in the short to medium term.

7. As would be expected, monitored groundwater sites display fluctuations in water level as a result of seasonal variation in rainfall recharge. The magnitude of these changes varies considerably by site, ranging from a few millimetres up to several metres. The magnitude of change is influenced by rainfall patterns, bore depth, aquifer type (confined or unconfined) and hydraulic properties, the overlying land cover, and proximity to a stable surface water boundary or groundwater discharge area (e.g. river or sea).
8. Data collected over three years of monitoring at each site (2017-2020) has been assessed to determine the state of groundwater levels across monitored aquifers. The assessment shows that current water levels do not differ significantly from historical long-term averages. The analysis also illustrated similarities in spatial and temporal responses to rainfall across some sites.
9. Water level data collected at each monitoring location has been analysed for trends. This included analysis of long-term trends, where a site had a minimum of ten years of data available, and more recent trends using data from the five year period to June 2020.
10. The results of the trend analysis show that there has been no meaningful change in water level over time at the vast majority of sites. The exceptions to this were site GND0708 near Hawera, which experienced a slight decrease in its long-term water level and GND2253 near Patea, which exhibited a slight increasing trend over recent years.
11. The declining trend in GND0708 was identified in the previous report and an investigation to ascertain a cause of the declining water levels was initiated thereafter. The investigation concluded that it was unlikely that water levels were being reduced as a result of local groundwater abstractions. A visual assessment of the data indicates the changes observed may be part of longer-term water level pattern at the site and not indicative of any widespread reduction in groundwater levels across the aquifer. Further investigation into the trend seen in GND2253 suggests the increase is likely a result of the bore's hydraulic connection with a nearby public water supply bore, from which pumped volumes have decreased.
12. The results of the analyses undertaken show that groundwater abstraction and usage is well within current allocation limits, with little pressure on the region's groundwater systems, at the present time. This suggests that Council's policies relating to groundwater abstraction and usage continue to support sustainable management of the region's groundwater resource.

Recommendations

That the Taranaki Regional Council:

- a) receives the memorandum and technical report *Groundwater Quantity - State of the Environment Monitoring Triennial Report 2017-2020* and notes the specific recommendations therein.

Background

13. The Council's *Regional Fresh Water Plan for Taranaki* (2001) (RFP) contains an objective and associated policies relating to the sustainable management of groundwater. In essence, groundwater use is limited to the sustainable yield of the aquifer, whereby the abstraction rate does not cause long-term depletion of the groundwater resource. The concept of sustainable yield is implemented through the standards, terms and conditions contained within regional rules.

14. To track progress against these requirements, the Council maintains a groundwater quantity state of the environment monitoring programme, which seeks to:
 - To assess the current state of groundwater allocation across the region's major aquifer systems
 - To provide information on the current range of groundwater levels at a selected number of sites across the region's major aquifer systems
 - To identify spatial and temporal trends in water level caused by natural and/or anthropogenic influences, including allocation pressures.
15. The programme is comprised of two primary components. These include the desk-based assessment of groundwater allocation volumes, based on a review of consent information and records held within the Council's water accounting system, and the operation and assessment of data collected from the regional groundwater level monitoring network.
16. This information is used to measure how well management practices, policies and rules are working, and whether environmental outcomes are being achieved.

Discussion

17. Groundwater abstraction primarily occurs across a small number of the region's aquifers, where the water needs of overlying land use or development can't be met by a public/community supply, or a surface water abstraction.
18. The volume of groundwater allocated for abstraction across the Taranaki region remains low, with only 73 consents authorising the taking of groundwater as of 30 June 2020 (Figure 1).
19. The highest level of allocation is seen in the Whenuakura aquifer, where 10.6% of the estimated sustainable yield is allocated across the aquifer (Table 1). The Matemateaonga aquifer has approximately 2.7% of its estimated sustainable yield allocated. All other aquifers have insignificant volumes of water allocated (<1% of estimated sustainable yield).
20. The relatively low demand placed on groundwater resources across Taranaki is likely due to several factors. Firstly, most areas of Taranaki receive regular and plentiful rainfall, with a steep rainfall gradient inward from coastal areas. The high rainfall experienced in Taranaki means that, outside of coastal areas, soil moisture deficits are generally low and when they do occur, they are generally short lived. As a result, Taranaki has not seen the rapid increase in water demand for pasture irrigation as has been seen elsewhere in New Zealand.
21. The rainfall characteristics and topography within Taranaki also means that there are many rivers and streams accessible for water supply. Surface water is typically preferred to groundwater sources for water supply, given they can be obtained at a much lower capital cost. The low yields from Taranaki aquifers often mean that multiple bores are required to supply high demand uses, making the use of groundwater uneconomic. Surface water systems are generally able to sustain the majority of water demand in Taranaki, although several catchments are now fully allocated.
22. Notwithstanding the above, there is potential for growth in groundwater demand in the future. Any significant growth would likely be driven by a shift in current land use, development of new land uses or industrial activities that require greater higher water

inputs than those activities that predominate currently. If more surface water systems across the region reach their allocation limit in coming years, any future increases in regional water demand may necessitate the need for more groundwater sourced water supply.

23. Climate change also has the potential to influence future rainfall patterns in Taranaki and, as a result, the volume of water recharging its groundwater systems. This could impact both the regional water demand and the volume of groundwater available for allocation.

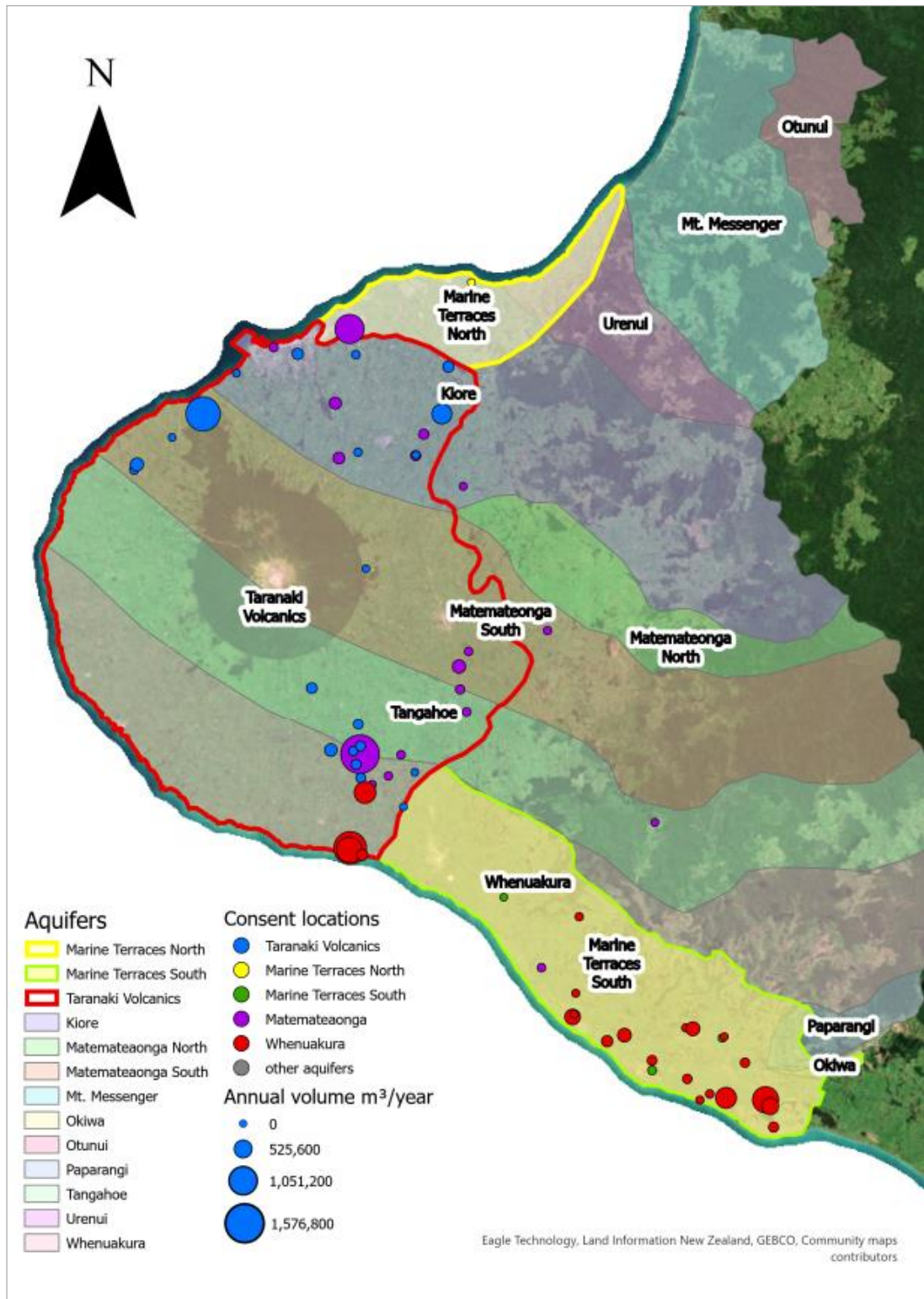


Figure 1: Locations of consented groundwater abstractions and the volume of water allocated as of 30 June 2020.

Table 1: A comparison of groundwater allocated across Taranaki with the estimated sustainable yields for each groundwater aquifer (as at 30 June 2020).

Geological age	Aquifer	(ML/yr)		
		Sustainable yield	Allocated	% allocated
Quaternary	Taranaki Volcanics	617,670,699	5,262,205	0.9
	Marine Terraces North	40,463,833	133,433	0.3
	Marine Terraces South	96,732,208	508,800	0.5
Tertiary	Kiore	154,171,531	149,600	0.1
	Matemateaonga	165,961,911	4,425,795	2.7
	Mt. Messenger	140,017,639	70,540	<0.1
	Okiwa	751,065	3,287	0.4
	Otunui	37,177,534	18,432	<0.1
	Paparangi	9,928,462	14,708	0.2
	Tangahoe	96,069,770	134,119	0.1
	Urenui	45,661,458	0	0
Whenuakura	71,384,932	7,553,830	10.6	

24. The Council monitors groundwater levels at 15 sites across the region. Nine of these sites are classified as long-term sites, where data has been collected for at least ten years. Six further sites have been added to the programme since 2012 to improve the spatial coverage of the monitoring network (Figure 2).
25. Water level data is collected electronically at all sites, which is checked and validated with manual level measurements. The length of data record varies across sites, from four to 36 years. Sites are classified as having long-term records where data has been collected for a minimum of 10 years, while short-term sites have a minimum of five years of data available.
26. The network spans six of the region's major aquifer systems, which cover areas of the region with the most significant levels of abstraction pressure. The data collected illustrates the natural variability in water levels across the region's aquifers (Figure 2).
27. Monitoring of water levels at sites intersecting unconfined aquifers, primarily in the Taranaki Volcanics and Marine Terraces aquifers, show strong responses to seasonal rainfall patterns. This generally results in water levels rising during periods of the year with higher rainfall (winter, spring) and falling during drier periods (summer, autumn).
28. The magnitude of seasonal fluctuations and the speed of level response to rainfall is influenced by factors other than aquifer confinement, including: the permeability and storage characteristics of strata in which the groundwater resides, aquifer water storage capacity, the depth to the water table and the overlying land cover and proximity to a stable surface water boundary.

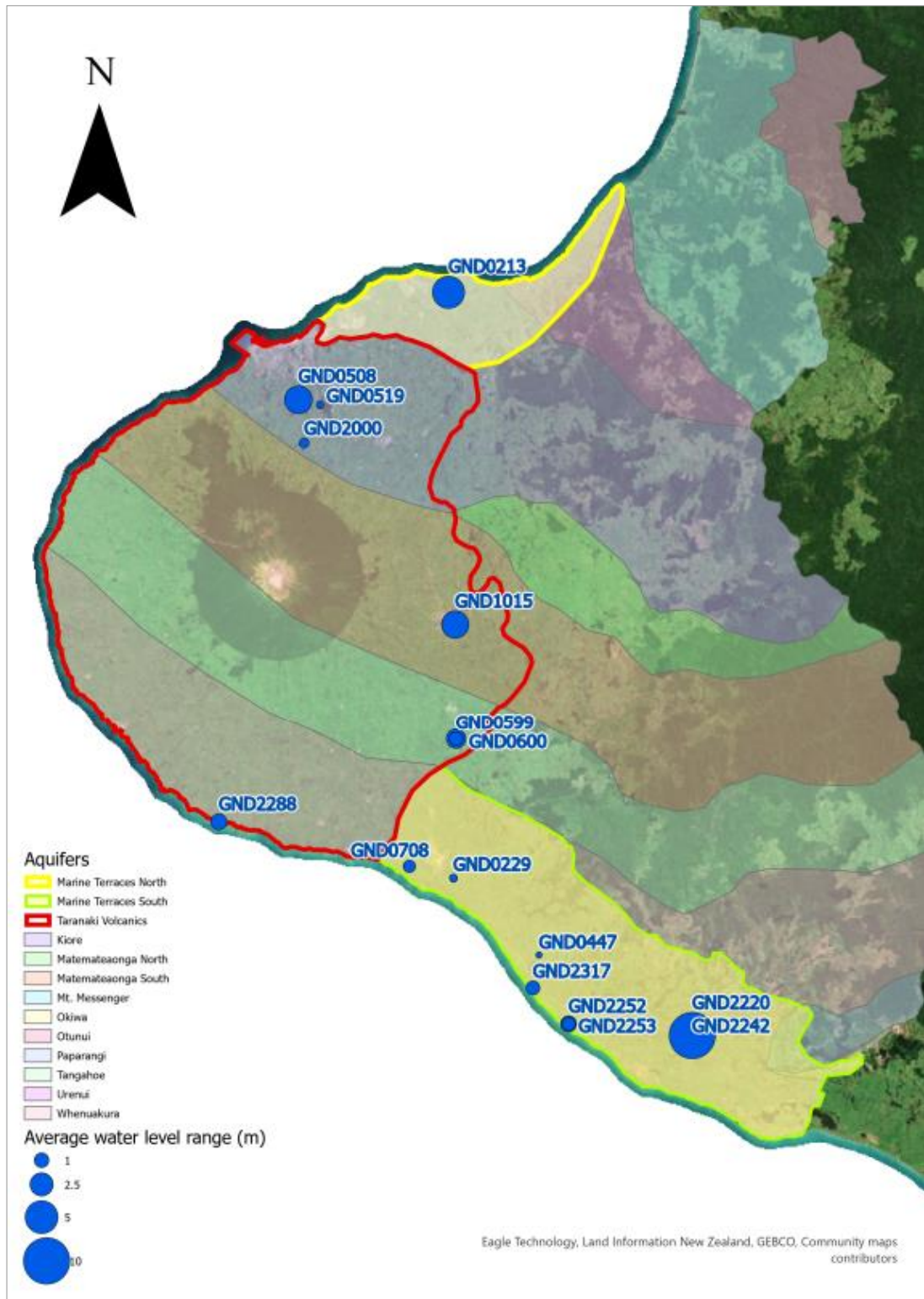


Figure 2: Plot showing observed ranges in average annual water level fluctuation by site and aquifer.

29. The impact of seasonal fluctuations in rainfall recharge volumes on groundwater levels are more subdued in confined aquifers, which are disconnected from direct rainfall recharge by overlying low permeability strata. As a result, the magnitude of level fluctuations are typically much less in these aquifers than seen in shallow unconfined groundwater systems, where the water table is close to the surface and receiving direct rainfall recharge.
30. The water level data from some sites also illustrates the influence of water abstraction on groundwater systems, whereby drawdown of water levels occurs as a result of pumping, with a corresponding rebound in water level when pumping stops.
31. The groundwater level data collected between 2017 to 2020 was analysed to determine the state of groundwater levels across monitored aquifers. The assessment showed that recent water levels do not differ significantly from historical long-term averages at monitored sites. The analysis also illustrated similarities in spatial and temporal responses to rainfall across some sites.
32. Short-term trend analysis was undertaken for all sites with a minimum of five years' data to assess recent trends in groundwater level change. Where a site had a minimum of 10 years of available data, an analysis of the full data record from that site was also conducted to assess longer-term trends in groundwater level.
33. Following the statistical analysis to determine trend direction, further consideration was given to whether any identified trends were environmentally meaningful. This assessment included consideration of the following:
 - 33.1. In a confined aquifer, which is generally very slow to recharge and may have a significant volume of water held in storage, any unexpected water level change that exceeds the range of water levels previously seen within the aquifer is likely to be meaningful.
 - 33.2. In semi-confined and unconfined aquifers, which are generally strongly influenced by rainfall recharge, any unexpected water level change that significantly exceeds the range of water levels previously seen within the aquifer and/or does not mimic local climatic patterns is likely to be meaningful.
34. The results of the trend analysis show that there has been no meaningful change in water level over time at the majority of sites, with the exception of three sites.
35. Water levels at site GND0708 (Whenuakura aquifer, near Hawera) were found to have declined over the long-term data record. An investigation concluded that it was unlikely that the decline was a result of local abstraction pressure, but was potentially part of longer-term patterns in water level in the area. Water levels at other sites in the aquifer did not display a similar decline in water level, suggesting this is a localised issue.
36. Further analysis of the increase in water level seen in GND2253 (Whenuakura aquifer, near Patea) was also undertaken. A comparison against local rainfall patterns indicated the increase was not a result of climatic processes. The increase in water level is likely to be linked to the hydraulic connection between GND2253 and a nearby public supply bore. Abstraction from the supply bore was reduced over the monitoring period which allowed the aquifer, and consequentially the water level in GND2253, to recover.
37. A short-term decline in water level in GND2220 (Whenuakura aquifer at Waverley) was also identified that could not be directly attributed to rainfall. The slight decline may be related to a change in the abstraction regime in a nearby public supply bore. This will

continue to be monitored closely to ensure it is not an indication of any issue with the ongoing sustainability of the aquifer.

38. In summary, analysis of groundwater level data has found isolated impacts of localised abstractions on water levels at specific sites, but overall, groundwater levels remain stable at the majority of monitored locations. The results of the analysis undertaken in preparing this report show that the Council's policies related to groundwater abstraction and usage continue to support sustainable management of the region's groundwater resource.
39. The report includes one recommendation:
THAT the Council's regional groundwater level monitoring network be extended as further suitable sites are identified. Sites intersecting aquifers where current monitoring coverage is limited should be prioritised, as should sites to the west of Taranaki Maunga.
40. Any potential modifications to Council's groundwater monitoring network will be considered as part of Council's broader state of environment monitoring network review during 2022-2023.

Financial considerations—LTP/Annual Plan

41. This memorandum and the associated recommendations are consistent with the Council's adopted Long-Term Plan and estimates. Any financial information included in this memorandum has been prepared in accordance with generally accepted accounting practice.

Policy considerations

42. This memorandum and the associated recommendations are consistent with the policy documents and positions adopted by this Council under various legislative frameworks including, but not restricted to, the *Local Government Act 2002*, the *Resource Management Act 1991* and the *Local Government Official Information and Meetings Act 1987*.

Iwi considerations

43. This memorandum and the associated recommendations are consistent with the Council's policy for the development of Māori capacity to contribute to decision-making processes (schedule 10 of the *Local Government Act 2002*) as outlined in the adopted long-term plan and/or annual plan. Similarly, iwi involvement in adopted work programmes has been recognised in the preparation of this memorandum.

Community considerations

44. This memorandum and the associated recommendations have considered the views of the community, interested and affected parties and those views have been recognised in the preparation of this memorandum.

Legal considerations

45. This memorandum and the associated recommendations comply with the appropriate statutory requirements imposed upon the Council.

Appendices/Attachments

Document 2959008: Groundwater Quantity State of the Environment Monitoring Triennial Report 2017-2020 Technical Report 2021-86 (Executive summary and recommendations).

Groundwater Quantity

State of the Environment Monitoring Triennial Report 2017-2020

Technical Report 2021-86



Working with people | caring for Taranaki



Taranaki Regional Council
Private Bag 713
Stratford

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Document: 2959008 (Pdf)
July 2022

Groundwater Quantity
State of the Environment Monitoring
Triennial Report
2017-2020

Technical Report 2021-86

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Executive summary

Regional councils have responsibilities under the Resource Management Act (1991) to monitor the state of the environment within their region. The Taranaki Regional Council (the Council) monitors the state and trends across the region's groundwater systems using a number of measures, including chemical and microbial water quality, groundwater levels and usage.

The focus of this report is regional groundwater quantity. The report incorporates an assessment of the volume of groundwater currently allocated for abstraction, which is compared against the estimated sustainable yields from the region's predominant aquifers. Water level data collected from a 15 site regional monitoring network were analysed to assess the range of groundwater level fluctuation across aquifers and assess possible drivers of observed fluctuations. An analysis of current state and trends in water level change over time is also presented.

The volume of groundwater allocated for abstraction across the region remains low, with only minor increases in the demand for groundwater over the last decade. As of 30 June 2020, there were only 73 current consents authorising the taking of groundwater. The highest level of allocation is currently seen in the Whenuakura and Matemateaonga aquifers (10.6% and 2.7% of sustainable yield respectively). All other aquifers have insignificant volumes of water allocated (<1 % of estimated sustainable yield).

With low demand for groundwater in Taranaki, none of the region's aquifers are presently under significant pressure. While there may be an increase in demand as people look to move away from less secure surface water sources, this is not expected to place groundwater under significant pressure in the short to medium term.

As expected, monitored groundwater sites display fluctuations in water level as a result of seasonal variations in rainfall recharge. The magnitude of these changes varies considerably by site, ranging from a few millimetres up to several metres. The magnitude of these fluctuations is influenced by rainfall patterns, bore depth, aquifer type (confined or unconfined) and hydraulic properties, the overlying land cover, and proximity to a stable surface water boundary or groundwater discharge area (e.g. river or sea).

The data collected over the last three years of monitoring at each site has also been assessed to determine the current state of groundwater levels across monitored aquifers. The assessment shows that current water levels do not differ significantly from historical long-term averages. The analysis also illustrated similarities in spatial and temporal responses to rainfall across some sites.

Water level data collected at each monitoring location has been analysed for trends. This included analysis of both long-term trends and more recent trends using data from the last five year period (2015-2020).

The results of the trend analysis show that at the vast majority of sites there has been no meaningful change in water level over time. The exceptions to this were site GND0708, near Hawera, which was found to have experienced a slightly decreasing trend over its long-term data record and GND2253, near Patea, which exhibited a slight increasing trend in recent years.

The declining trend in GND0708 was identified in the previous report and an investigation to ascertain a cause of the declining water levels was initiated. The investigation found that it was unlikely that water levels were being reduced as a result of local groundwater abstractions. A visual assessment of the data indicates the changes observed may be part of longer-term water level pattern at the site and not indicative of any widespread reduction in groundwater levels across the aquifer. Further investigation into the trend seen in GND2253 illustrates hydraulic connection with a nearby public water supply bore.

The results of the analyses undertaken show that groundwater abstraction and usage is well within current allocation limits, with little pressure on the region's groundwater systems at the present time.

This suggests that Council's policies relating to groundwater abstraction and usage continue to support sustainable management of the region's groundwater resource.

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1 Introduction

1.1 State of the environment monitoring (SEM)

Regional councils have responsibilities under the *Resource Management Act (1991)* (RMA) to monitor the state of the environment within their region. The purpose of state of the environment monitoring (SEM) is to collect sufficient data to produce information on the general health of the environment.

The Taranaki Regional Council (the Council) monitors the state and trends across the region's groundwater resource using a number of measures, including chemical and microbial water quality, groundwater levels and usage. The results of the monitoring undertaken are reported in two separate SEM reports, one covering groundwater quality and the other dealing specifically with groundwater quantity, as reported in this document.

The SEM Groundwater Quantity Programme has three primary objectives:

- To assess the current state of groundwater allocation across the region's major aquifer systems;
- To provide information on the current range of groundwater levels at a selected number of sites across the region's major aquifer systems;
- Identify spatial and temporal trends in water level arising as a result of natural and/or anthropogenic influences, including allocation pressures.

This information can then be used to measure how well management practices, policies and rules are working, and whether environmental outcomes are being achieved.

1.2 Groundwater quantity management

The *Regional Policy Statement for Taranaki (2010)* (RPS) sets out the Council's approach to the sustainable management of groundwater use across the Taranaki region. Policies set out in the RPS are intended to protect against adverse effects on groundwater flows arising from over abstraction. It is intended that this be achieved by managing groundwater take volumes within the sustainable yields of specific aquifer units. Policies set out in the RPS also recognise the connection between groundwater and surface water systems and therefore the potential for reduced surface water flows as a result of groundwater abstraction. The RPS also details a range of other matters to be considered in relation to the taking and use of groundwater, while promoting its use as a potential alternative to surface water. These recognise the need for groundwater to be available for reasonable domestic, stock watering and firefighting needs, as required by section 14(3) of the RMA, subject to the taking or use not resulting in any adverse effects on the environment.

The main method of policy implementation is through the *Regional Freshwater Plan for Taranaki (2001)* (RFP), which sets out regional rules to allow, regulate and avoid adverse effects on the environment from the taking and use of groundwater. Under Rule 48 of the RFP, the taking of groundwater of up to 50 m³/day, at a rate not exceeding 1.5 L/s, is permitted, providing several conditions are met. Takes exceeding this volume or rate, or not meeting all associated conditions, require a resource consent. Through the consenting process, the matters set out for consideration under the RPS are assessed, as are the wider environmental effects of any proposed take.

The Council also undertakes a comprehensive programme of consent compliance monitoring. This includes the monitoring of consents authorising the taking of groundwater. The range of monitoring carried out is dependent on the risk associated with the specific take, but in most instances will include requirements to record the volumes of water taken and/or the rates of take. The recording of specific take data is also a requirement under the *Resource Management (Measuring of Water Takes) Regulations (2010)* for any take exceeding 5 L/s. In any addition to these requirements, the Council may also require monitoring of water

levels in a pumping bore, or surrounding bores. The monitoring of groundwater levels is the primary means of assessing the effects of a groundwater take, be those of a specific take or the cumulative impact of multiple takes within an aquifer unit.

1.3 Groundwater quantity monitoring programme

The groundwater quantity monitoring programme is an amalgamation of two SEM groundwater monitoring programmes that were previously delivered separately by the Council, namely the pressures on groundwater resources and groundwater levels monitoring programmes. The two programmes have been amalgamated to provide a more integrated assessment of groundwater allocation pressures and the potentially observable impacts of groundwater takes (reduced groundwater levels).

The revised programme is comprised of two primary components. These include the desk based assessment of groundwater allocation volumes, based on a review of consent information and records held within the Council's water accounting system, and the operation and assessment of data from a regional groundwater level monitoring network.

This is the second report prepared under the revised programme structure. The first report covered the 2015-2016 and 2016-2017 monitoring years.

2 Regional hydrogeology

The Taranaki region hosts an extensive groundwater resource that is widely utilised for potable water supply (predominantly domestic and limited municipal), agricultural (stock water and irrigation) and industrial usage. Aquifer bearing formations can be generally characterised into those of Quaternary and Tertiary age. Figure 1 illustrates the geographical distribution of the major geological units in Taranaki. The aquifer systems in Taranaki are informally named after the geological units they occur in.

2.1 Taranaki volcanic deposits

Quaternary aged volcanic deposits cover a wide area of the Taranaki region, extending from the coastal boundary in the west, to the Tertiary deposits of the Taranaki basin in the east, and bounded to the north and south by the Quaternary marine terrace deposits.

The Taranaki volcanic deposits contain both coarse material (sands, breccia and agglomerates) and fine material (clay, tuff and ash), resulting in irregular lithologies and anisotropic hydrogeologic conditions (Taylor and Evans, 1999). These result in a complex system of unconfined, perched and semi confined aquifers within the volcanic deposits. The water table in the ring plain, which extends radially from Taranaki, Maunga is typically encountered between 1 to 10 m below ground level. Seasonal variations in water table depth of up to 5 m are common. Groundwater flow generally reflects surface topography and flows radially from Taranaki Maunga. Recharge to the Taranaki Volcanics Aquifer is mainly by local rainfall infiltration.

Shallow wells and bores drawing water from unconfined aquifers in the volcanic deposits typically yield in the range 0.5-2.5 L/s. Higher yielding confined aquifers are reported from volcanic deposits in the Kaitake Ranges (19 L/s), New Plymouth (10 L/s), Okato (20 L/s) and Kapuni (8 L/s).

Shallow, unconfined groundwater systems within the Taranaki volcanic deposits also provide baseflow to the many rivers and streams that traverse the Taranaki ring plain. A number of streams rising both within Te Papakura o Taranaki and at lower elevations across the ring plain are known to be spring fed, with the most significant contributions from groundwater occurring at elevations within Te Papakura o Taranaki.

2.2 Marine terrace deposits

The marine terrace deposits occur in coastal areas south of Hawera and, to a lesser extent, the coastal areas north of New Plymouth. Basal units are typically marine sands often with conglomerate or shell layers, grading upward to terrestrial sediments.

The marine terrace sediments range up to about 40 m in thickness and contain multiple unconfined aquifers. The water table within the marine terrace deposits generally lies between 1 to 15 m below ground level. Recharge to the Marine Terrace Aquifer is primarily by local rainfall infiltration.

Numerous shallow wells and bores draw from unconfined aquifers contained within the marine terrace deposits, with yields in the range 0.3-2.6 L/s. No confined aquifers are known to occur in the marine terrace deposits.

2.3 Tertiary sedimentary formations

Nine Tertiary sedimentary formations are recognised in the region (Figure 1). The formations as a whole are gently tilted towards the southwest. Seven formations are exposed in the eastern Taranaki hill country and continue beneath the volcanic and marine terrace deposits, while two (Otunui and Mt. Messenger) are fully exposed.

Little is known about groundwater use in the Otunui and Mt. Messenger formations. The Urenui Formation is regarded as an aquiclude/aquitard, and as such is not aquifer-bearing. In all of the other formations,

shallow wells and bores draw from unconfined aquifers, and at depth the same formations host more productive confined aquifers.

Higher yielding confined aquifers are reported from the Kiore Formation at Bell Block (35 L/s), Matemateaonga Formation at Kapuni and Eltham (7-20 L/s) and the Whenuakura Formation at Patea and Waverley (8-10 L/s).

2.4 Rainfall and climate variability

The Taranaki region receives regular rainfall throughout the year as a result of its westerly position, its mid-latitude location and topography. Average annual rainfall volumes across the region range from approximately 1,000 mm along some southern coastal margins to in excess of 7,000 mm on the upper slopes of Taranaki Maunga. Rainfall volumes increase rapidly with elevation away from the coast (Figure 2). The high rainfall volumes across Taranaki generally result in rainfall surpluses being available to recharge the region's groundwater systems, particularly where aquifer recharge zones are located in elevated areas, be it off Taranaki Maunga or the eastern hill country.

Variation in global climate patterns have the potential to affect the volume of rainfall seen in Taranaki, as it does elsewhere. The predominant processes include the El Niño-Southern Oscillation cycle (ENSO) and the Inter-decadal Pacific Oscillation (IPO). ENSO and the IPO are natural cycles that operate over timescales of years and decades, respectively.

The ENSO cycle results in interchanging El Niño and La Niña weather patterns. During El Niño New Zealand tends to experience stronger or more frequent winds from the west in summer, which can encourage dryness in eastern areas and more rain in the west. In winter, the winds tend to blow more from the south, causing colder temperatures across the country. In spring and autumn, south westerly winds are more common

During La Niña events northeasterly winds tend to become more common, bringing moist, rainy conditions to north eastern areas of the North Island and reduced rainfall to the lower and western South Island. Warmer than average air and sea temperatures can occur around New Zealand during La Niña.

In El Niño years, Taranaki tends to experience reduced rainfall volumes. In La Niña years increased rainfall volumes are generally recorded, particularly during winter and spring, and a greater occurrence of heavy rainfall events, often associated with subtropical lows coming from the north Tasman (NIWA, 2008).

The Inter-decadal Pacific Oscillation (IPO) is a Pacific-wide natural fluctuation in the climate, which causes shifts in Pacific Ocean circulation patterns. There are two IPO phases, positive and negative, with phase changes experienced every 20-30 years. In the positive phase, westerly quarter winds over the country and anticyclones in the north Tasman are more prevalent. The most recent IPO reversal occurred 1999-2000, with a shift to a negative phase. This would be expected to encourage more La Niña activity (NIWA, 2008). Thompson et al. (2006) examined rainfall figures from New Plymouth during two distinct IPO phases and concluded that rainfall producing processes at New Plymouth and in the surrounding districts in North Taranaki were not being influenced to any great extent by the phase of the IPO.

Climate change projections for the wider region suggest increasing precipitation and more extreme rainfall events in the coming decades, with longer and more frequent dry spells. NIWA reports Taranaki can expect a mixture of changes in rainfall, with an increase in rainfall of up to 8-12% in winter, with decreases in inland and northern areas in autumn and spring under different climate change scenarios. An increase in the number of dry days, particularly from spring through to autumn, can be expected with little change in winter projected by 2090. For all future climate scenarios, we anticipate seeing an increase in drought conditions, particularly by 2090. Based on the available information, it is not predicted that climate change effects will significantly alter groundwater recharge volumes over the time-scales of current climate change projections.

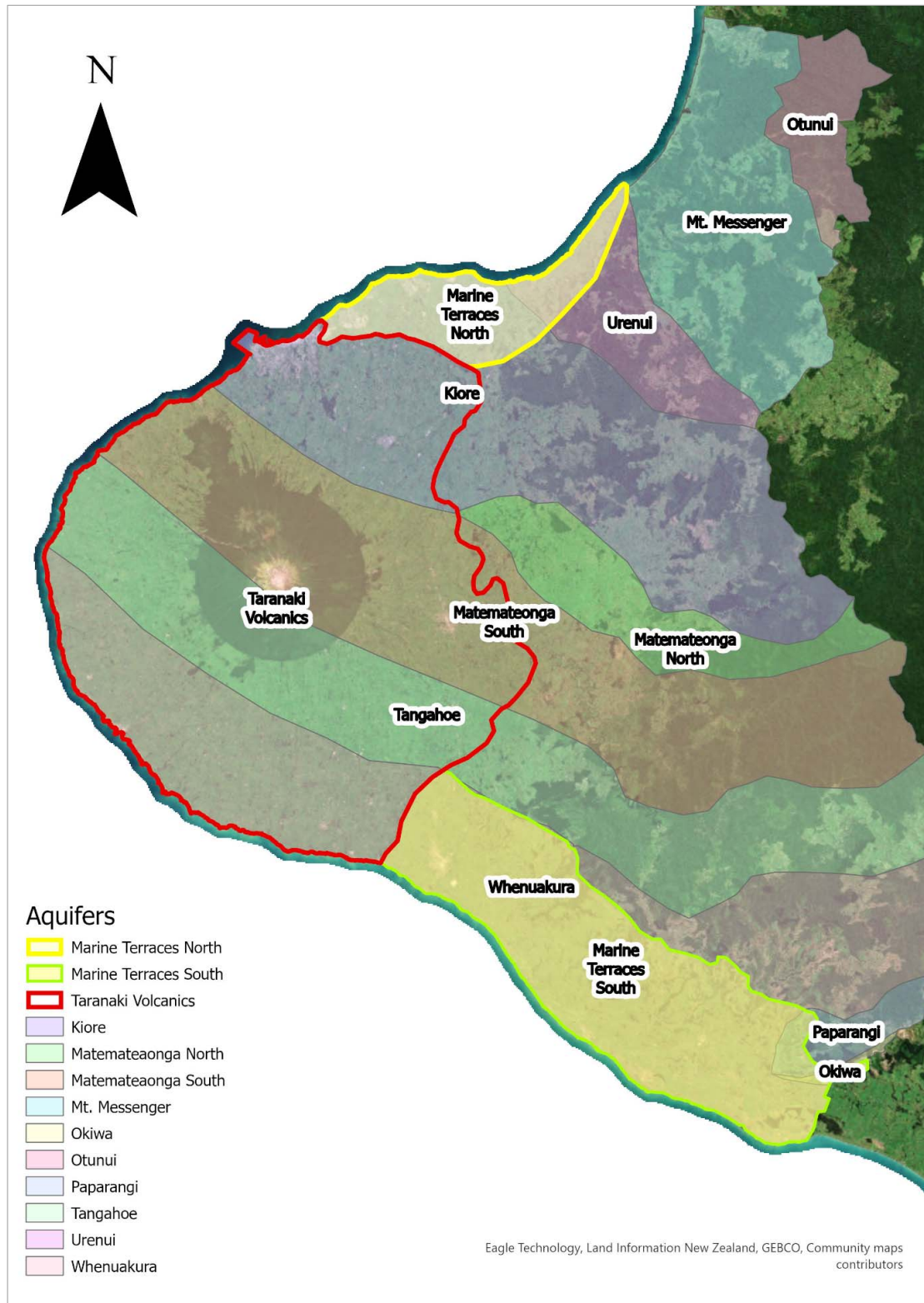


Figure 1 Distribution of the main geological units (aquifers) of the Taranaki region

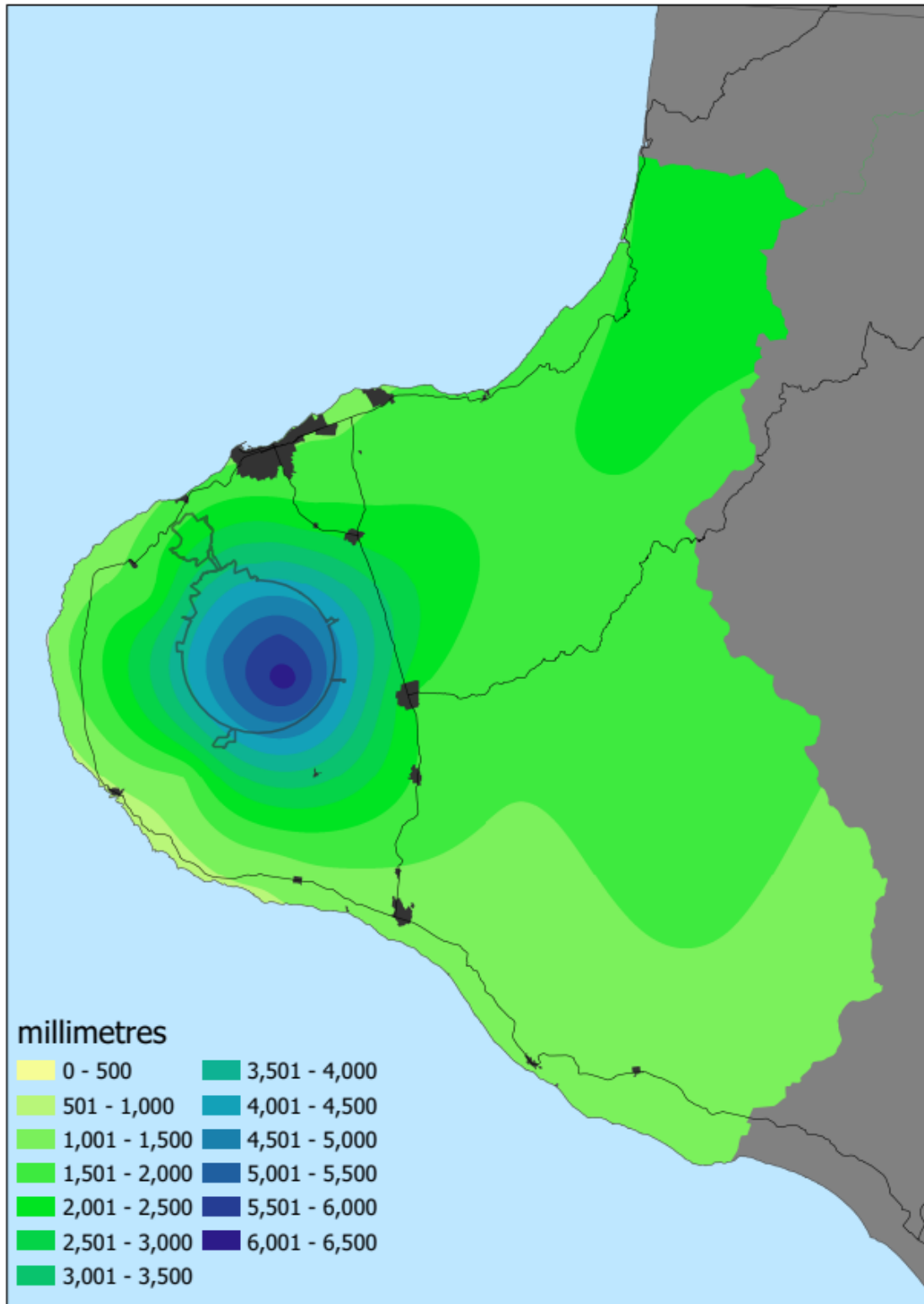


Figure 2 Patterns of rainfall distribution across Taranaki and average annual volumes (2017-2020)

2.1 Estimates of recharge and sustainable groundwater yields

For the purposes of groundwater accounting, the region has been subdivided into 12 groundwater aquifers that align with geological unit boundaries (Figure 1).

An estimate of sustainable yield has been calculated for each of the aquifers displayed in Figure 1. These have been calculated by estimating the amount of rainfall likely to recharge each aquifer on an annual basis. The calculations are therefore based on conservative estimates of 'new' water entering each aquifer each year, not on water that is already in storage.

The total volume of rainfall potentially recharging each aquifer (rainfall recharge) was calculated by multiplying 30% of the average annual rainfall by the spatial area of each aquifer receiving direct recharge from rainfall (i.e. unconfined areas of an aquifer exposed at surface). Sustainable yields have been conservatively set at 35% of rainfall recharge for all aquifers. This equates to allocable volumes that are approximately 5-10% of the total annual rainfall, so is very conservative (Table 1). In other words, it is assumed that the remaining 90-95% of rainfall either evaporates, is discharged as surface run-off or replenishes groundwater storage. Calculations are based on those proposed by Ministry for the Environment (MfE), 2008.

Table 1 Estimates of sustainable yields calculated for all groundwater aquifers

Geological age	Aquifer	Classification	(ML/yr)
			Sustainable yield
Quaternary	Taranaki Volcanics	Unconfined	617,670,699
	Marine Terraces North	Unconfined	40,463,833
	Marine Terraces South	Unconfined	96,732,208
Tertiary	Kiore	Confined	154,171,531
	Matemateaonga	Confined	165,961,911
	Mt. Messenger	Confined	140,017,639
	Okiwa	Confined	751,065
	Otunui	Confined	37,177,534
	Paparangi	Confined	9,928,462
	Tangahoe	Confined	96,069,770
	Urenui	Confined	45,661,458
	Whenuakura	Confined	71,384,932

3 Groundwater allocation

Groundwater abstraction primarily occurs across a small number of the region's potentially water bearing hydrogeological units, where overlying land use or development has necessitated a particular water supply need that cannot be adequately met by municipal or community supply, or a surface water abstraction.

The typically low yields associated with the region's shallow unconfined aquifers mean that abstraction of groundwater is generally only suitable for low demand uses. As a result, the majority of abstractions from these aquifers are likely to be permitted under rules set out in the RFWP, which set out limits in terms of abstraction rate and volume. The total volume of groundwater allocated across Taranaki is comprised of takes permitted by the RFWP and those authorised by a resource consent.

Estimates of potential permitted take demands were recently developed by the Council, as part of its water quantity accounting system development project. Further details of the methodology used to develop these permitted take estimates can be found in the report detailing this work (TRC, 2017). In summary though, an overall potential permitted take demand was estimated on a catchment basis, based on livestock and dairy shed water demands. The total estimated permitted take demand was proportioned between surface and groundwater sources. The permitted groundwater take estimates were also aggregated and apportioned by aquifer. This includes an estimate of the volume of permitted groundwater takes sourced from both unconfined aquifers and areas of Tertiary aquifers confined by overlying Quaternary hydrogeological units.

The volume of water allocated through resource consents was calculated using consents data stored in the Council's IRIS database. A total of 73 consents authorising the taking of groundwater, 68 for water supply and five for dewatering purposes, were current as of 30 June 2020. The locations of all consented groundwater abstractions are set out in Figure 3. The special conditions attached to each of these consents vary, as a result of standard consent conditions evolving over time. All current consents to abstract groundwater have either a take rate or volume restriction or, in some cases, a combination of both.

Where volume limits are stipulated in the conditions of a consent, this figure was used to calculate the volume of water that could potentially be taken under the consent on an annual basis. Where a take was restricted by rate, the maximum authorised rate of take has been used to calculate the volume of water that could potentially be taken under the consent over the course of a year. Both calculations assume that each take is fully utilised, that is, the maximum volume is taken on a daily or weekly basis, or abstraction occurs 24 hours a day, 365 days of the year for those consents which only specify a limit on the rate of take. Both of these scenarios are highly unlikely, and therefore the calculated usage figures likely represent an overestimation of actual water use.

Table 2 summarises the current levels of groundwater allocation against estimated sustainable yields for each aquifer.

The implications and significance of this data is discussed in Section 6.1 of this report.

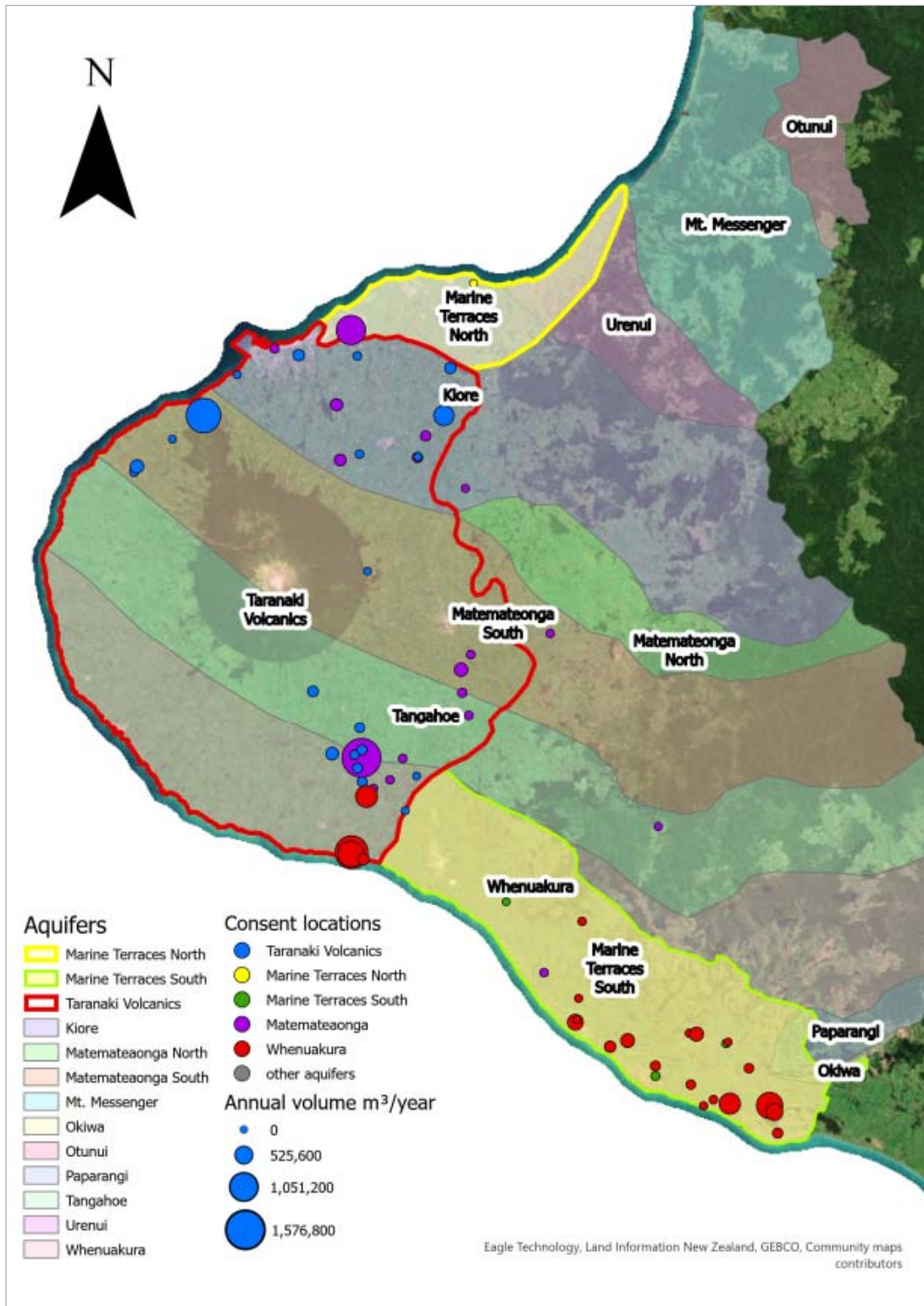


Figure 3 Locations of consented groundwater abstractions as of 30 June 2020

Table 2 Current levels of groundwater allocation across Taranaki in comparison to calculated sustainable yields for each groundwater aquifer (as at 30 June 2020)

Geological age	Aquifer	(ML/yr)		
		Sustainable yield	Allocated	% allocated
Quaternary	Taranaki Volcanics	617,670,699	5,262,205	0.9
	Marine Terraces North	40,463,833	133,433	0.3
	Marine Terraces South	96,732,208	508,800	0.5
Tertiary	Kiore	154,171,531	149,600	0.1
	Matemateaonga	165,961,911	4,425,795	2.7
	Mt. Messenger	140,017,639	70,540	<0.1
	Okiwa	751,065	3,287	0.4
	Otunui	37,177,534	18,432	<0.1
	Paparangi	9,928,462	14,708	0.2
	Tangahoe	96,069,770	134,119	0.1
	Urenui	45,661,458	0	0
Whenuakura	71,384,932	7,553,830	10.6	

4 Regional groundwater level monitoring network

The monitoring of groundwater levels enables the Council to examine the relationships between groundwater recharge and discharge within regional groundwater and surface water systems. Where recharge volumes exceed those discharged, groundwater levels rise. Conversely, if discharge volumes exceed recharge, groundwater levels fall. Fluctuations in recharge are predominantly related to climatic patterns, but can also be artificially influenced by activities such as pasture irrigation onto recharge areas. Discharge volumes are influenced by both natural processes, such as flow from springs and groundwater seepage to rivers and the coast, and the removal of groundwater by abstraction.

The Council monitors groundwater levels at 15 sites across the region. Nine of these sites are classified as long-term sites, where data has been collected for in excess of ten years. Six further sites have been added to the programme since 2012 to improve the spatial coverage of the monitoring network.

The monitoring network now includes sites in all of the region's water bearing formations that are most utilised for water supply, with site distribution targeted toward areas of greater water use pressure. The monitoring network includes sites of varying depth in order to monitor water level fluctuations in both unconfined and confined groundwater systems.

The network includes two multi-well monitoring sites, located south of Eltham (sites GND0599 and GND0600) and at Patea (sites GND2252 and GND2253). At each of these sites, two wells have been installed in close proximity to monitor vertically separated aquifer units.

Table 3 sets out the distribution of sites included in the monitoring network by aquifer. Specific details of each site are provided in Table 4 and their respective geographical locations are illustrated in Figure 4 and Figure 5 respectively.

Table 3 Distribution of groundwater level monitoring sites by aquifer across Taranaki (groundwater aquifers in bold text represent those with the greatest level of water use pressure)

Aquifer	Number of monitoring locations
Taranaki Volcanics	4
Marine Terraces North	1
Marine Terraces South	1
Kiore	0
Matemateaonga	3
Mt. Messenger	0
Okiwa	0
Otunui	0
Paparangi	0
Tangahoe	1
Urenui	0
Whenuakura	5

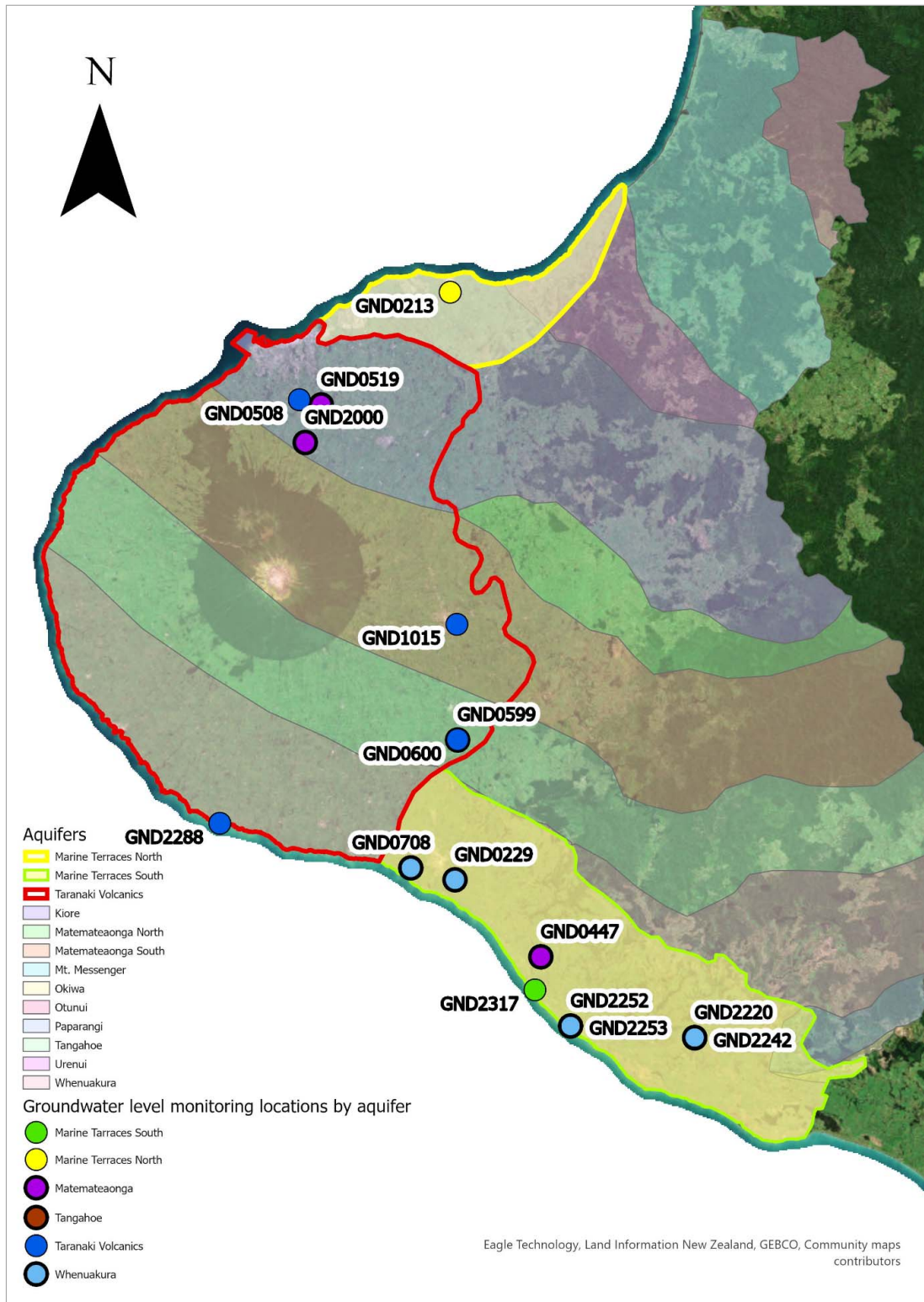


Figure 4 Monitoring site locations by aquifer

Table 4 Details of sites included in the regional groundwater monitoring network

Site code	Name	Altitude (m AMSL)	Total depth (m BGL)	Screened interval (m BGL)	Aquifer	Aquifer type	Total length of data record (Years)	Period of manual data records	Period of continuous data records*
GND0213	Motunui	54	22	18 - 21	Marine Terraces North	Unconfined	36	-	10 Jan 83 - 30 Jun 20
GND0229	Kiwi-1	95	297	68 - 297	Whenuakura	Confined	21	29 May 98 - 10 Jun 14	10 Jun 14 - 30 Jun 20
GND0447	Manutahi-1	82	1,383	542 - 562	Matemateaonga	Confined	25	28 Oct 94 - 19 Mar 13	19 Mar 13 - 30 Jun 20
GND0508	Carrington Rd.	120	14	8 - 14	Taranaki Volcanics	Unconfined	16	25 Jun 03- 12 Dec 12	12 Dec 12 - 30 Jun 20
GND0519	Mangamahoe-1	145	795	644 - 766	Matemateaonga	Confined	24	28 Oct 94 - 27 Sep 13	27 Sep 13 - 30 Jun 20
GND0599	Eltham-7	216	83	79 - 82	Tangahoe	Confined	23	17 Dec 96 - 22 Mar 13	22 Mar 13 - 30 Jun 20
GND0600	Eltham-7A	216	20	16 - 19	Taranaki Volcanics	Unconfined	23	26 Nov 96 - 22 Mar 13	22 Mar 13 - 30 Jun 20
GND0708	Nolan Rd.	70	94	82 - 94	Whenuakura	Confined	21	28 Jul 98 - 22 Mar 13	22 Mar 13 - 30 Jun 20
GND1015	Stratford Landfill BH3	300	8	2 - 8	Taranaki Volcanics	Unconfined	5	-	30 Jun 15 - 30 Jun 20
GND2000	Scout Rd.	251	464	228 - 291	Matemateaonga	Confined	10	-	11 Jun 13 - 30 Jun 20
GND2220	STDC Swinbourne St.	90	200	123 - 172	Whenuakura	Confined	7	-	28 Nov 12 - 30 Jun 20
GND2252	Patea Sentinel (Lower)	37	154	148 - 154	Whenuakura	Confined	7	-	22 Nov 12 - 30 Jun 20
GND2253	Patea Sentinel (Upper)	37	96	93 - 96	Whenuakura	Confined	7	-	22 Nov 12 - 30 Jun 20
GND2288	Oeo Landfarm	39	7	4 - 7	Taranaki Volcanics	Unconfined	4	-	27 Aug 15 - 30 Jun 20
GND2317	Vanners Landfarm	31	13	8 - 13	Marine Terraces South	Unconfined	4	-	21 Dec 15 - 30 Jun 20

*Equipment failure resulted in lost or erroneous data on the following occasions:

GND0519 - 13 January 2016 to 30 June 2017 and 10 April 2019 to 28 May 2020; **GND0508** - 03 April to 30 July 2019; **GND0600** - 31 January 2019 to 26 April 2019

GND2000 - 01 November 2017 to 18 October 2018 and 18 July 2019 to 16 October 2019; **GND0447** - 21 April 2017 to 20 April 2018; **GND0708** - 13 February 2018 to 23 April 2018

GND1015 - 14 November 2017 to 23 April 2018; **GND2253** - 19 February 2019 to 19 Nov 2019; **GND2252** - 10 May 2016 to 5 August 2016 and 25 August 2018 to 5 December 2018

GND2220 - 2 July 2019 to 8 July 2019; 16 February 2020 to 20 February 2020 and 26 March 2020 to 2 April 2020

4.1 Data collection

The method of water level data collection and frequency is variable across the network and by site. Historically, water level measurements at long-term monitoring sites (with the exception of GND0213) were obtained by manual water level measurement, at approximately monthly intervals. In some cases, collection of these manual measurements was intermittent which has resulted in gaps in the data record at some sites.

Data at site GND0213 has been recorded electronically since 1983 using a pressure transducer. Since records began, the frequency of measurement at the site has ranged from weekly to 15 minute intervals.

From 2012, pressure transducers were installed at all monitoring sites to enable the electronic measurement and recording of water level data. Data across all sites is now recorded at 15 minute intervals. Water level data is downloaded from the sites at quarterly intervals. The electronic level measurements are compensated for both barometric pressure and manual water level measurements taken at the time of the data download.

All groundwater level measurements are referenced to a standard datum of metres above mean sea level (m AMSL).

The groundwater level data is stored in the Council's time series data management system.

5 Results

5.1 Influences on observed groundwater level fluctuation

Almost all monitored sites show some fluctuation in groundwater levels as a result of seasonal variation in rainfall volumes and discharge processes. Given that the majority of groundwater recharge occurs during winter and spring, it is common to see annual peaks in groundwater levels over these periods. Conversely, when rainfall volumes reduce over summer, and soil moisture deficits are high, groundwater levels decline. As a result, minimum levels are generally recorded in late summer/early autumn. Any variation in seasonal (or annual) drivers generally result in a corresponding groundwater level response. The Taranaki region generally receives regular and plentiful rainfall however, meaning aquifers are regularly replenished.

Table 5 presents a summary of the annual ranges in water levels observed at each monitoring location across the length of their respective data records. The minimum annual water level change represents the smallest difference between the highest and lowest water level recorded over a calendar year, over the course of a site's monitoring record. Conversely, the maximum range represents the largest difference in water level observed. The average annual water level range across all sites included in the monitoring network is illustrated in Figure 5.

Table 5 Summary of observed annual variations in observed water level by site across the monitoring network (sorted by min to max average annual range)

Site code	Name	Aquifer	Aquifer type	Minimum annual water level range (m)	Maximum annual water level range (m)	Average annual water level range (m)
GND0213	Motunui	Marine Terraces North	Unconfined	2.8	6.0	4.8
GND0229	Kiwi-1	Whenuakura	Confined	0.1	0.7	0.3
GND0447	Manutahi-1	Matemateaonga	Confined	0.1	0.4	0.2
GND0508	Carrington Rd.	Taranaki Volcanics	Unconfined	1.6	5.3	3.6
GND0519	Mangamahoe-1	Matemateaonga	Confined	0.1	0.4	0.2
GND0599	Eltham-7	Tangahoe	Confined	0.4	1.6	0.9
GND0600	Eltham-7A	Taranaki Volcanics	Unconfined	0.3	3.9	1.8
GND0708	Nolan Rd.	Whenuakura	Confined	0.2	1.5	0.7
GND1015	Stratford Landfill BH3	Taranaki Volcanics	Unconfined	2.9	3.8	3.4
GND2000	Scout Rd.	Matemateaonga	Confined	0.2	1.1	0.4
GND2220	STDC Swinbourne St*	Whenuakura	Confined	7.1	19.1	11.2
GND2252	Patea Sentinel (Lower)	Whenuakura	Confined	0.4	1.8	1.2
GND2253	Patea Sentinel (Upper)	Whenuakura	Confined	0.4	1.3	0.8
GND2288	Oeo Landfarm	Taranaki Volcanics	Unconfined	0.7	1.8	1.2
GND2317	Vanners Landfarm	Marine Terraces South	Unconfined	0.2	1.5	0.9

*Note * The annual water level change seen in GND2220 is a result of pumping activity rather than a response to rainfall recharge.*

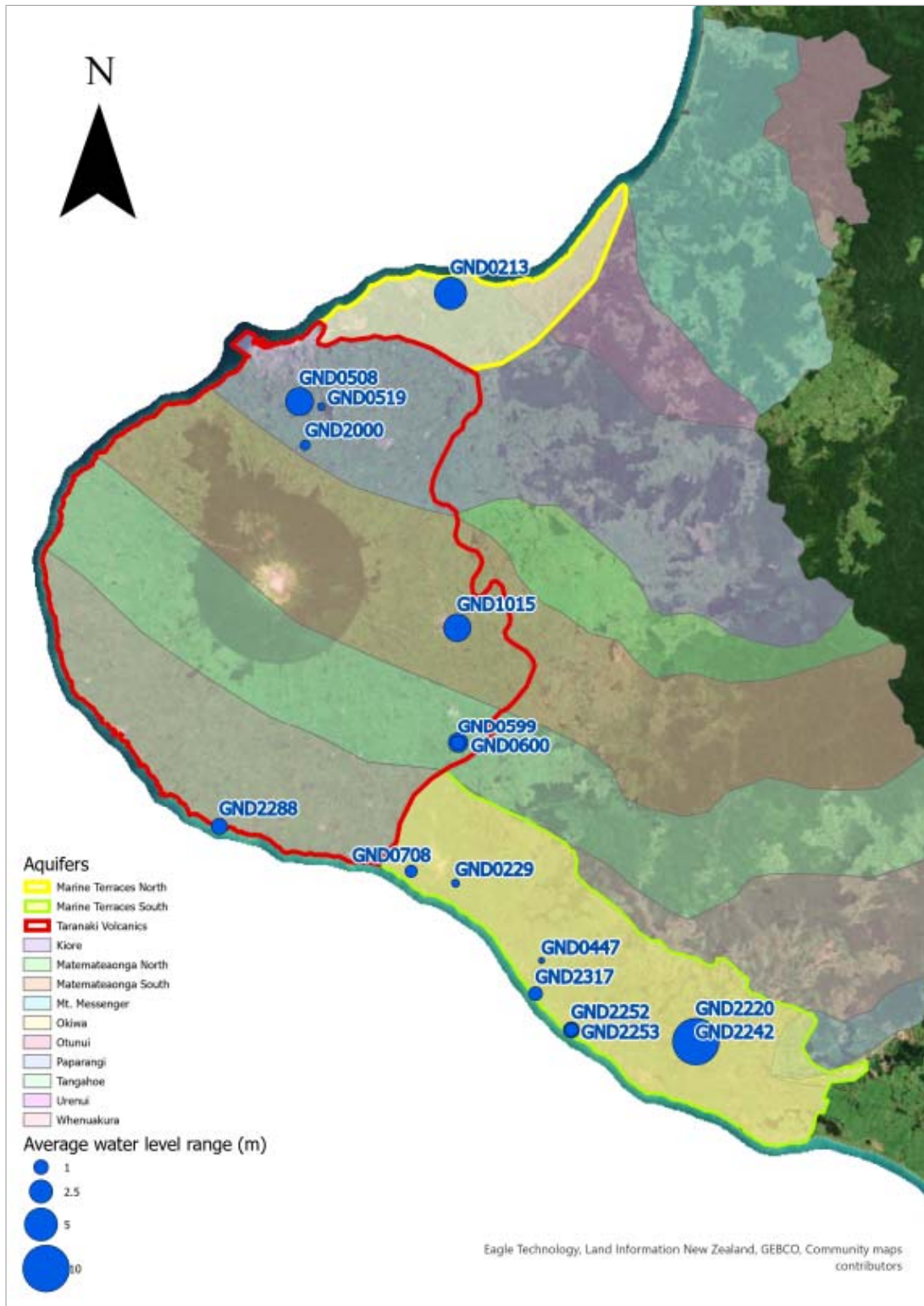


Figure 5 Plot showing observed ranges in average annual water level fluctuation by site and aquifer

The impact of seasonal fluctuations in rainfall recharge on groundwater levels are more subdued in confined aquifers, which are disconnected from direct rainfall recharge by overlying low permeability strata. As a result, the magnitude of level fluctuations are typically much less than those seen in shallow unconfined groundwater systems, where the water table is close to the surface and receiving direct rainfall recharge. The magnitude of seasonal fluctuations and the speed of level response to rainfall is also influenced by factors other than aquifer confinement. These include the permeability and storage characteristics of strata in which the groundwater resides, its water storage capacity, the depth to the water table and the overlying land cover. Monitoring locations located close to a stable surface water boundary, such as a river or the sea, generally show less pronounced seasonal fluctuations in water level in comparison to similar sites located further away from such an influence. This is illustrated in the much smaller seasonal variations seen at shallow coastal sites in comparison to shallow sites located further inland.

Figure 6 presents a comparison of the water level response to rainfall at site GND0508, which intersects a shallow unconfined aquifer in the volcanic deposits, and site GND0708, which intersects a confined aquifer within the Whenuakura Formation. The figure illustrates the difference between these aquifers in terms of the speed and magnitude of response to rainfall events and associated recharge. Water levels at site GND0508 show a rapid response to rainfall events. There is also a pronounced seasonal pattern in the data from this site, with water level fluctuations ranging between 1.6 m and 5.3 m each year.

In comparison, the plot of water level data from site GND0708 shows very little correlation to local rainfall events. This is because the aquifer is disconnected from localised rainfall by its confining layer. While it is likely there is some leakage through the confining layer, the majority of recharge to the aquifer occurs where it is exposed at surface in the eastern hill country to the east of the site. While there is seasonality visible within the water level record, the magnitude of seasonal range in water level is much smaller, generally less than 1 m.

The factors described above can be characterised as 'natural' influences on groundwater levels. In addition to these, groundwater levels can also be significantly influenced by anthropogenic factors, most significantly the effects of groundwater abstractions. The effects of abstraction on water can occur over both the short and long-term. In simplistic terms, the short-term impact of an abstraction is the localised drawdown (lowering) of groundwater levels as water is removed from the aquifer during pumping. If the volume of groundwater abstracted from an aquifer exceeds the volume of water recharging it, a long-term decline in groundwater level is likely. Natural and anthropogenic influences on groundwater levels generally combine during summer months to exacerbate effects, as water demand is high and aquifer recharge volumes are low.

The greatest range of groundwater level fluctuations is seen in GND2220 which is an observation bore in close proximity to the South Taranaki District Council (STDC) Swinbourne Street production bore (GND2242). The groundwater level data from the site is plotted alongside total daily abstraction data from the Swinbourne Street production bore in Figure 7. Both bores intercept the same interval within the Whenuakura aquifer. The short-term effects of the abstraction on local water levels is evident in the steep and repeated drawdown of water level when abstraction is occurring. The magnitude of the water level drawdown at site GND2220 is in the range of 5 to 10 m. The water level trace from the site is typical of abstraction influence, whereby a rapid drop in water level occurs on pump start-up, followed by gradually reducing rate of drawdown over time as the pumping and aquifer recharge rates approach a steady state. The plot also illustrates the rapid initial recovery in water levels when pumping stops, with the recovery rate reducing over time. While the data from site GND2220 illustrates the short-term drawdown and recovery of water levels at the site in response to abstraction, further analysis of the data shows that water levels are declining over the longer-term, indicating a potentially unsustainable level of abstraction from the aquifer at this location. The analysis of trends in water level is discussed further in the following sections of this report.

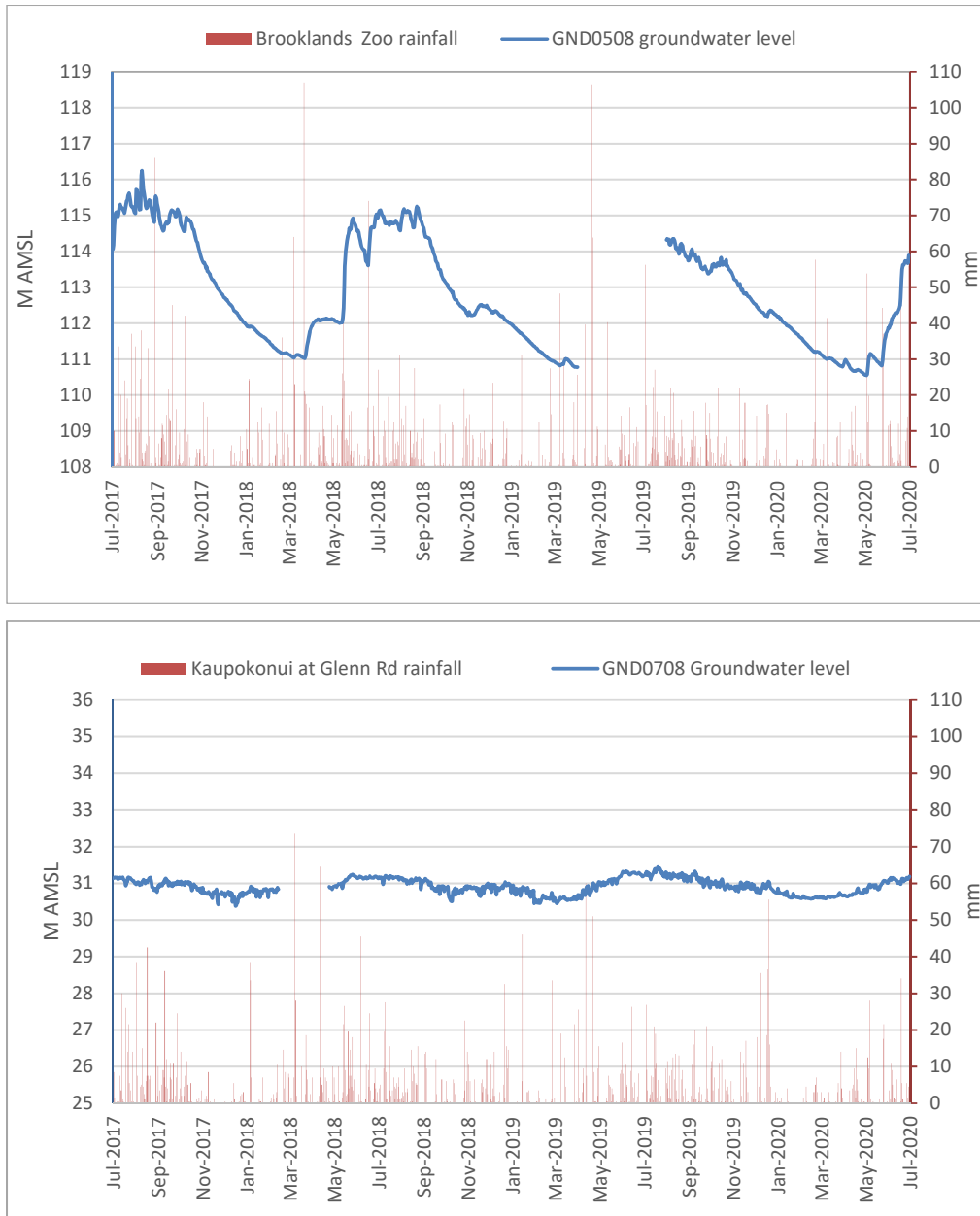


Figure 6 Comparison of hydrographs from sites GND0508 and GND0708 illustrating variation in observed water level fluctuation in response to rainfall between unconfined (GND0508) and confined aquifers (GND0708)

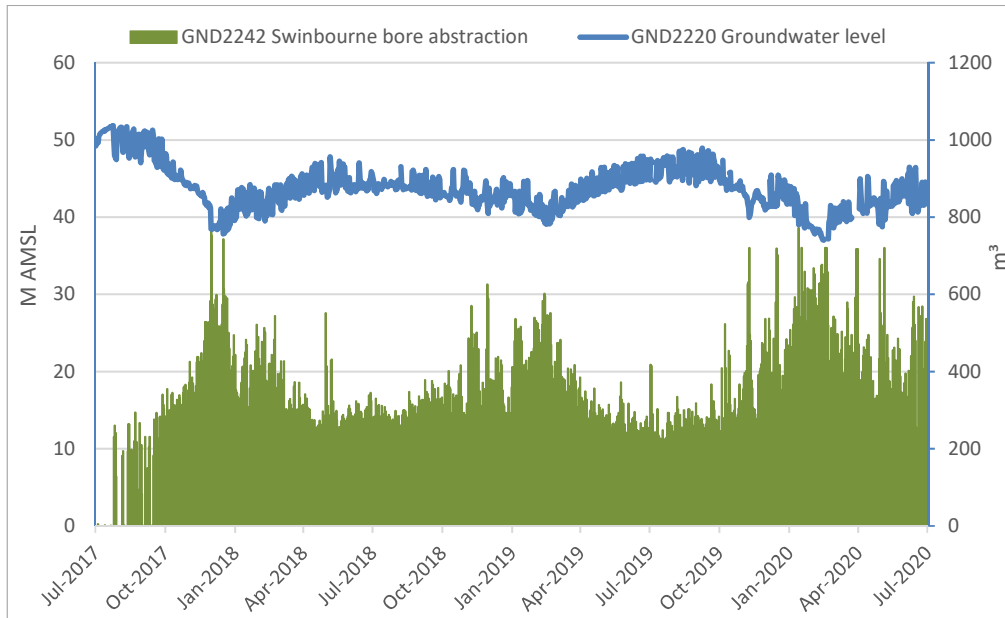


Figure 7 Groundwater level response in observation bore GND2220 during abstraction at supply bore GND2242

5.2 Current state of water levels at monitored sites (2017-2020)

The current state of groundwater levels across the region have been assessed using the most recent three years of data analysed (2017-2020). Averaging data over a three yearly time period for the assessment of state is consistent with the reporting frequency of this programme and reduces the influence of extremes experienced over any single year. The data analysed is presented in the form of envelope plots. These plots compare mean monthly groundwater levels over the 2017-2020 period with the mean monthly levels averaged over a site's entire data record. Also plotted are the historical monthly minimum and maximum levels, which provide further context when assessing recent data. Plots have been compiled for each site with a long-term data record (Figure 8). For consistency with the statistical analysis presented in the following section of this report, a long-term record is defined as being a minimum of ten years.

Across the majority of sites intersecting both unconfined and confined aquifers, current groundwater levels do not differ significantly from historical long-term averages. The variations in seasonal response that occur from year to year are generally in response to rainfall recharge with deeper aquifers exhibiting a less defined seasonal response in comparison to those at shallower depths.

5.2.1 Groundwater level response in monitored aquifers

GND0508 and GND0600 intersect the shallow Taranaki Volcanics Aquifer, albeit GND0600 in the south of the region and GND0508 in the north. GND0508 shows a general decline in average levels during drier months and a slight increase during wetter months in comparison to historical means. In contrast GND0600 indicates an increase in levels over all seasons in comparison to historical means.

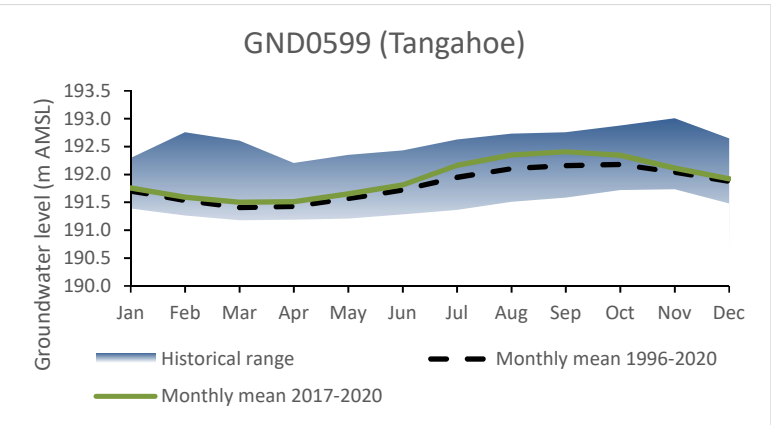
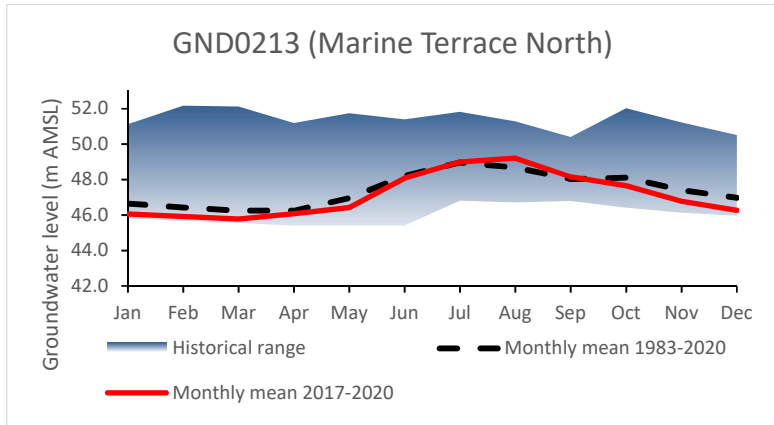
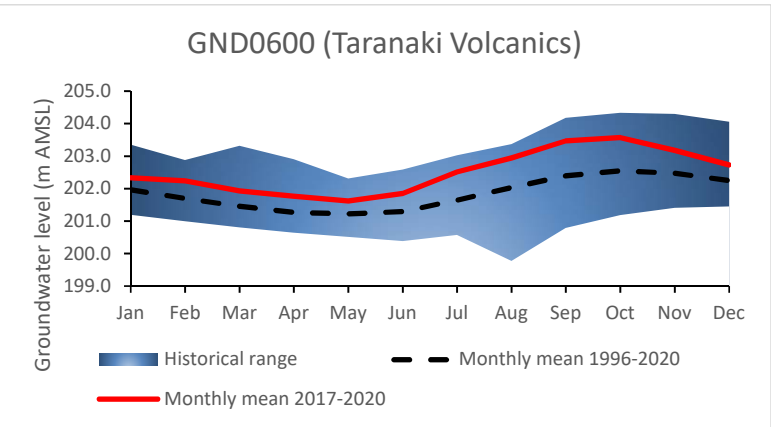
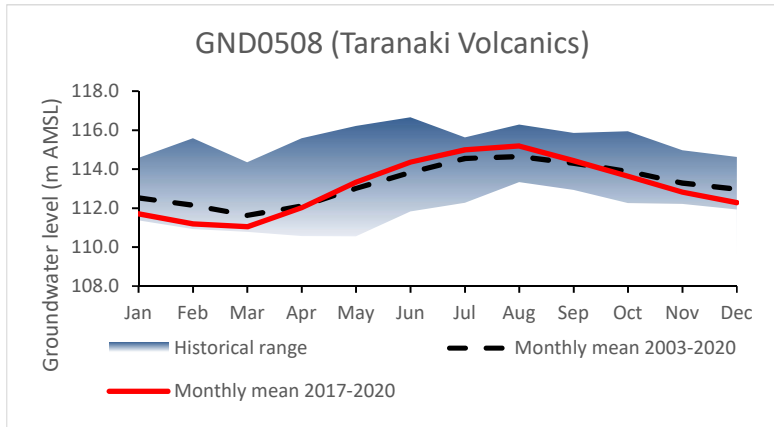
The difference in responses seen between GND0508 and GND0600 is likely solely related to their location with rainfall recharge patterns varying across the region depending on proximity to Taranaki Maunga and the Coast (Figure 2). The levels seen in GND0599 support this assumption as although GND0599 is screened across a deeper aquifer (Tangahoe) the trends and responses in the bore although more subdued closely mimic those of GND0600. These bores although separated by a confining layer are located in close proximity to each other and levels within both bores are primarily influenced by local rainfall recharge.

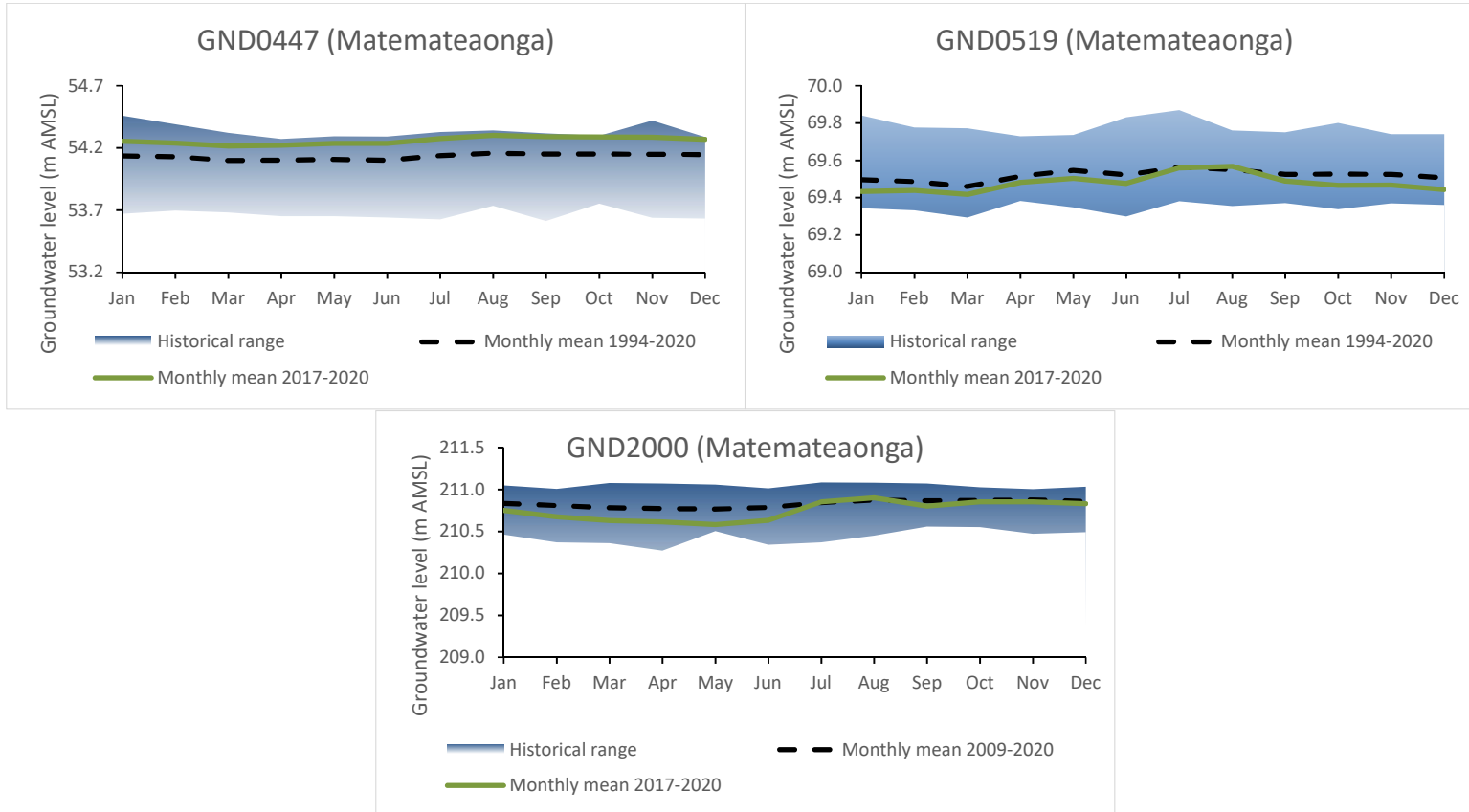
The Marine Terrace Aquifer is intersected by GND0213 in the north of the region, where it is generally unconfined and therefore heavily influenced by rainfall recharge.

Sites within the Matemateaonga aquifer show a mixed response with water levels in GND0447 showing an increase in comparison to historical levels and GND0519 and GND2000 a slight decrease across the majority of months.

Within the Whenuakura aquifer, levels across the recent monitoring period were generally slightly lower across the majority of months in comparison to historical means with the greatest deviation from historical mean seen in GND0229. The slight declining trend seen in GND0708 is related to a longer term downward trend and is discussed further in the following section of this report.

In summary, the assessment of data shows that current water levels at monitored sites do not differ significantly from historical long-term averages. The analysis of monthly mean level data has also illustrated similarities in spatial and temporal responses to rainfall across some sites. The Council's monitored rainfall sites indicate during the 2017-2018 period annual mean rainfall was higher than the annual historical mean at the majority of sites. In contrast during 2018-2019 and 2019-2020 the majority of rainfall sites indicated a lower mean rainfall resulting in a much drier years (Table 6). The annual mean rainfall for the 2017-2020 period in comparison to historical mean rainfall is provided in relation to groundwater monitoring sites in Figure 9.





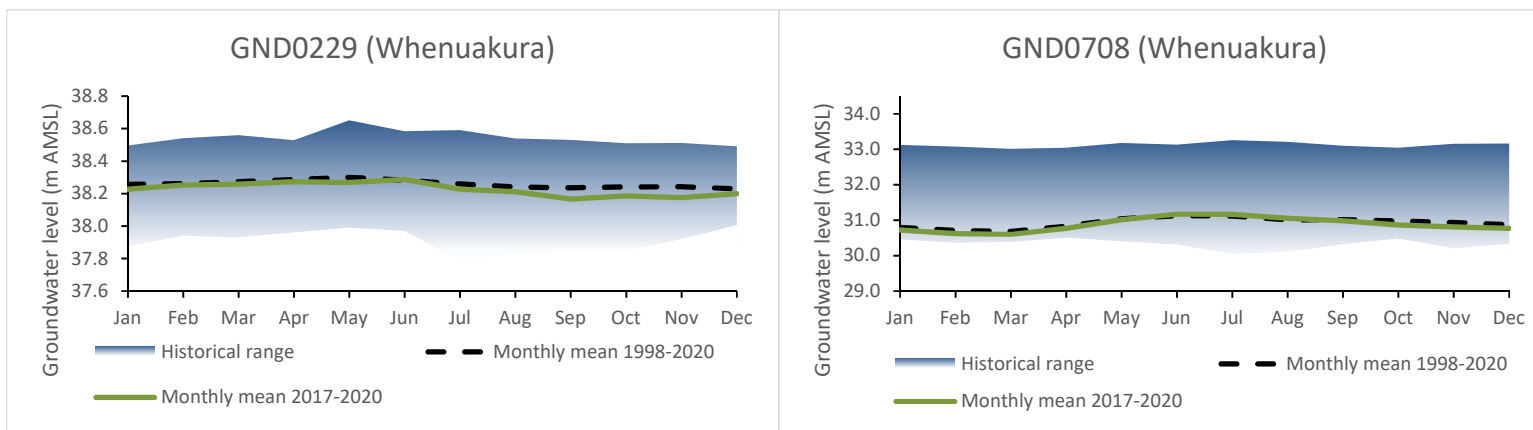


Figure 8 Envelope plots comparing monthly average water levels at each site over the period 2017-2020 with a long-term averages and extreme values. Sites with their monthly means (2017-2020) displayed as a red line are classified as intersecting unconfined aquifers and green lines representing confined aquifer sites. Each plot is titled with site code and aquifer name in brackets

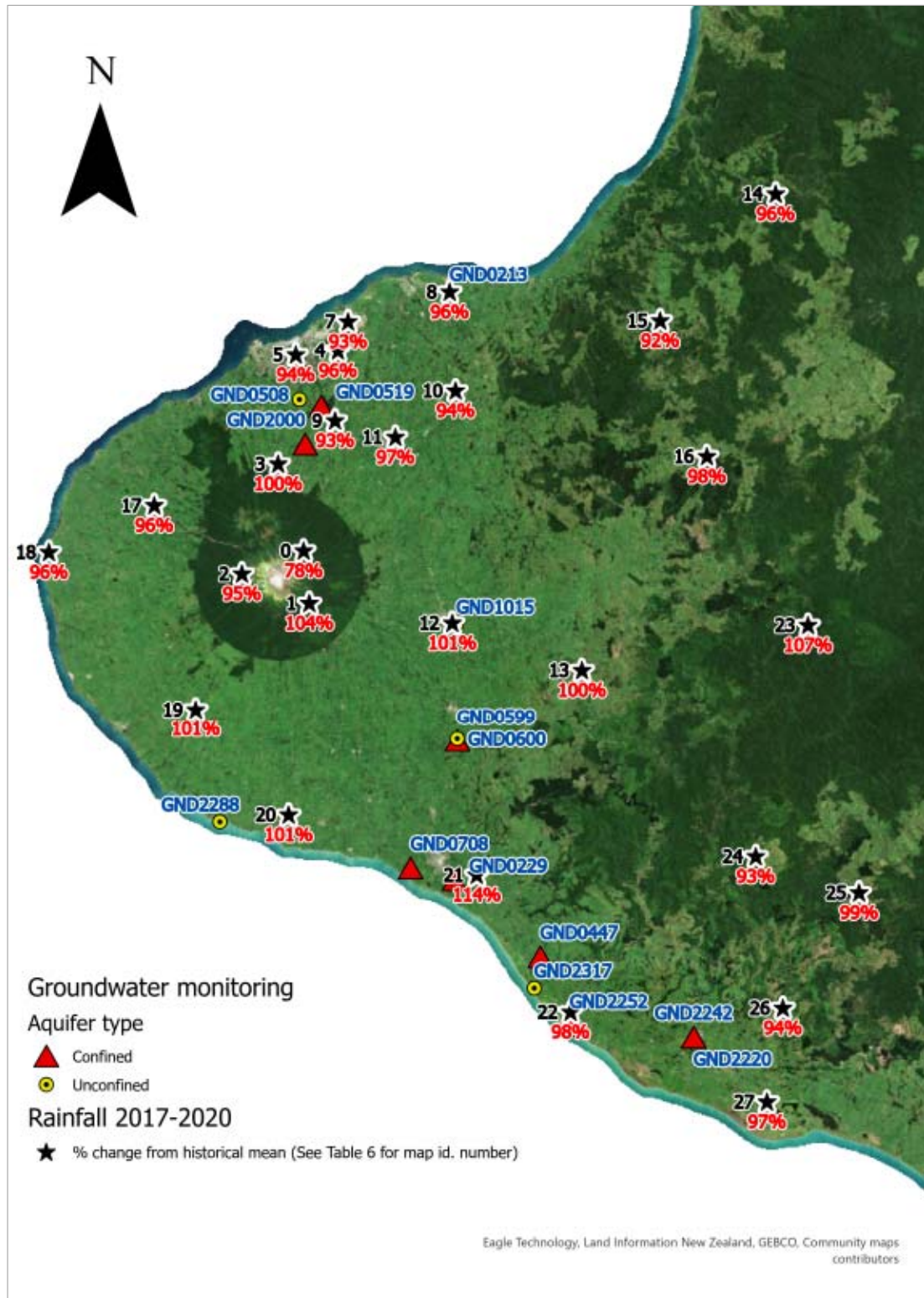


Figure 9 Groundwater monitoring sites by aquifer type and mean rainfall percent change from historical mean for the 2017-2020 monitoring period

Table 6 Rainfall percent change from historical mean during the review period

Rainfall monitoring site	Map id	2017-2018	2018-2019	2019-2020	2017-2020
North Egmont at Visitor's Centre	0	92%	73%	70%	78%
Dawson Falls	1	120%	91%	101%	104%
Kahui Hut	2	108%	86%	91%	95%
Mangorei Upper	3	116%	86%	98%	100%
Hillsborough	4	115%	84%	88%	96%
Brooklands Zoo at New Plymouth	5	121%	79%	83%	94%
Mangati at SH3	7	109%	80%	89%	93%
Motunui M39 at Weston W3	8	122%	79%	89%	96%
Waiwhakaiho at Egmont Village	9	110%	76%	93%	93%
Manganui at Everett Park	10	114%	80%	89%	94%
Inglewood at Oxidation Ponds	11	115%	83%	94%	97%
Patea at Stratford	12	125%	84%	95%	101%
Mangaehu at Bridge	13	124%	82%	95%	100%
Kotare at O'Sullivans	14	111%	82%	94%	96%
Uriti at Kaka Rd	15	105%	80%	92%	92%
Pohokura Saddle	16	119%	80%	95%	98%
Stony at Mangatete Bridge	17	109%	83%	96%	96%
Kapoaiaia at Lighthouse	18	112%	81%	95%	96%
Taungatara at Eltham Rd	19	110%	98%	94%	101%
Kaupokonui at Glenn Rd	20	116%	94%	91%	101%
Tawhiti at Duffy's	21	123%	112%	106%	114%
Patea at Bore 3	22	111%	95%	88%	98%
Omaru at Charlies	23	135%	82%	102%	107%
Omahine at Moana Trig	24	110%	80%	89%	93%
Waitotara at Rimunui Station	25	119%	83%	94%	99%
Waitotara at Ngutuwera	26	108%	90%	84%	94%
Waitotara at Hawken Rd	27	121%	86%	82%	97%

5.3 Statistical trend analysis

The groundwater level data collected has been analysed to identify trends in groundwater level change at each monitored site. The statistical analysis was conducted using R (R core team 2020). The analysis was carried out using the non-parametric Seasonal Mann-Kendall (SMK) test and Sen slope estimator (SSE) (Helsel and Hirsch, 1992). SSE is also referred to as the Mann-Kendall Slope Estimator (SKSE) and is used to represent the magnitude and direction of trends in water level without the influence of seasonal variations. SSE (slope) is expressed as cm per year of water level change.

A key purpose of the analysis is to evaluate the long-term availability and sustainability of groundwater resources in the Taranaki Region, the focus of the data analysis is to examine persistent decadal or longer trends that have occurred in bores since the onset of widespread irrigation and groundwater pumping.

To remove daily and seasonal variation in groundwater levels induced by irrigation pumping, the median groundwater level measured in winter between January and March of each year was used in the analysis (as no irrigation takes place).

The data used comprises manual monthly samples during the early phase of monitoring, and continuously recorded data for the later parts of the record. For the trend analyses, continuous data are aggregated to monthly mean values to be consistent with earlier records. A comparison with random monthly re-sampled values from the continuous data, found that the trends were almost invariable for each random re-sampling. A short-term groundwater level analysis was undertaken on monitoring bores that have a minimum of five years continuous data available as of 30 June 2020. Results are included in Table 7. Analysis on all the available data was undertaken on all sites that have a minimum of ten years continuous data. Results are included in Table 8. A comparison of statistical significance between short-term (5 year) and long-term (10 or more years) is included as Table 9. The full statistical reports are included as Appendix I and Appendix II respectively.

The confidence level gives an indication of how strong the trend is with confidence levels of 90% and over determined as very likely, those between 67% and 90% determined as likely and below 67% as indeterminate.

The analysis indicates that of the 14 sites where sufficient data was available over the five year period the majority of sites show a declining trend. The exceptions are GND2253 which indicated an increasing trend, and GND0447, GND0708 and GND1015 which all showed no discernible trend over the short-term data record.

The analysis undertaken on the nine sites where sufficient data was available to ascertain a long-term trend shows five sites exhibit an increasing trend and four a declining trend.

Where a short-term trend was identified a statistical analysis of local rainfall trends was also undertaken to ascertain if any of the short-term trends were meaningful and not a direct result of climatic variation (Table 9). Of the nine sites a trend was identified only one site GND2253 did not exhibit a similar trend to local rainfall patterns.

Where a long-term statistical trend was identified a visual comparison between daily groundwater levels and any available long-term local rainfall volumes was undertaken. The results of the analysis are discussed in the following section.

Table 7 Results of short-term trend analysis (2015 to 2020)

Site	Number of monthly mean values	Year range	Slope (cm/yr)	Trend Direction	Confidence in Trend	Confidence (%)
GND0213	60	2015-2020	-3.346	Decreasing	Likely Falling	69.0
GND0229	60	2015-2020	-2.418	Decreasing	Very Likely Falling	100.0
GND0447	49	2015-2020	-0.080	Indeterminate	Indeterminate	50.0
GND0508	58	2015-2020	-12.502	Decreasing	Very Likely Falling	93.9
GND0519	-	2015-2020	Insufficient data available during the period*			
GND0599	60	2015-2020	-4.069	Decreasing	Likely Falling	82.1
GND0600	58	2015-2020	-7.026	Decreasing	Very Likely Falling	91.9
GND0708	59	2015-2020	-0.122	Decreasing	Indeterminate	52.9
GND1015	56	2015-2020	1.569	Increasing	Indeterminate	53.1
GND2000	48	2015-2020	-3.988	Decreasing	Very Likely Falling	99.7
GND2220	60	2015-2020	-100.970	Decreasing	Very Likely Falling	100.0
GND2242	59	2015-2020	-209.808	Decreasing	Very Likely Falling	100.0
GND2252	56	2015-2020	-4.221	Decreasing	Very Likely Falling	99.2
GND2253	53	2015-2020	6.472	Increasing	Very Likely Rising	100.0

*These bores were not analysed for five yearly trends due to significant data gaps.

Table 8 Results of long-term trend analysis to 30 June 2020 (minimum 10 years)

Site	Number of monthly mean values	Year range	Slope (cm/yr)	Trend Direction	Confidence in Trend	Confidence (%)
GND0213	448	1983-2020	-0.444	Decreasing	Very Likely Falling	96.3
GND0229	197	1998-2020	0.374	Increasing	Very Likely Rising	99.9
GND0447	235	1995-2020	1.997	Increasing	Very Likely Rising	100.0
GND0508	165	2004-2020	1.398	Increasing	Likely Rising	83.2
GND0519	146	1995-2020	-1.185	Decreasing	Very Likely Falling	100.0
GND0599	241	1997-2020	-0.265	Decreasing	Likely Falling	83.9
GND0600	243	1997-2020	1.297	Increasing	Very Likely Rising	99.1
GND0708	225	1999-2020	-11.465	Decreasing	Very Likely Falling	100.0
GND2000	106	2009-2020	2.490	Increasing	Very Likely Rising	99.9

Table 9 Comparison of short-term statistical trends in groundwater level and local rainfall

Site	Trend Direction	Short-Term Trend	Rainfall Station	Trend Direction	Short-Term Trend
GND0213	Decreasing	Likely Falling	Motunui	Decreasing	Very Likely Falling
GND0229	Decreasing	Very Likely Falling	Tawhiti	Indeterminate	Indeterminate
GND0508	Decreasing	Very Likely Falling	Brooklands Zoo	Decreasing	Very Likely Falling
GND0599	Decreasing	Likely Falling	Mangaehu/Patea	Decreasing	Likely Falling
GND0600	Decreasing	Very Likely Falling	Mangaehu/Patea	Decreasing	Likely Falling
GND2000	Decreasing	Very Likely Falling	Waiwhakaiho	Decreasing	Likely Falling
GND2220	Decreasing	Very Likely Falling	Patea	Decreasing	Likely Falling
GND2242	Decreasing	Very Likely Falling	Patea	Decreasing	Likely Falling
GND2252	Decreasing	Very Likely Falling	Patea	Decreasing	Likely Falling
GND2253	Increasing	Very Likely Rising	Patea	Decreasing	Likely Falling

5.4 Meaningful trend analysis

It is recognised that the statistical significance of a trend does not necessarily imply a 'meaningful' trend i.e. one that is likely to be relevant in a natural resources management sense.

To ascertain whether the statistical trend seen within an aquifer is meaningful the following needs to be considered:

- In a confined aquifer which is generally very slow to recharge and may have a significant volume of water held in storage any unexpected water level change that exceeds the range of water levels previously seen within the aquifer is likely to be meaningful.
- In semi confined and unconfined aquifers which are generally strongly influenced by rainfall recharge any unexpected water level change that significantly exceeds the range of water levels previously seen within the aquifer which does not mimic local climatic patterns is likely to be meaningful.

In addition to the type of aquifer the magnitude of any change also has to be considered in context. For example: a one metre decline in water levels within a confined aquifer that generally exhibits little change from year to year would be considered significant. Whereas a one metre change within an unconfined aquifer that fluctuates in response to rainfall recharge would likely be considered insignificant.

5.4.1 Short-term meaningful trends

To ascertain whether a short-term statistical trend is meaningful the groundwater level trend in each bore have been compared to rainfall trends over the same period in Table 9. The comparison showed that the majority of short-term groundwater level trends are a response to climatic variations.

The only bores that exhibited a trend not relatable to rainfall were GND2253 which showed a slight increase in water levels in contrast to a decreasing trend in local rainfall and GND2220 which appears to be declining in response to abstraction at the nearby municipal supply bore GND2242.

5.4.1.1 GND2253 short-term rising trend

An increasing statistically significant trend was identified in GND2253 over the short-term. The water level response in GND2253 clearly shows the influence of rainfall in the bore with high rainfall events and sustained periods of rainfall corresponding with higher water levels (Figure 10). GND2252 which monitors a deeper aquifer at the same location shows a similar but slightly subdued response.

Figure 11 compares water level in both bores to abstraction and shows that the deeper bore GND2252 exhibits a significant response to abstraction with water levels declining during periods of greater abstraction. A more subdued response to abstraction, although not as easily discernible in the graph below, would also be expected in GND2253 due to the proximity of the two bores and the connectivity between the two aquifer intervals.

During the previous monitoring period (2015-2017) GND2252 exhibited a slight declining water level trend linked to localised abstraction via GND2197. The water levels in GND2252 now appear to have stabilised in response to a reduction in abstraction volumes. The slight increasing trend identified in GND2253 is therefore likely also a response to the reduced abstraction and is not an indication of any meaningful change within the aquifer itself.

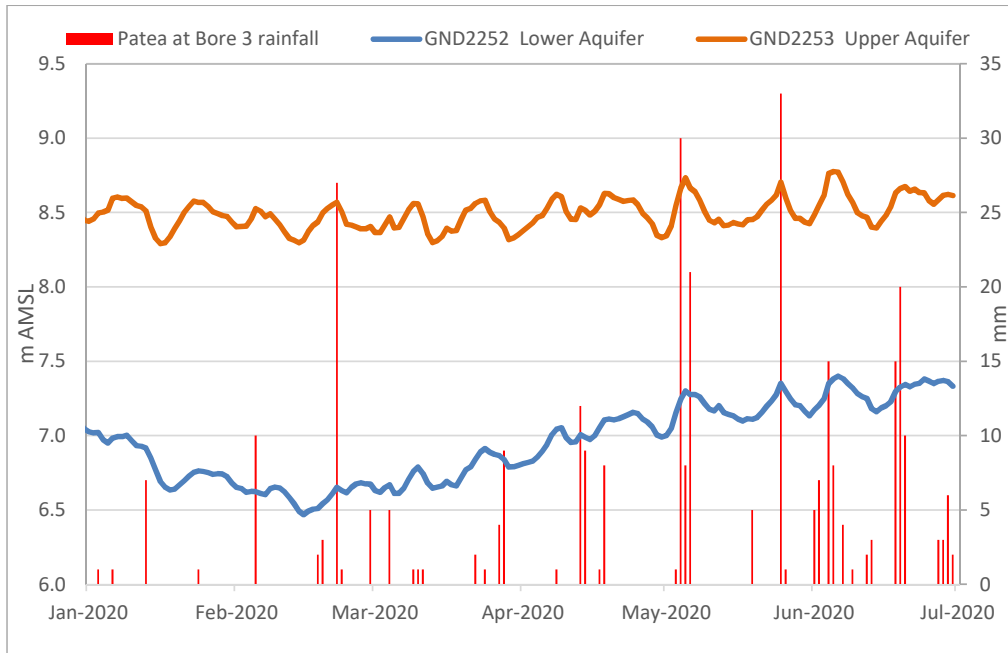


Figure 10 Groundwater levels in GND2252 and GND2253 compared to rainfall

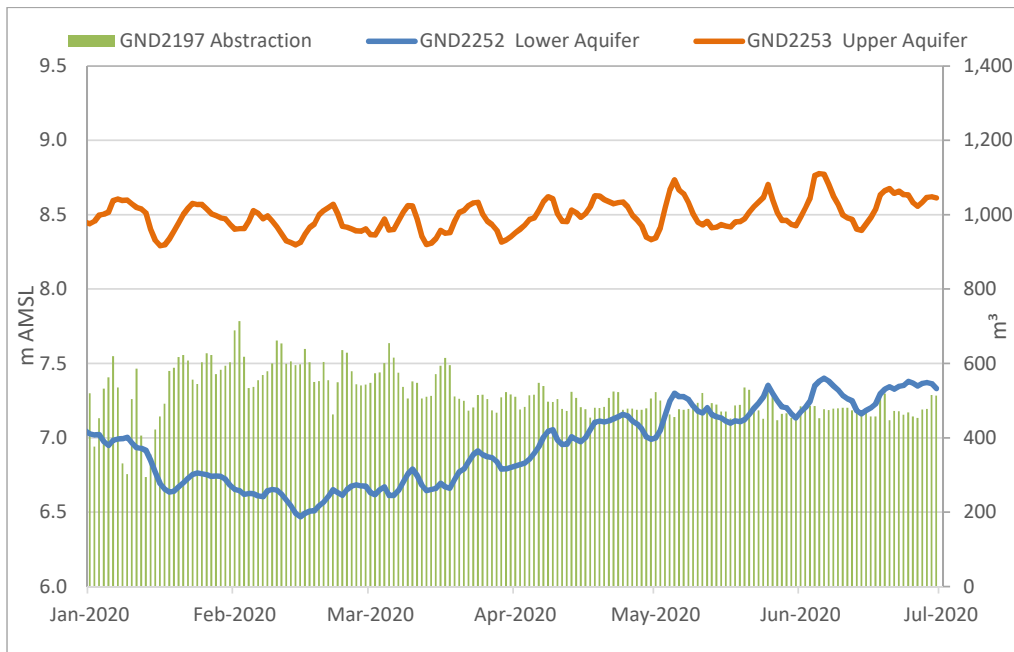


Figure 11 Groundwater levels in GND2252 and GND2253 compared to abstraction

5.4.1.2 GND2220 short-term declining trend

GND2220 was installed to monitor the response within the deep Whenuakura aquifer due to abstraction in the Municipal supply bore GND2242. The monitoring bore provides a more discernable groundwater level trace as it is not directly influenced by the fluctuations resulting from operation of the pump. A comparison between abstraction and water level indicate the declining levels may be partially or solely related to an

increase in abstraction at the site (Figure 7). To date the decline is minimal and therefore not environmentally significant. Due to the relatively short-term data set available for assessment and the effects of pumping it is not possible at this time to determine if the decline is unsustainable. Groundwater levels will continue to be monitored closely.

5.4.2 Long-term meaningful trends

Where a long-term statistical trend was identified a visual comparison against rainfall records over the same period, if available, was undertaken. Where a site did not have adequate rainfall data to make a direct comparison, the scale of any changes in conjunction with available rainfall data has been utilised to determine the significance of any trend. All nine of the long-term monitoring sites exhibited either a falling or rising statistical trend and are discussed below.

5.4.2.1 GND0213 long-term falling trend

GND0213 is located in the north of the region and intercepts the marine terrace deposits. The Motunui rainfall gauge is located at the same site and has recorded rainfall since 1998. A comparison between daily water levels and rainfall shows a similar increasing trend in both data sets. Due to the significant fluctuations in water level exhibited in the bore each year (average range of 4.8 m) and the strong seasonal response the slight statistical trend seen in the data since 1983 of <1 cm per year is not considered significant.

5.4.2.2 GND0229 long-term rising trend

GND0229 intercepts a deep confined aquifer in the south of the region. A comparison of daily water levels in the bore and local rainfall volumes since 1998 indicate the bore exhibits a subdued response to long-term climatic variations. The slight increase in water levels seen over time is therefore likely a response to a slight increase in rainfall in the vicinity of the site and is not indicative of any meaningful trend in the aquifer.

5.4.2.3 GND0447 long-term rising trend

GND0447 is screened within a deep confined aquifer in the south of the region. A comparison between daily water levels and local rainfall since 1997 indicate that although water levels do not exhibit a strong seasonal response they do respond to high intensity rainfall events. As the statistical trend in water levels at this site appears linked to climatic variations it is not considered indicative of any meaningful trend in the aquifer.

5.4.2.4 GND0508 long term rising trend

GND0508 intercepts the shallow unconfined Taranaki Volcanics Aquifer in the north of the region. The water level at the site shows a significant response (averaging 3.6 m per year) to local rainfall. The long-term data set indicates that the slight increasing trend in water levels is related to a slight increase in rainfall volumes over time and is therefore not considered indicative of any meaningful trend in the aquifer.

5.4.2.5 GND0519 long-term falling trend

GND0519 is screened within a confined aquifer in the north of the region. Water levels in the bore exhibit a small range of change annually (average range 20 cm per year). As there is a large gap in the water level data between 2018 and 2019 due to failure of the logger the data between 1994 and 2018 has been compared against local rainfall volumes. The comparison indicates that the slight falling trend seen in water level of 1.1 cm per year is linked to a reduction in local rainfall volume over the same period and therefore is not considered meaningful.

5.4.2.6 GND0599 long-term falling trend and GND0600 long-term rising trend

GND0599 and GND0600 are located in the central part of the region. The bores intercept separate aquifer intervals and are installed side by side. Rainfall at Stratford has been used for comparison and indicates that both bores mimic rainfall with GND0599, the deeper of the two bores, showing a more subdued response. The statistical trend analysis indicated a slight increase in GND600 and slight decrease in GND0599 overtime. However as both bores exhibit a substantial respond to rainfall and the trend seen in each bore is small (equates to <1% per year of annual water level range) these trends are not considered significant.

5.4.2.7 GND0708 long-term falling trend

GND0708 intersects a confined aquifer near Hawera in the south of the region. While the long-term trend identified at GND0708 has statistical significance, the change in water level over the trend period is relatively minor. Statistical analysis of the short-term data also indicated a slight decline in groundwater level over the most recent five year period although this was at a reduced rate and not deemed statistically significant. The trends do not appear directly related to local rainfall recharge. Following the discovery of the long-term falling trend in GND0708 a recommendation to undertake a further investigation in to the cause of the decline was included in the 2015-2017 monitoring report. The outcome of the investigation are discussed below in Section 5.4.3.

5.4.2.8 GND2000 long-term rising trend

Site GND2000 intersects the Matemateaonga aquifer at Scout Road in North Taranaki. The well is screened in a confined aquifer between 228 and 291 m BGL. A statistically significant increasing long-term trend was identified in the data recorded at GND2000. Although at this stage the increase is relatively minor a more detailed analysis of the data in comparison to local rainfall was undertaken. The analysis confirms there is a slight subdued response to rainfall in the bore (Figure 12) and therefore the slight increase in water level is not considered symptomatic of a meaningful change within the wider aquifer.

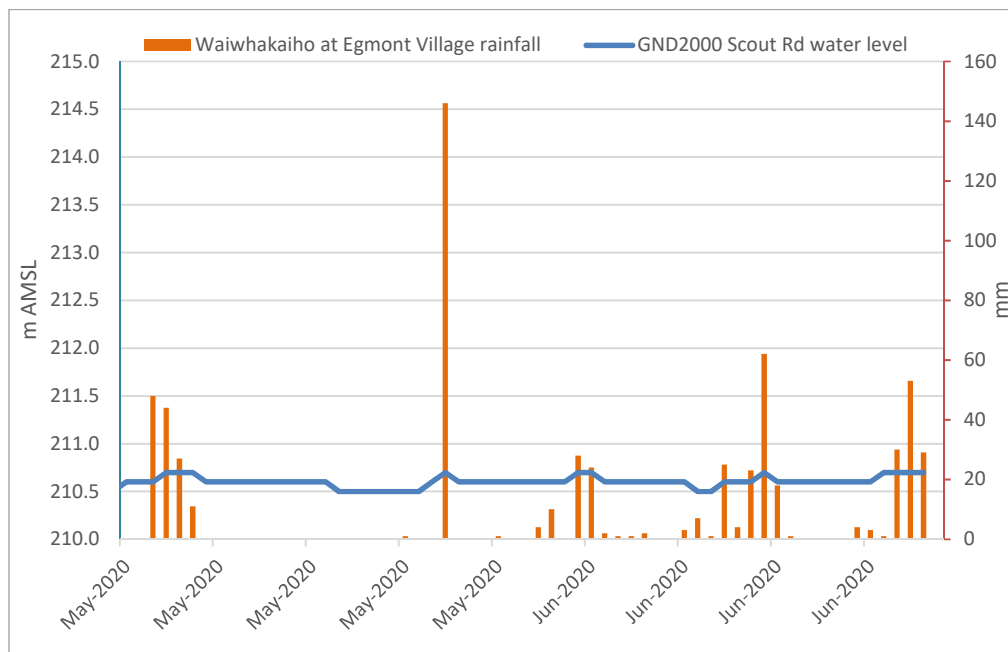


Figure 12 GND2000 comparison of water level response to rainfall from May to July 2020

5.4.2.9 Long-term meaningful trend summary

The results show that for eight of the nine sites where sufficient data was available to enable long-term trend analysis, there has been no meaningful change in groundwater level over the full period of their respective data records. The one exception to this was site GND0708, which has shown a slightly declining trend (the water level is falling) over its 21 year data record.

5.4.3 GND0708 long-term declining water level investigation

Following identification of the long-term declining trend in water level at GND0708 in the 2015-2017 monitoring report an investigation into the likely cause of the decline was recommended.

The investigation included a desktop study that identified an additional five bores that take water from the Whenuakura aquifer within a 3.5 km radius of GND0708. As no consents were in place in relation to the bores an assumption was made that all bores were abstracting under the permitted water take rules set out in RFWP and were therefore very unlikely to have any discernable effects on the aquifer. A field investigation was then initiated to identify any additional sites and to ensure that the registered bores were complying with the permitted take limit of $50 \text{ m}^3/\text{day}$. The investigation involved two Council Officers surveying the area, talking to landowners and inspecting any bore/wells to ascertain whether the cause of the declining water levels could be related to abstractions from the aquifer.

During the investigation the Council Officers located several additional shallow unregistered historical wells that were no longer in use and confirmed that all bores or wells still in use were operating within the permitted take rules.

Further examination of the water level data indicates that the decline in the bore appears to be following a loosely decadal pattern, with each ten year period including a decline in levels lasting around five years followed by a period of relative stability (Figure 13).

Statistical analysis of the short-term data also indicated a slight decline in groundwater level over the most recent five year period although this was at a reduced rate and not deemed statistically significant.

Rainfall is monitored at the Tawhiti at Duffy's rainfall site approximately 8 km to the south-east of the bore. The historical rainfall data available at this site is presented alongside the groundwater level in GND0708 in Figure 13. Rainfall shows a slight downward trend in comparison to water level over the monitored period.

Over the most recent three year period (displayed in Figure 13 alongside historical data) water levels appear to be increasing which may indicate the commencement of a period of recovery or stabilisation. As the decline is localised and is not indicative of an overall decline in the Whenuakura aquifer the levels will continue to be monitored and no further investigation is deemed necessary at this time.

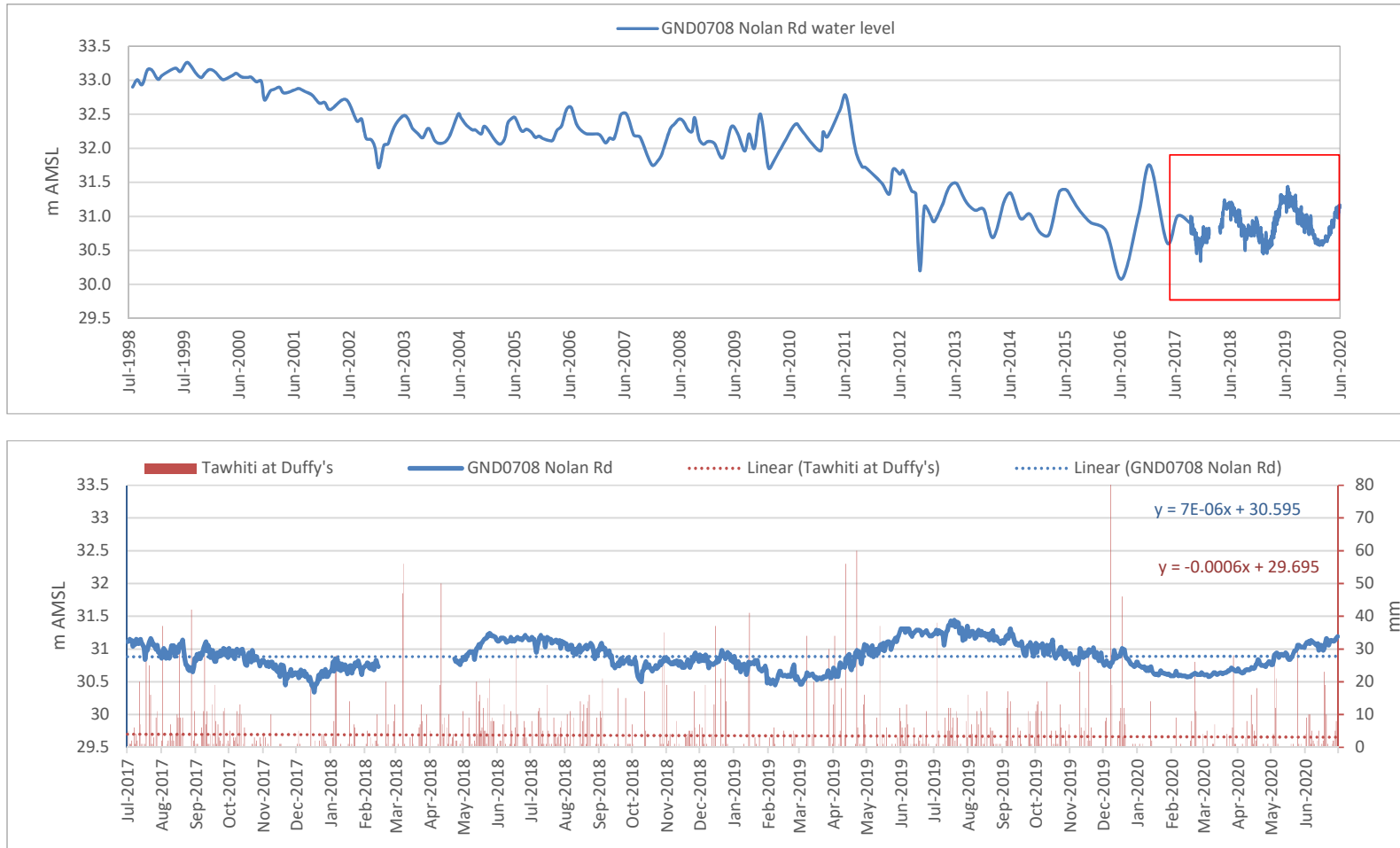


Figure 13 Plot of historical water levels in GND0708 since 1998 (higher) and compared to recent rainfall response 2017-2020 (lower)

6 Discussion

6.1 Allocation pressures

The volume of groundwater allocated for abstraction across the Taranaki region remains low, with only 73 consents authorising the taking of groundwater current as of 30 June 2020. The demand for groundwater has increased slightly over the last decade, but remains low with the total groundwater allocation to 30 June 2020 equating to less than 2% of the regions estimated sustainable yield.

The highest level of allocation is currently seen in the Whenuakura aquifer, where a combined total of 10.6% of estimated sustainable yield is allocated across the aquifer. The Matemateaonga aquifer has approximately 2.7% allocated. All other aquifers have insignificant volumes of water allocated (<1% of estimated sustainable yield).

The relatively low demand placed on groundwater resources for abstractive purposes across Taranaki is likely due to several factors. Firstly, most areas of Taranaki receive regular and plentiful rainfall, with a steep rainfall gradient inward from coastal areas. The high rainfall experienced in Taranaki also means that, outside of coastal areas, soil moisture deficits are generally low and when there is a deficit, it is generally short lived. As a result Taranaki has not seen the rapid increase in water demand for pasture irrigation, as has been seen elsewhere in New Zealand. The rainfall characteristics and topography within Taranaki also means there is an abundance of surface water systems, which means rivers and streams are generally accessible when water supply is needed. Where available, surface water supplies are typically preferred to groundwater sources, given they can be obtained at a much lower capital cost. The low yields from Taranaki aquifers often mean that multiple bores are required to supply high demand uses, making the use of groundwater uneconomic. Surface water systems are generally able to sustain the majority of current water demand in Taranaki, although several catchments are fully allocated.

Notwithstanding the above, there is potential for growth in groundwater demand in the future. Any significant growth would likely be driven by a shift in current land use, development of new land uses or industrial activities that require greater higher water inputs than those activities that predominate currently. If more surface water systems across the region reach their allocation limit in coming years, any future increases in regional water demand may necessitate the need for more groundwater sourced water supply.

Climate change also has the potential to influence future rainfall patterns in Taranaki and, as a result, the volume of water recharging its groundwater systems. This could impact both the regional water demand and the volume of groundwater available for allocation. It is currently projected however that Taranaki will see little change in its annual rainfall volumes in the short to medium-term, and potentially a slight increase in rainfall by 2090, particularly over winter months, when the majority of groundwater recharge occurs. If current predictions are realised, it's unlikely that the volume of groundwater available for allocation across the region will change significantly in the future. Predicted longer-term reductions in summer low flows in Taranaki's rivers may result in further development of the regions groundwater resources.

6.2 Groundwater levels

Groundwater level data is currently collected from 15 monitoring sites across the region. The length of data records from these sites is variable. Sites have been classified as having long-term records where data has been collected for a minimum of ten years, while short-term sites have a minimum of five year's data available. The method of data collection has also varied over the course of the programme, with electronic data capture replacing manual monthly measurements.

The data collected illustrates the natural variability in water levels across the region's aquifers. Monitoring of water levels at sites intersecting unconfined aquifers, primarily in the Taranaki volcanic and marine

terrace hydrogeological units, show strong response to seasonal rainfall patterns. This generally results in water levels rising during periods of the year with higher rainfall (winter, spring) and falling during drier periods (summer, autumn). The magnitude of seasonal fluctuations and the speed of level response to rainfall is also influenced by factors other than aquifer confinement though: these include the permeability and storage characteristics of strata in which the groundwater resides, its water storage capacity, the depth to the water table and the overlying land cover and proximity to a stable surface water boundary.

The impact of seasonal fluctuations in rainfall recharge volumes on groundwater levels are more subdued in confined aquifers, which are disconnected from direct rainfall recharge by overlying low permeability strata. As a result, the magnitudes of level fluctuations are typically much less than seen in shallow unconfined groundwater systems where the water table is close to the surface and receiving direct rainfall recharge.

The water level data from some specific sites also illustrate the influence of water abstraction on groundwater systems, whereby drawdown of water levels occurs as a result of pumping, with a corresponding rebound in water level when pumping stops.

Data collected over the last three years of monitoring at each site (2017-2020) has been assessed to determine the current state of groundwater levels across monitored aquifers. The assessment shows that current water levels do not differ significantly from historical long-term averages at monitored sites. The analysis also illustrated similarities in spatial and temporal responses to rainfall across some sites.

Trend analysis was carried out on the data collected at all sites with a minimum of five years' data. This data was used to assess short-term (recent) trends in groundwater level change. Where a site had a minimum of ten years of available data, an analysis of the full data record from that site was also conducted to assess longer-term trends in groundwater level. The results of the trend analysis were assessed against a set criteria of statistical significance to define a trend classification.

Following the statistical trend analysis any site exhibiting a trend were further examined to ascertain if the trend was meaningful. To assess the meaningfulness of the trend the levels have to be taken in context. In a shallow bore that exhibits a strong seasonal response any change in levels needs to be compared against both long and short-term rainfall patterns. In a confined bore with no discernible seasonal influence some consideration to any changes in local or regional abstraction needs to be given.

The results of the trend analysis show that at the vast majority of sites, there has been no meaningful change in water level over time.

The exception to this was site GND0708 (Hawera – Whenuakura Aquifer), which was found to have experienced a slightly declining trend in water level over both its long-term data record of 21 years and the most recent five year period. Localised abstraction pressure was investigated following a recommendation in the previous report and found not to be the cause of observed declines in water level at site GND0708.

The slightly declining trend in GND0708 appear to be localised as other monitoring sites in the same aquifer do not show similar trends. It is therefore concluded that the observed trends are not indicative of any widespread changes in groundwater levels across the aquifer.

The slightly declining water levels observed at site GND2252 discussed in the previous monitoring report now appear relatively stable following a slight reduction in abstraction, which has allowed the aquifer to recover. The reduction in abstraction is also likely the cause of the slightly increasing trend seen in GND2253 which could not be attributed directly to rainfall.

The short-term declining levels in GND2220 will continue to be monitored closely to determine whether the decline is temporary and therefore likely to recover, or is indicating issues with the sustainability of the current abstraction.

In summary, analysis of groundwater level data found slight changes in water level trend at specific sites but overall, groundwater levels remain stable at the majority of monitored locations. The results of the analyses undertaken show that groundwater abstraction and usage is well within current allocation limits, with little pressure on the region's groundwater systems at the present time. This suggests that Council's policies relating to groundwater abstraction and usage continue to support sustainable management of the region's groundwater resource.

7 Recommendations from the 2015-2017 biennial report

It is recommended:

1. THAT any of the planned responses outlined in Section 7.0 be implemented as proposed, where not already completed; and
2. THAT the Council's regional groundwater level monitoring network be extended as further suitable sites are identified. Sites intersecting aquifers where current monitoring coverage is limited should be prioritised, as should sites to the west of Taranaki Maunga.

These recommendation were implemented during the period being reported.

8 Recommendations

It is recommended:

1. THAT the Council's regional groundwater level monitoring network be extended as further suitable sites are identified. Sites intersecting aquifers where current monitoring coverage is limited should be prioritised, as should sites to the west of Taranaki Maunga.

Glossary of common terms and abbreviations

The following abbreviations and terms may be used within this report:

Anisotropic	Different physical properties in all directions.
Aquifer	A permeable water-bearing geological formation through which water moves under natural conditions and which yields water to wells at a sufficient rate to be a practical source of water supply.
Bore	Bore means a hole drilled into the ground and completed for the abstraction of water or hydrocarbons to a depth of greater than 20 metres below the ground surface.
Confined aquifer	When an impermeable formation, such as clay, overlies an aquifer so that air and water are no longer in contact and the pressure is no longer equal to atmospheric pressure. Water in a well will stand at a different level to the water table.
ENSO	El Nino-Southern Oscillation - is a recurring climate pattern involving changes in the temperature of waters in the central and eastern tropical Pacific Ocean.
Heterogeneity	The quality or state being diverse in physical character or content.
Heterogeneous	See Heterogeneity.
Hydraulic head	A measurement of liquid pressure above a specified datum.
m	Metres
m AMSL	Metres above mean sea level
m asl	Metres above sea level (the equivalent of m AMSL in this report)
Permitted activity	An activity that can be undertaken without the need for a resource consent, provided specified conditions are met, as set out in the RFWP.
Policy	A specific statement that guides or directs decision making. A policy indicates a commitment to a general course of action in working towards the achievement of an objective.
Recharge	The addition of water from other sources to an aquifer, e.g., seepage from rivers, percolation of rainfall.
Resource consent	Refer Section 87 of the RMA. Resource consents include land use consents (refer Sections 9 and 13 of the RMA), coastal permits (Sections 12, 14 and 15), water permits (Section 14) and discharge permits (Section 15).
RFWP	Regional Freshwater Plan for Taranaki (2001).
RMA	Resource Management Act 1991 and including all subsequent amendments.
Saline intrusion	The movement of saline water into freshwater aquifers.
Sustainable yield	The quantity of groundwater that can be abstracted from an aquifer for a prolonged period without depleting the resource or causing other adverse effects on groundwater quality or other groundwater users.
Unconfined aquifer	Groundwater which is freely connected to the atmosphere and which is free to rise and fall in the saturated zone, or water of an unconfined aquifer, or water under water table conditions.
Water table	The upper level of an underground surface in which the soil or rocks are permanently saturated with water.
Well	A hole dug, augured or drilled, tapping the water-table or springs to a depth of 20 metres or less below the ground surface.
Yield	The volume of water per unit of time able to be abstracted from a bore or well.

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Appendix I

Results of statistical short-term water level trend analysis by site

Groundwater Level Trend Report

07 December, 2021

Trend Analysis

Five year trend results are presented in a summary table. The direction and magnitude of monotonic trends is reported accompanied by the confidence in the reported result being true.

Trend analyses on groundwater level data for Taranaki boreholes is carried-out to characterize and document changes in the hydrologic status of the system. Water levels in individual bores vary in response to natural and anthropogenic stresses on daily, seasonal, decadal, and longer time scales. A key purpose of the analysis is to evaluate the long-term availability and sustainability of groundwater resources in the Taranaki Region, the focus of the data analysis is to examine persistent decadal or longer trends that have occurred in bores since the onset of widespread irrigation and groundwater pumping.

Water-level measurements from these identified wells then were used in the analyses. To remove daily and seasonal variation in groundwater levels induced by irrigation pumping, the median groundwater level measured in winter between January and March of each year was used in the analysis. The resulting data reflect the influence of multi-year precipitation patterns and the cumulative effects of pumping and irrigation recharge.

The data used comprises manual monthly samples during the early phase of monitoring, and continuously recorded data for the later parts of the record. For the trend analyses, continuous data are aggregated to monthly mean values to be consistent with earlier records. A comparison with random monthly re-sampled values from the continuous data, found that the trends were almost invariable for each random re-sampling.

5 Years Trends						
Site	n monthly means	Year range	Slope (cm/yr)	Trend Direction	Confidence in Trend	Confidence (%)
GND0213 Motunui M39	60	2016-2020	-3.346	Decreasing	Likely Falling	69.0
GND0229 Kiwi-1	60	2016-2020	-2.418	Decreasing	Very Likely Falling	100.0
GND0447 Manutahi-1	49	2016-2020	-0.080	Indeterminate	Indeterminate	50.0
GND0508 Carrington Rd	58	2016-2020	-12.502	Decreasing	Very Likely Falling	93.9
GND0519 Mangamahoe-1		2016-2020				
GND0599 STDC 7	60	2016-2020	-4.069	Decreasing	Likely Falling	82.1
GND0600 STDC 7a	58	2016-2020	-7.026	Decreasing	Very Likely Falling	91.9

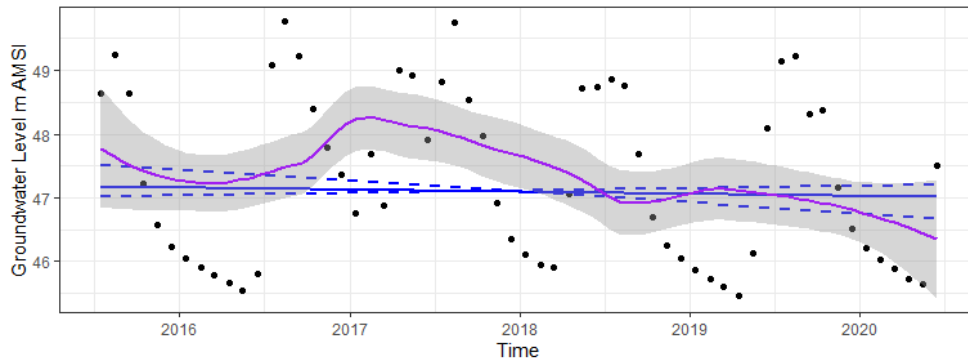
5 Years Trends						
Site	n monthly means	Year range	Slope (cm/yr)	Trend Direction	Confidence in Trend	Confidence (%)
GND0708 Nolan Rd	59	2016-2020	-0.122	Decreasing	Indeterminate	52.9
GND1015 at Stratford landfill	56	2016-2020	1.569	Increasing	Indeterminate	53.1
GND2000 Scout Rd	48	2016-2020	-3.988	Decreasing	Very Likely Falling	99.7
GND2220 STDC Swinbourne Mon Bore	60	2016-2020	-100.970	Decreasing	Very Likely Falling	100.0
GND2242 STDC Waverley Swinbourne bore	59	2016-2020	-209.808	Decreasing	Very Likely Falling	100.0
GND2252 Patea Sentinel Lower Aquifer	56	2016-2020	-4.221	Decreasing	Very Likely Falling	99.2
GND2253 Patea Sentinel Upper Aquifer	53	2016-2020	6.472	Increasing	Very Likely Rising	100.0

Trend Plots

Five year groundwater level trends are plotted for each site.

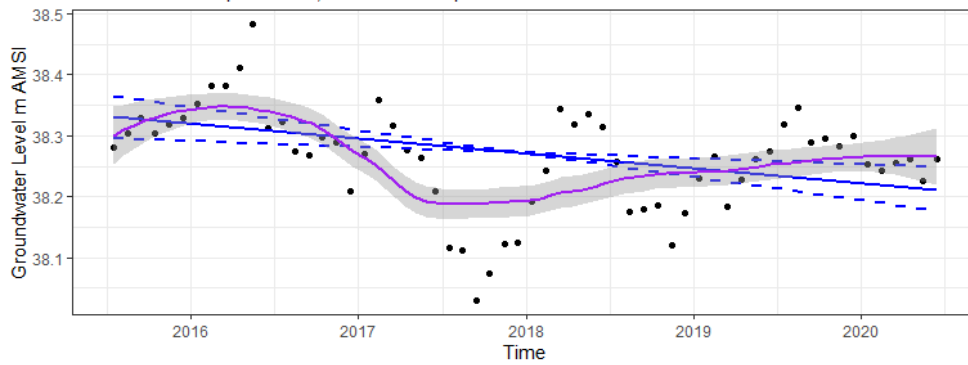
GND0213 Motunui M39 Seasonal Trend Analysis

% Annual Sen Slope = -0.1 , Annual Sen Slope = -0.0335



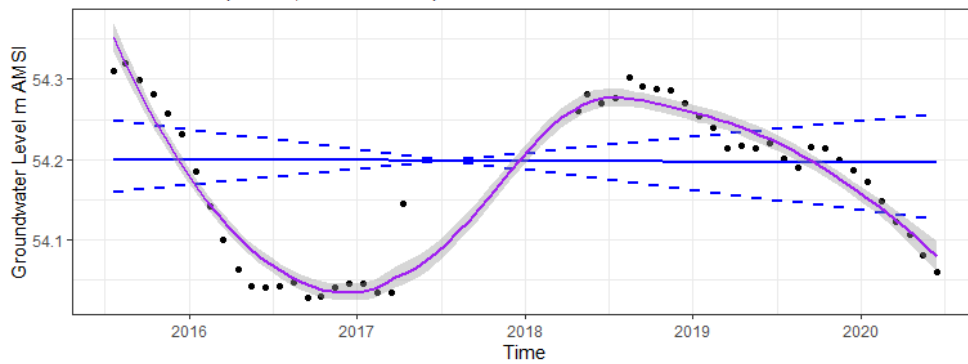
GND0229 Kiwi-1 Seasonal Trend Analysis

% Annual Sen Slope = -0.1 , Annual Sen Slope = -0.0242



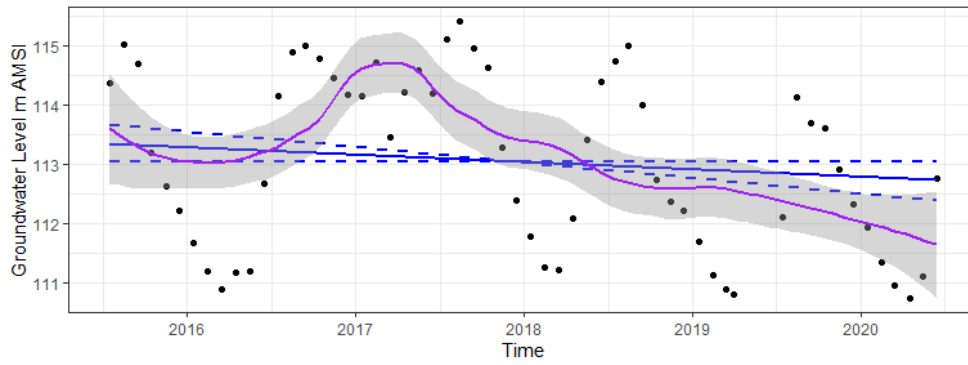
GND0447 Manutahi-1 Seasonal Trend Analysis

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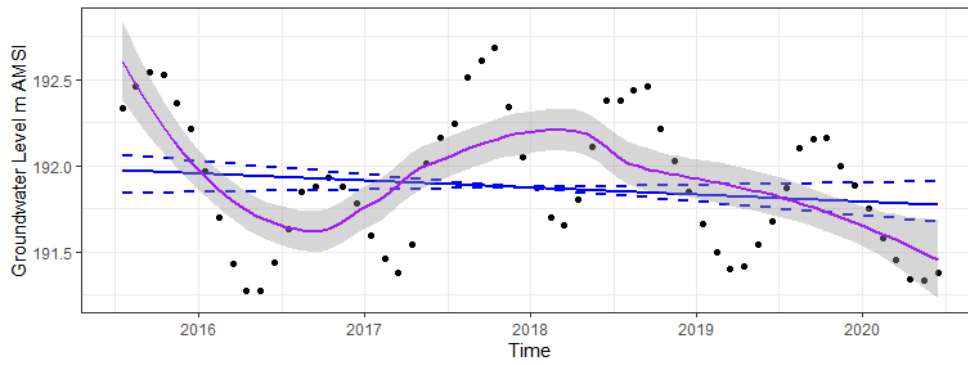
GND0508 Carrington Rd Seasonal Trend Analysis

% Annual Sen Slope = -0.1 , Annual Sen Slope = -0.125



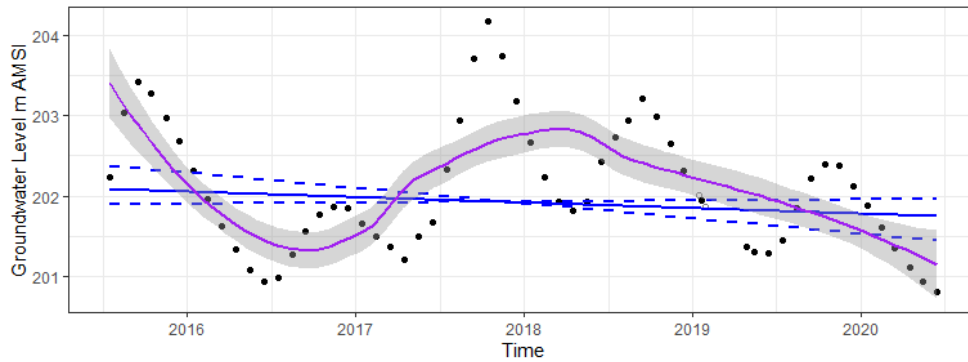
GND0599 STDC 7 Seasonal Trend Analysis

% Annual Sen Slope = 0 , Annual Sen Slope = -0.0407



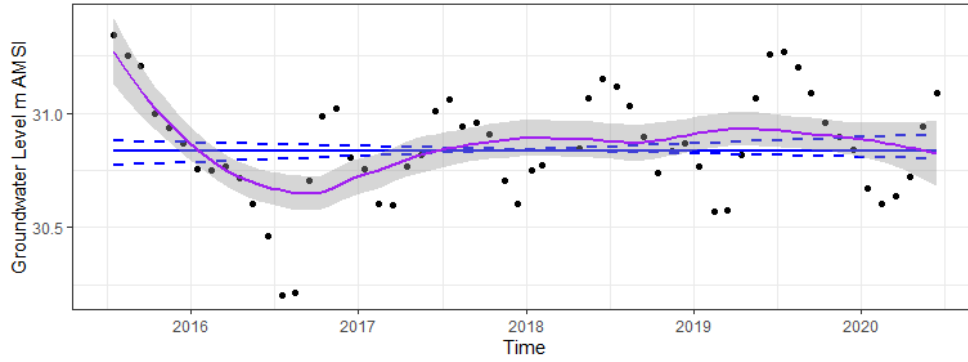
GND0600 STDC 7a Seasonal Trend Analysis

% Annual Sen Slope = 0 , Annual Sen Slope = -0.0703



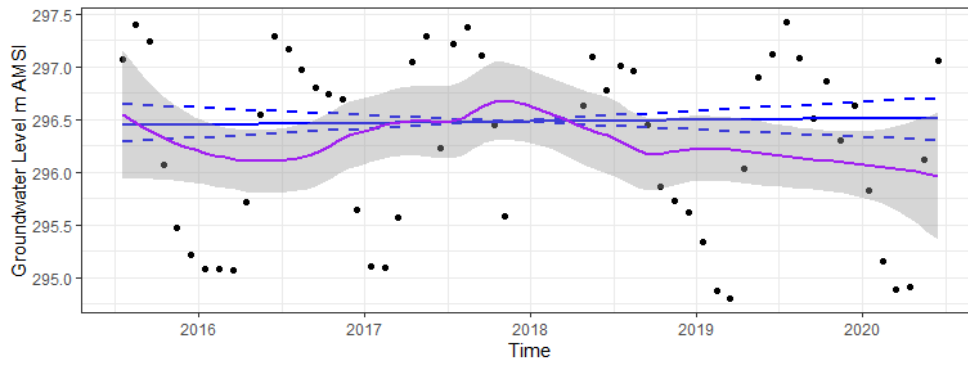
GND0708 Nolan Rd Seasonal Trend Analysis

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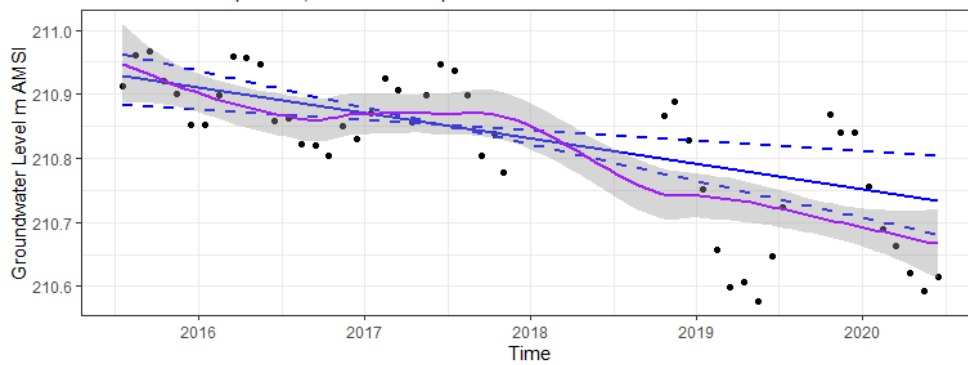
GND1015 at Stratford landfill Seasonal Trend Analysis

% Annual Sen Slope = 0 , Annual Sen Slope = 0.0157



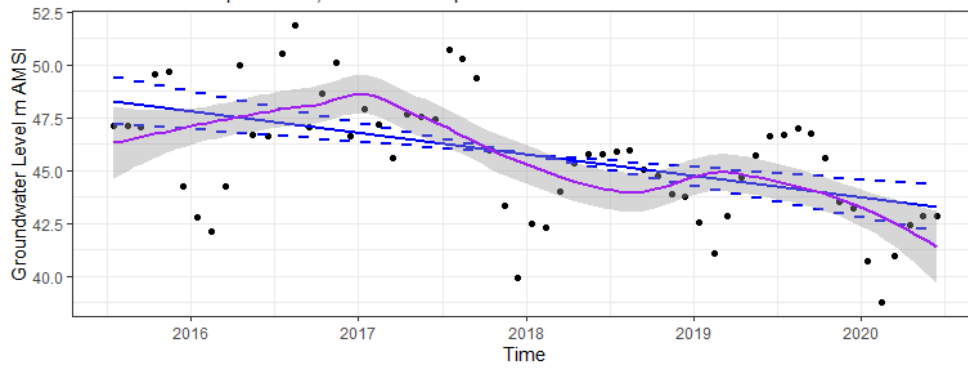
GND2000 Scout Rd Seasonal Trend Analysis

% Annual Sen Slope = 0 , Annual Sen Slope = -0.0399



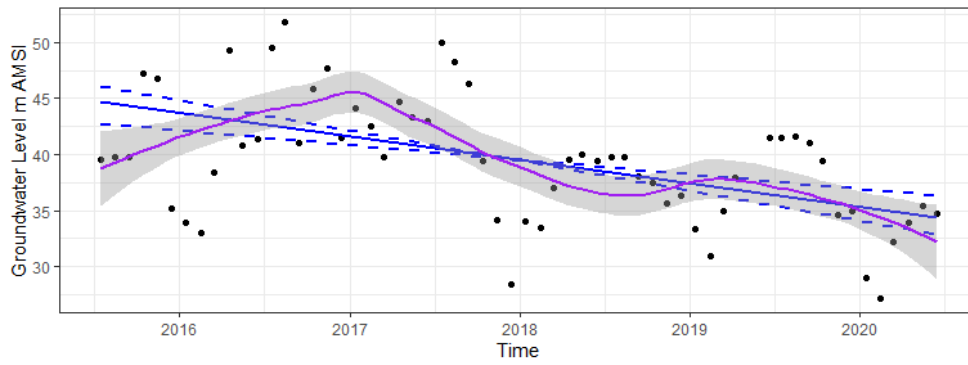
GND2220 STDC Swinbourne Mon Bore Seasonal Trend Analysis

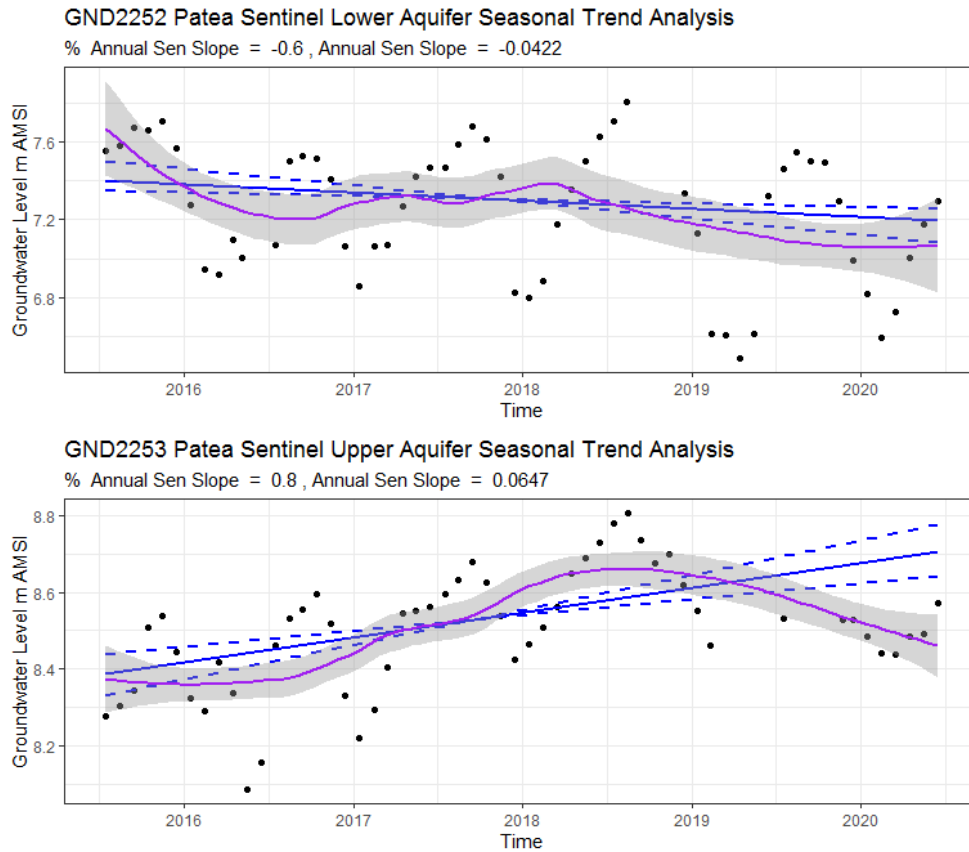
% Annual Sen Slope = -2.2 , Annual Sen Slope = -1.01



GND2242 STDC Waverley Swinbourne bore Seasonal Trend Analysis

% Annual Sen Slope = -5.3 , Annual Sen Slope = -2.1



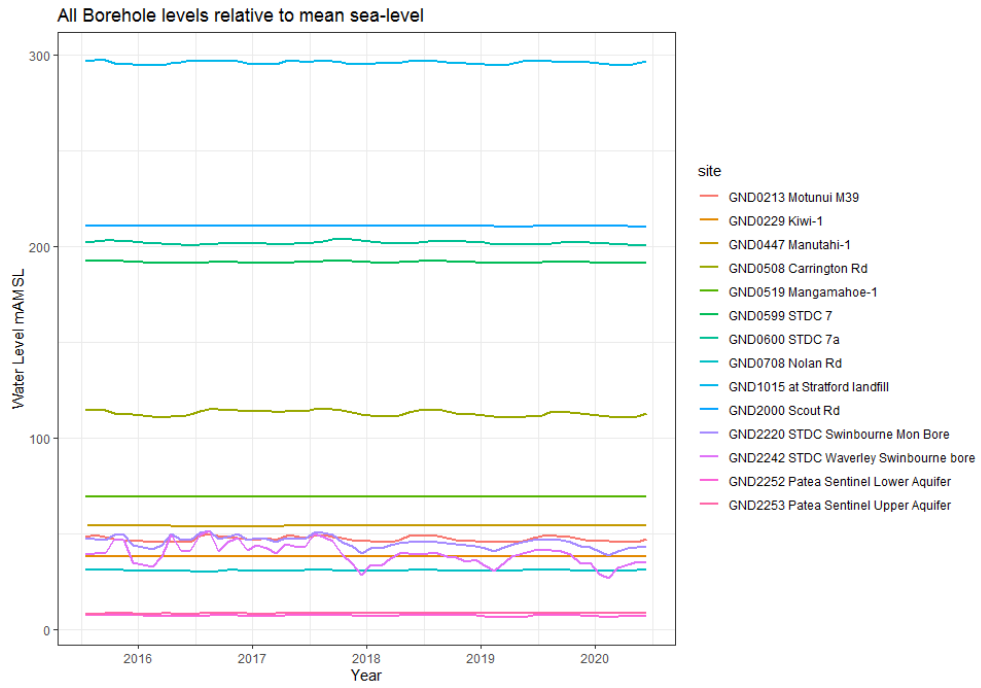


Change in groundwater level distribution over time

By plotting how often each level occurs over a period of time, we can see what the general level is, and also the upper and lower level range. When we overlay the plots for two periods we can see if there has been a change over time. The plots below show confirm the trend patterns and high variability from location to location and at a location.

All Sites Plot

With both sites all years.



Appendix II

Results of statistical long-term water level trend analysis by site

Groundwater Level Trend Report

07 December, 2021

Trend Analysis

Long-term trend results are presented in a summary table. The direction and magnitude of monotonic trends is reported accompanied by the confidence in the reported result being true.

Trend analyses on groundwater level data for Taranaki boreholes is carried-out to characterize and document changes in the hydrologic status of the system. Water levels in individual bores vary in response to natural and anthropogenic stresses on daily, seasonal, decadal, and longer time scales. A key purpose of the analysis is to evaluate the long-term availability and sustainability of groundwater resources in the Taranaki Region, the focus of the data analysis is to examine persistent decadal or longer trends that have occurred in bores since the onset of widespread irrigation and groundwater pumping.

Water-level measurements from these identified wells then were used in the analyses. To remove daily and seasonal variation in groundwater levels induced by irrigation pumping, the median groundwater level measured in winter between January and March of each year was used in the analysis. The resulting data reflect the influence of multi-year precipitation patterns and the cumulative effects of pumping and irrigation recharge.

The data used comprises manual monthly samples during the early phase of monitoring, and continuously recorded data for the later parts of the record. For the trend analyses, continuous data are aggregated to monthly mean values to be consistent with earlier records. A comparison with random monthly re-sampled values from the continuous data, found that the trends were almost invariable for each random re-sampling.

All Data Trends						
Site	n monthly means	Year range	Slope (cm/yr)	Trend Direction	Confidence in Trend	Confidence (%)
GND0213 Motunui M39	448	1983-2020	-0.444	Decreasing	Very Likely Falling	96.3
GND0229 Kiwi-1	197	1998-2020	0.374	Increasing	Very Likely Rising	99.9
GND0447 Manutahi-1	235	1995-2020	1.997	Increasing	Very Likely Rising	100.0
GND0508 Carrington Rd	165	2004-2020	1.398	Increasing	Likely Rising	83.2
GND0519 Mangamahoe-1	146	1995-2020	-1.185	Decreasing	Very Likely Falling	100.0
GND0599 STDC 7	241	1997-2020	-0.265	Decreasing	Likely Falling	83.9

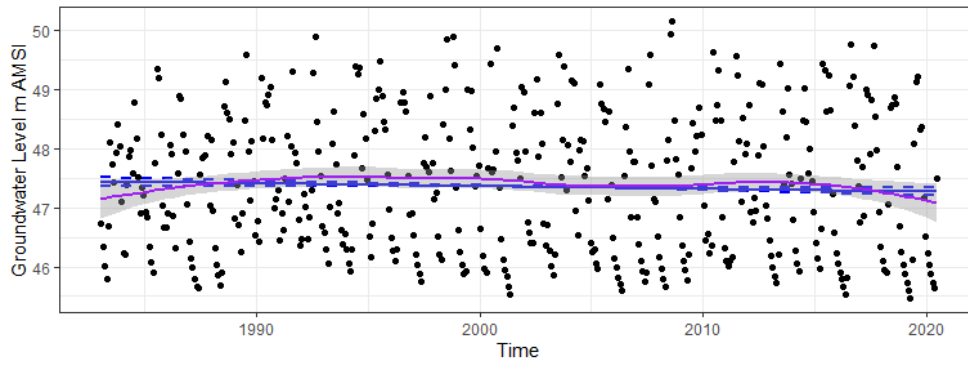
All Data Trends						
Site	n monthly means	Year range	Slope (cm/yr)	Trend Direction	Confidence in Trend	Confidence (%)
GND0600 STDC 7a	243	1997-2020	1.297	Increasing	Very Likely Rising	99.1
GND0708 Nolan Rd	225	1999-2020	-11.465	Decreasing	Very Likely Falling	100.0
GND1015 at Stratford landfill	57	2015-2020	-1.122	Decreasing	Indeterminate	55.9
GND2000 Scout Rd	106	2009-2020	2.490	Increasing	Very Likely Rising	99.9
GND2220 STDC Swinbourne Mon Bore	91	2013-2020	-52.012	Decreasing	Very Likely Falling	100.0
GND2242 STDC Waverley Swinbourne bore	81	2014-2020	-147.364	Decreasing	Very Likely Falling	100.0
GND2252 Patea Sentinel Lower Aquifer	89	2013-2020	-5.611	Decreasing	Very Likely Falling	100.0
GND2253 Patea Sentinel Upper Aquifer	86	2013-2020	3.039	Increasing	Very Likely Rising	100.0

Trend Plots

Long Term groundwater level trends are plotted for each site.

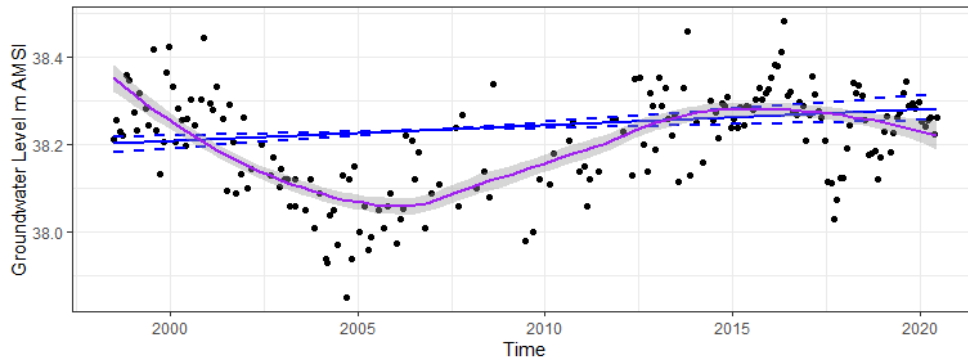
GND0213 Motunui M39 Seasonal Trend Analysis

% Annual Sen Slope = 0 , Annual Sen Slope = -0.00444



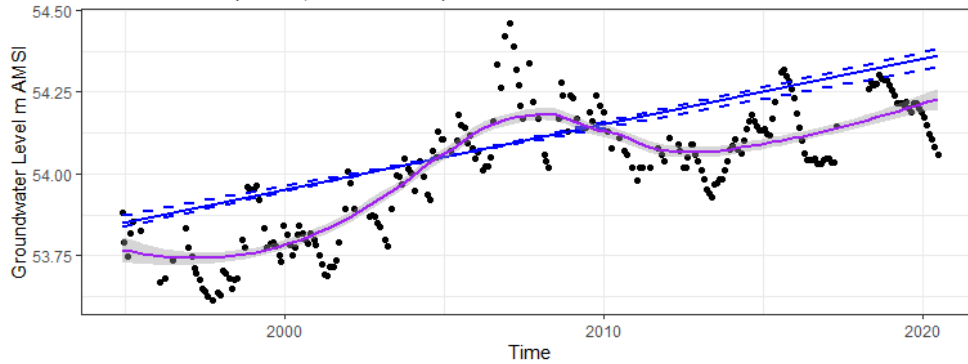
GND0229 Kiwi-1 Seasonal Trend Analysis

% Annual Sen Slope = 0 , Annual Sen Slope = 0.00374



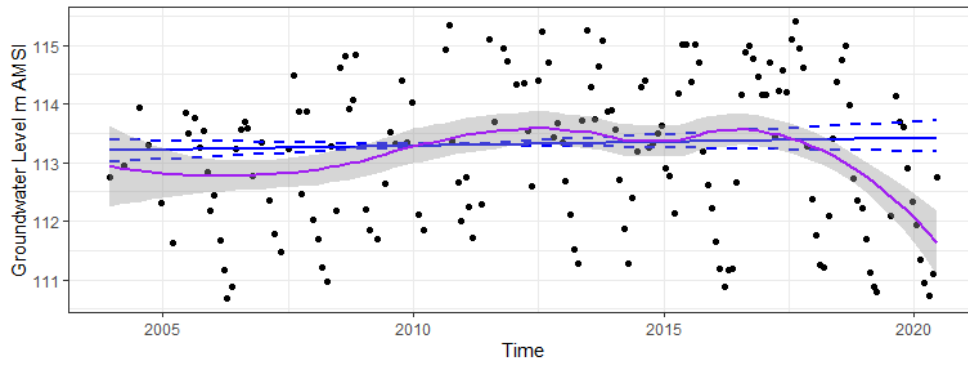
GND0447 Manutahi-1 Seasonal Trend Analysis

% Annual Sen Slope = 0 , Annual Sen Slope = 0.02



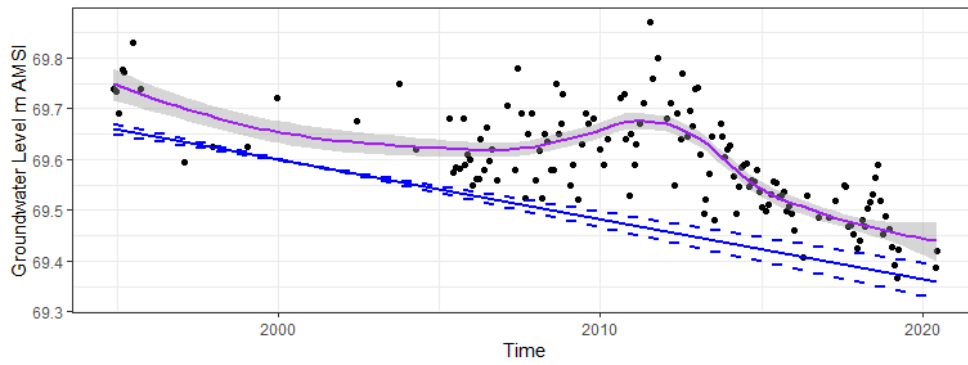
GND0508 Carrington Rd Seasonal Trend Analysis

% Annual Sen Slope = 0 , Annual Sen Slope = 0.014



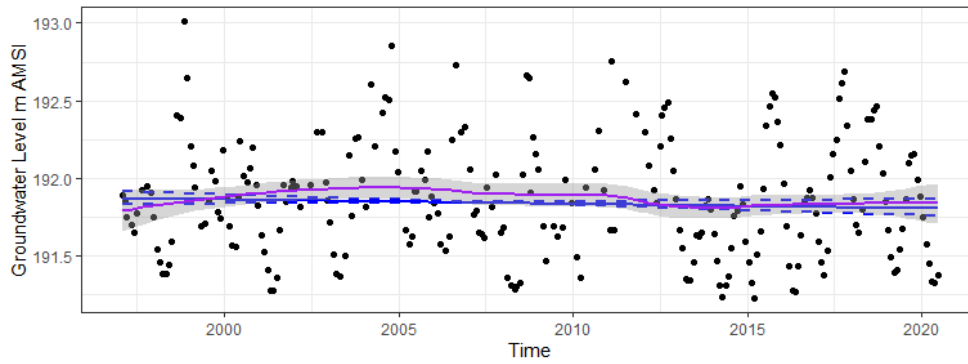
GND0519 Mangamahoe-1 Seasonal Trend Analysis

% Annual Sen Slope = 0 , Annual Sen Slope = -0.0119



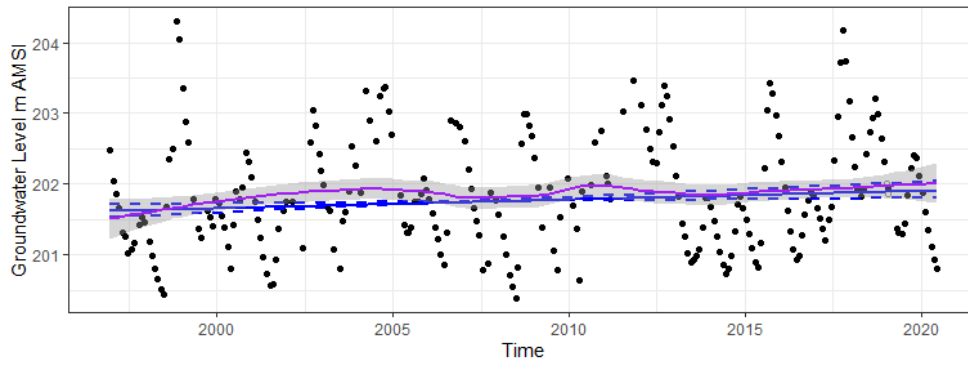
GND0599 STDC 7 Seasonal Trend Analysis

% Annual Sen Slope = 0 , Annual Sen Slope = -0.00265



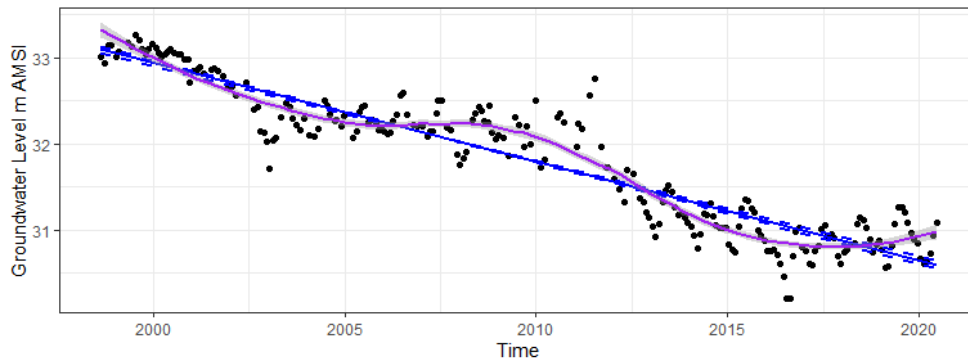
GND0600 STDC 7a Seasonal Trend Analysis

% Annual Sen Slope = 0 , Annual Sen Slope = 0.013



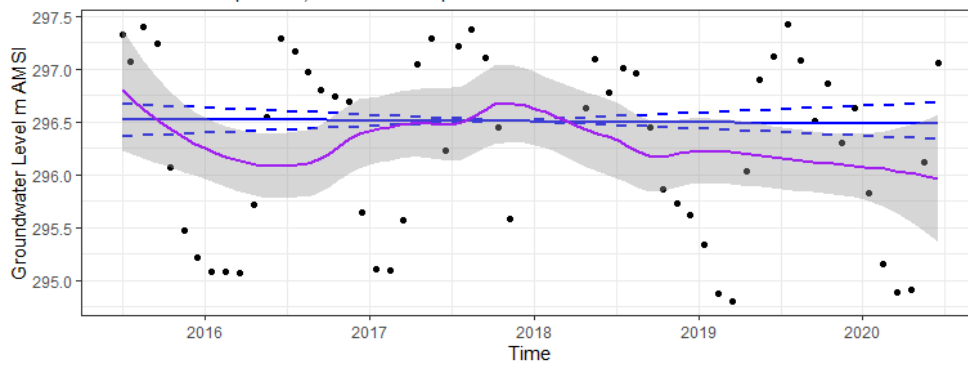
GND0708 Nolan Rd Seasonal Trend Analysis

% Annual Sen Slope = -0.4 , Annual Sen Slope = -0.115



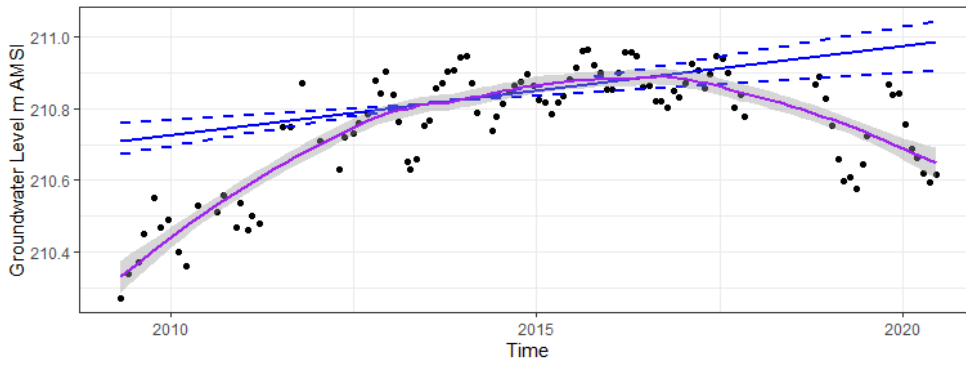
GND1015 at Stratford landfill Seasonal Trend Analysis

% Annual Sen Slope = 0 , Annual Sen Slope = -0.0112



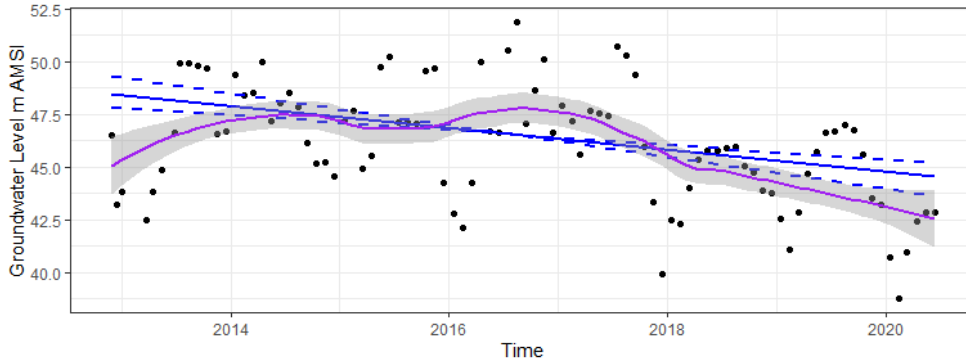
GND2000 Scout Rd Seasonal Trend Analysis

% Annual Sen Slope = 0 , Annual Sen Slope = 0.0249



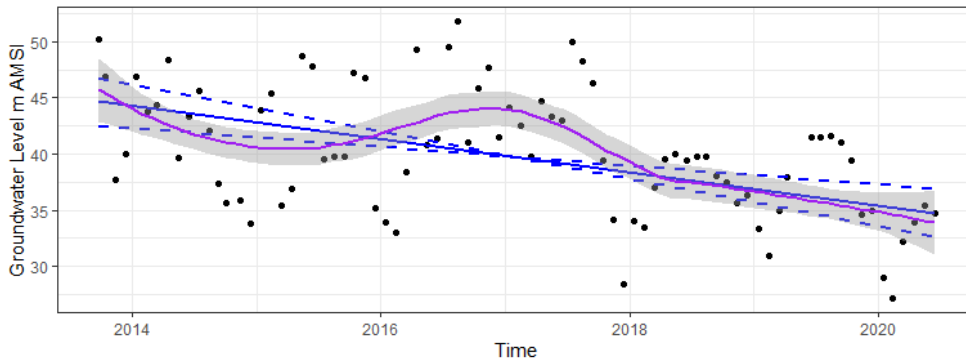
GND2220 STDC Swinbourne Mon Bore Seasonal Trend Analysis

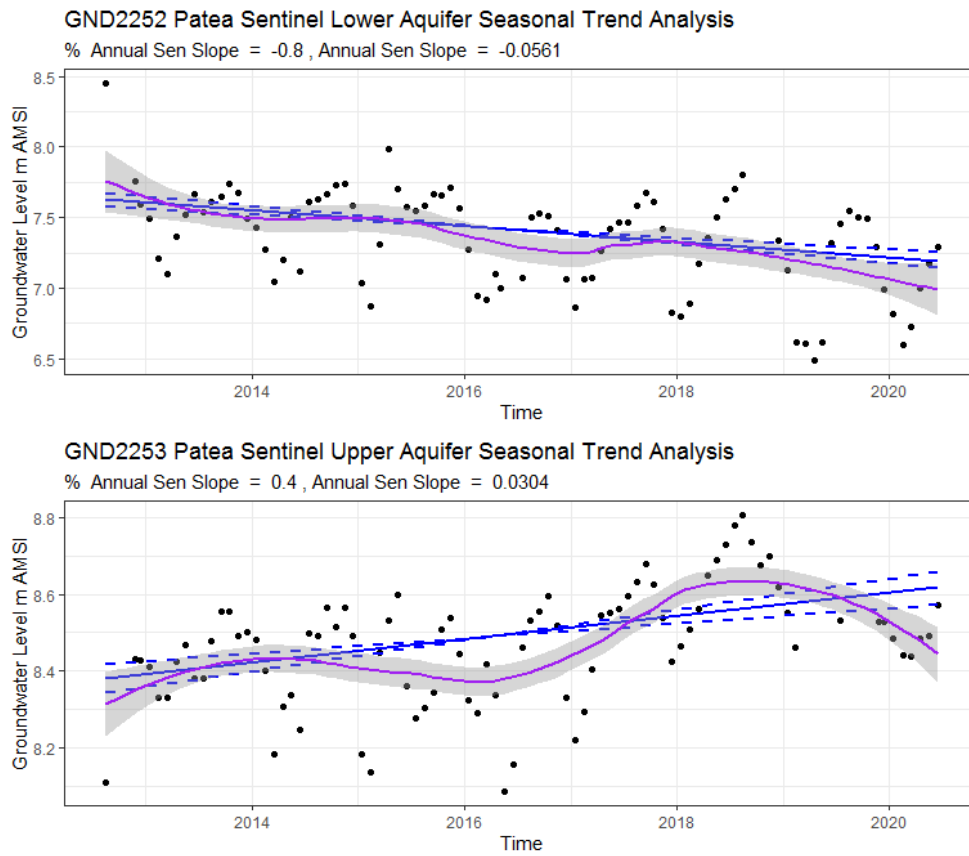
% Annual Sen Slope = -1.1 , Annual Sen Slope = -0.52



GND2242 STDC Waverley Swinbourne bore Seasonal Trend Analysis

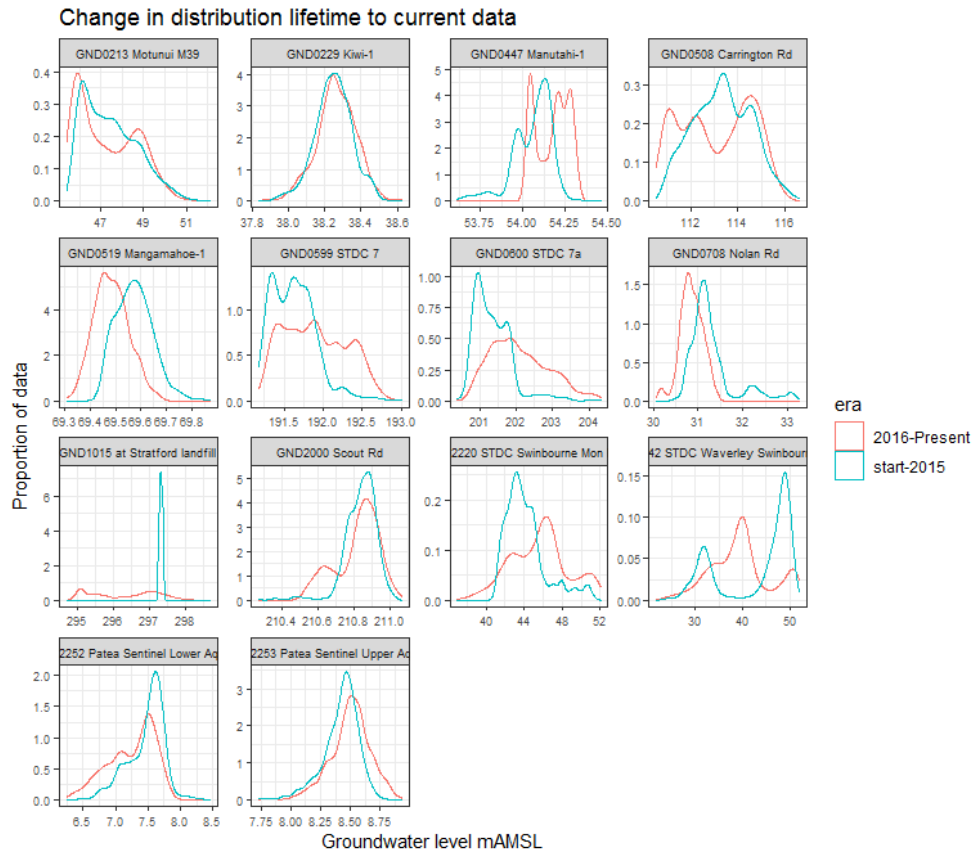
% Annual Sen Slope = -3.7 , Annual Sen Slope = -1.47





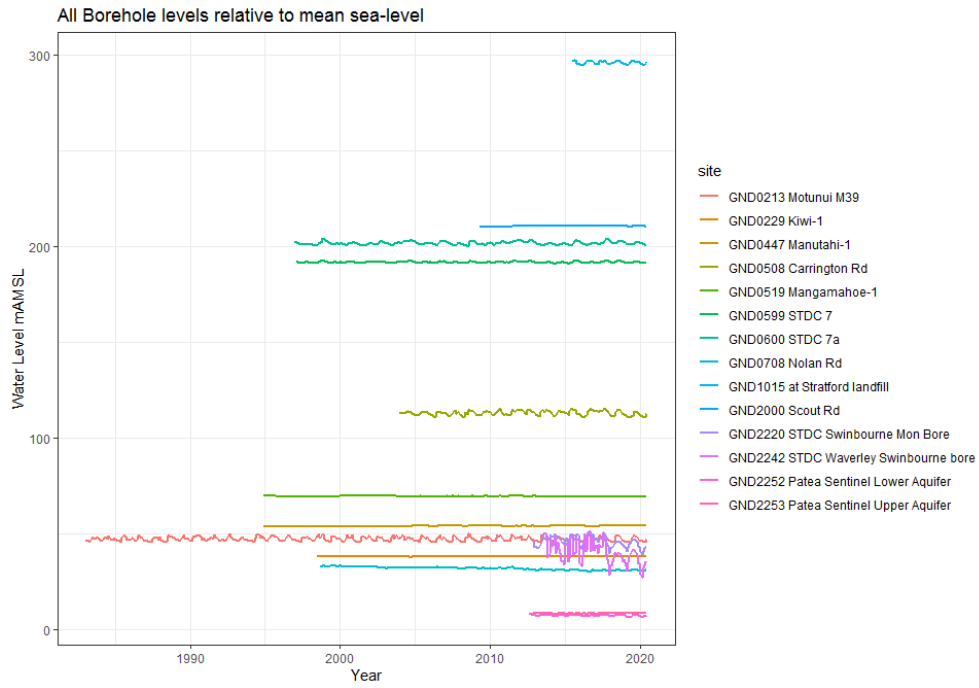
Change in groundwater level distribution over time

By plotting how often each level occurs over a period of time, we can see what the general level is, and also the upper and lower level range. When we overlay the plots for two periods we can see if there has been a change over time. The plots below show confirm the trend patterns and high variability from location to location and at a location.



All Sites Plot

With both sites all years.





Date: 26 July 2022

Subject: **Taranaki water quality state spatial modelling**

Approved by: AJ Matthews, Director - Environment Quality
S J Ruru, Chief Executive

Document: 3084189

Purpose

1. The purpose of this memorandum is to provide the Committee with an overview of the findings of a recent report commissioned by Taranaki Regional Council (TRC), *Taranaki water quality state spatial modelling* by Land Water People (LWP).

Executive summary

2. The *National Policy Statement for Freshwater Management 2020* (NPS-FM) requires that every regional council, in consultation with its community, develop a plan for maintaining or improving the state of freshwater in the region.
3. The National Objectives Framework (NOF) contained within the NPS-FM directs councils and communities to set values and desired environmental outcomes (objectives) for the state of fresh water bodies in their regions. Action plans and limits on resource use must then be established to achieve these agreed outcomes.
4. Progress against identified values and objectives is assessed by monitoring and reporting against a range of measures on the state of a river or lake, referred to as attributes. Attributes are measurable characteristics such as nutrient concentrations, (sediment), macroinvertebrates and faecal indicator bacteria measured as *Escherichia coli* (*E. coli*). The NOF sets out 22 compulsory attributes, used to assess the extent to which freshwater values and objectives are being provided for. A number of these attributes have 'national bottom line' which is the minimum standard that must be achieved.
5. To set objectives and limits, the council must first determine the current state of each attribute - known as the 'baseline state'. The amount of data available to calculate baseline state for attributes in Taranaki rivers and lakes is variable. Presently, the Council maintains a relatively modest water quality state of environment monitoring network, with just 11 long-term physico-chemical monitoring sites. There is however, a more comprehensive network of ecological monitoring sites for macroinvertebrates.
6. The NPS-FM is clear that councils must use the best information available and take all practicable steps to reduce uncertainty. Decision-making cannot be delayed on the basis of incomplete data and information, or uncertainty about the robustness of this

information. This includes using the best available information to determine the baseline state of freshwater attributes in rivers and lakes throughout the region.

7. Given the limited regional coverage of water quality monitoring sites, the Council commissioned water quality experts Land Water People (LWP) to assess the current water quality state at Council's river water quality monitoring sites, and develop regional spatial models of river water quality state for a range of attributes. LWP has previously undertaken national scale spatial water quality modelling for the Ministry for the Environment (MfE), and has delivered similar regional assessments for Horizons Regional Council and Environment Southland.
8. The primary purpose of spatial modelling is to provide large-scale water quality assessments that are more representative of the true spatial patterns of water quality than assessments based purely on data from physical monitoring sites. The latter approach can be limiting, particularly there is a small number of sites representing large spatial areas. It can also lead to conclusions about water quality patterns being biased by the non-random locations of monitoring sites.
9. Spatial models use statistical relationships between water quality results at monitored sites and several predictor variables (rainfall, river flow, land cover, stocking densities etc.) to make predictions of water quality state at unmonitored locations. To improve modelling confidence, monitoring data from neighbouring regions (Manawatū-Whanganui and Waikato) and NIWA's national river water quality monitoring network were incorporated into the spatial models for Taranaki to supplement data from our own regional monitoring networks.
10. The report provided by LWP describes the modelling methods and results, including predictions of attribute state across all river reaches in Taranaki. The work also includes an assessment of the relationships between water quality state and catchment conditions (predictor variables) and details the uncertainty associated with the water quality predictions generated.
11. As expected, the most significant water quality challenges highlighted by the model are consistent with those evident in the data from our physical monitoring networks. The most significant of these being bacterial contamination (based on *E. coli* concentrations) and sediment (based on visual clarity). Further analysis showed the strongest predictors (drivers) of water quality state were variable by attribute. For *E. coli* and visual clarity, rainfall, temperature, river flow, land cover and the intensity of upstream agricultural land use were found to have the most significant influence on the results.
12. Alongside other sources of information, including Council's recently published State of Environment 2022 report, the outputs from modelling will provide useful context regarding the state of water quality and ecosystem health across the region as we continue work to implement the requirements of the NPS-FM.

Recommendations

That the Taranaki Regional Council:

- a) receives the technical report, *Taranaki water quality state spatial modelling* and notes that the outputs from the modelling carried will provide useful context regarding the state of water quality and ecosystem health across the region as we continue work to implement the requirements of the NPS-FM.

Background

13. As part of their *Essential Freshwater* programme, the government gazetted the NPS-FM September 2020. In response, Council has developed an NPS-FM implementation plan. Over the next two years this implementation programme will support the development of a new Regional Policy Statement (RPS) and Natural Resources Plan (NRP) for Taranaki, with the aim of giving effect to NPS-FM requirements. Council's Policy and Planning Committee receives regular updates on progress against the implementation plan.
14. A significant component of the NPS-FM is the National Objectives Framework (NOF) (Figure 1). The NOF requires councils to work with tangata whenua and the community to identify values and desired outcomes (objectives) for freshwater. At a minimum, the NPS-FM requires that the four compulsory values of ecosystem health, human contact, threatened species and mahinga kai are provided for.
15. The NOF requires that Councils monitor and report on progress against these values objectives. Progress is measured by assessing the current and future state of different attributes - measures of water quality or ecosystem health. The NOF includes 22 compulsory attributes for both rivers and lakes. For the values of ecosystem health and human contact, the relevant compulsory attributes include measures such as nutrients, sediment, macroinvertebrates and bacteria as *Escherichia coli* (*E. coli*).
16. The NOF also sets out a grading system used to describe the state of each attribute against set criteria. This is a sliding scale from A - the best state - to D (or E) as the worst state. For most attributes, the NOF sets a 'national bottom line' that represents the minimum standard that must be achieved.
17. The Council is required to establish the 'baseline' state of all attributes and to work with tangata whenua and the community to establish 'target' states to achieve agreed freshwater values and objectives. Relevant limits and action plans must also be developed that facilitate the achievement of target states.
18. Under the NOF, baseline state means the best state for each attribute out of the following:
 - a) the state on the date the attribute is first identified by a regional council
 - b) the state on the date on which a regional council set a freshwater objective for the attribute under the *National Policy Statement for Freshwater Management 2014 (as amended in 2017)*
 - c) the state of the attribute on 7 September 2017.
19. The Council has been undertaking work to establish baseline states for a number of the compulsory attributes set out in the NOF. This has included analysis of data captured across our state of the environment monitoring networks. The results of this analysis, the trends in water quality state, and a summary of the region's most significant water quality challenges were presented in a recent report: *Our Place: Taranaki State of the Environment 2022*.
20. Physical monitoring networks will always be limited in terms of their spatial coverage. Budget and resource constraints limit the number of sites that can be established and operated and there are often biases in site locations, with monitoring generally targeted toward areas of known water quality pressure.



Figure 1: Infographic describing the components of the NOF, as set out in the NPS-FM (source: Ministry for the Environment).

21. The density of state of the environment monitoring sites across Taranaki is variable across programmes. The Council operates a relatively modest spatial network of water

quality monitoring sites, but a significantly more comprehensive network macroinvertebrate monitoring sites.

22. To provide a more complete picture of the current state of water quality and related attributes across Taranaki, the Council commissioned LWP to assess the current water quality state at Council's river water quality monitoring sites, and develop spatial models of river water quality state for Taranaki. LWP has previously undertaken national scale spatial water quality modelling for the Ministry for the Environment (MfE), and has delivered similar regional assessments for Horizons Regional Council and Environment Southland.
23. The report *Taranaki water quality state spatial modelling* by LWP describes the NOF grades achieved for each attribute at monitored sites and the modelled predictions of attribute state across all river reaches in Taranaki. The work also includes an assessment of the relationships between water quality state and catchment conditions (predictor variables) and details the uncertainty associated with the predictions generated.

Discussion

24. Spatial models use statistical relationships between physical measurements made at monitored sites and upstream catchment conditions using a range of predictor variables (rainfall, river flow, land cover, stocking densities etc.). The models then make predictions of water quality state based on the relative significance of predictor variables upstream of unmonitored locations.
25. These relationships are established using a technique known as random forest modelling, which in turn is based on statistical regression. Further information on methods can be found in the appended report.
26. The modelling makes predictions of baseline state for macroinvertebrates, visual clarity, dissolved reactive phosphorus (DRP), *E. coli*, ammonia and nitrate based on the specific criteria set out in the NOF for each attribute. Predictions were generated for every river segment across the region.
27. To improve modelling confidence, monitoring data from neighbouring regions (Manawatū-Whanganui and Waikato) and NIWA's national river water quality monitoring network were incorporated into the spatial models for Taranaki to supplement data from our own regional monitoring networks.
28. As expected, the most significant water quality challenges highlighted by the modelling are consistent with those evident in the data from our physical monitoring sites. The most significant of these being bacterial contamination (based on *E. coli* concentrations) and sediment (based on visual clarity). The models provide a greater understanding of the spatial extent of these challenges regionally, than is possible based on observations from physical monitoring networks alone (see Figures 2 to 5).
29. Analysis also showed that the strongest predictors (drivers) of water quality also varied by attribute. For *E. coli* and visual clarity, rainfall, temperature, river flow, land cover and the intensity of upstream agricultural land use were found to have the most significant influence on water quality state.

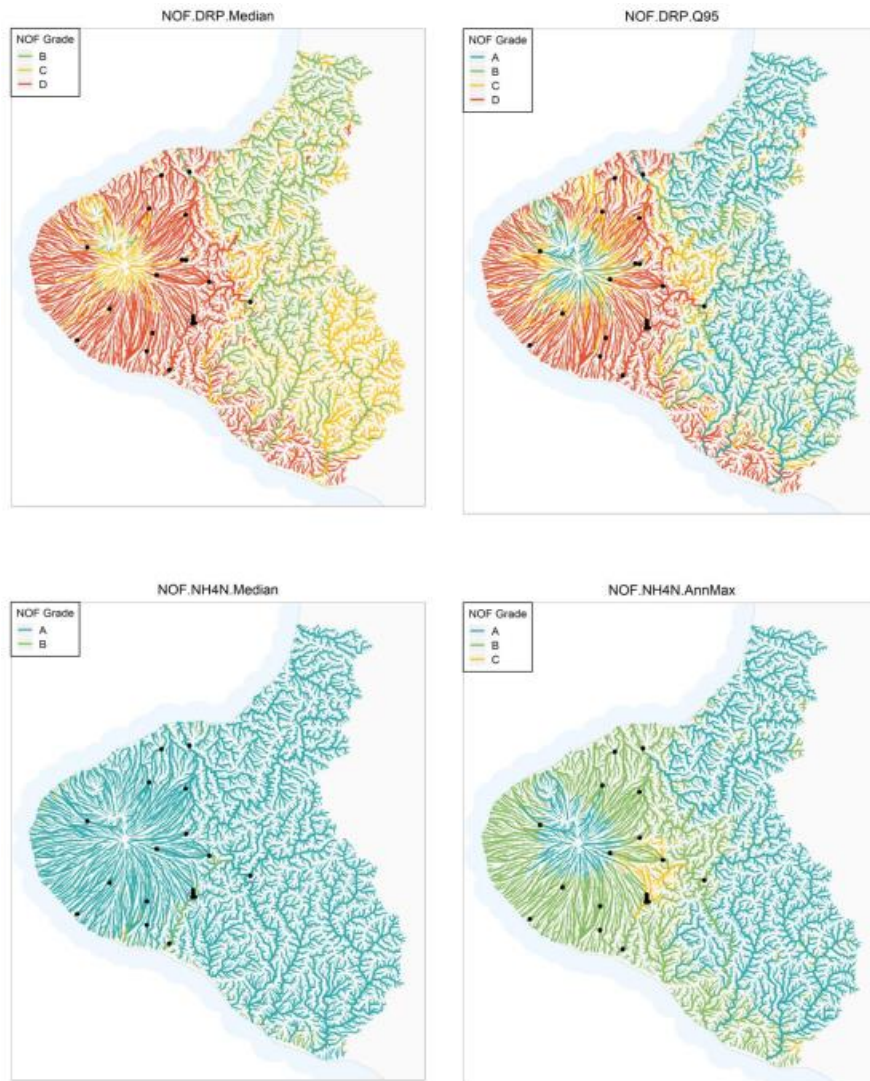


Figure 2: Predicted NOF grades for dissolved reactive phosphorous (DRP) for both median (top left) and 95th percentile (top right) measures; and ammonia (NH₄-N) for both annual median (bottom left) and annual maximum (bottom right). Black dots indicate TRC sites used in model fitting.

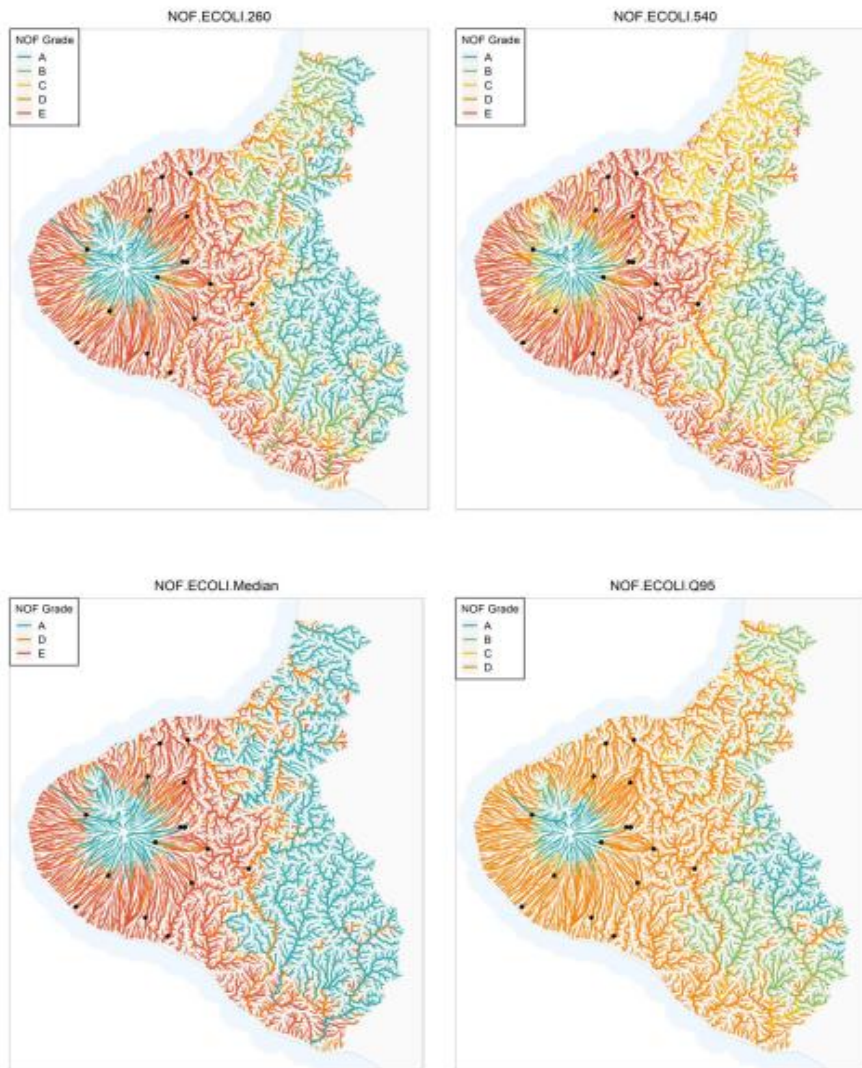


Figure 3: Predicted NOF grades for the *E. coli* attributes for human contact: percentage of exceedances over 260/100mL (top left); percentage of exceedances over 540/100mL (top right); median/100mL (bottom left); and 95th percentile/100mL (bottom right).

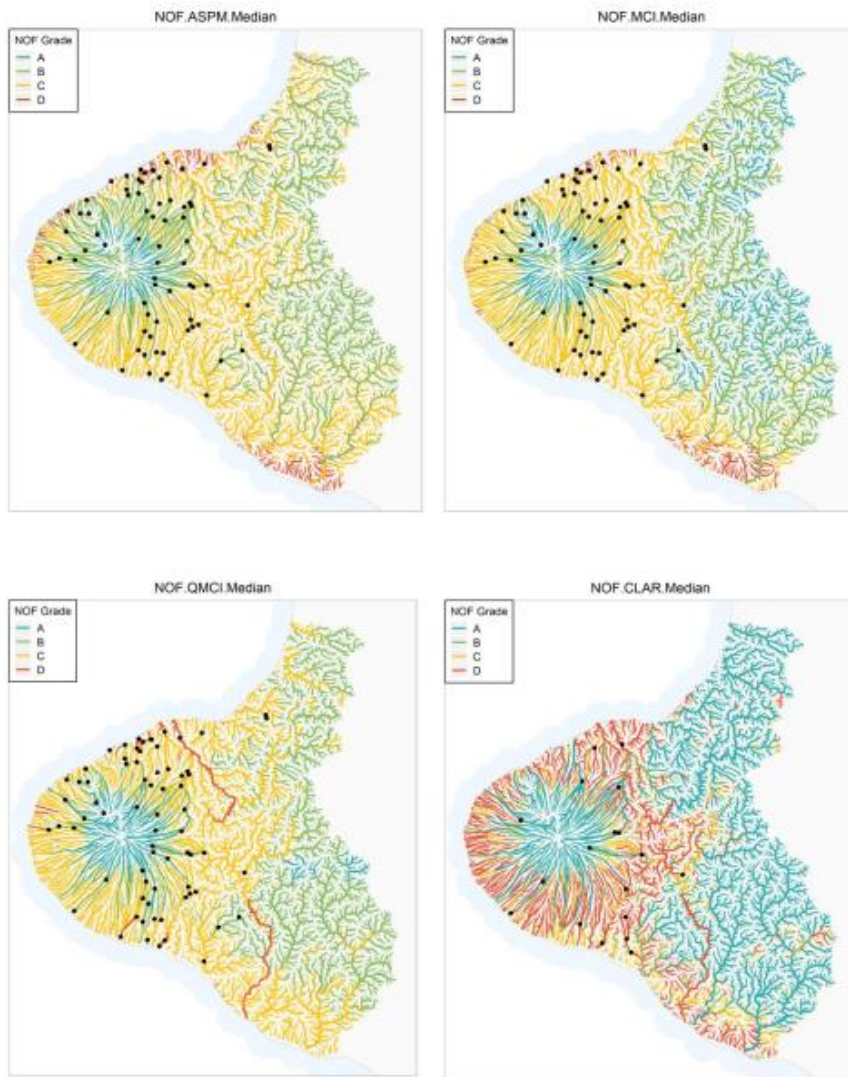


Figure 4: Predicted NOF grades for macroinvertebrate attributes (APSM, MCI and QMCI) and visual clarity (CLAR).

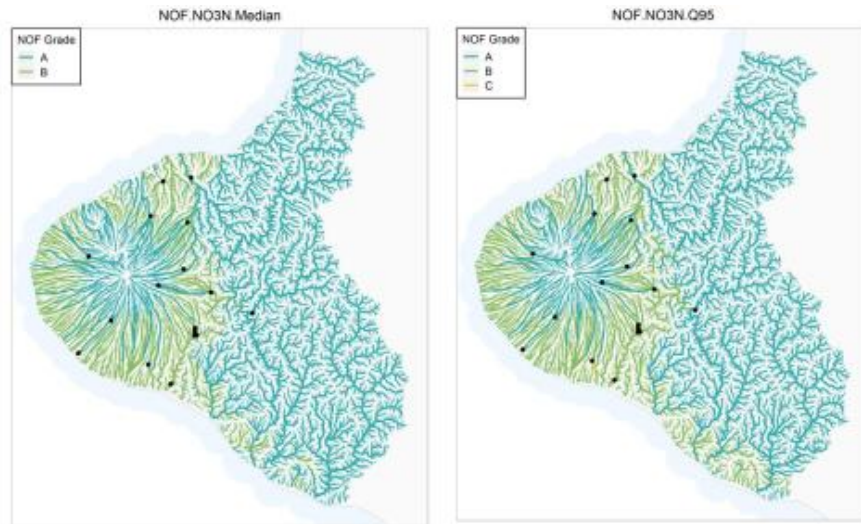


Figure 5: Predicted NOF grades for nitrate attributes (NO₃-N) as an annual median (left) and annual 95th percentile (right).

30. When utilising modelling outputs it is critical to understand and acknowledge model performance, or how well modelled predictions align with real world observations. This includes the need to understand the associated levels of confidence (or uncertainty) in modelled predictions.
31. The performance of the spatial models was assessed using a variety of methods, including Nash-Sutcliffe efficiency, percent bias, the root mean square deviation and relative deviation. Further information on these methods can be found in the appended report. Using each assessment method, model performance for each attribute was graded using a sliding scale from 'very good' to 'poor'.
32. Overall, model performance was variable by attribute, ranging from 'very good' to 'satisfactory' for most attributes. It is noted that the model had poorer performance in predicting ammonia and DRP concentrations.
33. The overall uncertainty in the spatial model is represented as upper and lower confidence limits in the predicted values for each river segment. When represented using NOF grading bands, for most attributes this uncertainty translates to the lower confidence limit (or 'worst case' scenario) being one NOF band worse than the predicted result. The exceptions are visual clarity, DRP (95th percentile), and *E. coli* (median) attributes, where the uncertainty is closer to two NOF band grades (Figure 6).
34. Alongside other sources of information, including our recently published State of Environment 2022 report, the outputs from modelling will provide useful context regarding the state of water quality and ecosystems health across the region as we continue work to implement the NPS-FM.



Figure 6: Possible range in NOF attribute grades based on the upper and lower confidence intervals in modelled predictions for all river segments in Taranaki.

Financial considerations—LTP/Annual Plan

35. This memorandum and the associated recommendations are consistent with the Council’s adopted Long-Term Plan and estimates. Any financial information included in this memorandum has been prepared in accordance with generally accepted accounting practice.

Policy considerations

36. This memorandum and the associated recommendations are consistent with the policy documents and positions adopted by this Council under various legislative frameworks including, but not restricted to, the *Local Government Act 2002*, the *Resource Management Act 1991* and the *Local Government Official Information and Meetings Act 1987*.

Iwi considerations

37. Outputs from the spatial water quality modelling will inform discussions, alongside other sources of data, information and knowledge relating to the state of our environment, as we jointly work through implementation of the NPS-FM with iwi and hapū.
38. This memorandum and the associated recommendations are consistent with the Council’s policy for the development of Māori capacity to contribute to decision-making processes (schedule 10 of the *Local Government Act 2002*) as outlined in the adopted long-term plan and/or annual plan. Similarly, iwi involvement in adopted work programmes has been recognised in the preparation of this memorandum.

Community considerations

39. This memorandum and the associated recommendations have considered the views of the community, interested and affected parties and those views have been recognised in the preparation of this memorandum.

Legal considerations

40. This memorandum and the associated recommendations comply with the appropriate statutory requirements imposed upon the Council.

Appendices/Attachments

Document 2984640: *Taranaki water quality state spatial modelling report*



Taranaki water quality state spatial modelling

February 2022

Prepared By:

Caroline Fraser

For any information regarding this report please contact:

Caroline Fraser

Phone: 0220491779

Email: caroline@landwaterpeople.co.nz

LWP Ltd
PO Box 70
Lyttelton 8092
New Zealand

LWP Client Report Number: 2021-14
Report Date: September 2021
LWP Project: TRC State Spatial Modelling

Quality Assurance Statement

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Version	Reviewed By	
	Ton Snelder	

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1 Introduction

This report describes an analysis of river water quality state in the Taranaki Region in two steps. First, the study evaluated water quality state at Taranaki Regional Council (TRC) river monitoring sites and graded each site into relevant attribute bands designated in Appendix 2A and 2B of the National Policy Statement – Freshwater Management (NZ Government, 2020). Second, data from river water quality sites were used to develop spatial models of river water quality state.

The primary purpose of the spatial modelling is to provide large-scale water quality assessments that are more representative of the true patterns of water quality than assessments based on aggregated data from individual monitoring sites. The latter approach can lead to conclusions about water quality patterns that are biased by the non-random locations of monitoring sites. Previous studies have shown that the aggregating river water quality monitoring data from sites nationally, without spatial modelling, leads to an over-representation of some types of catchment (e.g., catchments dominated by pastoral land cover) and under-represent other types of catchments (e.g., catchments dominated by native forest) (Snelder *et al.*, 2014; Whitehead, 2018). Spatial modelling of water quality state as a function of catchment and other characteristics reduces the problem of biased representation of the monitoring sites and produces predicted patterns of river water quality that can be used to inform decisions at unmonitored locations and can lead to other insights. For the spatial modelling, TRC monitoring sites were supplemented by monitoring data from neighbouring regions and the national river water quality network (NRWQN) to increase coverage of the range of environmental conditions in the region.

The results provide detailed data describing the grades assigned to river water quality sites in the region for a range of water quality measures. In addition, we describe the statistical performance of the spatial models, provide maps showing regional predictions of river water quality state for the water quality measures, and identify important relationships between water quality state and catchment conditions.

2 Data

2.1 Water quality data

River water quality data was used in this study to investigate spatial patterns in water quality state across the Taranaki region. We obtained water quality data timeseries representing physico-chemical, microbiological and biological variables from the TRC database. To supplement the spatial coverage provided by the TRC monitoring network, we also obtained water quality state timeseries data for monitoring sites in neighbouring regions (Manawatū-Whanganui and Waikato) and for sites within Taranaki that are monitored by NIWA, as part of the National River Water Quality Network (NRWQN) (Larned *et al.* 2018). Table 1 describes the variables and total numbers of sites by region.

Statistics such as median and 95th percentile values that define NPS-FM (2020) NOF attribute states were calculated for each site and water quality variable from the timeseries data as described in section 3.1.3. Note that the numbers of non-TRC sites reflect the availability of sites that complied with the data requirement rules used for calculating the statistics that are outlined in section 3.1.3.

Table 1: Water quality variables and associated numbers of sites included in this study. Where “MW” is Manawatū Whanganui and “Wk” is Waikato

Variable type	Variable name	Description	Units	Number of sites		
				TRC +NRWQN	MW	Wk
Physico-Chemical	CLAR	Black Disc Visibility	m	30	11	82
	DRP	Dissolved Reactive Phosphorous	mg l ⁻¹	38	123	112
	NH ₄ -N	Ammoniacal Nitrogen (pH Adjusted)	mg l ⁻¹	38	116	106
	NH ₄ -N_raw	Ammoniacal Nitrogen (raw)	mg l ⁻¹	41	124	112
	NO ₃ -N	Nitrate	mg l ⁻¹	32	124	112
	pH	Field pH	pH	38	NA	NA
	TN	Total Nitrogen	mg l ⁻¹	32	124	112
	TP	Total Phosphorous	mg l ⁻¹	30	124	112
Micro-biological	<i>E. coli</i>	<i>E. coli</i> cfu	cfu 100mL ⁻¹	32	124	112
Biological	ASPM	Average score per metric	ASPM	85	0	0
	MCI	Macroinvertebrate Community Index	MCI	88	83	56
	SQMCI	Semi-Quantitative Macroinvertebrate Community Index	SQMCI	85	0	0

2.2 Predictor variable data

In this study, predictive spatial models of water quality state statistics were derived by combining monitoring site water quality statistics with predictors associated with the digital network to make predictions for unmonitored locations. The following sections describe the predictor variables used in these models.

2.2.1 Catchment characteristics

The spatial models were based on a digital drainage network that represents the region’s streams and rivers and their associated catchments. We used the GIS-based digital drainage network, which underlies the River Environment Classification (REC; Snelder and Biggs, 2002). The digital network was derived from 1:50,000 scale contour maps and represents the rivers within the region as 16,627 segments bounded by upstream and downstream confluences, each of which is associated with a sub-catchment.

The digital drainage network is linked to a database describing a wide range of descriptors of the individual network segments and their upstream catchment characteristics (Wild *et al.*, 2005). We used catchment characteristics as predictors in the predictive spatial models (Table 2). Catchment topography was derived from a digital elevation model. Catchment climate characteristics were derived from climate station data as described by Wild *et al.* (2005). Catchment land cover descriptors were derived from the national Land Cover Database-3 (LCDB3) which differentiates 33 categories based on analysis of satellite imagery from 2008 (Iris.scinfo.org.nz). Descriptions of catchment regolith are derived from the Land Resources Inventory (LRI) including interpretations of the LRI categories made by Leathwick *et al.* (2003). Descriptions of catchment hydrology were derived from national-scale hydrological modelling

(e.g., Booker and Snelder, 2012). The catchment characteristics considered in this study are summarised in Table 2.

2.2.2 Stocking density data

The catchment characteristics included five predictors that quantified the density of pastoral livestock in 2017 as indicators of land use intensity. These predictors were based on publicly available information describing the density of pastoral livestock¹. These predictors improve the discrimination of catchment land use intensity compared to previous studies that have only had access to descriptions of the proportion of catchment occupied by different land cover categories (e.g., Whitehead, 2018). The densities of four livestock types (dairy, beef, sheep and deer) in each catchment were standardised using 'stock unit (SU) equivalents', which is a commonly used measure of metabolic demand by New Zealand's livestock (Parker, 1998). We express land use intensity as the total stock units divided by catchment area (i.e., SU ha⁻¹). We also use four additional predictors which describe the proportion of the stock units attributable to each of the four livestock types.

2.2.3 Summary of all predictor variables

Table 2. Predictor variables used in spatial models.

Predictor	Abbreviation	Description	Unit
Geography and topography	usArea	Catchment area	m ²
	usLake	Proportion of upstream catchment occupied by lakes	%
	usElev	Catchment mean elevation	m ASL
	usSlope	Catchment mean slope	degrees
	segAveElev	Segment mean elevation	degrees
Climate	usAvTWarm	Catchment averaged summer air temperature	degrees C x 10
	usAvTCold	Catchment averaged winter air temperature	degrees C x 10
	usAnRainVar	Catchment average coefficient of variation of annual rainfall	mm y ⁻¹ r
	usRainDays10	Catchment average frequency of rainfall > 10 mm	days month ⁻¹
	usRainDays20	Catchment average frequency of rainfall > 20 mm	days month ⁻¹
	usRainDays100	Catchment average frequency of rainfall > 100 mm	days month ⁻¹
	segAveTCold	Segment mean minimum winter air temperature	degrees C x 10
Hydrology	MeanFlow	Estimated mean flow	m ³ s ⁻¹
	nNeg	Mean number of days per year on which flow was less than that of the previous day	Year ⁻¹
	MALF7	Mean annual 7-day low flow divided by the mean flow	Unitless
	FRE3	Mean number of events per year that exceeded three times the long-term median flow	Year ⁻¹
	JulFlow	Mean daily flow for July divided by the mean daily flow	Unitless
	FloodFlow	Log10 mean annual 1-day maximum flow divided by the mean daily flow.	Unitless
Geology*	usHard	Catchment average induration or hardness value	Ordinal*
	usPhos	Catchment average phosphorous	Ordinal*

¹ https://statisticsnz.shinyapps.io/livestock_numbers/.

Predictor	Abbreviation	Description	Unit
	usParticleSize	Catchment average particle size	Ordinal*
	usCalcium	Catchment average calcium	
Land cover	usIntensiveAg	Proportion of catchment occupied by combination of high producing exotic grassland, short-rotation cropland, orchard, vineyard and other perennial crops (LCDB3 classes 40, 30, 33)	Proportion
	usIndigForest	Proportion of catchment occupied by indigenous forest (LCDB3 class 69)	Proportion
	usUrban	Proportion of catchment occupied by built-up area, urban parkland, surface mine, dump and transport infrastructure (LCDB3 classes 1,2,6,5)	Proportion
	usScrub	Proportion of catchment occupied by scrub and shrub land cover (LCDB3 classes 50, 51, 52, 54, 55, 56, 58)	Proportion
	usWetland	Proportion of catchment occupied by lake and pond, river and estuarine open water (LCDB3 classes 20, 21, 22)	Proportion
	usBare	Proportion of catchment occupied by bare ground (LCDB3 classes 10, 11, 12,13,14, 15)	Proportion
	usExoticForest	Proportion of catchment occupied by exotic forest (LCDB3 class 71)	Proportion
Stocking density data	SUTotal_2017	Stock unit density for all stock types in 2017 (i.e., total stock units)	SU ha ⁻¹
	PropDairy_2017	Proportion of total stock unit density attributable to dairy cows in 2017	Proportion
	PropBeef_2017	Proportion of total stock unit density attributable to beef cows in 2017	Proportion
	PropSheep_2017	Proportion of total stock unit density attributable to sheep in 2017	Proportion
	PropDeer_2017	Proportion of total stock unit density attributable to deer in 2017	Proportion

3 Methods

3.1 Water quality state analyses

3.1.1 Grading of monitoring sites

The water quality state for river and lake monitoring sites is graded based on attributes and associated attribute state bands defined by the National Objectives Framework (NOF) of the National Policy Statement – Freshwater Management (NPS-FM) (Ministry for the Environment, 2020) (Table 3).

Each table of appendix 2 of the NPS-FM (2020) represents an **attribute** that must be used to define an objective that provides for a particular environmental **value**. For example, Appendix 2A, Table 6 defines the nitrate toxicity attribute, which is defined by nitrate-nitrogen concentrations that will ensure an acceptable level of support for “Ecosystem health (Water quality)” value. Objectives are defined by one or more **numeric attribute states** associated with each attribute. For example, for the nitrate-nitrogen attribute there are two numeric attribute states defined by the annual median and the 95th percentile concentrations.

For each numeric attribute, the NOF defines categorical numeric attribute states as four (or five) **attribute bands**, which are designated A to D (or A to E, in the case of the *E. coli* attribute). The attribute bands represent a graduated range of support for environmental values from high (A band) to low (D or E band). The ranges for numeric attribute states that define each attribute band are defined in Appendix 2 of the NPS-FM (2020). For most attributes, the D band represents a condition that is unacceptable (with the threshold between the C and the D band being referred to as “**bottom line**”) in any waterbody nationally. In the case of the Nitrate (toxicity) and Ammonia (toxicity) attributes in the 2020 NPS-FM, the C band is unacceptable, and for the DRP attribute, no bottom line is specified.

The primary aim of the attribute bands designated in the NPS-FM is as a basis for objective setting as part of the NOF process. The attribute bands are intended to be simple shorthand for communities and decision makers to discuss options and aspirations for acceptable water quality and to define objectives. Attribute bands avoid the need to discuss objectives in terms of technically complicated numeric attribute states and associated numeric ranges. Each band is associated with a narrative description of the outcomes for values that can be expected if that attribute band is chosen as the objective. However, it is also logical to use attribute bands to provide a grading of the current state of water quality; either as a starting point for objective setting or to track progress toward objectives.

A site can be **graded** for each attribute by assigning it to attribute bands (e.g., a site can be assigned to the A band for the Nitrate toxicity attribute). A site grading is done by using the numeric attribute state (e.g., annual median nitrate-nitrogen) as a **compliance statistic**. The value of the compliance statistic for a site is calculated from a record of the relevant water quality variable (e.g., the median value is calculated from the observed monthly nitrate-nitrogen concentrations). The site’s compliance statistic is then compared against the numeric ranges associated with each attribute band and a grade assigned for the site (e.g., an annual median nitrate-nitrogen concentration of 1.3 mg/l would be graded as “B-band”, because it lies in the range >1.0 to ≤ 2.4 mg/l). Note that for attributes with more than one numeric attribute state, we have provided a grade for each numeric attribute state (e.g., for the Nitrate (toxicity) attribute, grades are defined for both the median and 95th percentile concentrations).

Table 3 provides a summary of the NOF numeric attribute states calculated in this study. In addition to these NOF attributes, we have also calculated median states for Total Nitrogen (TN), Total Phosphorous (TP) and raw Ammoniacal Nitrogen (NH4N).

Table 3: Details of the NOF attributes used to grade the state of the river monitoring sites.

NPS-FM Reference – NOF Attribute	Numeric attribute state description	Units	Abbreviated name
A2A; Table 5 - Ammonia	Median concentration of Ammoniacal-N (pH adjusted)	mg l ⁻¹	NOF.NH4N.AnnMax
	Maximum concentration of Ammoniacal-N (pH adjusted)	mg l ⁻¹	NOF.NH4N.Median
A2A; Table 6 - Nitrate	Median concentration of Nitrate	mg l ⁻¹	NOF.NO3N.Median
	95th percentile concentration of Nitrate	mg l ⁻¹	NOF.NO3N.Q95
A2A.; Table 8 - Suspended fine sediment	Median visual clarity	m	NOF.CLAR.Median
A2A; Table 9 - <i>Escherichia coli</i>	% exceedances over 260 cfu 100 mL ⁻¹	%	NOF.ECOLI.260

NPS-FM Reference – NOF Attribute	Numeric attribute state description	Units	Abbreviated name
	% exceedances over 540 cfu 100 mL ⁻¹	%	NOF.ECOLI.540
	Median concentration of <i>E. coli</i>	cfu 100 ml ⁻¹	NOF.ECOLI.Median
	95th percentile concentration of <i>E. coli</i>	cfu 100 ml ⁻¹	NOF.ECOLI.Q95
	Overall attribute state ¹	NA	NOF.ECOLI.Swim
A2B; Table 14 – Macroinvertebrates ²	Median MCI score	-	NOF.MCI.Median
	Median ASPM score	-	NOF.ASPM.Median
	Median QMCI score ³	-	NOF.QMCI.Median
A2B; Table 20 - DRP	Median concentration of DRP	mg l ⁻¹	NOF.DRP.Median
	95th percentile concentration of DRP	mg l ⁻¹	NOF.DRP.Q95

Notes:

- (1) The overall attribute state is defined as the worst of the attribute state bands for the other 4 *E. coli* statistics.
- (2) Following NPS-FM requirements Macroinvertebrate attributes are only calculated based on data collected in Dec-Mar.
- (3) QMCI is not monitored in by TRC. TRC requested that their monitored SQMCI data was compared against the NPS-FM QMCI numeric attribute state.

3.1.2 Handling censored values

Censored values in the TRC water quality data were handled followed the methodology used by Larned et al (2018). Censored values were replaced by imputation for the purposes of calculating the compliance statistics. Left censored values (values below the detection limit(s)) were replaced with imputed values generated using ROS (Regression on Order Statistics; Helsel, 2012), following the procedure described in Larned *et al.* (2015). The ROS procedure produces estimated values for the censored data that are consistent with the distribution of the uncensored values and can accommodate multiple censoring limits. When there are insufficient non-censored data to evaluate a distribution from which to estimate values for the censored observations, censored values are replaced with half of their reported value.

Censored values above the detection limit were replaced with values estimated using a procedure based on “survival analysis” (Helsel, 2012). A parametric distribution is fitted to the uncensored observations and then values for the censored observations are estimated by randomly sampling values larger than the censored values from the distribution. The survival analysis requires a minimum number of observations for the distribution to be fitted; hence in the case that there were fewer than 24 observations, censored values above the detection limit were replaced with 1.1* the detection limit. The supplementary file outputs provide details about whether and how imputation was conducted for each site by criteria assessment.

3.1.3 Time period for assessments and data requirements

When grading sites based on NPS-FM attributes, it is general practice to define consistent time periods for all sites and to define the acceptable proportion of missing observations (i.e., data gaps) and how these are distributed across sample intervals so that site grades are assessed from comparable data. The time period, acceptable proportion of gaps and

representation of sample intervals by observations within the time period are commonly referred to as site inclusion or filtering rules (Larned *et al.*, 2018).

We chose time periods and filtering rules to be consistent with those used by Larned *et al.* (2018), in order to ensure that the state statistics calculated for the TRC sites were consistent with those calculated for the NRWQN and sites in the neighbouring regions. The grading assessments were made for the 5-year time period to the end of December 2017, with the exception that ASPM, MCI and SQMCI were evaluated for a 5-year time period to the end of June 2017 (aligning the assessment period with water-years). State observations were only included in the spatial models if they met the filtering requirements outlined in Larned *et al.* (2018): (1) for monthly monitored data, this required that 90% of months in the 5-year period had observations; (2) for macroinvertebrate observations, the requirement was that there was at least one observation in 4 of the 5 water years.

We also assessed the changes in water quality state over time for the monitored water quality sites within the Taranaki region. The outcomes of this analysis are described in detail in Appendix A and B. Briefly, for each site, we evaluated the compliance statistics associated with the numeric attribute states described in Table 3 and assigned grades for rolling 5-year period windows since the beginning of site records. It had initially been intended to develop separate spatial models that were representative of water quality state at the beginning of the region's monitoring record. However, there was a lack of donor sites from neighbouring regions, and limited variation in the water quality statistics for sites in Taranaki relative to the errors in the state spatial models. Therefore, this additional spatial modelling was not able to be pursued.

3.1.4 pH Adjustment of Ammonia

Ammonia is toxic to aquatic animals and is directly bioavailable. When in solution, ammonia occurs in two forms: the ammonium cation (NH_4^+) and unionised ammonia (NH_3); the relative proportions of the forms are strongly dependent on pH (and temperature). Unionised ammonia is significantly more toxic to fish than ammonium, hence the total ammonia toxicity increases with increasing pH (and/or temperature) (ANZECC, 2000). The NPS-FM attribute for ammonia requires a correction to account for pH. We applied a pH correction to $\text{NH}_4\text{-N}$ to adjust values to equivalent pH 8 values, following the methodology outlined in Hickey (2014). For pH values outside the range of the correction relationship (pH 6-9), the maximum (pH<6) and minimum (pH>9) correction ratios were applied.

3.1.5 Evaluation of compliance statistics

For numeric attribute states specified as "Annual" (maximum, median, 95th percentile) in the NPS-FM (2020), we calculated the compliance statistics over the entire 5-year period used for the state assessment (i.e., 1 January 2013 to 31 December 2017, or 1 July 2012 to 30 June 2017).

3.2 Spatial modelling of state and export coefficients

We used statistical spatial modelling to predict state (e.g., NPS-FM compliance statistics) for all segments of the region's river network (section 3.2.1). The modelled predictions represent an estimate of state at unmonitored locations and can be used to make comparisons between locations.

3.2.1 Random forest models

We fitted a variety of water quality characteristics derived for each monitoring site (e.g., NPS-FM numeric attribute states) to a suite of predictor variables using random forest (RF) models (Breiman, 2001; Cutler *et al.*, 2007). An RF model is an ensemble of individual classification and regression trees (CART). In a regression context, CART partitions observations (in this case the individual water quality variables) into groups that minimise the sum of squares of the response (i.e., assembles groups that minimise differences between observations) based on a series of binary rules or splits that are constructed from the predictor variables. CART models have several desirable features including requiring no distributional assumptions and the ability to automatically fit non-linear relationships and high order interactions. However, single regression trees have the limitations of not searching for optimal tree structures, and of being sensitive to small changes in input data (Hastie *et al.*, 2001). RF models reduce these limitations by using an ensemble of trees (a forest) and making predictions based on the average of all trees. An important feature of RF models is that each tree is grown with a bootstrap sample of the fitting data (i.e., the observation dataset). In addition, a random subset of the predictor variables is made available at each node to define the split. Introducing these random components and then averaging over the forest increases prediction accuracy while retaining the desirable features of CART.

A RF model produces a limiting value of the generalization error (i.e., the model maximises its prediction accuracy for previously unseen data; Breiman, 2001). The generalization error converges asymptotically as the number of trees increases, so the model cannot be over-fitted when more trees are added. The number of trees needs to be set high enough to ensure an appropriate level of convergence, and this value depends on the number of variables that can be used at each split. We used default options that included making one third of the total number of predictor variables available for each split, and 500 trees per forest. Some studies report that model performance is improved by including more than ~ 50 trees per forest, but that there is little improvement associated with increasing the number of trees beyond 500 (Cutler *et al.*, 2007). Our models took less than a minute to fit when using the default of 500 trees per forest.

Unlike linear models, RF models cannot be expressed as equations. However, the relationships between predictor and response variables represented by RF models can be represented by importance measures and partial dependence plots (Breiman, 2001; Cutler *et al.*, 2007). During the fitting process, RF model predictions are made for each tree for observations that were excluded from the bootstrap sample; these excluded observations are known as out-of-bag (OOB) observations. To assess the importance of a specific predictor variable, the values of the response variable are randomly permuted for the OOB observations, and predictions are obtained from the tree for these modified data. The importance of the predictor variable is indicated by the degree to which prediction accuracy decreases when the response variable is randomly permuted. Importance is defined in this study as the loss in model performance (i.e., the increase in the mean square error; MSE) when predictions are made based on the permuted OOB observations compared to those based on the original observations. The differences in MSE between trees fitted with the original and permuted observations are averaged over all trees and normalized by the standard deviation of the differences (Cutler *et al.*, 2007).

A partial dependence plot is a graphical representation of the marginal effect of a predictor variable on the response variable when the values of all other predictors are held constant at their mean values. The benefit of holding the other predictors constant is that the partial dependence plot effectively ignores their influence on the response variables. Partial

dependence plots do not perfectly represent the effects of each predictor variable, particularly if predictor variables are highly correlated or strongly interacting, but they do provide an approximation of the modelled predictor-response relationships that are useful for model interpretation (Cutler *et al.*, 2007)

RF models include any of the original set of predictor variables that are chosen during the model fitting process. However, marginally important predictor variables may be redundant (i.e., their removal does not affect model performance) and their inclusion complicates model interpretation. We used a backward elimination procedure to remove redundant predictors from the initial 'saturated' models (i.e., models that included any of the original predictor variables). The procedure first assesses the model mean square error (MSE) using a 10-fold cross validation process. The predictions made to the hold out observations during cross validation are used to estimate the MSE and its standard error. The model's least important predictor variables are then removed in order, with the MSE and its standard error being assessed for each successive model. The final, 'reduced' model is defined by the "one standard error rule" as the model with the fewest predictor variables whose error is within one standard error of the best model (i.e., the model with the lowest cross validated MSE) (Breiman *et al.*, 1984). Importance levels for predictor variables were not recalculated at each reduction step to avoid over-fitting (Svetnik *et al.*, 2004).

Although RF models do not depend on distributional assumptions, transformation of the response variable to an approximately symmetric distribution can improve model performance. We investigated transformations (e.g. log10, sqrt or logit) of the modelled water quality (i.e., response) variables on the model performance. Where performance was improved, we made predictions using these models.

All calculations were performed in the R statistical computing environment (R Development Core Team 2009) using the *randomForest* package and other specialised packages.

3.2.2 Model performance

Model performance was assessed by comparing observations with independent predictions (i.e., sites that were not used in fitting the model), which were obtained from the OOB observations. We summarised the model performance using five statistics; regression R^2 , Nash-Sutcliffe efficiency (NSE), percent bias (PBIAS), the relative root mean square deviation (RSR) and the root mean square deviation (RMSD).

The regression R^2 value is the coefficient of determination derived from a regression of the observations against the predictions. The R^2 value indicates the proportion of the total variance explained by the model, but is not a complete description of model performance (Piñeiro *et al.*, 2008).

NSE indicates how closely the observations coincide with predictions (Nash and Sutcliffe, 1970). NSE values range from $-\infty$ to 1. A NSE of 1 corresponds to a perfect match between predictions and the observations. An NSE of 0 indicates the model is only as accurate as the mean of the observed data and values less than 0 indicate the model predictions are less accurate than using the mean of the observed data.

Bias measures the average tendency of the predicted values to be larger or smaller than the observed values. Optimal bias is zero, positive values indicate underestimation bias and negative values indicate overestimation bias (Piñeiro *et al.*, 2008). PBIAS is computed as the sum of the differences between the observations and predictions divided by the sum of the observations (Moriassi *et al.*, 2007).

RSR is a measure of the characteristic model uncertainty. It is estimated as the mean deviation of predicted values with respect to the observed values (the root mean square deviation), divided by the standard deviation of the observations (Moriassi *et al.*, 2007).

The normalization associated with PBIAS and RSR allowed the performance of models to be compared across all of the modelled water quality variables. Model predictions were evaluated to be very good, good, satisfactory or unsatisfactory, following the criteria proposed by Moriassi *et al.*, 2007, outlined in Table 4.

Table 4: Performance criteria for statistics used in this study, from (Moriassi *et al.*, 2007).

Performance Rating	RSR	NSE	PBIAS
Very good	$RSR \leq 0.50$	$NSE > 0.75$	$ PBIAS < 25$
Good	$0.50 < RSR \leq 0.60$	$0.65 < NSE \leq 0.75$	$25 \leq PBIAS < 40$
Satisfactory	$0.60 < RSR \leq 0.70$	$0.50 < NSE \leq 0.65$	$40 \leq PBIAS < 70$
Unsatisfactory	$RSR > 0.70$	$NSE \leq 0.5$	$ PBIAS \geq 70$

RMSD is a measure of the characteristic model statistical error or uncertainty. RMSD is the mean deviation of predicted values with respect to the observed values (distinct from the standard error of the regression model). We used RMSD to evaluate the confidence intervals of the predictions.

3.2.3 Modelled relationships

RF model importance measures were used to quantify the contribution of each predictor to the model prediction accuracy (Breiman, 2001; Cutler *et al.*, 2007). Partial dependence plots (PDPs) were used to describe the fitted predictor-response relationships (Cutler *et al.*, 2007).

We approximated the direction of the influence of each predictor by the sign of a linear regression fitted to the data representing the PDPs i.e., the regressor is the range in the predictor variable (the variable on the x-axis of the PDP) and the regressand is the corresponding marginal response (the variable on the y-axis of the PDP). There is a loss of information associated with representing the PDP as linear regression because PDPs can have non-linear shapes and describe non-monotonic responses. This loss of information was considered an acceptable trade-off with the simpler representation of the key modelled relationships. We reversed the sign of these slopes for variables for which increasing state indicated an improvement (this included the variables: MCI, CLAR). We used heat plots to graphically display the relative contributions and direction of influence of each of the predictors. In these plots, the intensity of the colour is a measure of the importance, and the direction of influence is indicated by the colour; red indicates that increasing values of the predictor corresponds to degrading state/load and green indicates that increasing values of the predictor correspond to improving state/load).

3.2.4 Representativeness of sites used in RF models

A graphical comparison was used to gauge how well all the monitoring sites used to fit the RF models represented environmental variation at the regional scale. Here, representativeness refers to the degree to which the distribution of the predictor variable over the monitored sites matches the distribution of the predictor variable over all segments of the digital river network in the region. Poor representativeness indicates reduced reliability of the model predictions

because some parts of the environmental conditions that are present in the region are not represented in the fitting data.

We made the comparison by assessing how closely the distributions of each predictor for the monitoring sites matched the distribution over all segments of the digital river network using probability-probability (P-P) plots. A P-P plot is a scatter plot of the cumulative frequency distributions (CFDs) of the two datasets. A CFD varies between 0 and 1 and the comparison line is the 45° line from (0,0) to (1,1). Probability-probability plots that are close to 1:1 line, indicate that the monitoring sites are a representative sample of the environmental conditions occurring across the whole region (i.e., over all segments of the river network). Biases in the representation of the whole region by the sites are associated with deviations from the 1:1 line (i.e., either above or below the 1:1 line). Inconsistent representation of the environmental conditions across the region by the sampling sites may also be associated with the probability-probability plot appearing as a 'S' curve (i.e., alternately above and below the 1:1 line). Note that representativeness of monitored sites is different from model bias, which is defined in Section 3.2.2.

3.2.5 Model predictions

Predictions are made with RF models by “running” new cases down every tree in the fitted forest and averaging the predictions made by each tree (Cutler et al., 2007). Some of the models in this study were fitted to log₁₀- or square root transformed data and when the model predictions were back-transformed, we corrected for retransformation bias using the smearing estimate (Duan, 1983). The back-transformed predictions were used to produce regional maps depicting the variation in each modelled characteristic.

3.2.6 Evaluating confidence intervals of spatial model predictions

The 95% confidence intervals for values predicted by our spatial models of NPS-FM attribute states for individual segments can be obtained using the following equations. Equation 6 and 7 are used for calculating the intervals for the state estimates that were log₁₀ of square root transformed prior to model fitting and the prediction uncertainty (RMSD) values have been reported in the log₁₀ or square root transformed space.

$$95\% CI = 10^{[\log_{10}(x) \pm 1.96 \times RMSD]} \quad \text{Equation 6}$$

$$95\% CI = (sqrt(x) \pm 1.96 \times RMSD)^2 \quad \text{Equation 7}$$

where x is the estimated value in the original units, RMSD is the model error and 1.96 is the standard normal deviate or Z-score for probability ($0.025 \leq Z \leq 0.975$). The prediction confidence intervals for the log₁₀-and square root transformed variables, when expressed in the original units of the variables, are asymmetric and their values vary in proportion to the predicted water quality value.

4 Results

4.1 State

Table 5 provides a summary of water quality grades for each NPS-FM attribute, demonstrating the number and percentage of sites that are classified in each NOF grade. Figure 1 provides maps for each attribute showing the sites coloured by their evaluated state grade. Predicted NOF compliance statistics and grades are provided in the supplementary file *TRC State with Time_v210916.xlsx*.

Table 5: Summary of the number and percentage (in brackets) of sites assigned to state grades for the period ending December (or June for macroinvertebrates) 2017 for sites monitored within the Taranaki region. Total number of sites is the number of sites that met minimum data requirements outlined in section 3.1.3.

NOF Attribute	Total no. of sites	State grade				
		A	B	C	D	E
NOF.ASPM.Median	74	11 (14.7%)	39 (52%)	18 (24%)	7 (9.3%)	NA
NOF.Clar	20	7 (35%)	3 (15%)	1 (5%)	9 (45%)	NA
NOF.DRP.Median	21	3 (14.3%)	2 (9.5%)	1 (4.8%)	15 (71.4%)	NA
NOF.DRP.Q95	12	5 (23.8%)	1 (4.8%)	5 (23.8%)	10 (47.6%)	NA
NOF.ECOLI.260	17	4 (23.5%)	1 (5.9%)	0 (0%)	5 (29.4%)	7 (41.2%)
NOF.ECOLI.540	17	1 (5.9%)	1 (5.9%)	3 (17.6%)	5 (29.4%)	7 (41.2%)
NOF.ECOLI.Median	17	5 (29.4%)	NA	NA	5 (29.4%)	7 (41.2%)
NOF.ECOLI.Q95	17	2 (11.8%)	0 (0%)	0 (0%)	15 (88.2%)	NA
NOF.ECOLI.Swim	17	4 (23.5%)	1 (5.9%)	0 (0%)	5 (29.4%)	7 (41.2%)
NOF.MCI.Median	74	12 (15.8%)	17 (22.4%)	40 (52.6%)	7 (9.2%)	NA
NOF.NH4N.AnnMax	19	3 (15.8%)	12 (63.2%)	3 (15.8%)	1 (5.3%)	NA
NOF.NH4N.Median	19	13 (68.4%)	6 (31.6%)	0 (0%)	0 (0%)	NA
NOF.NO3N.Median	18	10 (55.6%)	7 (38.9%)	1 (5.6%)	0 (0%)	NA
NOF.NO3N.Q95	18	10 (55.6%)	7 (38.9%)	1 (5.6%)	0 (0%)	NA
NOF.QMCI.Median	74	30 (40%)	10 (13.3%)	16 (21.3%)	19 (25.3%)	NA



Figure 1: Maps showing NPS-FM NOF attribute state grades (excluding *E. coli*) for the 5-year period ending December (or June for macroinvertebrates) 2017.

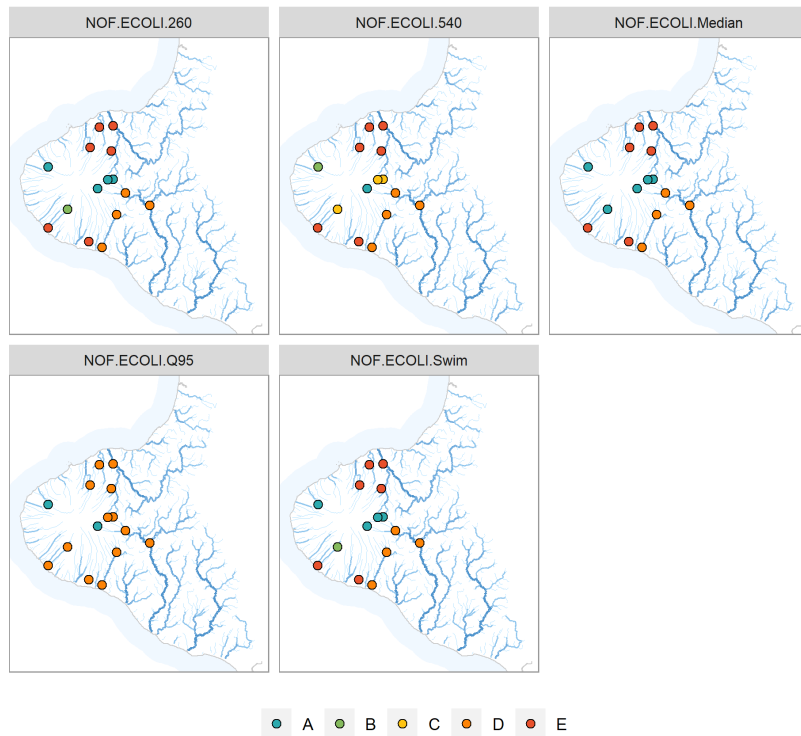


Figure 2: Maps showing NPS-FM NOF attribute state grades the *E.coli* attribute states for the 5-year period ending December 2017.

4.2 State spatial modelling

4.2.1 Model performance

We considered two alternative transformations of the data (as well as untransformed data) in order to optimise the performance of the spatial models of state statistics. Generally, the physico-chemical variables yielded best model performance when the response was \log_{10} transformed (as they are generally strongly right skewed), whereas variables in the units of % or proportion (e.g., G260, G540) performed best with a square root transformation. Variables with approximately normal or uniform distributions (e.g., MCI, QMCI, ASPM) showed little to no improvement following variable transformation. The transformations used for each variable are listed along with model performance measures (in transformed units) in Table 6.

Table 6. Performance of the state statistics RF spatial models. Performance was determined using independent predictions (i.e., sites that were not used in fitting the models) generated from the out-of-bag observations. N=Total number of sites used to fit the model, N_T= Number of sites from Taranaki used, R² = coefficient of determination of observation versus predictions, NSE = Nash-Sutcliffe efficiency, PBIAS = percent bias, RSR = relative root mean square error, RMSD = root mean square deviation. RMSD units are the transformed original units.

Attribute Name	N	N _T	R ²	NSE	PBIAS	RSR	RMSD	Transformation
NOF.Clar	113	20	0.59	0.57	8.39	0.65	0.21	Log10
NOF.DRP.Median	256	21	0.43	0.43	0.11	0.75	0.33	Log10
NOF.DRP.Q95	256	21	0.39	0.39	1.26	0.78	0.41	Log10
NOF.ECOLI.260	253	17	0.70	0.70	-0.36	0.55	0.13	Sqrt
NOF.ECOLI.540	253	17	0.67	0.67	-0.56	0.57	0.12	Sqrt
NOF.ECOLI.Median	253	17	0.67	0.67	-0.11	0.58	0.32	Log10
NOF.ECOLI.Q95	253	17	0.64	0.64	-0.25	0.60	0.37	Log10
NOF.NH4N.AnnMax	241	19	0.37	0.36	2.00	0.80	0.54	Log10
NOF.NH4N.Median	241	19	0.25	0.23	0.54	0.88	0.51	Log10
NOF.NO3N.Median	254	18	0.66	0.66	-0.92	0.58	0.38	Log10
NOF.NO3N.Q95	254	18	0.77	0.77	-1.54	0.48	0.24	Log10
NOF.MCI.Median	204	74	0.74	0.74	-0.08	0.51	9.59	None
NOF.ASPM.Median	74	74	0.65	0.64	-0.16	0.60	0.07	None
NOF.QMCI.Median	74	74	0.52	0.52	-0.62	0.69	1.05	None
NH4N.raw.Median	258	22	0.23	0.20	0.93	0.90	0.49	Log10
TN.Median	256	20	0.74	0.74	1.19	0.51	0.22	Log10
TP.Median	256	20	0.65	0.65	0.30	0.59	0.25	Log10

The RF model for the 95th percentile of NO₃N, had very good performance as indicated by the following statistics: NSE > 0.75, RSR < 0.5 (Table 6). The RF models of E. coli (G260, G540, median), MCI, ASPM, NO₃N (median), TN and TP had good performance as indicated by the following statistics: NSE > 0.65, RSR < 0.6 (Table 6). The RF models of Clarity, E. coli (95th percentile), and QMCI had satisfactory performance as indicated by the following statistics: NSE > 0.65, RSR < 0.6 (Table 6). The models for DRP (median and 95th percentile) and NH₄N (adjusted median and annual maximum, and raw median) had poorer performance, with NSE values of 0.43, 0.39, 0.25, 0.37 and 0.23, respectively. Most models had very low bias; the largest bias was 8.4% for Clarity. RMSD values provide an indication of the magnitude of the characteristic error in the transformed units of each variable. Scatter plots of predicted versus observed water quality compliance statistics indicating the model performance are shown in Figure 3.

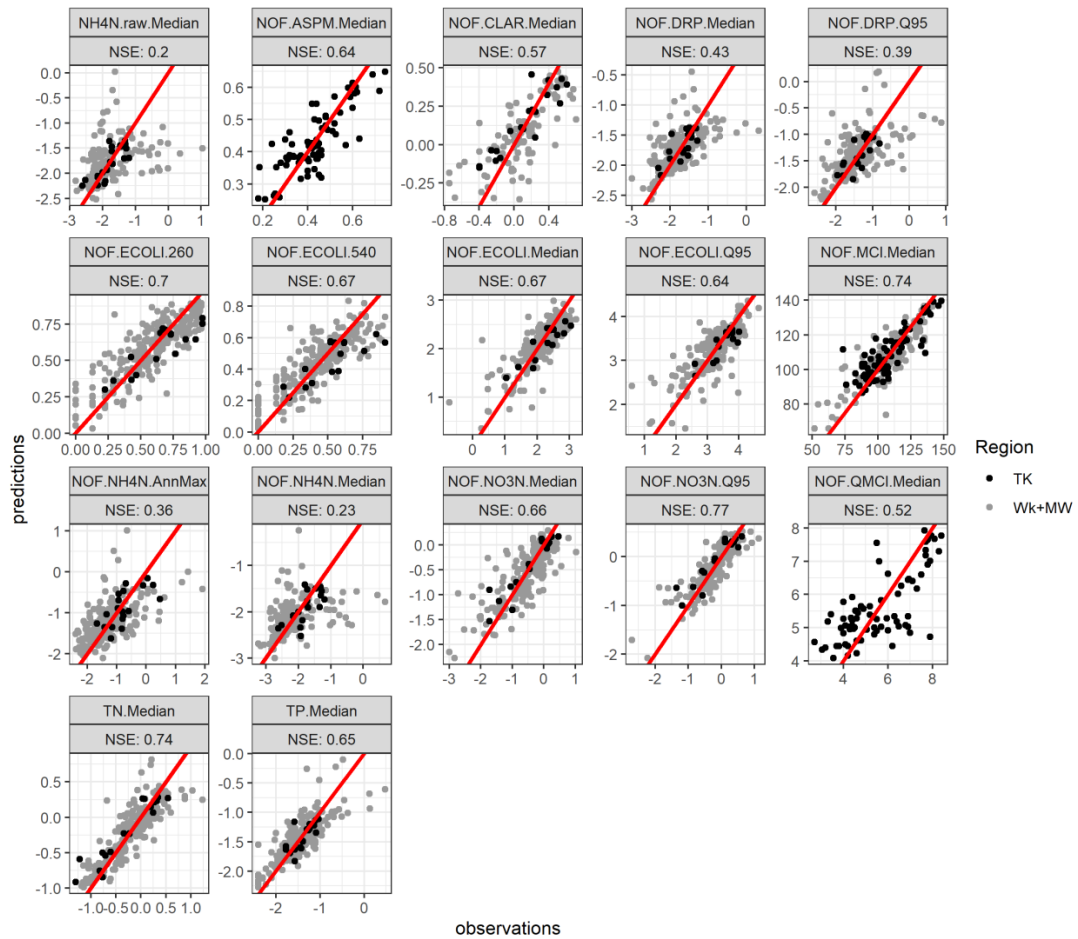


Figure 3: Comparison of observed water quality compliance statistics versus values predicted by the RF models. Points in black for sites within the Taranaki region. Points shown in grey are for sites in neighbouring regions that were also used to train the RF models. Note that the observed values are plotted on the Y-axis and predicted values on the X-axis, following (Piñeiro et al., 2008). The solid red line is one-to-one. Units for the variables are the transformed values (as per Table 6) of the original units.

4.2.2 Modelled relationships

Figure 4 illustrates the relative importance and the direction of the fitted relationships between the water quality compliance statistics and the model predictors for each model.



Figure 4: Relationships of predictors included in the ‘reduced’ random forest models with the water quality compliance statistics. Colours indicate the importance and direction of influence of each predictor on the modelled state statistics. Red indicates increasing predictor magnitudes are associated with increasing values of the state statistics, whereas green indicates increasing predictor magnitudes are associated with decreasing values. Blank cells indicate that the predictor was not included in the “reduced” random forest model.

4.2.3 Monitored site representativeness

The representativeness of the monitoring sites used in fitting the RF models (both from TRC and neighbouring regions) of the environmental gradients defined by the 24 most important predictor variables were inconsistent (Figure 5). The monitoring sites were generally biased towards higher values of many predictors as indicated by the probability-probability plot line lying above the red 1:1 line in Figure 5 (e.g., FRE3, *usElev*, *PropDeer_2017*, *PropDairy_2017*, *usUrban*, *usScrub*). This indicates that the monitoring sites generally overestimate catchments with: a high relative contribution to stocking units from deer and dairy cows, flashier flows, higher mean elevations and the presence of urban areas and scrub. The monitoring sites were biased towards lower values of some predictors as indicated by the probability-probability plot line lying below the red 1:1 line in Figure 5 (e.g., *usSlope*, *usRainDays10*, *usParticleSize*). This indicates the sites generally under-represent rivers with catchments with steeper slopes, higher frequency of rainfall events greater than 10mm, and catchment geology comprising larger particle sizes. The monitoring sites were biased towards median values of some predictors as indicated by the probability-probability plot line forming a flat S-curve, relative to the red 1:1 line in Figure 5 (e.g., *SUDensityTotal_2017*, *usNativeForest*, *usIntensiveAg*). This indicates the sites generally under-represent rivers with catchments with very high or very low stocking density and native forest coverage. The

monitoring sites were biased towards upper and lower values of some predictors as indicated by the probability-probability plot line forming a steep S-curve, relative to the red 1:1 line in Figure 5 (e.g., *JulFlow*, *usTmax*). This indicates the sites generally over-represent rivers with catchments with very high or very low relative winter flows and average maximum temperatures.

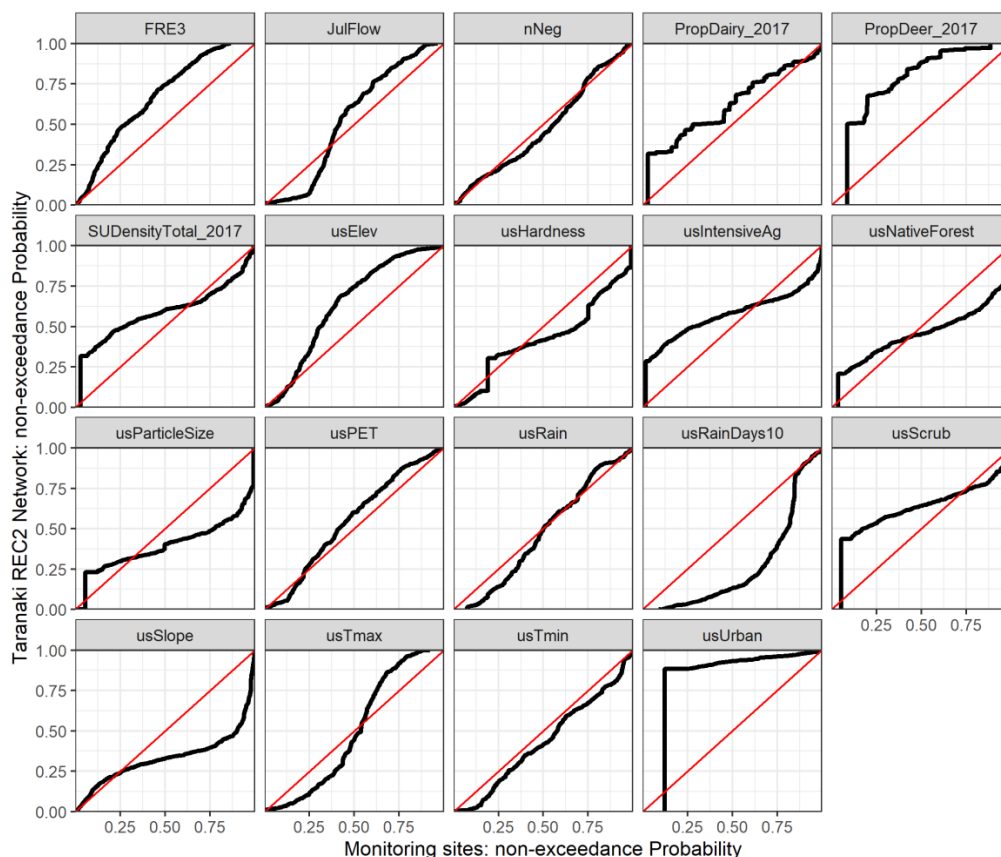


Figure 5 Probability-probability plots for the top 24 most important predictors used by the water quality compliance statistics spatial models describing the representativeness of the water quality monitoring sites used to fit the spatial models.

4.2.4 Model predictions

Figure 6 (a-d) shows maps of NOF grades evaluated from the spatial model predictions. Maps of the continuous water quality compliance statistics spatial model predictions are provided in Appendix C. There were some patterns in NOF grades that were consistent across all model predictions. For example, water quality tended to be least degraded in the eastern headwaters, in the northern part of the region and on Mount Taranaki. The most degraded areas were typically along the coastal areas (particularly on the western and southern coasts), as well as the low-lying areas around Stratford. Supplementary files with the estimated water quality compliance statistics and their 95% confidence intervals for all REC2 reaches in the Taranaki region are provided in TRCWQ_PredictionsDF_REC2_for2017__210826.csv

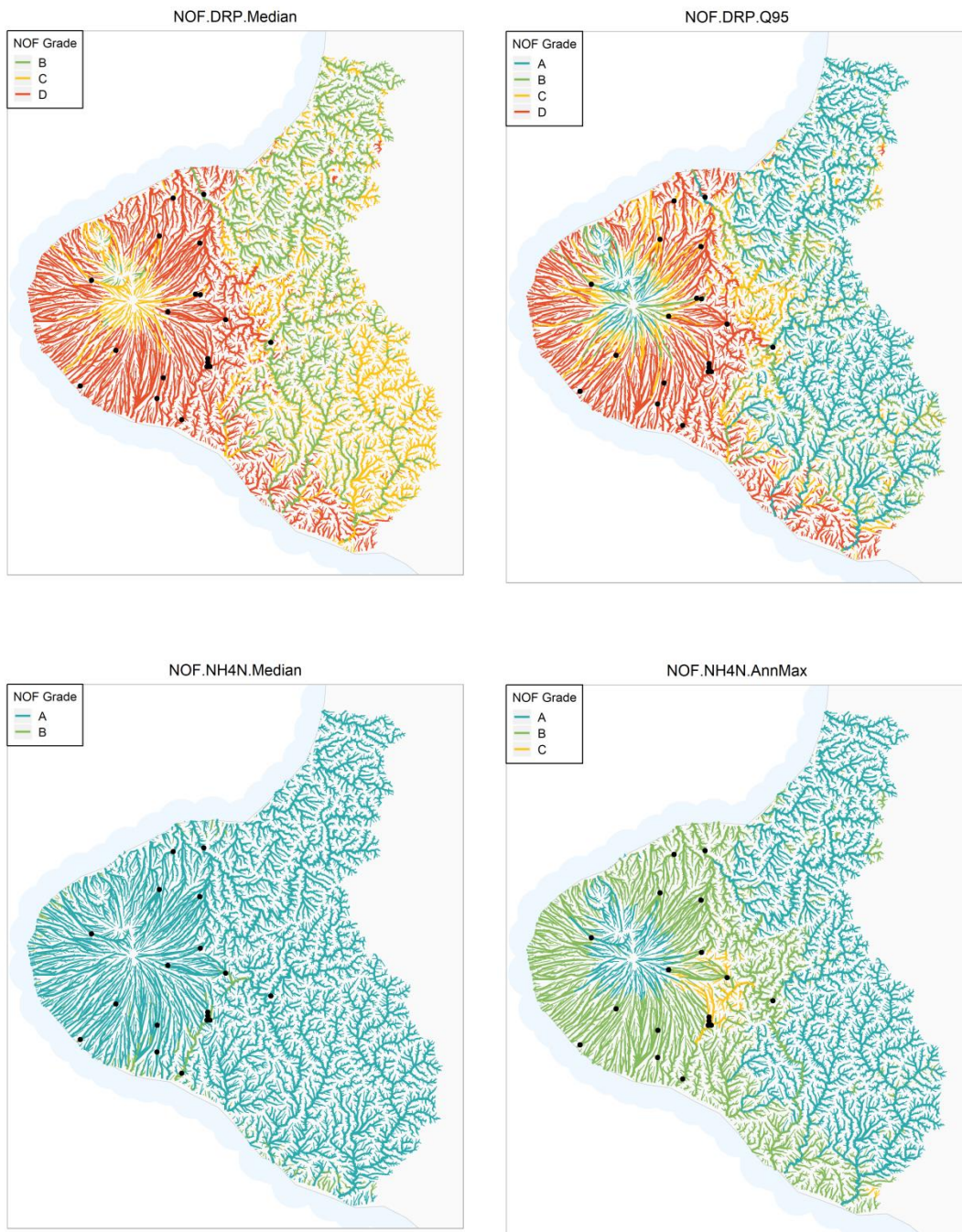


Figure 6: (a) Predicted NOF grades for selected water quality variables, for all segments of the regional network. Black dots indicate TRC sites used in model fitting.

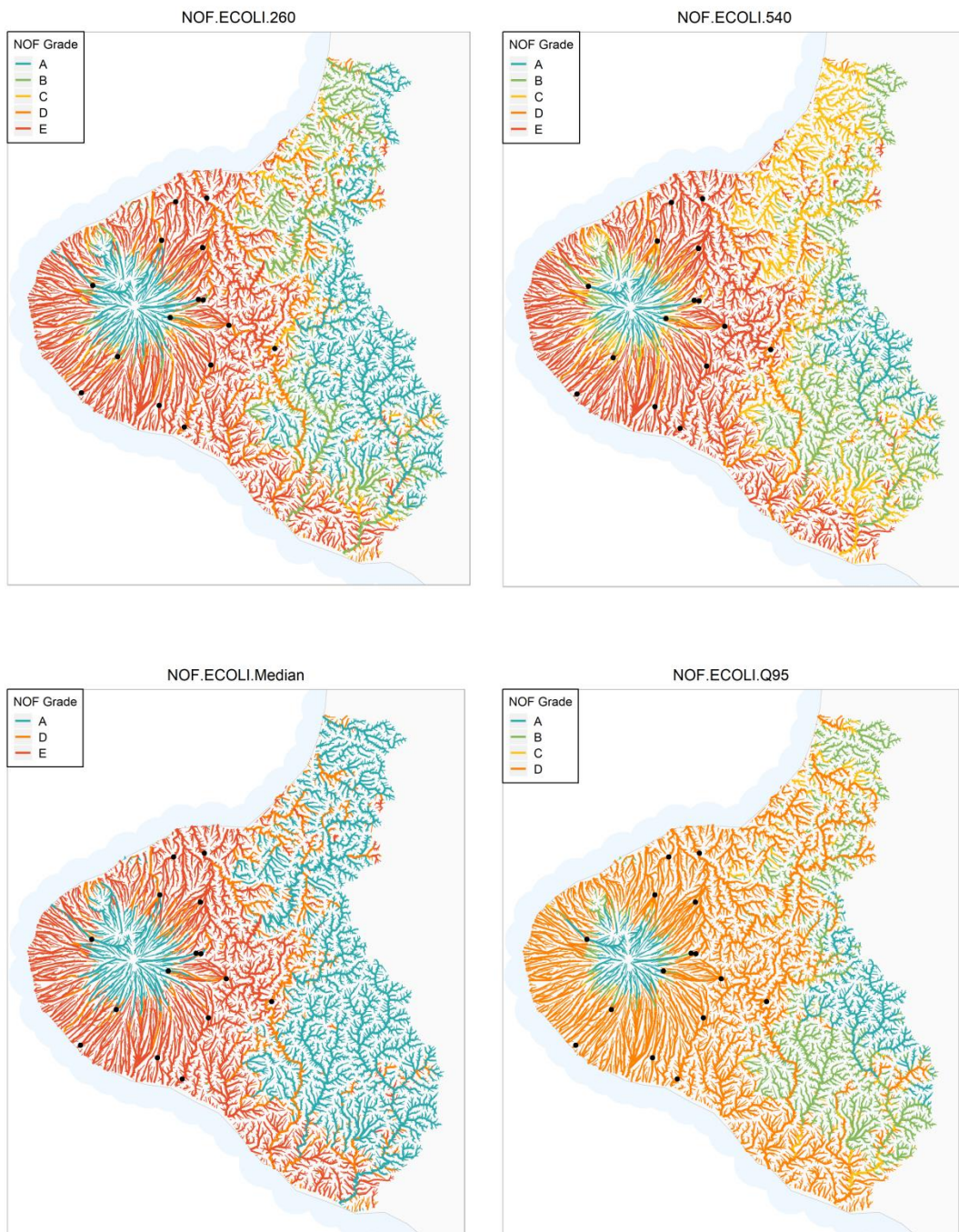


Figure 6: (b) Predicted NOF grades for selected water quality variables, for all segments of the regional network. Black dots indicate TRC sites used in model fitting.

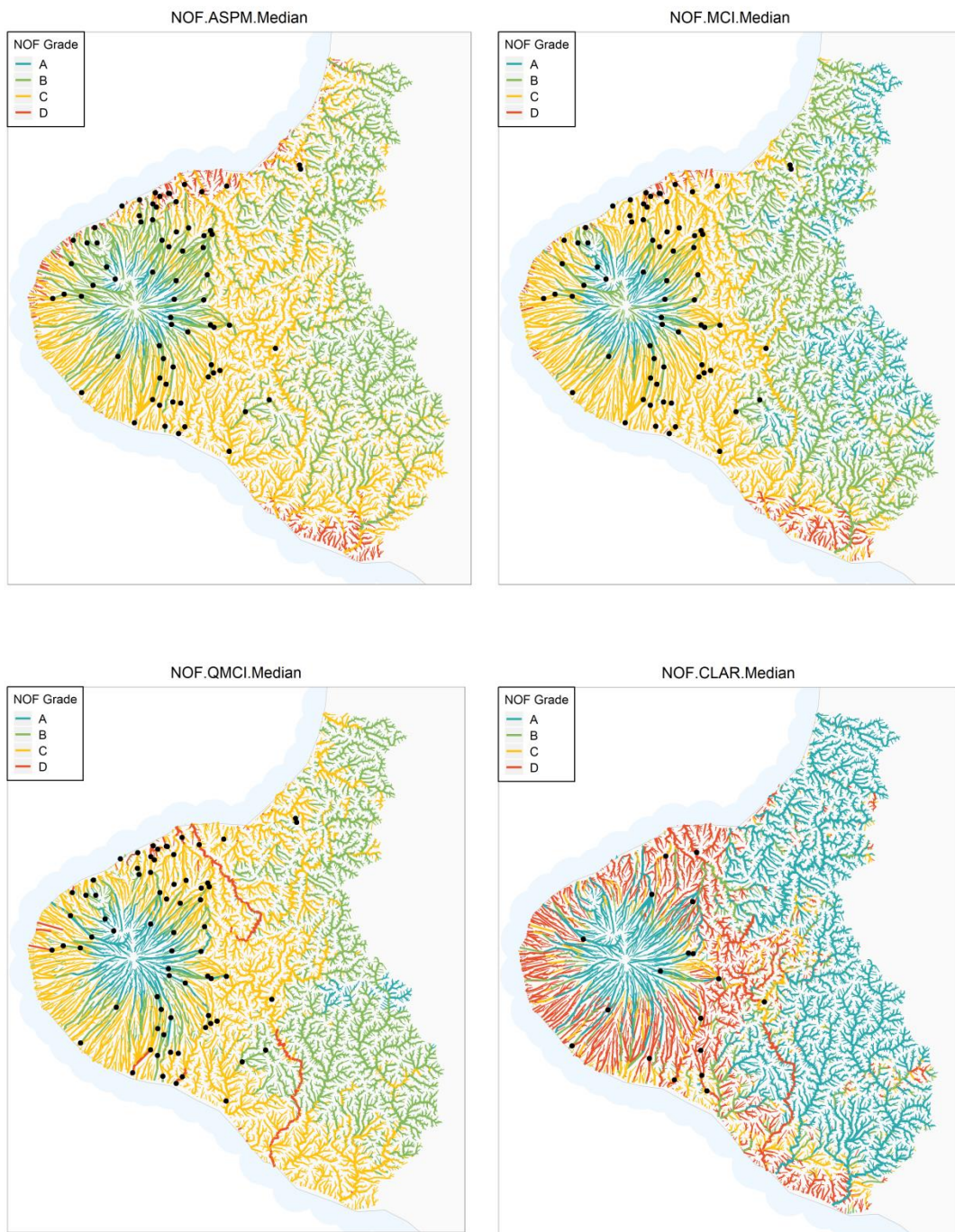


Figure 6: (c) Predicted NOF grades for selected water quality variables, for all segments of the regional network. Black dots indicate TRC sites used in model fitting.

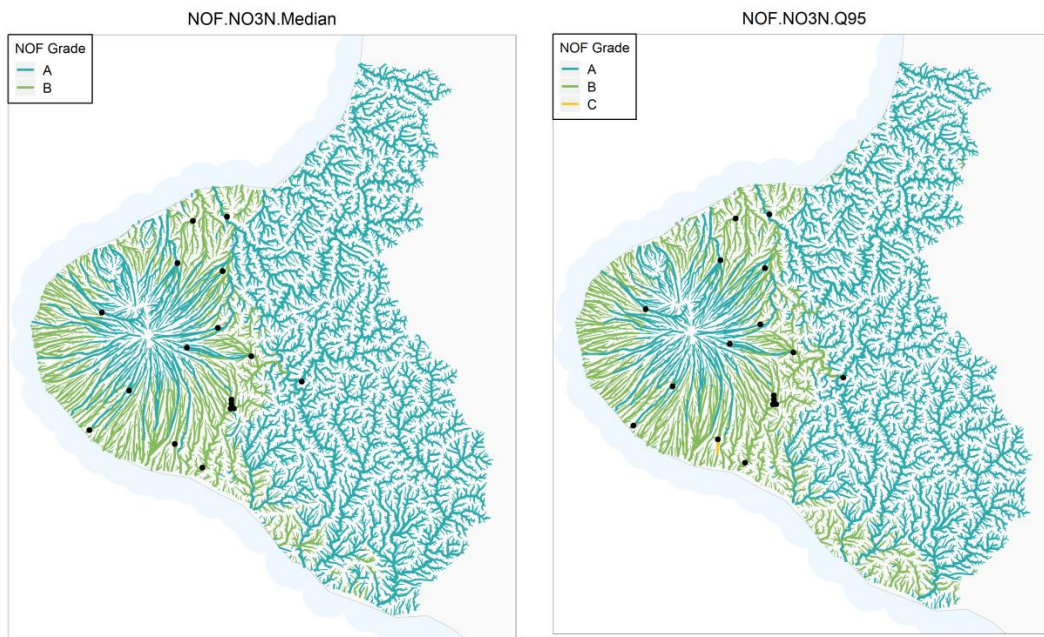


Figure 6: (d) Predicted NOF grades for selected water quality variables, for all segments of the regional network. Black dots indicate TRC sites used in model fitting.

5 Discussion

Our spatial models represent broad scale patterns in water quality (as NPS-FM attribute state statistics) based on catchment characteristics as predictor variables. The diversity of important predictor variables in the models indicates that a complex mixture of natural and anthropogenic processes (e.g., geochemical reactions, atmospheric deposition, anthropogenic nutrient input, geomorphic processes, microbial activity) influence water quality outcomes. The differences in the performance of the RF models among water quality variables (Table 6) may reflect differences in the biophysical processes that control those variables. Some biophysical processes may be poorly represented by the catchment-averaged spatial predictor variables. For example, concentrations of dissolved and total nitrogen and phosphorus in rivers are influenced to differing degrees by adsorption-desorption processes, deposition and suspension, and biological assimilation, transformation and removal; these mechanisms are not explicitly represented in the RF models. The absence of predictors that account for these and other processes means that some level of unexplained variation is inevitable.

Predictions made for individual locations are uncertain, and these uncertainties are quantified by the model RMSD values (Table 6). However, the bias of the spatial models for each contaminant was low (Table 6). This indicates that the predicted patterns reflect broad scale relative differences in water quality state between locations.

Acknowledgements

We thank Regan Phipps of Taranaki Regional Council for assistance with defining the aims of this study, providing the input datasets, and reviewing the draft report. Thanks also to Lizzie Ingham and Jeremy Wilkinson for feedback on the draft report.

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Appendix A: Comparison of water quality compliance statistics between start of time and 2017

The NPS-FM requires a 'baseline state' to be defined as either the state in September 2017, or the state at the beginning of the site observation record. We calculated the water quality compliance statistics at the start of each observation record (the 'start state') as the water quality compliance statistic for the first 5-year period that complied with our data requirement filtering rules. The start states are compared with the 2017 states (hereafter 2017 state) in Figure 7.

For clarity and macroinvertebrate attributes (ASPM, MCI, QMCI), points lying above the 1:1 line indicate that start state was better than the 2017 state. For other variables, points lying below the 1:1 line indicate start state was better than the 2017 state (i.e., that water quality state has degraded over the time period).

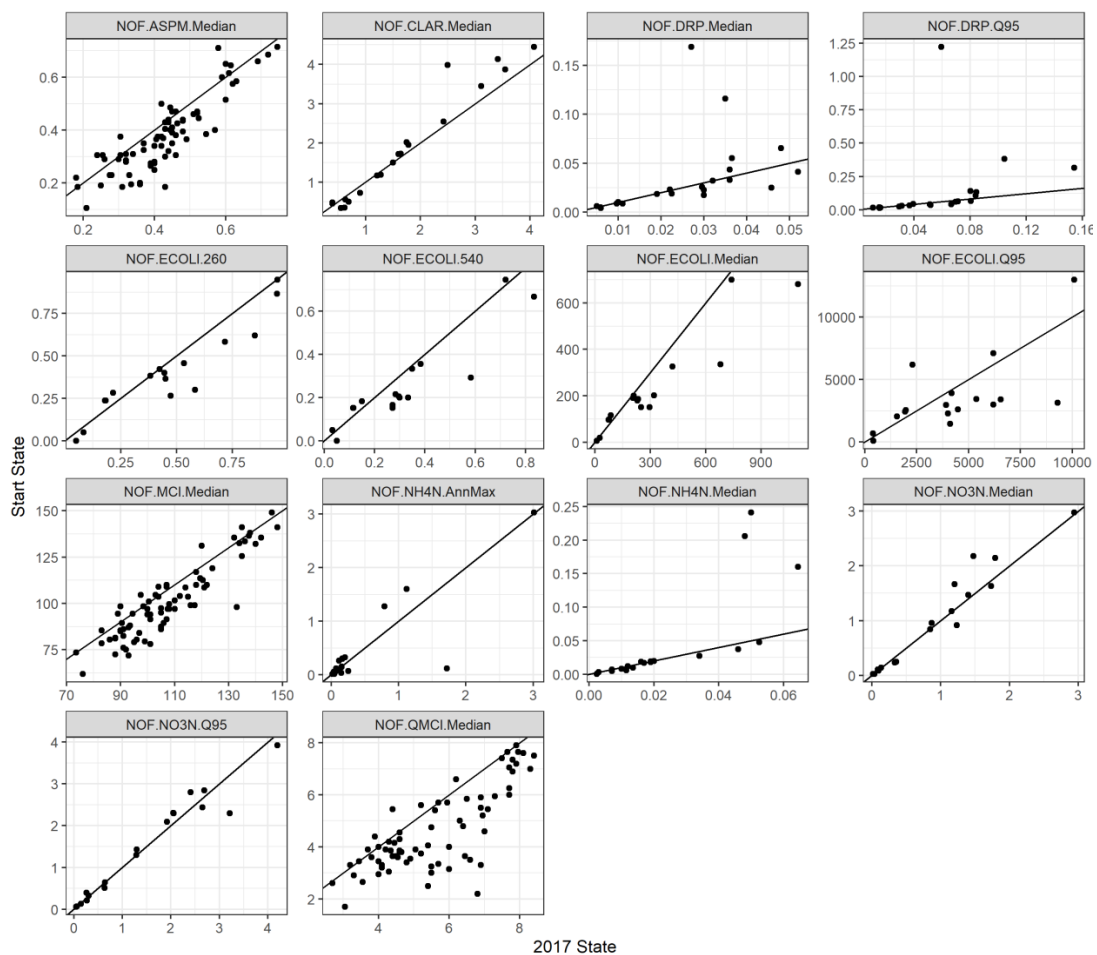


Figure 7: Comparison of water quality compliance statistics from the beginning of observation records with those ending in 2017. The black line is a 1:1 line.

Macroinvertebrate state at most sites was better in 2017 compared with the start state, and those that indicate some degradation, are only worse by a small amount (generally not enough to change the site's NOF grade). The *E. coli* compliance statistics show relatively consistent degradation across sites compared to the start state. In general, the differences between the

start state and the 2017 state were small in comparison to the variability in the water quality compliance statistics across sites.

In general, these differences between start states and 2017 state were small, or of similar magnitude to the RMSD of the state spatial models (e.g., Figure 3 and Table 6). As such, we concluded that assessment of the differences between spatial models based on the 2017 state and some earlier time period would not yield statistically significant results. We recommend, that where observed start states for monitoring sites indicate a higher water quality state than 2017, then the start state be used as a baseline, but for any assessment that uses the modelled compliance statistics to define state, the modelled (2017) predicted state is used as the baseline.

Appendix B: Comparison of compliance statistics and NOF grades over different time periods

For river water quality monitoring sites in the Taranaki region, we calculated compliance statistics for all 5-year periods within the records that complied with the data requirement rules outlined in section 3.1.3. Compliance statistics and NOF grades are provided in tabular form in the supplementary file: *TRC State with Time_v210826.xlsx*. Summaries of the variation in NOF grades for each site and NOF numeric attribute state are shown in Figure 8 to Figure 13.

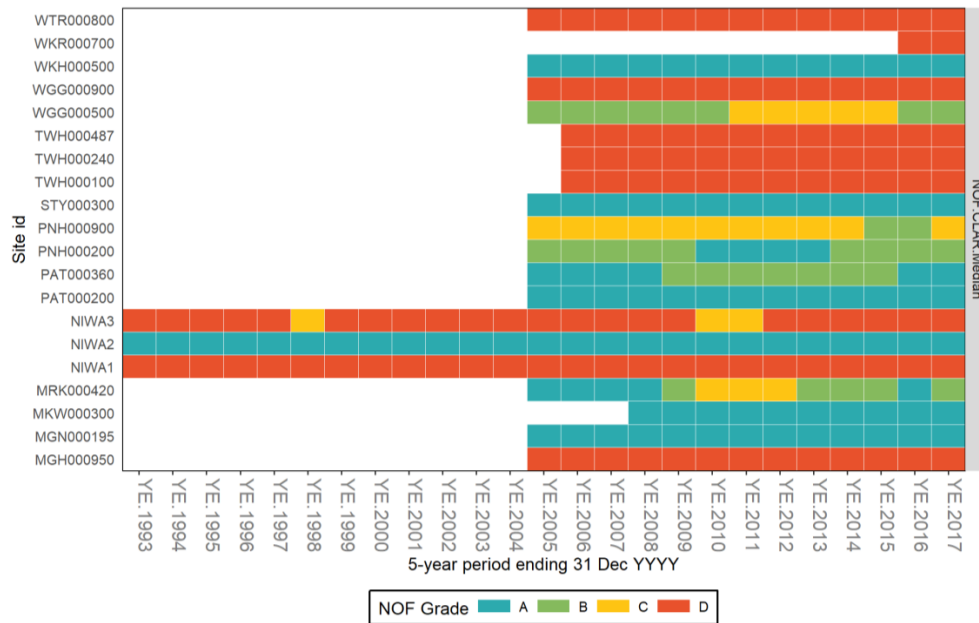


Figure 8: Variation in NOF suspended fine sediment attribute grades for sites over time.

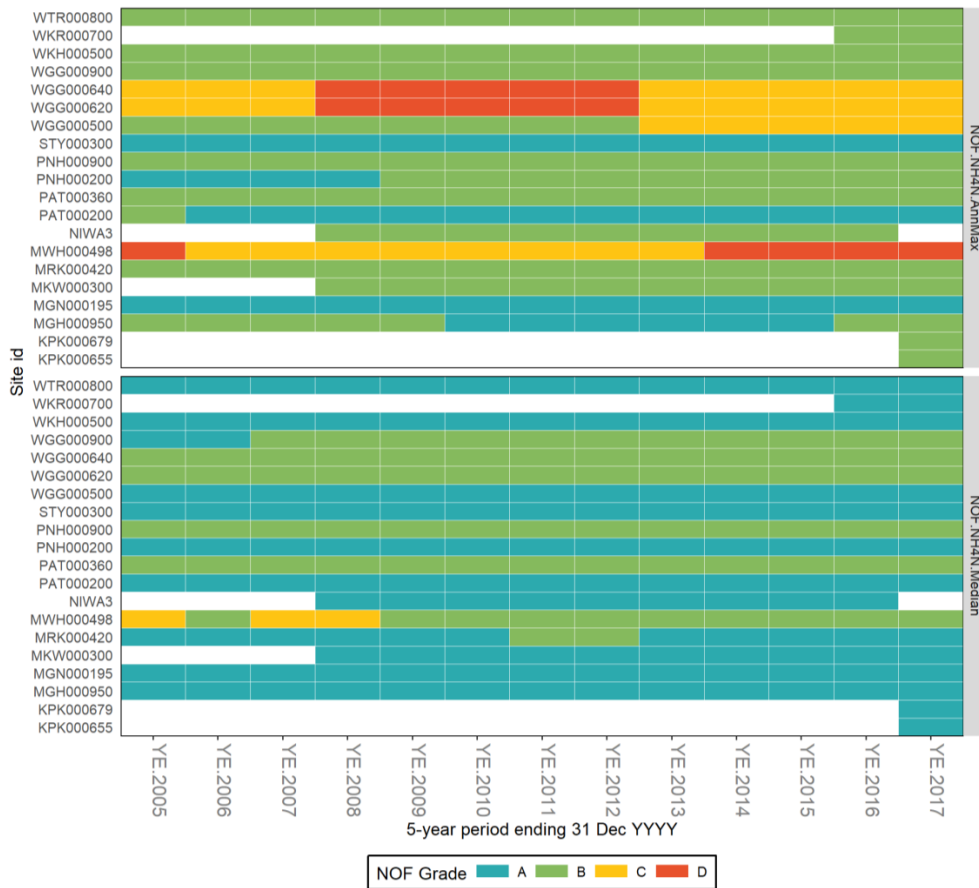


Figure 9: Variation in NOF Ammonia attribute grades for sites over time.



Figure 10: Variation in NOF DRP attribute grades for sites over time.

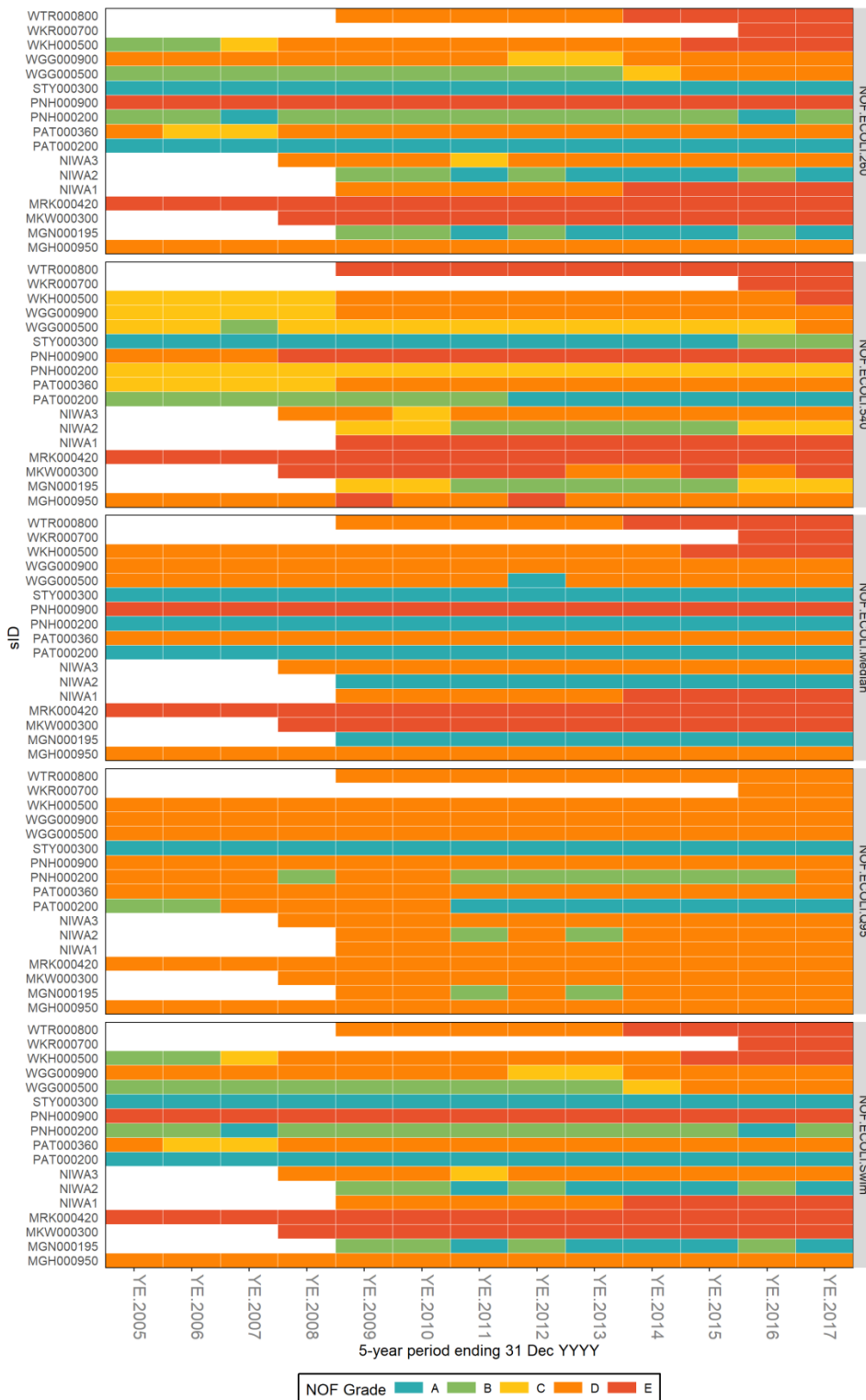


Figure 11: Variation in NOF E. coli attribute grades for sites over time.

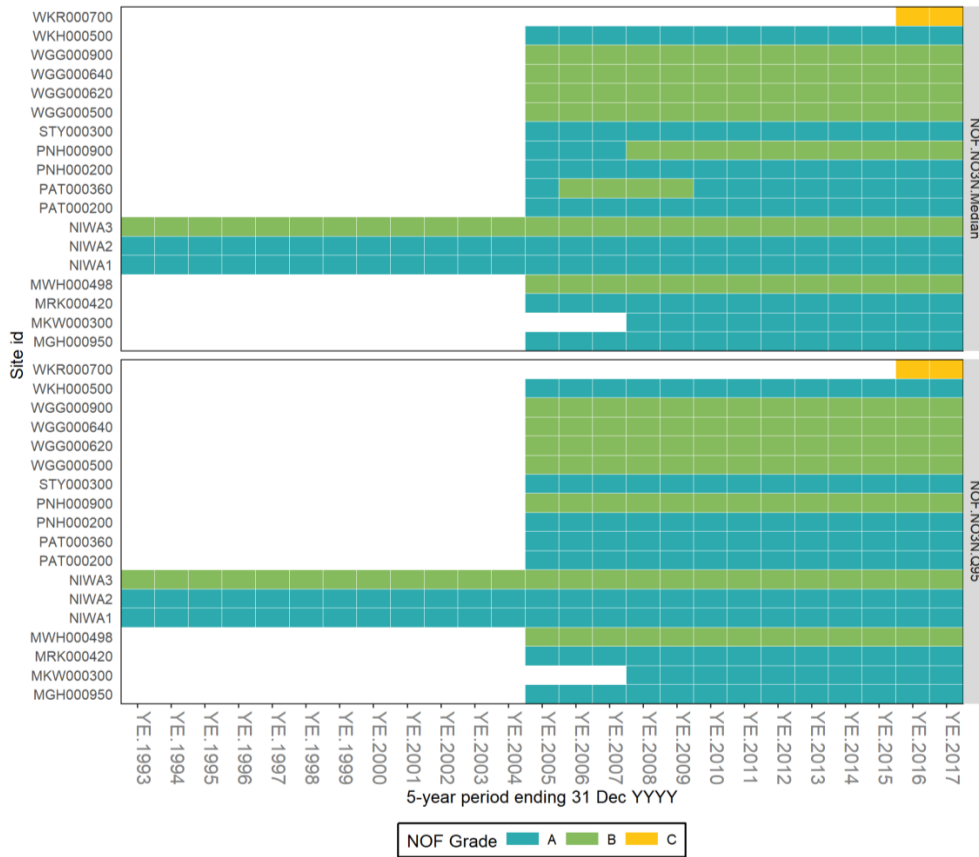


Figure 12: Variation in NOF Nitrate attribute grades for sites over time.

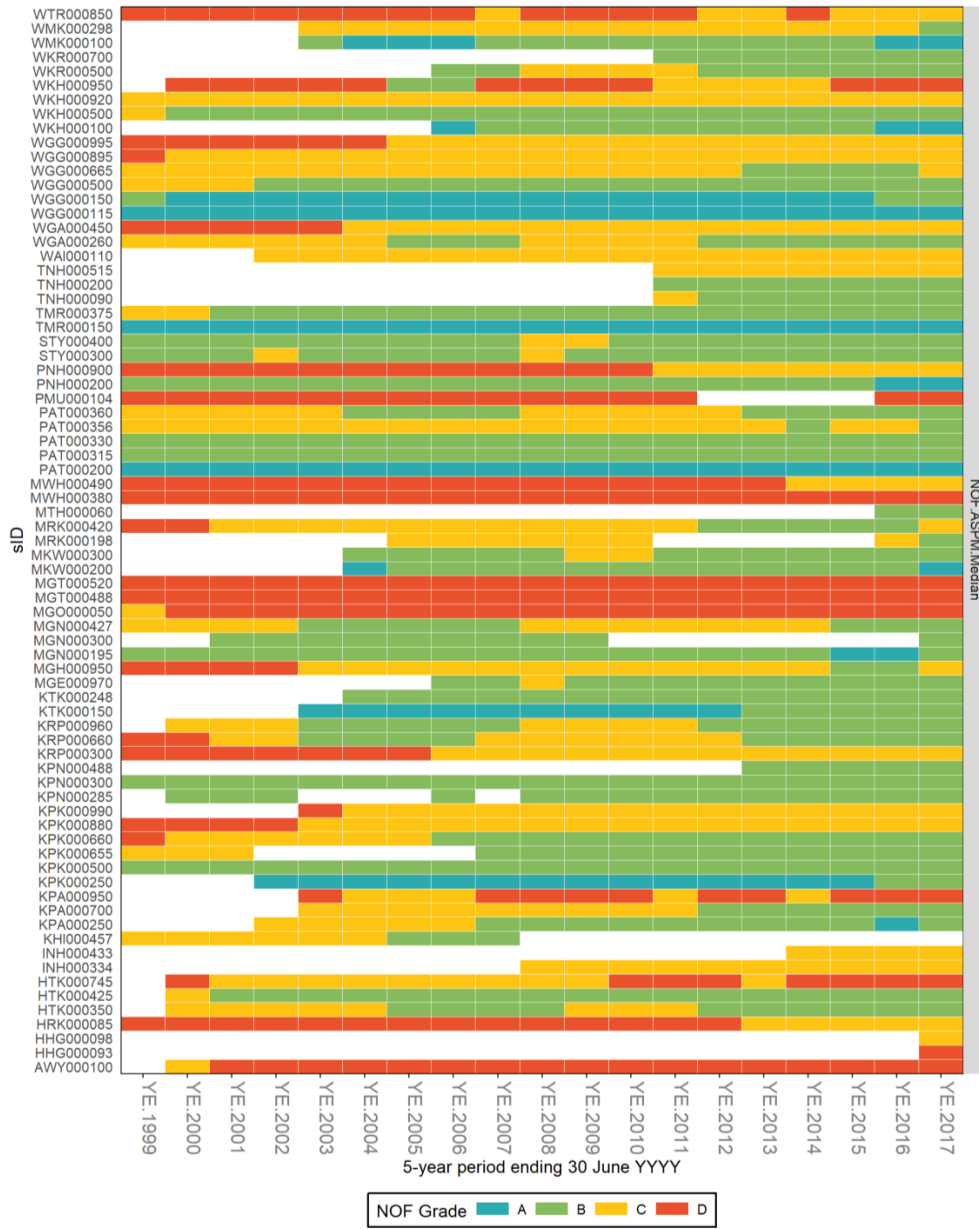


Figure 13: Variation in NOF ASPM attribute grades for sites over time.

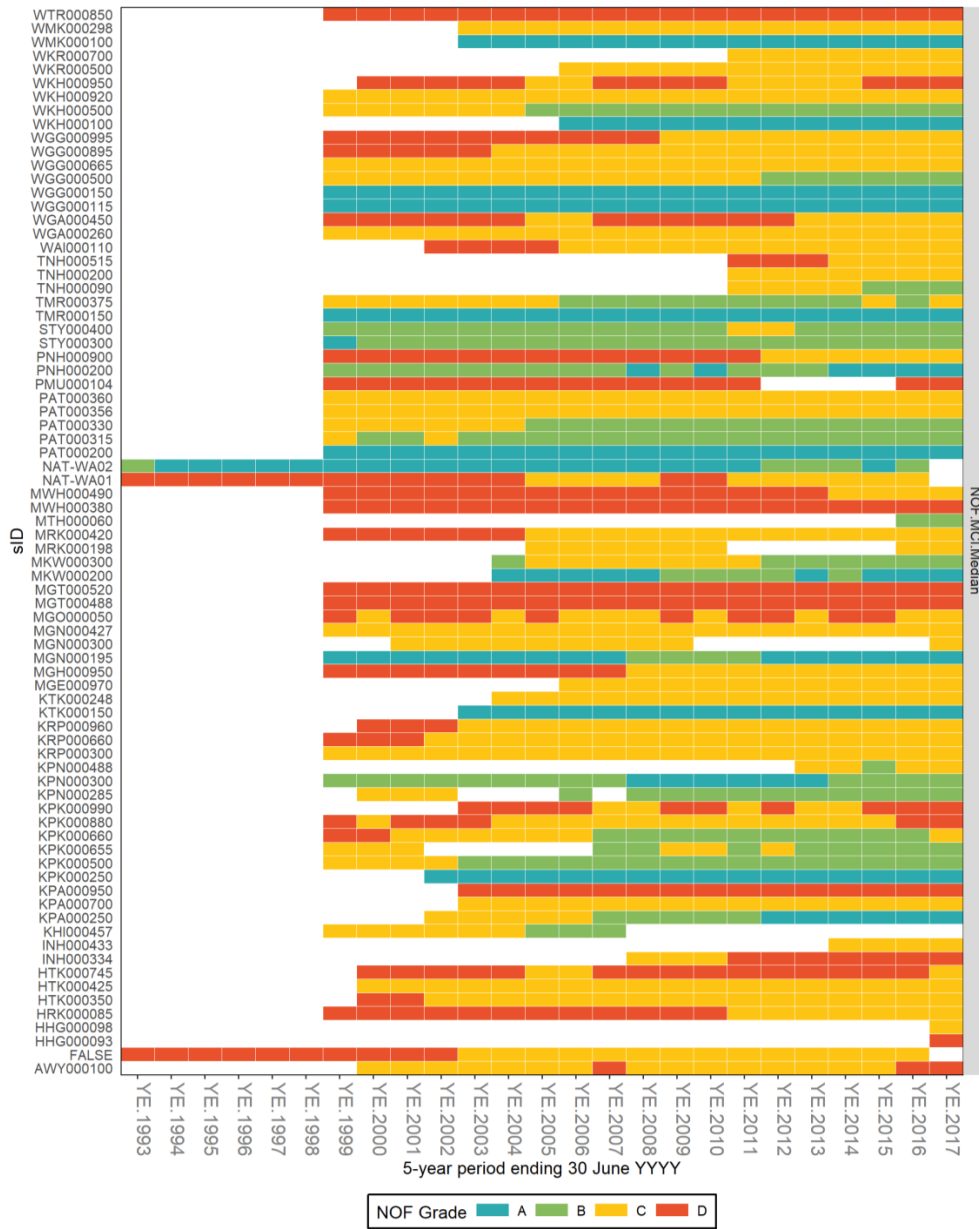


Figure 14: Variation in NOF MCI attribute grades for sites over time.

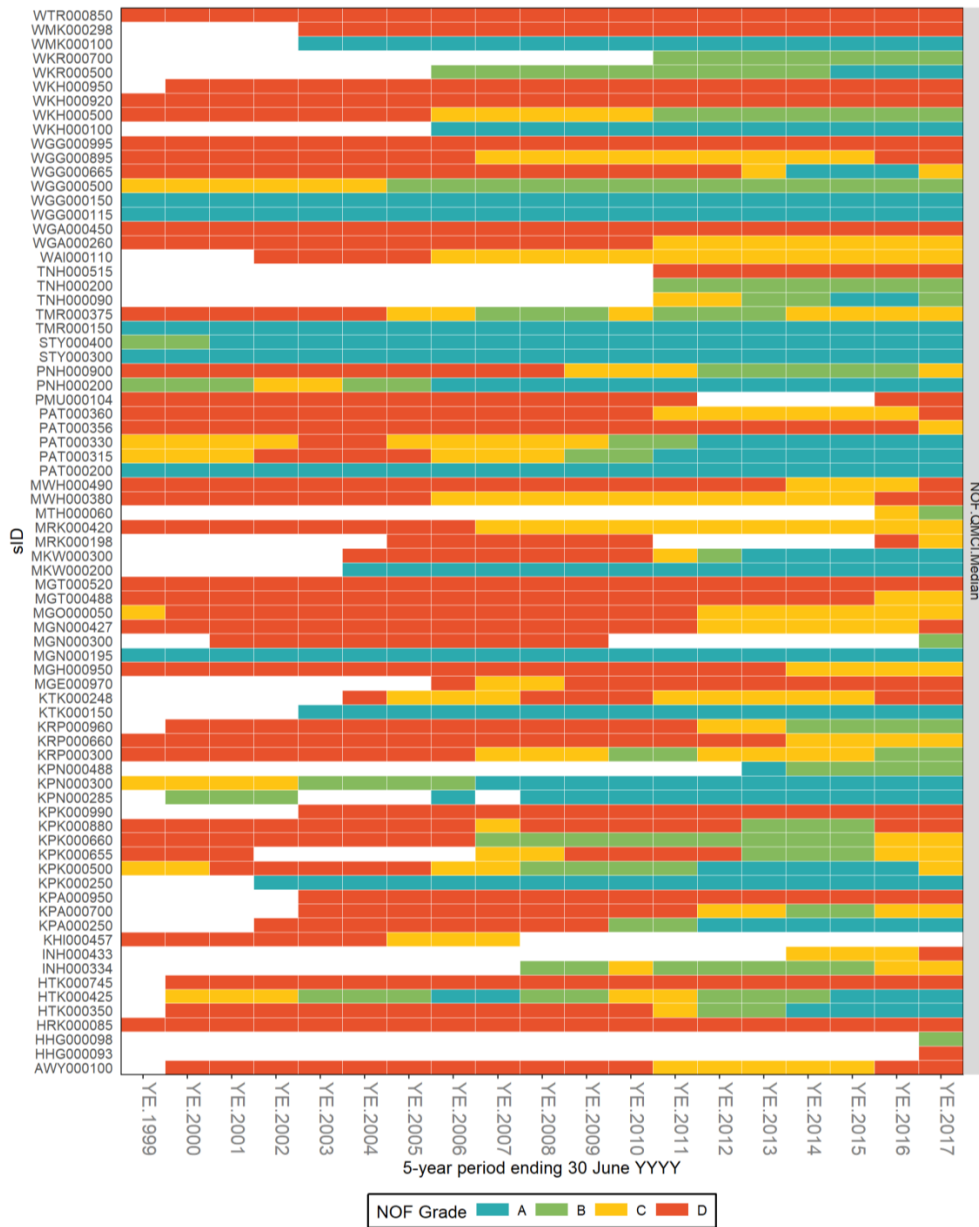


Figure 15: Variation in NOF QMCI attribute grades for sites over time. (Note this comparison is made using TRC SQMCI observations).

Appendix C: Continuous spatial model predictions

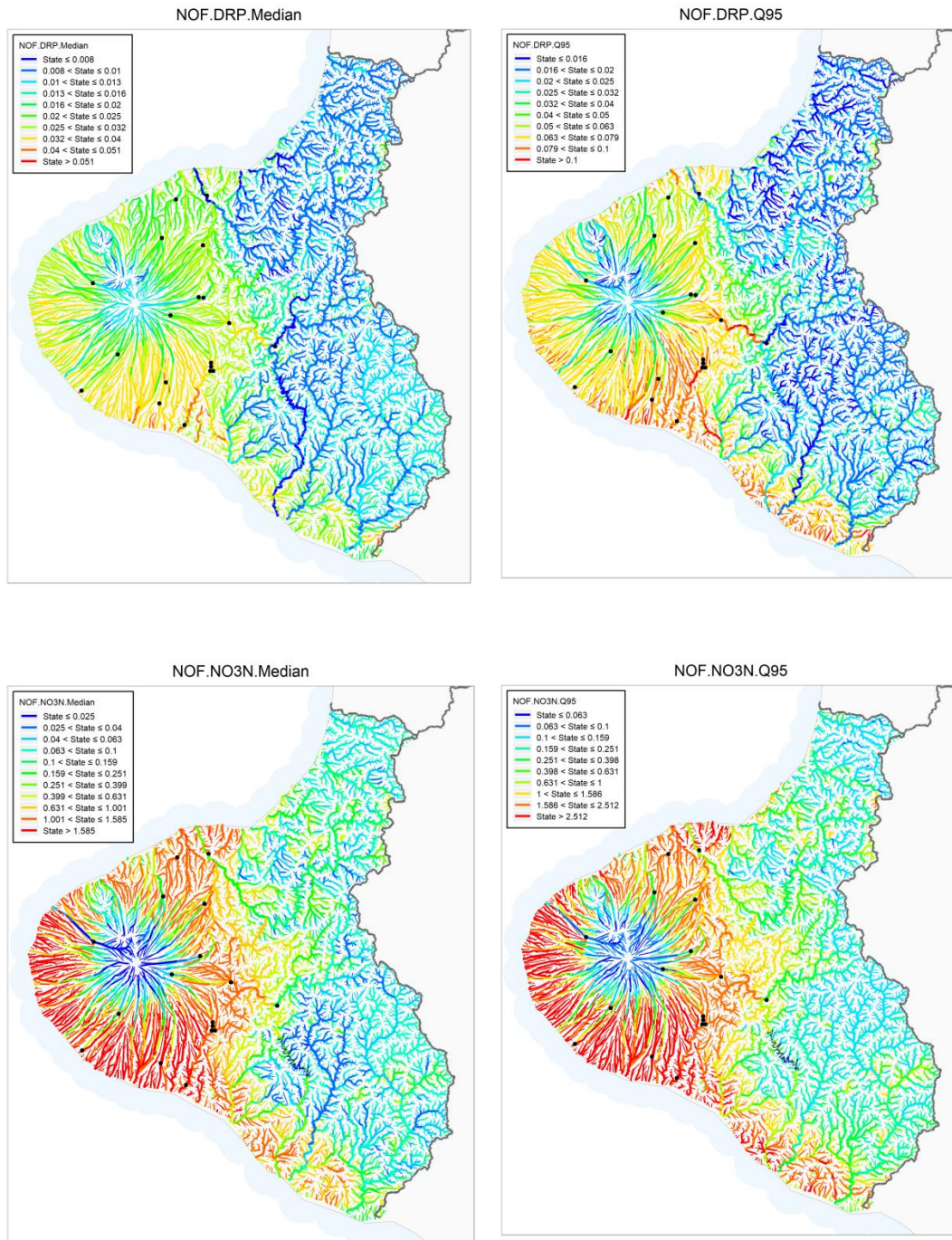


Figure 16: (a) Predicted water quality compliance statistics for selected water quality variables, for all segments of the regional network.

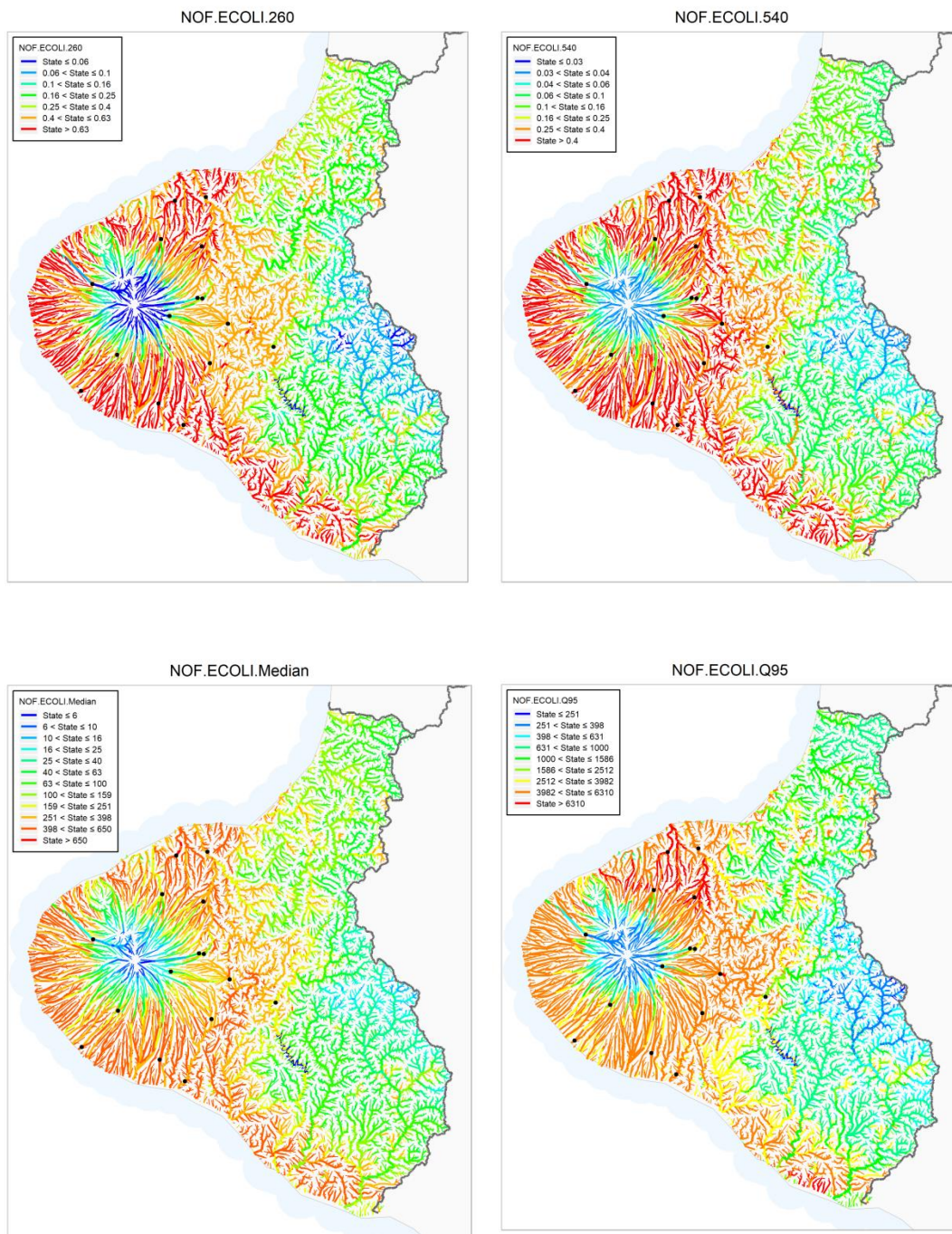


Figure 16 (b): Predicted water quality compliance statistics for selected water quality variables, for all segments of the regional network.

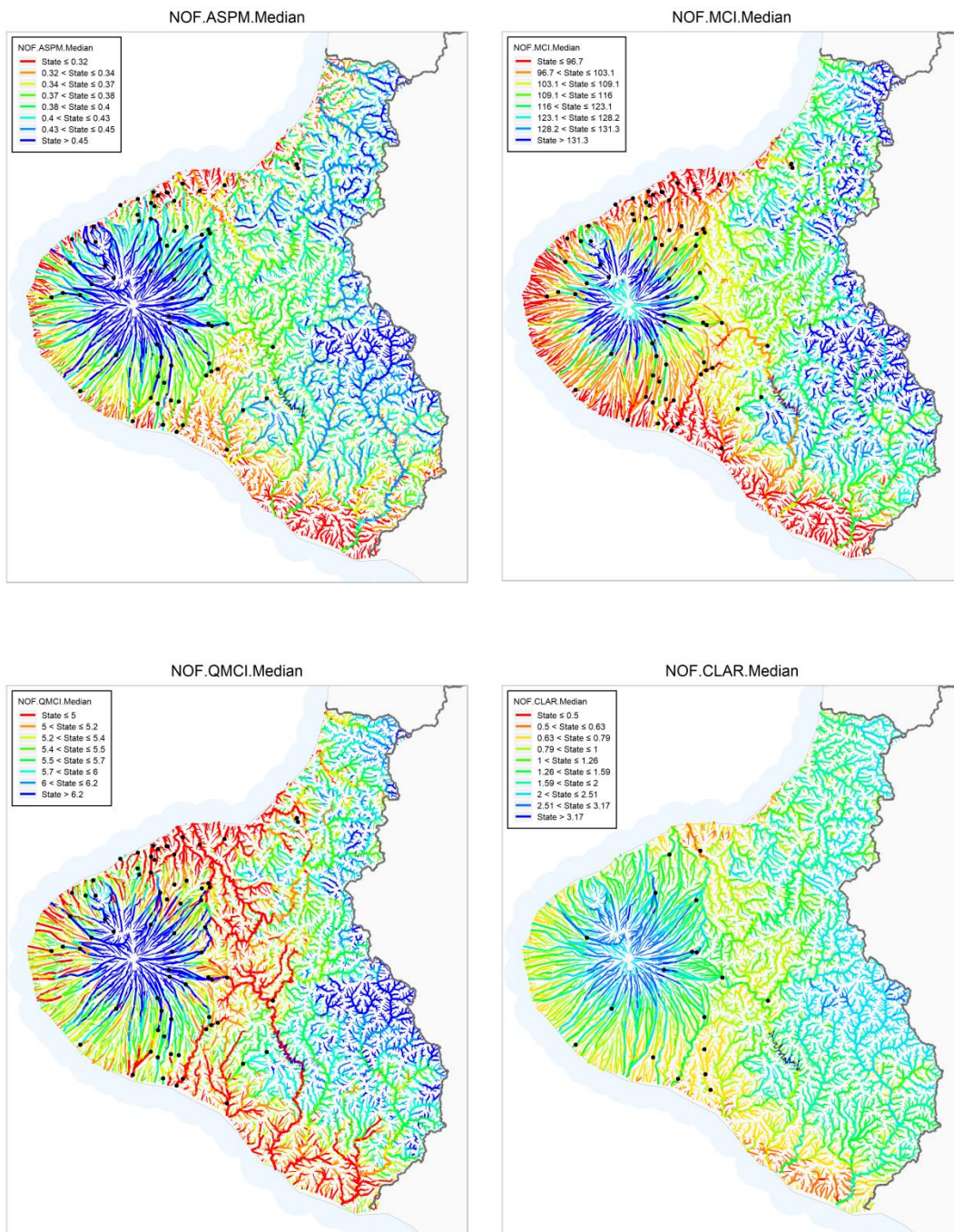


Figure 16 (c): Predicted water quality compliance statistics for selected water quality variables, for all segments of the regional network.

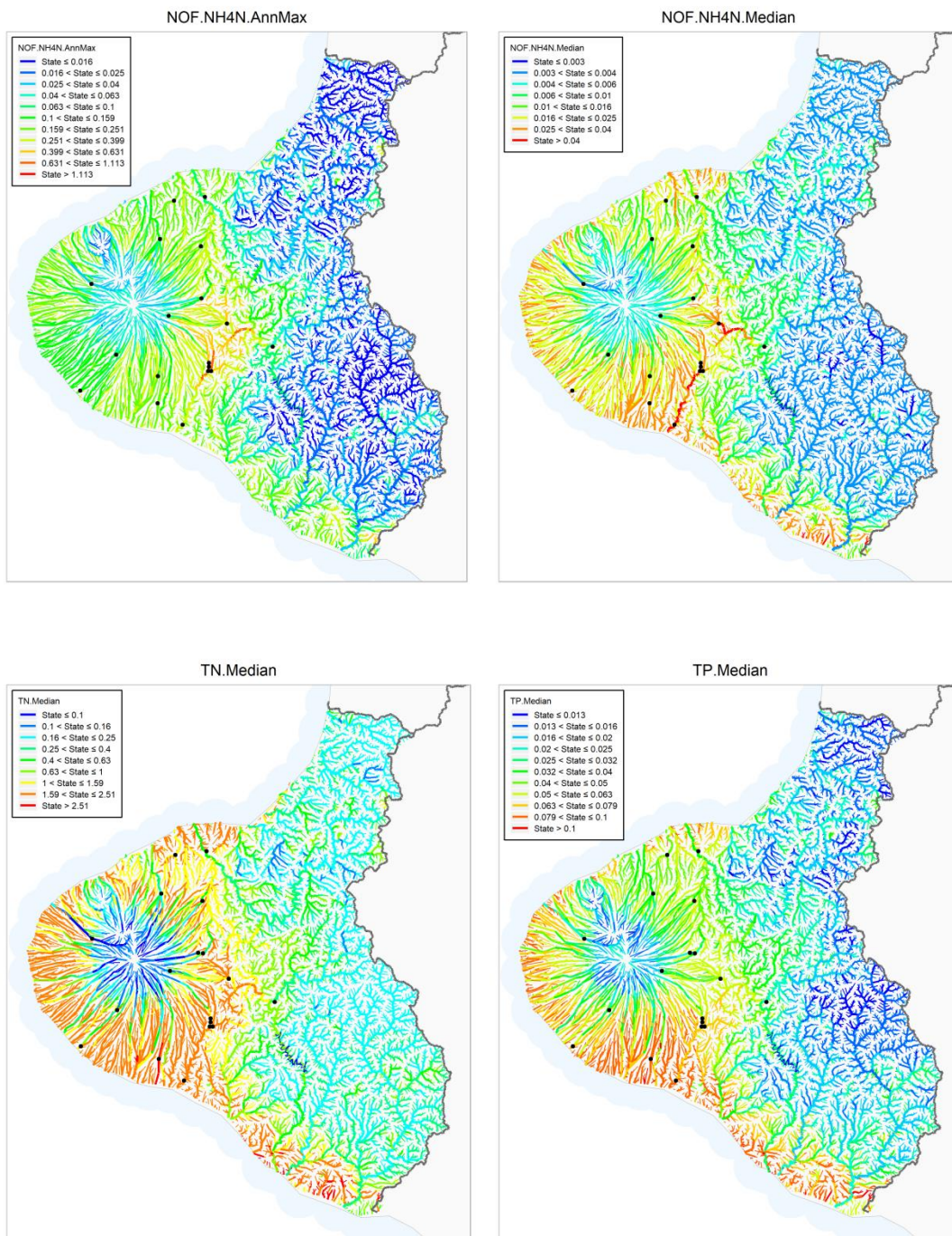


Figure 16 (d): Predicted water quality compliance statistics for selected water quality variables, for all segments of the regional network.



Date: 26 July 2022

Subject: **Submission on draft National Policy Statement for Indigenous Biodiversity**

Approved by: D Harrison, Director - Operations
S J Ruru, Chief Executive

Document: 3085463

Purpose

1. The purpose of this memorandum is to seek Members' endorsement of the Councils draft submission on the *Draft National Policy Statement for Indigenous Biodiversity - Exposure Draft* (the Exposure Draft).
2. The deadline for submissions precluded a draft submission being presented to this meeting.

Executive summary

3. The Government is looking at ways to reverse the decline of indigenous biodiversity in Aotearoa New Zealand.
4. On 9 June 2022, the Ministry for Environment (MfE) released the Exposure Draft. The Exposure Draft sets out draft provisions for a *National Policy Statement for Indigenous Biodiversity* (NPS-IB). A draft implementation plan was also presented for comment.
5. The deadline for submissions was 21 July 2022.
6. In response, Council officers made a submission identifying a number of concerns relating to the draft NPS-IB provisions and implementation plan. In general, the submission is supportive of the intent and objectives of the draft NPS-IB. However, changes to the draft NPS-IB are sought to address a number of issues and concerns with current provisions and/or realise opportunities to improve on the NPS-IB. Key issues identified include:
 - If left unchanged, some of the NPS-IB provisions are likely to result in unwarranted cost shifting to councils. Including mapping requirements for significant natural areas (SNAs) and highly mobile fauna
 - Need for the Government to support the implementation of the NPS-IB by assuming a stronger leadership role that extends beyond just policy development
 - Requirement to map or describe the location of "ecosystems" identified as taonga could be overly onerous in the absence of comprehensive timely Government

guidance and direction to support the interpretation and application of that part of the NPS-IB

- NPS-IB requirements to survey and map “highly mobile fauna” should be undertaken by central government to ensure a nationally consistent approach and to give effect to national priorities for maintaining and enhancing indigenous biodiversity, particularly given that Government departments such as the Department of Conservation (DOC) have a stronger mandate and expertise to undertake such work.
- Question the practicalities and policy intent of NPS-IB requirements that councils meet a 10% restoration target for urban vegetation cover and separate indigenous vegetation targets for non-urban areas
- Note the potential for conflict with other national directions such as the *National Policy Statement for Urban Development* and *National Policy Statement for Freshwater Management* and note that some land uses are treated differently, e.g. forestry
- Note that the implementation plan is inadequate. Seek that the Government better support active management and the implementation of the NPS-IB, including the development and improvement of national datasets, available to councils, that map indigenous biodiversity features required by the NPS-IB.

7. Consultation on the Exposure Draft closed on 21 July 2022 at 5pm.

Recommendations

That the Taranaki Regional Council:

- a) receives the memorandum and the attached submission on the exposure draft on the *National Policy Statement for Indigenous Biodiversity*
- b) endorses the submission on the Exposure Draft
- c) determines that this decision be recognised not significant in terms of section 76 of the *Local Government Act 2002*
- d) determines that it has complied with the decision-making provisions of the *Local Government Act 2002* to the extent necessary in relation to this decision; and in accordance with section 79 of the Act, determines that it does not require further information, further assessment of options or further analysis of costs and benefits, or advantages and disadvantages prior to making a decision on this matter.

Background

8. As Members are aware, many of New Zealand’s indigenous plants, animals and fungi are unique to this country. However, some of these, along with their ecosystems, are under threat of extinction.
9. Under section 30(1)(ga) of the Resource Management Act 1991 (RMA), regional councils are responsible for the “...*establishment, implementation and review of objectives, policies and methods for maintaining indigenous biological diversity*”. Under section 31(1)(b)(iii) of the RMA, district councils are responsible for the “...*the control of any actual or potential effects of the use and development, or protection of land, including for the purpose of ... the maintenance of indigenous biological diversity*”.
10. On 25 November 2019, the Government released the consultation document *He kura koiora i hokia: a discussion document on a proposed National Policy Statement for Indigenous*

Biodiversity (NPS-IB). The consultation document included a draft NPS-IB that represents the Government's response to address the decline in New Zealand's indigenous biodiversity, including threatened and rare species and ecosystems.

11. From November 2019 to March 2020, the Government sought public feedback on the introduction of its NPS-IB. The Government received over 7000 submissions with the Council also submitting on the consultation document.
12. Since then, the Ministry for the Environment (MfE) has been working on changes to the draft NPS-IB.
13. MfE are now seeking feedback from practitioners, iwi/hapū Māori, and stakeholders on the Exposure Draft to ensure its provisions are workable. The Exposure Draft purportedly takes into account submissions received during the public consultation period although significant changes or actions sought by the Council remain unaddressed.

Key features of the draft NPS-IB

14. The Government's stated aim for the NPS-IB is to resolve uncertainty and under-valuing of indigenous biodiversity under the RMA. Pursuant to Section 6(c) of the RMA the protection of "...*areas of significant vegetation and habitats of indigenous fauna*" is a matter of national importance that councils must recognise and provide for when exercising their functions and powers under the RMA.
15. Through a NPS-IB, the Government is seeking a step change in the management and protection of indigenous biodiversity. It follows on from the work of a Biodiversity Collaborative Group, a stakeholder-led group funded by MfE to develop national-level policy for indigenous biodiversity in New Zealand.
16. The NPS-IB applies to terrestrial indigenous biodiversity throughout New Zealand, including wetlands. Indigenous biodiversity in the coastal marine area (CMA) and freshwater will continue (with some exceptions) to be managed under the *New Zealand Coastal Policy Statement* (NZCPS) and the *National Policy Statement for Freshwater Management*. It also covers all types of land, including public, private and Māori land.
17. The fundamental framework adopted in the NPS-IB to achieve an integrated and holistic approach to maintaining indigenous biodiversity is Te Rito te Harakeke. This framework recognises that the health and wellbeing of our terrestrial environment, its ecosystems and unique indigenous vegetation and fauna, is vital for the health and wellbeing of the wider environment and communities. It also recognises the role people have as stewards and tangata whenua as kaitiaki in the protection, maintenance and restoration of indigenous biodiversity. The NPS-IB requires Te Rito o te Harakeke and its six essential elements to be "*given effect to*".
18. The NPS-IB also has a strong emphasis on the recognition of tangata whenua as kaitiaki. For example, every local authority must actively involve tangata whenua (to the extent they wish to be involved) in the management of indigenous biodiversity. This includes active involvement in giving effect to Te Rito o te Harakeke, in processes including decision making and when making or changing policy statements and plans that relate to indigenous biodiversity.
19. NPS-IB requirements largely fall on territorial authorities (TAs). However, there are significant responsibilities for regional councils. A key feature of the draft NPS-IB is that it requires TAs to identify areas of significant indigenous vegetation or significant habitat of indigenous fauna that qualify as SNAs. The draft NPS-IB sets out principles to

follow in the process of identifying SNAs, as well as the ecological criteria for identifying and mapping them. The aim is to make the identification of SNAs more consistent across New Zealand.

20. The effect and costs of implementing the NPS-IB will be significant on both councils (in relation to implementation requirements) and on resource users (in relation to opportunity costs). Significantly, many types of development within or affecting SNAs will be constrained, as the draft NPS-IB requires that such development “avoid”:
 - a) loss of ecosystem representation and extent
 - b) disruption to sequences, mosaics, or ecosystem function
 - c) fragmentation of SNAs or the or loss of buffers or connections within an SNA
 - d) a reduction in the function of the SNA as a buffer or connection to other important habitats or ecosystems
 - e) a reduction in the population size or occupancy of Threatened or At Risk (Declining) species that use an SNA for any part of their life cycle.
21. The “effects management hierarchy” set out in the NPS-IB must be applied to “*other effects*”. This hierarchy requires consideration of, in descending order of priority, avoidance, minimisation, remediation, biodiversity offsetting then biodiversity compensation.
22. There are some limited exceptions to the requirement to avoid effects, including exemptions relating to nationally and regionally significant infrastructure, Māori land, and development on existing lots within SNAs. In relation to areas used for pastoral farming and plantation forests, the NPS-IB has provisions that allow those uses to continue, even if they are within areas that are identified as SNAs.
23. Local authorities will be required to take steps to maintain indigenous biodiversity outside of SNAs. Specifically, regional policy statements and plans will be required to:
 - a) apply the effects management hierarchy to any adverse effects on indigenous biodiversity of a new subdivision, use, or development that may be irreversible
 - b) provide appropriate controls to manage other adverse effects on indigenous biodiversity of a new subdivision, use and development.
24. Significantly, councils will be required to take active steps to increase indigenous vegetation cover to at least 10% in urban and non-urban area (and consider higher targets for ‘other’ areas).
25. The NPS-IB also contains principles regarding biodiversity offsetting and compensation and requires councils to promote the resilience of indigenous biodiversity to climate change.
26. The NPS-IB also requires regional councils to prepare regional biodiversity strategies in accordance with Appendix 5 of the NPS-IB and in collaboration with TAs, tangata whenua, communities and other identified stakeholders.

The submission

27. In brief, the submission is supportive of the general intent of the NPS-IB. However, if left unchanged, some of the NPS-IB provisions lack certainty and clarity, may result in perverse outcomes, and are likely to result in significant cost shifting to councils. The submission urges the Government to assume a stronger leadership role across the

biodiversity systems that extends beyond just policy development but includes meaningful actions and resourcing to support the implementation of the NPS-IB.

28. A summary of key points made in the draft submission are as follows:

- The submission generally supports the criteria for identifying SNAs. However, requirements for regional councils to assist TAs in undertaking a district-wide assessment are ambiguous and may derogate from the TAs roles and responsibilities. The Council also notes the new definition of SNAs and clause 3.8(5) creates a 'gap' where sites known to meet SNA criteria but are not mapped in a plan are not recognised as an SNA and will be at risk of damage between plan changes
- Support NPS-IB requirements to describe the location of indigenous species that are taonga but questions extending that requirement to mapping or describing the location of "ecosystems" identified as taonga. Comprehensive Government guidance and direction to support the interpretation and application of this part of the NPS-IB is also sought
- Question NPS-IB requirements on councils to survey and map "highly mobile fauna" when the Government should be demonstrating leadership and departments such as DOC are better placed to do such work and provide the nationally consistent approach sought by the Government
- Question the practicalities and policy intent of NPS-IB requirements that councils meet a 10% restoration target for urban and non urban environments for vegetation cover (and consider higher targets for 'other' areas), including conflicting national directions with other policy instruments such as the *National Policy Statement for Urban Development*
- Seek that there is clarification on the definition of a non-urban areas and urban areas and what is to be considered as 'other areas'
- Seek that the Government better support active management and the implementation of the NPS-IB, including the development and improvement of national datasets available to councils that map indigenous biodiversity features required by the NPS-IB. The submission suggests that such datasets could then be made available to councils for them to be adopted and inserted into their plans as appropriate, e.g. similar in concept to the Government's Erosion Susceptibility Classification maps released to support the implementation of the *National Environmental Standards for Plantation Forestry*.

Implementation Plan

29. The submission urges the Government to assume a stronger leadership role across the biodiversity systems that extends beyond just policy development. The submission notes that the NPS-IB will impose significant costs on councils with regards to policy development and implementation. The submission suggests that the implementation plan, in its current form and in relation to the activities and resourcing that underpins the Government's support for NPS-IB, is woeful and represents a dereliction of their national leadership responsibilities.
30. The submission notes that the current draft implementation plan provides no direct or meaningful financial support for councils to meet the significant policy development and operational needs required by the NPS-IB. In particular, the submission notes the significant requirements for regional planning and policy development such as the development and implementation of the regional biodiversity strategies (Clause 3.23),

giving effect to Te Rito o te Harakeke (Clause 3.2), monitoring by regional councils (Clause 3.25) as well as the onerous task of reviewing current planning frameworks to align with the NPS-IB requirements.

31. It is the Council's contention that the implementation of all the NPS-IB requirements will be difficult and costly for all councils, especially in the wider context of other national direction that will need to be implemented over the next three years, e.g. Essential Freshwater Package, Three Waters, resource management reform and local government reform.
32. There will be a considerable capacity and capability shortfall within councils, which will have nation-wide implications for the NPS-IB. This capability and capacity constraint covers all aspects of implementation including, mapping requirements, maintaining schedules and databases, planning and policy development, consent compliance, monitoring and biodiversity and land management officers.
33. The submission notes that current resources allocated to assist councils, as indicated in the draft implementation plan, are likely to be woefully inadequate in meeting the requirements of this NPS-IB which will likely lead to delays in its implementation. The Council consider that this issue will be an ongoing challenge that will need active coordination and sustained and strategic resourcing to overcome.
34. The submission also seeks specific financial support to councils for SNA identification and for the mapping of highly mobile fauna and taonga areas (should the Government continue to devolve its leadership responsibilities to councils).
35. In addition to financial assistance, non-financial investment from the Government will be needed for the overall successful implementation of the NPS-IB objectives. The Council therefore sought that the Government place more emphasis on non-regulatory interventions (i.e. fund a package of support, grants and incentives). The Council notes and is concerned that detailed guidance setting out support and funding will not be developed until late 2023.
36. In conclusion, the submission seeks a stronger and more meaningful implementation plan, which details financial support to offset some of the major costs to the sector of implementing the NPS-IB. The guidance and example of best practice promised by MfE will be critical in the implementation and it is crucial that this not be delayed.

Where to from here?

37. Consultation on the Exposure Draft ended 21 July 2022 with the Government expected to make their final decisions and gazetting the NPS-IB by late 2022.
38. Based upon current proposals, and due to the Council already having a regional biodiversity strategy (*Biodiversity Strategy for the Taranaki Regional Council*), the Council must update or complete the strategy to align with NPS-IB requirements within 10 years after the commencement date of the NPS-IB.
39. Within 5 years after the commencement date of the NPS-IB, local authorities must publically notify any policy statement or plan changes to these necessary to give effect to Subpart 2 of Part 3 (Significant Natural Areas) and clause 3.24 (Information requirements).
40. Local authorities must notify any changes to their policy statements and plans that are necessary to give effect to the NPS-IB within 8 years after the commencement date of the NPS-IB.

Financial considerations—TP/Annual Plan

41. This memorandum and the associated recommendations are consistent with the Council's adopted Long-Term Plan and estimates. Any financial information included in this memorandum has been prepared in accordance with generally accepted accounting practice.

Policy considerations

42. This memorandum and the associated recommendations are consistent with the policy documents and positions adopted by this Council under various legislative frameworks including, but not restricted to, the *Local Government Act 2002*, the *Resource Management Act 1991* and the *Local Government Official Information and Meetings Act 1987*.

Iwi considerations

43. This memorandum and the associated recommendations are consistent with the Council's policy for the development of Māori capacity to contribute to decision-making processes (schedule 10 of the *Local Government Act 2002*) as outlined in the adopted long-term plan and/or annual plan. Similarly, iwi involvement in adopted work programmes has been recognised in the preparation of this memorandum.
44. The Council has taken into account the draft submission prepared by Ngā Kairapu, the Māori special interest group for Te Uru Kahika – the Regional Sector. The Council notes the draft submission is generally consistent with their draft submission.

Community considerations

45. This memorandum and the associated recommendations have considered the views of the community, interested and affected parties and those views have been recognised in the preparation of this memorandum.

Legal considerations

46. This memorandum and the associated recommendations comply with the appropriate statutory requirements imposed upon the Council.

Appendices/Attachments

Document 3079689: National Policy Statement for Indigenous Biodiversity Exposure draft

Document 3085650: National Policy Statement for Indigenous Biodiversity Draft Implementation Plan

Document 3079866: Draft submission on the National Policy Statement for indigenous biodiversity

NOT GOVERNMENT POLICY

NATIONAL POLICY STATEMENT FOR INDIGENOUS BIODIVERSITY

Exposure draft

June 2022



Ministry for the
Environment
Manatū Mō Te Taiao



Department of Conservation
Te Papa Atawhai



Te Kāwanatanga o Aotearoa
New Zealand Government

EXPOSURE DRAFT – NOT GOVERNMENT POLICY

Draft National Policy Statement for Indigenous Biodiversity

Authority

This National Policy Statement was approved by the Governor-General under section 52(2) of the Resource Management Act 1991 on [to come] and is published by the Minister for the Environment under section 54 of that Act.

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Part 1: Preliminary provisions

1.1 Title

(1) This is the National Policy Statement for Indigenous Biodiversity 2021.

1.2 Commencement

(1) This National Policy Statement comes into force on [to come].

1.3 Application

- (1) This National Policy Statement applies to indigenous biodiversity throughout Aotearoa New Zealand, other than indigenous biodiversity in the coastal marine area and aquatic indigenous biodiversity.
- (2) However:
- (a) geothermal ecosystems are covered by this National Policy Statement, whether or not they are or include water bodies (see clause 3.13); and
 - (b) specified highly mobile fauna are covered by this National Policy Statement, whether or not they use the coastal marine area or water bodies for part of their life cycle (see clause 3.20); and
 - (c) provisions relating to restoration extend to include wetlands (see clauses 3.21 and 3.22); and
 - (d) regional biodiversity strategies may extend to include the coastal marine area and water bodies (see clause 3.23).

1.4 Relationship with New Zealand Coastal Policy Statement

- (1) Both the New Zealand Coastal Policy Statement and this National Policy Statement apply in the terrestrial coastal environment.
- (2) If there is a conflict between the provisions of this National Policy Statement and the New Zealand Coastal Policy Statement 2010 (or any later New Zealand Coastal Policy Statement issued under the Act), the New Zealand Coastal Policy Statement prevails.

1.5 Fundamental concepts

- (1) The following are descriptions of terms that cannot adequately be described by a short definition. To give effect to this National Policy Statement it is important to understand these concepts fully.

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(2) **Te Rito o te Harakeke**

Hutia te rito o te harakeke Kei
hea te kōmako, e kō?
Kī mai ki ahau
He aha te mea nui o te ao?
Māku e kī atu
he tangata, he tangata, he tangata

When the centre of the flax bush is picked Where
will the bellbird sing?
You ask me
What is the greatest thing in the world?
My reply is
It is people, it is people, it is people.

Te Rito o te Harakeke is a concept that refers to the need to maintain the integrity of indigenous biodiversity. It recognises the intrinsic value and mauri of indigenous biodiversity as well as people's connections and relationships with it.

It recognises that our health and wellbeing are dependent on the health and wellbeing of indigenous biodiversity and that in return we have a responsibility to care for it. It acknowledges the web of interconnectedness between indigenous species, ecosystems, the wider environment, and the community.

Te Rito o te Harakeke comprises six essential elements to guide tangata whenua and local authorities in managing indigenous biodiversity and developing objectives, policies, and methods for giving effect to Te Rito o te Harakeke:

- (a) the intrinsic value and mauri of indigenous biodiversity:
- (b) the bond between people and indigenous biodiversity through whakapapa (familial) relationships and mutual interdependence:
- (c) the responsibility of care that tangata whenua have as kaitiaki, and that other New Zealanders have as stewards, of indigenous biodiversity:
- (d) the connectivity between indigenous biodiversity and the wider environment:
- (e) the incorporation of te ao Māori and mātauranga Māori:
- (f) the requirement for engagement with tangata whenua.

(3) **Maintenance of indigenous biodiversity**

The maintenance of indigenous biodiversity requires at least no reduction, as from the commencement date, in the following:

- (a) the size of populations of indigenous species:

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- (b) indigenous species occupancy across their natural range:
- (c) the properties and function of ecosystems and habitats:
- (d) the full range and extent of ecosystems and habitats:
- (e) connectivity between, and buffering around, ecosystems:
- (f) the resilience and adaptability of ecosystems.

(4) **Effects management hierarchy**

The effects management hierarchy is an approach to managing the adverse effects of an activity. It requires that:

- (a) adverse effects are avoided where practicable; and
- (b) where adverse effects cannot be demonstrably avoided, they are minimised where practicable; and
- (c) where adverse effects cannot be demonstrably minimised, they are remedied where practicable; and
- (d) where more than minor residual adverse effects cannot be demonstrably avoided, minimised, or remedied, biodiversity offsetting is provided where possible; and
- (e) where biodiversity offsetting of more than minor residual adverse effects is not demonstrably possible, biodiversity compensation is provided; and
- (f) if biodiversity compensation is not appropriate, the activity itself is avoided.

The terms 'biodiversity offset' and 'biodiversity compensation' are defined in clause 1.6, and the principles for their application are in Appendices 3 and 4.

1.6 Interpretation

(1) In this National Policy Statement:

Act means the Resource Management Act 1991

acknowledged taonga means indigenous species, populations, or ecosystems that are identified as taonga by tangata whenua under clause 3.19

biodiversity compensation means a conservation outcome that complies with the principles in Appendix 4 and results from actions that are intended to compensate for any more than minor residual adverse effects on indigenous biodiversity after all appropriate avoidance, minimisation, remediation, and biodiversity offset measures have been sequentially applied

biodiversity offset means a measurable conservation outcome that complies with the principles in Appendix 3 and results from actions that:

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- (a) redress any more than minor residual adverse effects on indigenous biodiversity after all appropriate avoidance, minimisation, and remediation measures have been sequentially applied; and
- (b) achieve a measurable net gain in type, amount, and condition (structure and quality) of indigenous biodiversity compared to that lost

buffer refers to a defined space between core areas of ecological value and the wider landscape that helps to reduce external pressures; and **buffering** has a corresponding meaning

commencement date means the date on which this National Policy Statement comes into force

connectivity refers to the structural or functional links or connections between habitats and ecosystems that provide for the movement of species and processes among and between the habitats or ecosystems **ecological district** means:

- (a) in relation to geothermal ecosystems in the Taupō Volcanic Zone, the Taupō Volcanic Zone; and
- (b) for all other areas, the ecological districts as shown in McEwen, W Mary (ed), 1987. *Ecological regions and districts of New Zealand*. Wellington: Department of Conservation

ecological integrity means the extent to which an ecosystem is able to support and maintain its:

- (a) composition (being its natural diversity of indigenous species, habitats, and communities); and
- (b) structure (being its biotic and abiotic physical features); and (c) functions (being its ecological and physical processes)

ecosystem means the complexes of organisms and their associated physical environment within an area (and comprise: a biotic complex, an abiotic environment or complex, the interactions between the biotic and abiotic complexes, and a physical space in which these operate)

ecosystem functions are the abiotic (physical) and biotic (ecological and biological) flows that are properties of an ecosystem **ecosystem services** are the benefits obtained from ecosystems such as:

- (a) supporting services (eg, nutrient cycling, soil formation, habitat creation):
- (b) provisioning services (eg, food, freshwater, wood, fibre, fuel):
- (c) regulating services (eg, water purification, climate regulation, flood regulation, disease regulation):

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(d) cultural services (eg, aesthetic, spiritual, educational, recreational) **effects management hierarchy** has the meaning in clause 1.5(4) **existing activity** means a subdivision, use or development that is:

- (a) lawfully established at the commencement date; but
- (b) not a land use covered by section 10 of the Act

fragmentation, in relation to indigenous biodiversity, refers to the fragmentation of habitat that results in a loss of connectivity and an altered spatial configuration of habitat for a given amount of habitat loss

functional need means the need for a proposed activity to traverse, locate or operate in a particular environment because the activity can only occur in that environment

geothermal ecosystem means a dynamic life-supporting system made up of a group of living organisms that are adapted to, and reliant on, geothermal resources **geothermal SNA** means an SNA that includes one or more geothermal ecosystems **geothermal system** means a system, defined by scientific investigation, that:

- (a) comprises:
 - (i) geothermal energy, stored as water or steam; and
 - (ii) the rocks confining it; and
 - (iii) associated water, steam, and gas emissions; and
 - (iv) the geothermal surface features resulting from those emissions; and (b) is believed to have no hydrological connection to another system

habitat means the area or environment where an organism or ecological community lives or occurs naturally for some or all of its life cycle, or as part of its seasonal feeding or breeding pattern

Te Rito o te Harakeke has the meaning given in clause 1.5(2)

identified taonga means acknowledged taonga that are identified in a district plan (as provided for in clause 3.19)

indigenous biodiversity means the living organisms that occur naturally in New Zealand, and the ecological complexes of which they are part, including all forms of indigenous flora, fauna, and fungi, and their habitats

indigenous vegetation means vascular and non-vascular plants that, in relation to a particular area, are native to the ecological district in which that area is located

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highly mobile fauna area means an area outside an SNA that is identified under clause 3.20 as an area used by specified highly mobile fauna

land environment means a land environment identified in the *Land Environments of New Zealand (LENZ) Classification System* (Leathwick et al., 2003, as maintained by Manaaki Whenua Landcare Research) **maintenance**, in relation to indigenous biodiversity, has the meaning in clause 1.5(3)

Māori lands means land that is any of the following:

- (a) Māori customary land and Māori freehold land (as defined in Te Ture Whenua Māori Act 1993):
- (b) any Māori reservation established under Te Ture Whenua Māori Act 1993 or its predecessors:
- (c) Treaty settlement land:
- (d) former Māori land or general land (as defined in Te Ture Whenua Māori Act 1993) owned by Māori that has at any time been acquired by the Crown or any local or public body for a public work or other public purpose, and has been subsequently returned to its former Māori owners or their successors and remains in their ownership:
- (e) general land (as defined in Te Ture Whenua Māori Act 1993) owned by Māori that was previously Māori freehold land, has ceased to have that status under an order of the Māori Land Court made on or after 1 July 1993 or under Part 1 of the Māori Affairs Amendment Act 1967, but remains in the ownership of the same whānau or hapū:
- (f) land held by or on behalf of an iwi or a hapū if the land was transferred from the Crown, a Crown body, or a local authority with the intention of returning the land to the holders of mana whenua over the land

mātauranga Māori means Māori customary knowledge, traditional knowledge, or intergenerational knowledge

mosaic means a pattern of two or more interspersed ecosystems, communities or habitats that contribute to the cumulative value of ecosystems in a landscape

natural range, in relation to a species, refers to the geographical area within which that species can be expected to be found naturally (without human intervention)

new subdivision, use, or development means a subdivision, use, or development that is not an existing activity nor an activity captured by section 10 of the Act

operational need means the need for a proposal or activity to traverse, locate or operate in a particular environment because of technical, logistical, or operational characteristics or constraints

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plantation forest has the meaning in the Resource Management (National Environmental Standards for Plantation Forestry) Regulations 2017

policy statements and plans includes regional policy statements and proposed regional policy statements, and regional plans, district plans, and proposed plans

public conservation land means land within the boundaries of any area of land held or managed under the [Conservation Act 1987](#) or any other Act specified in [Schedule 1](#) of that Act (other than land held for administrative purposes)

publish, in relation to an obligation on a local authority to publish material, means to make the material freely available to the public on the local authority's internet website or another webbased platform

reconstruction means reintroducing and maintaining appropriate biota to recreate an ecosystem that would not regenerate or recolonise even with best practice restoration interventions

resilience, in relation to an ecosystem, means the ability of the ecosystem to recover from and absorb disturbances, and its capacity to reorganise into similar ecosystems

restoration means the active intervention and management of modified or degraded habitats, ecosystems, landforms, and landscapes in order to maintain or reinstate indigenous natural character, ecological and physical processes, and cultural and visual qualities, and may include enhancement activities

sequence means a series of ecosystems or communities, often physically connected, that replace one another through space

SNA, or **significant natural area**, means:

(a) any area that, on the commencement date, is identified in a policy statement or plan as an area of significant indigenous vegetation or significant habitat of indigenous fauna (regardless of how it is described); and

(b) any area that, after the commencement date, is notified or included in a district plan as an SNA following an assessment of the area in accordance with Appendix 1 **species** includes

taxa **specific infrastructure** means any of the following:

(a) infrastructure that delivers a service operated by a lifeline utility (as defined in the Civil Defence Emergency Management Act 2002):

(b) regionally significant infrastructure that is identified as such in a regional policy statement or regional plan:

(c) any public flood control, flood protection, or drainage works carried out:

(i) by or on behalf of a local authority, including works carried out for the purposes set out in section 133 of the Soil Conservation and Rivers Control Act 1941; or

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(ii) for the purpose of drainage, by drainage districts under the Land Drainage Act 1908:

(d) defence facilities operated by the New Zealand Defence Force to meet its obligations under the Defence Act 1990

specified highly mobile fauna means the Threatened or At Risk species of highly mobile fauna that are identified in Appendix 2

terrestrial environment means land and associated natural and physical resources above mean high-water springs, excluding land covered by water, water bodies and freshwater ecosystems (as those terms are used in the National Policy Statement for Freshwater Management 2019) and the coastal marine area

Treaty settlement land means land held by a post-settlement governance entity (as defined in the Urban Development Act 2020) where the land was transferred or vested and held (including land held in the name of a person such as a tipuna of the claimant group, rather than the entity itself):

(a) as part of redress for the settlement of Treaty of Waitangi claims; or

(b) by the exercise of rights under a Treaty settlement Act or Treaty settlement deed

Threatened, At Risk, and At Risk (Declining) have, at any time, the meanings given in the *New Zealand Threat Classification System Manual* (Andrew J Townsend, Peter J de Lange, Clinton A J Duffy, Colin Miskelly, Janice Molloy and David A Norton, 2008, Science & Technical Publishing, Department of Conservation, Wellington), available at: <https://www.doc.govt.nz/globalassets/documents/science-and-technical/sap244.pdf>, or its current successor publication.

urban environment has the meaning in clause 1.4 of the National Policy Statement on Urban Development 2020.

(2) Terms defined in the Act and used in this National Policy Statement have the meanings in the Act, except as otherwise specified.

1.7 Incorporation by reference

(1) Clause 2(1) of Schedule 1AA of the Act does not apply to any material incorporated by reference in this National Policy statement.

(2) All material incorporated by reference in this National Policy Statement is available at [to come].

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Part 2: Objective and policies

2.1 Objective

(1) The objective of this National Policy Statement is to protect, maintain, and restore indigenous biodiversity in a way that:

- (a) recognises tangata whenua as kaitiaki, and people and communities as stewards, of indigenous biodiversity; and
- (b) provides for the social, economic, and cultural wellbeing of people and communities now and in the future.

2.2 Policies

Policy 1: Indigenous biodiversity is managed in a way that gives effect to Te Rito o te Harakeke.

Policy 2: Tangata whenua are recognised as kaitiaki, and enabled to exercise kaitiakitanga for indigenous biodiversity in their rohe, including through:

- (a) enabling tangata whenua to manage indigenous biodiversity on their land; and
- (b) the identification and protection of indigenous species, populations and ecosystems that are taonga.

Policy 3: A precautionary approach is adopted when considering adverse effects on indigenous biodiversity.

Policy 4: Indigenous biodiversity is resilient to the effects of climate change.

Policy 5: Indigenous biodiversity is managed in an integrated way, within and across administrative boundaries.

Policy 6: Significant indigenous vegetation and significant habitats of indigenous fauna are identified as significant natural areas (SNAs) using a consistent approach.

Policy 7: SNAs are protected by avoiding and managing adverse effects from new subdivision, use and development.

Policy 8: The importance of maintaining indigenous biodiversity outside SNAs is recognised and provided for.

Policy 9: Certain existing activities are provided for within and outside SNAs.

Policy 10: Activities that contribute to New Zealand's social, economic, cultural, and environmental well-being are recognised and provided for.

Policy 11: Geothermal SNAs are protected at a level that reflects their vulnerability, or in accordance with any pre-existing underlying geothermal system classification.

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Policy 12: Indigenous biodiversity is managed within plantation forestry.

Policy 13: Restoration of indigenous biodiversity is promoted and provided for.

Policy 14: Increased indigenous vegetation cover is promoted in both urban and non-urban environments.

Policy 15: Areas outside SNAs that support specified highly mobile fauna are identified and managed to maintain their populations across their natural range, and information and awareness of specified highly mobile fauna is improved.

Policy 16: Regional biodiversity strategies are developed and implemented to maintain and restore indigenous biodiversity at a landscape scale.

Policy 17: There is improved information and regular monitoring of indigenous biodiversity.

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Part 3: Implementation

3.1 Overview of Part

- (1) This Part sets out a non-exhaustive list of things that local authorities must do to give effect to the Objective and Policies in Part 2 of this National Policy Statement, but nothing in this Part limits the general obligation under the Act to give effect to that Objective and those Policies.
- (2) Nothing in this Part limits a local authority's functions and duties under the Act in relation to indigenous biodiversity.
- (3) In this Part:
 - (a) Subpart 1 sets out general approaches to implementing this National Policy Statement, and in particular how to give effect to Te Rito o te Harakeke:
 - (b) Subpart 2 sets out provisions relating to the identification of SNAs, the management of adverse effects on SNAs, and the general management of indigenous biodiversity outside SNAs:
 - (c) Subpart 3 sets out additional specific requirements relating to indigenous biodiversity.

Subpart 1 – Approaches to implementing this National Policy Statement

3.2 Te Rito o te Harakeke

- (1) Local authorities must engage with communities and tangata whenua to determine how to give effect to Te Rito o te Harakeke and its six essential elements in their regions and districts.
- (2) Giving effect to Te Rito o te Harakeke requires, at a minimum, that local authorities:
 - (a) recognise and provide for:
 - (i) te hauora o te koiora (the health of indigenous biodiversity); and
 - (ii) te hauora o te taonga (the health of taonga); and
 - (iii) te hauora o te taiao (the health of the wider environment); and
 - (iv) the interrelationships between those three hauora and te hauora o te tangata (the health of the people); and
 - (b) recognise that the protection, maintenance, and restoration of indigenous biodiversity requires:
 - (i) kaitiakitanga (including as provided for in clause 3.3) and stewardship; and

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- (ii) identifying the local approach to giving effect to Te Rito o te Harakeke; and
- (iii) adopting an integrated approach ki uta ki tai (as provided for in clause 3.4); and
- (c) taking steps to ensure that indigenous biodiversity is maintained and restored for the health, enjoyment and use by all New Zealanders, now and in the future.

3.3 Tangata whenua as kaitiaki

- (1) Every local authority must actively involve tangata whenua (to the extent they wish to be involved) in the management of indigenous biodiversity, and in particular:
 - (a) when identifying the local approach to giving effect to Te Rito o te Harakeke; and
 - (b) in the processes (including decision-making processes) for managing the implementation of this National Policy Statement; and
 - (c) when making or changing policy statements and plans that relate to indigenous biodiversity.
- (2) When involving tangata whenua as required by subclause (1), and particularly when making or changing objectives, policies, or methods to give effect to this National Policy Statement, local authorities must:
 - (a) ensure that consultation with tangata whenua:
 - (i) is early, meaningful and, as far as practicable, in accordance with tikanga Māori; and
 - (ii) has regard to the different levels of whānau, hapū, and iwi decision-making structures; and
 - (b) recognise and value the role of tangata whenua as kaitiaki of indigenous biodiversity; and
 - (c) provide specific opportunities for the exercise of kaitiaki, such as, for example, by bringing cultural understanding to monitoring; and
 - (d) allow for the sustainable customary use of indigenous biodiversity in accordance with tikanga.
- (3) Local authorities must work with tangata whenua to investigate the use of mechanisms available under the Act to involve tangata whenua in the management of, and decision-making about, indigenous biodiversity, such as:
 - (a) transfers or delegations of power under section 33 of the Act:
 - (b) joint management agreements under section 36B of the Act:
 - (c) mana whakahono a rohe (iwi participation arrangements) under subpart 2 of Part 5 of the Act.

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- (4) When a local authority considers the use of mechanisms to involve tangata whenua in the management of indigenous biodiversity the local authority must:
 - (a) record the matters considered and the reasons for any decisions reached, or for not making a decision; and
 - (b) publish those matters and reasons as soon as practicable, unless publication would be contrary to any legal obligation.
- (5) Local authorities must, with the consent of tangata whenua and as far as practicable in accordance with tikanga Māori, take all reasonable steps to incorporate mātauranga Māori relating to indigenous biodiversity when implementing this National Policy Statement.
- (6) Local authorities must develop processes for managing information provided by tangata whenua (including providing for how it may remain confidential if required by tangata whenua), particularly in relation to the identification and management of species, populations, and ecosystems as taonga (in accordance with clause 3.19).

3.4 Integrated approach

- (1) Local authorities must manage indigenous biodiversity and the effects on it from subdivision, use and development in an integrated way, which means:
 - (a) recognising the interactions ki uta ki tai (from the mountains to the sea) between the terrestrial environment, freshwater, and the coastal marine area; and
 - (b) providing for the coordinated management and control of subdivision, use and development, as it affects indigenous biodiversity across administrative boundaries; and
 - (c) considering the requirements of strategies and other planning tools required or provided for in legislation and relevant to indigenous biodiversity.

3.5 Social, economic, and cultural wellbeing

- (1) Local authorities must consider:
 - (a) that the protection, maintenance, and restoration of indigenous biodiversity contributes to the social, economic, and cultural wellbeing of people and communities; and
 - (b) that the protection, maintenance, and restoration of indigenous biodiversity does not preclude subdivision, use and development in appropriate places and forms; and
 - (c) that people and communities are critical to protecting, maintaining, and restoring indigenous biodiversity; and
 - (d) the importance of forming partnerships in protecting, maintaining, and restoring indigenous biodiversity; and

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- (e) the importance of respecting and fostering the contribution of tangata whenua as kaitiaki and of people and communities, particularly landowners, as stewards of indigenous biodiversity; and
- (f) the value of supporting people and communities in understanding, connecting to, and enjoying indigenous biodiversity.

3.6 Resilience to climate change

- (1) Local authorities must promote the resilience of indigenous biodiversity to climate change, including at least by:
- (a) providing for the maintenance of ecological integrity through natural adjustments of habitats and ecosystems; and
 - (b) considering the effects of climate change when making decisions on:
 - (i) restoration proposals; and
 - (ii) managing and reducing new and existing biosecurity risks; and
 - (c) maintaining and promoting the enhancement of the connectivity between ecosystems, and between existing and potential habitats, to enable migrations so that species can continue to find viable niches as the climate changes.

3.7 Precautionary approach

- (1) Local authorities must adopt a precautionary approach toward proposed activities where: (a) the effects on indigenous biodiversity are uncertain, unknown, or little understood; but (b) those effects are potentially significantly adverse.

Subpart 2 – Significant natural areas

3.8 Assessing areas that qualify as significant natural areas

- (1) Every territorial authority must undertake a district-wide assessment of the land in its district to identify areas of significant indigenous vegetation or significant habitat of indigenous fauna that qualify as SNAs.
- (2) The assessment must be done using the assessment criteria in Appendix 1 and in accordance with the following principles:
- (a) **partnership:** territorial authorities seek to engage with tangata whenua and landowners early, and must share information about indigenous biodiversity, potential management options, and any support and incentives that may be available:

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- (b) **transparency:** territorial authorities clearly inform tangata whenua and landowners about how information gathered will be used and make existing information, draft assessments and other relevant information available to tangata whenua and relevant landowners for review:
 - (c) **quality:** wherever practicable, the values and extent of natural areas are verified by physical inspection:
 - (d) **access:** if a physical inspection is required, permission of the landowner is first sought and the powers of entry under section 333 of the Act are used only as a last resort:
 - (e) **consistency:** the criteria in Appendix 1 are applied consistently, regardless of who owns the land:
 - (f) **boundaries:** the boundaries of areas of significant indigenous vegetation or significant habitat of indigenous fauna are determined without regard to artificial margins (such as property boundaries) that would affect the extent or ecological integrity of the area identified.
- (3) If requested by a territorial authority, the relevant regional council must assist the territorial authority in undertaking its district-wide assessment.
 - (4) A territorial authority need not comply with subclause (1) in respect of any SNA referred to in paragraph (a) of the definition of SNA (ie, an area already identified as an SNA at the commencement date) if, within 4 years after the commencement date, a suitably qualified ecologist confirms that, and how, the area qualifies as an SNA under the criteria in Appendix 1.
 - (5) If a territorial authority becomes aware (as a result of a resource consent application, notice of requirement or any other means) that an area may be an area of significant indigenous vegetation or significant habitat of indigenous fauna that qualifies as an SNA, the territorial authority must:
 - (a) conduct an assessment of the area in accordance with subclause (2) as soon as practicable; and
 - (b) if a new SNA is identified as a result, include it in the next plan or plan change notified by the territorial authority.
 - (6) If a suitably qualified ecologist confirms that an area that qualifies as an SNA comprises or contains a geothermal ecosystem, the SNA is a geothermal SNA.

3.9 Identifying SNAs in district plans

- (1) A territorial authority must notify any plan or plan change to include each area in its district that is identified as qualifying as an SNA.
- (2) The notified plan or plan change must include:
 - (a) the location of the SNA and a description of its attributes; and

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- (b) a map of the area; and
 - (c) specify whether the SNA is a geothermal SNA.
- (3) When a territorial authority does its 10-yearly plan review, it must assess its district in accordance with clause 3.8 (1) and (2) to determine whether changes are needed.

3.10 Managing adverse effects on SNAs of new subdivision, use, and development

- (1) This clause applies to all SNAs, except as provided in clause 3.11.
- (2) Local authorities must make or change their policy statements and plans to include objectives, policies, and methods that require that the following adverse effects on SNAs of any new subdivision, use, or development are avoided:
- (a) loss of ecosystem representation and extent:
 - (b) disruption to sequences, mosaics, or ecosystem function:
 - (c) fragmentation of SNAs or the or loss of buffers or connections within an SNA:
 - (d) a reduction in the function of the SNA as a buffer or connection to other important habitats or ecosystems:
 - (e) a reduction in the population size or occupancy of Threatened, At Risk (Declining) species that use an SNA for any part of their life cycle.
- (3) Local authorities must make or change their policy statements and plans to require that all adverse effects on SNAs of new subdivision, use, or development, other than the adverse effects identified in subclause (2), must be managed by applying the effects management hierarchy.
- (4) Every local authority must make or change its plan to ensure that, where adverse effects on an SNA are required to be managed by applying the effects management hierarchy, an application is not granted unless:
- (a) the decision-maker is satisfied that the applicant has demonstrated how each step of the effects management hierarchy will be applied; and
 - (b) any consent is granted subject to conditions that apply the effects management hierarchy.

3.11 Exceptions to clause 3.10

- (1) Clause 3.10 does not apply to the following, and adverse effects on SNAs of new subdivision, use, and development are managed instead as required by the clause indicated:
- (a) SNAs on Māori Lands (see clause 3.18):

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- (b) geothermal SNAs (see clause 3.13):
 - (c) SNAs within a plantation forest (see clause 3.14).
- (2) Clause 3.10(2) does not apply, and all adverse effects on an SNA must be managed instead in accordance with clause 3.10(3) and (4):
- (a) if a new use or development is required for the purposes of any of the following;
 - (i) specific infrastructure that provides significant national or regional public benefit; or
 - (ii) mineral extraction that provides significant national public benefit that could not otherwise be achieved domestically; or
 - (iii) aggregate extraction that provides significant national or regional public benefit that could not otherwise be achieved domestically; and
 - (b) there is a functional or operational need for the new use or development to be in that particular location; and
 - (c) there are no practicable alternative locations for the new use, or development.
- (3) Clause 3.10(2) does not apply, and all adverse effects on an SNA must be managed instead in accordance with clause 3.10(3) and (4), if:
- (a) a new use or development is associated with a single dwelling on an allotment created before the commencement date; and
 - (b) there is no location within the existing allotment where a single residential dwelling and essential associated on-site infrastructure can be constructed in a manner that avoids the adverse effects specified in clause 3.10(2).
- (4) Clause 3.10(2) does not apply to an SNA, and all adverse effects on the SNA must be managed instead in accordance with clause 3.10(3) and (4), or any other appropriate management approach, if:
- (a) the use or development is for the purpose of maintaining or restoring an SNA (provided it does not involve the permanent destruction of significant habitat of indigenous biodiversity); or
 - (b) the use or development:
 - (i) is in an area of indigenous vegetation or habitat of indigenous fauna (other than an area managed under the Forests Act 1949) that was established and is managed primarily for a purpose other than the maintenance or restoration of indigenous biodiversity; and
 - (ii) the losses are necessary to meet that purpose.
- (5) Clause 3.10 does not apply to adverse effects on an SNA:

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- (a) from any use or development required to address a very high risk to public health or safety; or
- (b) if the SNA is solely because of the presence of a kānuka or manuka species that is threatened exclusively on the basis of myrtle rust; or
- (c) from the sustainable customary use of indigenous biodiversity conducted in accordance with tikanga; or
- (d) from work or activity of the Crown on public conservation land, provided that the work or activity:
 - (i) is undertaken in a way that is consistent with any applicable conservation management strategy, conservation management plan, or management plan established under the Conservation Act 1987 or any other Act specified in Schedule 1 of that Act; and
 - (ii) does not have a significant adverse effect beyond the boundary of the public conservation land.
- (e) from work within Te Urewera of Te Urewera Board, the chief executive of Tūhoe Te Uru Taumatua, or the Director-General of Conservation, provided that the work:
 - (i) is for the purpose of managing Te Urewera under the Te Urewera Act 2014 and is consistent with the Te Urewera Act and the management plan under that Act; and
 - (ii) does not have a significant adverse effect on the environment beyond the boundary of Te Urewera.

3.12 SNAs on Māori lands

- (1) SNAs on Māori Lands must be managed in accordance with clause 3.18, except that: (a) geothermal SNAs on Māori lands must be managed in accordance with clause 3.13; and (b) SNAs within plantation forests must be managed in accordance with clause 3.14.

3.13 Geothermal SNAs

- (1) Every local authority that has a geothermal SNA in its region or district must work with tangata whenua to make or change its policy statements and plans to include objectives, policies, and methods that, in relation to any new subdivision, use, and development:
- (a) provide a level of protection of the geothermal SNA:
 - (i) that:
 - (A) reflects the vulnerability of the geothermal SNA to use or development; or

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- (B) in the case of a local authority that has (at the commencement date) classified its geothermal systems, is consistent with the geothermal system classification in which the geothermal SNA is located; and
 - (ii) that has regard to the practicability of applying the approach in clause 3.10(2) and (3) to the geothermal SNA; and
 - (iii) that, in the case of a geothermal SNA on Māori lands, provides for new occupation, use, and development that enables tangata whenua to use and develop geothermal resources in a manner consistent with the vulnerability of the geothermal SNA to use or development, or consistent with the geothermal system classification in which the geothermal SNA is located (as applicable), and in accordance with tikanga; and
- (b) require the decision-maker on any resource consent application to:
- (i) have particular regard to the adverse effects described in clause 3.10(2) when managing adverse effects on the geothermal SNAs; and
 - (ii) consider any practicable measures for the restoration of the geothermal SNAs.
- (2) Any assessment of the vulnerability of a geothermal SNA must be undertaken by a suitably qualified expert.
- (3) Local authorities must publish:
- (a) the basis on which the objectives, policies, and methods relating to the management of each geothermal SNA was decided; and
 - (b) the nature and extent of involvement of tangata whenua in developing those objectives, policies, and methods.
- (4) In relation to a geothermal SNA, this clause prevails over any other provision of this National Policy Statement that might apply to the SNA, other than clause 3.15 (about existing activities), which applies to geothermal SNAs in the same way as it applies to other SNAs.

3.14 Plantation forests with SNAs

- (1) An SNA that is within a plantation forest must be managed over the course of consecutive rotations of production in the manner necessary to maintain the long-term populations of any Threatened or At Risk species in the SNA.
- (2) Local authorities must make or change their policy statements and plans to include objectives, policies, and methods to give effect to the requirements of subclause (1).

3.15 Existing activities affecting SNAs

- (1) Regional councils must identify in their policy statements the existing activities, or types of existing activities, that this clause applies to.

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- (2) Local authorities must make or change their plans to ensure that the existing activities identified in relevant regional policy statements may continue as long as the effects on any SNA (including cumulative effects):
 - (a) are no greater in intensity, scale, or character over time than at the commencement date; and
 - (b) do not result in the loss of extent or degradation of ecological integrity of the SNA.
- (3) If an existing activity does not meet the conditions described in subclause (2), the adverse effects of the activity on the relevant SNA must be managed in accordance with clause 3.10.

3.16 Maintaining indigenous biodiversity outside SNAs

- (1) This clause applies to all areas outside SNAs, other than Māori lands (because clause 3.18 applies instead).
- (2) Local authorities must take steps to maintain indigenous biodiversity in areas to which this clause applies, including by making or changing their policy statements and plans to:
 - (a) apply the effects management hierarchy to any adverse effects on indigenous biodiversity of a new subdivision, use, or development that may be irreversible; and
 - (b) providing appropriate controls to manage other adverse effects on indigenous biodiversity of a new subdivision, use and development.

3.17 Maintenance of improved pasture

- (1) This clause applies to the maintenance of improved pasture where it may affect an SNA.
- (2) Local authorities must allow the maintenance of improved pasture to continue if:
 - (a) there is adequate evidence to demonstrate that the maintenance of improved pasture is part of a regular cycle of periodic maintenance of that pasture; and
 - (b) any adverse effects of the maintenance of improved pasture on an SNA are no greater in intensity, scale, or character than the effects of activities previously undertaken as part of the regular cycle of periodic maintenance of that pasture; and
 - (c) the improved pasture has not itself become an SNA; and
 - (d) the land is not a depositional landform that has not been cultivated; and
 - (e) the maintenance of improved pasture will not adversely affect a Threatened or At Risk (Declining) species.
- (3) In this clause:

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maintenance of improved pasture includes the removal of indigenous vegetation for the purpose of maintaining the improved pasture, whether the removal is by way of cutting, crushing, applying chemicals, draining, burning, cultivating, over-planting, applying seed of exotic pasture species, mob stocking, or making changes to soils, hydrology, or landforms

depositional landform means a landform that is alluvial (matter deposited by water, eg, fans, river flats, and terraces), colluvial (matter deposited by gravity at the base of hillslopes, eg, talus), or glacial (matter deposited by glaciers, eg, moraines and outwash)

improved pasture means an area of land where exotic pasture species have been deliberately sown or maintained for the purpose of pasture production, and species composition and growth has been modified and is being managed for livestock grazing.

Subpart 3 – Specific requirements

3.18 Māori lands

- (1) Local authorities must work in partnership with tangata whenua and Māori landowners to develop, and include in policy statements and plans, objectives, policies, and methods that, to the extent practicable:
 - (a) maintain and restore indigenous biodiversity on Māori lands; and
 - (b) protect SNAs and identified taonga on Māori lands.
- (2) Objectives, policies, and methods developed under this clause must, to the extent practicable:
 - (a) enable new occupation, use, and development of Māori lands to support the social, cultural, and economic wellbeing of tangata whenua; and
 - (b) enable the provision of new papakāinga, marae and ancillary community facilities, dwellings, and associated infrastructure; and
 - (c) apply or allow alternative approaches to, or locations for, new occupation, use, and development that avoid, minimise, or remedy adverse effects on SNAs and identified taonga on Māori lands, and apply options for offsetting and compensation; and
 - (d) recognise and be responsive to the fact that there may be no or limited alternative locations for tangata whenua to occupy, use, and develop their lands.
- (3) The decision-maker on any resource consent application must, when considering matters affecting Māori lands, take into account all the matters in subclause (2).
- (4) Subclauses (2) and (3) do not apply to Māori lands to the extent that the land is set aside under legislation for full or partial legal protection for the purpose of protecting indigenous biodiversity on that land. 'Legal protection' includes covenants and land status such as are available under the Reserves Act, Conservation Act, National Parks Act (or equivalent)'.

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- (5) Local authorities must consider and realise opportunities to provide incentives for the protection and maintenance of indigenous biodiversity, and the protection of SNAs and identified taonga, on Māori lands.

3.19 Identified taonga

- (1) Every territorial authority must work together with tangata whenua (using an agreed process) to determine the indigenous species, populations, and ecosystems in the district that are taonga; and these are acknowledged taonga.
- (2) Local authorities must recognise that tangata whenua have the right not to determine the indigenous species, populations and ecosystems that are taonga, and to choose the level of detail at which any acknowledged taonga, or their location or values, are described.
- (3) If tangata whenua agree, territorial authorities must identify acknowledged taonga in their district plans by:
 - (a) describing the taonga and, to the extent agreed by tangata whenua, mapping their location and describing their values; and
 - (b) describing, to the extent agreed by tangata whenua, the historical, cultural, and spiritual relationship of tangata whenua with the taonga.
- (4) Local authorities must work together with tangata whenua to protect both acknowledged and identified taonga as far as practicable and involve tangata whenua (to the extent that they wish to be involved) in the management of identified taonga.
- (5) In managing effects on identified taonga, local authorities must recognise that the possible adverse effects on identified taonga include effects on:
 - (a) the mauri of the taonga:
 - (b) the values of the taonga as identified by tangata whenua:
 - (c) the historical, cultural, and spiritual relationship of tangata whenua with the taonga, as identified by tangata whenua.
- (6) Local authorities must make or change their policy statements and plans as necessary to ensure that the sustainable customary use of identified taonga by tangata whenua in accordance with tikanga and in a manner consistent with the protection of the identified taonga is provided for.
- (7) To avoid doubt, no species, population, or ecosystem in the coastal marine area, and no aquatic species or population in water bodies, can be determined to be taonga under this clause (see clause 1.3).

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3.20 Specified highly mobile fauna

- (1) Every regional council must record areas outside SNAs that are highly mobile fauna areas, by working together with tangata whenua (in the manner required by clause 3.3), territorial authorities in its region, and the Department of Conservation.
- (2) If it will help manage specified highly mobile fauna, regional councils must include in their regional policy statements (where possible) a map and description of each highly mobile fauna area in its region.
- (3) Local authorities must include objectives, policies, or methods in their policy statements and plans for managing the adverse effects of new subdivision, use, and development on highly mobile fauna areas, in order to maintain viable populations of specified highly mobile fauna across their natural range.
- (4) Local authorities must provide information to their communities about:
 - (a) specified highly mobile fauna and their habitats; and
 - (b) best practice techniques for managing adverse effects on any specified highly mobile fauna and their habitats in their regions and districts.

3.21 Restoration

- (1) Local authorities must include objectives, policies, and methods in their policy statements and plans to promote the restoration of indigenous biodiversity, including through reconstruction of areas.
- (2) The objectives, policies, and methods must prioritise all the following for restoration:
 - (a) SNAs whose ecological integrity is degraded:
 - (b) threatened and rare ecosystems representative of naturally occurring and formerly present ecosystems:
 - (c) areas that provide important connectivity or buffering functions:
 - (d) wetlands whose ecological integrity is degraded or that no longer retain their indigenous vegetation or habitat for indigenous fauna:
 - (e) any national priorities for indigenous biodiversity protection.
- (3) Local authorities must consider providing incentives for restoration in priority areas referred to in subclause (2), and in particular where those areas are on Māori lands, in recognition of the opportunity cost of maintaining indigenous biodiversity on that land.
- (4) Local authorities must consider imposing or reviewing restoration or enhancement conditions on resource consents and designations relating to activities in areas prioritised for restoration.

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3.22 Increasing indigenous vegetation cover

- (1) Every regional council must assess the percentage of indigenous vegetation cover in: (a) each of its urban environments; and
(b) its non-urban environments.
- (2) The assessment may be done by a desktop analysis, by ground truthing, or both, and must be done in collaboration with relevant territorial authorities.
- (3) Regional councils must:
 - (a) set a target of at least 10% indigenous vegetation cover for any urban or non-urban environment that has less than 10% cover of indigenous vegetation; and
 - (b) consider setting targets of higher than 10% for other areas, to increase their percentage of indigenous vegetation cover; and
 - (c) include any indigenous vegetation cover targets in their regional policy statements.
- (4) Local authorities must promote the increase of indigenous vegetation cover in their regions and districts through objectives, policies, and methods in their policy statements and plans:
 - (a) having regard to any targets set under subclause (3) by regional councils; and
 - (b) giving priority to all the following:
 - (i) areas referred to in clause 3.21(2);
 - (ii) ensuring species richness;
 - (iii) restoration at a landscape scale across the region.

3.23 Regional biodiversity strategies

- (1) Every regional council must prepare a regional biodiversity strategy that complies with Appendix 5 in collaboration with territorial authorities, tangata whenua, communities and other identified stakeholders.
- (2) Local authorities must have regard to the relevant regional biodiversity strategy when developing restoration objectives, policies, and methods for inclusion in regional policy statements and plans.

3.24 Information requirements

- (1) Every local authority must make or change its policy statements or plans to require that if a resource consent application is required in relation to an indigenous biodiversity matter, the application is not considered unless it includes a report that:

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- (a) is prepared by a qualified and experienced ecologist; and
 - (b) complies with subclause (2); and
 - (c) is commensurate with the scale and significance (to indigenous biodiversity) of the proposal.
- (2) The report by the ecologist must:
- (a) include a description of the adverse effects of the proposal on indigenous biodiversity and how those effects will be managed using the effects management hierarchy; and
 - (b) identify any effects on identified taonga; and
 - (c) identify the ecosystem services associated with indigenous biodiversity at the site; and
 - (d) include an assessment of the ecological integrity and connectivity within and beyond the site; and
 - (e) include mātauranga Māori and tikanga Māori assessment methodology, where relevant; and
 - (f) if biodiversity offsetting is proposed, set out:
 - (i) a detailed plan of what is proposed, including a quantified loss and gain calculation, the currency used in the calculation, and the data that informs the calculation and plan; and
 - (ii) a description of how the relevant principles in Appendix 3 of the National Policy Statement for Indigenous Biodiversity have been addressed; and
 - (iii) an assessment of the likely success of the plan in achieving a net gain in biodiversity values:
 - (g) if biodiversity compensation is proposed, set out:
 - (i) a detailed plan of what is proposed; and
 - (ii) a description of how the relevant principles in Appendix 4 of the National Policy Statement for Indigenous Biodiversity have been addressed; and
 - (iii) an assessment of the likely success of the plan in achieving its outcomes.

3.25 Monitoring by regional councils

- (1) Regional councils must work with territorial authorities, relevant agencies and tangata whenua to develop a monitoring plan for indigenous biodiversity in their regions and each of their districts.
- (2) Every monitoring plan must:

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- (a) establish methods and timeframes for monitoring:
 - (i) the maintenance of indigenous biodiversity in, and the ecological integrity and physical extent of, SNAs; and
 - (ii) the maintenance of identified taonga; and
 - (iii) the achievement of restoration objectives established under clause 3.21; and
 - (iv) the percentage of indigenous vegetation cover in urban and non-urban environments in its region, as required under clause 3.22.
 - (b) use best practice methods, or nationally agreed standards or methods, for monitoring areas that allow for comparability; and
 - (c) to the extent possible, where tangata whenua agree, use scientific monitoring methods and mātauranga Māori and tikanga Māori monitoring methods equally; and
 - (d) recognise the importance of long-term trends in monitoring results, and the relationship between results and the overall state of indigenous biodiversity; and
 - (e) establish methods, such as action plans, for responding to monitoring that indicates the objectives of this National Policy Statement will not be met.
- (3) Methods and timeframes may include different methods and timeframes relating to SNAs and identified taonga but, if national monitoring methods are available, must use those methods.

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Part 4: Timing

4.1 Timing generally

- (1) Every local authority must give effect to this National Policy Statement as soon as reasonably practicable.
- (2) Local authorities must publicly notify any changes to their policy statements and plans that are necessary to give effect to this National Policy Statement within 8 years after the commencement date.

4.2 Timing for planning provisions for SNAs

- (1) Local authorities must publicly notify any policy statement or plan or changes to these necessary to give effect to subpart 2 of Part 3 (Significant Natural Areas) and clause 3.24 (Information requirements) within 5 years after the commencement date.

4.3 Timing for regional biodiversity strategies

- (1) A regional council that, at the commencement date, has or is in the processes of preparing a regional biodiversity strategy must update or complete the strategy within 10 years after the commencement date.
- (2) A regional council that, at the commencement date, has not prepared or begun to prepare a regional biodiversity strategy must initiate preparation of a strategy within 3 years after the commencement date, and must complete it within 10 years after the commencement date.

4.4 Existing policy statements and plans

- (1) To the extent that policy statements and plans already (at the commencement date) give effect to this National Policy Statement, local authorities are not obliged to make changes to wording or terminology merely for consistency with it.
- (2) In case of dispute, the onus is on the local authority to show that, despite the different wording or terminology used, their policy statement or plan does implement this National Policy Statement.
- (3) However, if a local authority chooses to amend an operative policy statement or plan by merely changing wording or terminology for consistency with this National Policy Statement, the amendment is to be treated as the correction of a minor error (and therefore, under clause 20A of Schedule 1 of the Act, the amendment can be made without using a process in that Schedule).

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Appendix 1: Criteria for identifying areas that qualify as significant natural areas

1 Direction on approach

- (1) This appendix sets out the criteria for identifying significant indigenous vegetation or significant habitats of indigenous fauna in a specific area, so that the area qualifies as an SNA.
- (2) An area qualifies as a significant natural area if it meets any one of the attributes of the following four criteria:
 - (a) representativeness:
 - (b) diversity and pattern:
 - (c) rarity and distinctiveness:
 - (d) ecological context.

2 Context for assessment

- (1) The context for an assessment of an area is:
 - (a) its ecological district; and
 - (b) in the context of the rarity assessment only, its land environment.

3 Manner and form of assessment

- (1) Every assessment must include at least:
 - (a) a map of the area; and
 - (b) a description of its significant attributes, including for each criterion a description of the attribute (as specified below) that applies; and
 - (c) a description of the indigenous vegetation, indigenous fauna, habitat, and ecosystems present; and
 - (d) additional information such as the key threats, pressures, and management requirements.
- (2) An assessment under this appendix must be conducted by a suitably qualified ecologist (which, in the case of an assessment of a geothermal ecosystem, requires an ecologist with geothermal expertise).

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A Representativeness criterion

- (1) Representativeness is the extent to which the indigenous vegetation or habitat of indigenous fauna in an area is typical or characteristic of the indigenous biodiversity of the relevant ecological district.

Key assessment principles

- (2) Representativeness may include commonplace indigenous vegetation and the habitats of indigenous fauna, which is where most indigenous biodiversity is present. It may also include degraded indigenous vegetation, ecosystems and habitats that are typical of what remains in depleted ecological districts. It is not restricted to the best or most representative examples, and it is not a measure of how well that indigenous vegetation or habitat is protected elsewhere in the ecological district.
- (3) Significant indigenous vegetation has ecological integrity typical of the indigenous vegetation of the ecological district in the present-day environment. It includes seral (regenerating) indigenous vegetation that is recovering following natural or induced disturbance, provided species composition is typical of that type of indigenous vegetation.
- (4) Significant indigenous fauna habitat is that which supports the typical suite of indigenous animals that would occur in the present-day environment. Habitat of indigenous fauna may be indigenous or exotic.
- (5) The application of this criterion should result in identification of indigenous vegetation and habitats that are representative of the full range and extent of ecological diversity across all environmental gradients in an ecological district, such as climate, altitude, landform, and soil sequences. The ecological character and pattern of the indigenous vegetation in the ecological district should be described by reference to the types of indigenous vegetation and the landforms on which it occurs.

Attributes of representativeness

- (6) An area that qualifies as an SNA under this criterion has at least one of the following attributes:
 - (a) indigenous vegetation that has ecological integrity that is typical of the character of the ecological district:
 - (b) habitat that supports a typical suite of indigenous fauna that is characteristic of the habitat type in the ecological district and retains at least a moderate range of species expected for that habitat type in the ecological district.

B Diversity and pattern criterion

- (1) Diversity and pattern is the extent to which the expected range of diversity and pattern of biological and physical components within the relevant ecological district is present in an area.

Key assessment principles

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- (2) **Diversity of biological components** is expressed in the variation of species, communities, and ecosystems. Biological diversity is associated with variation in physical components, such as geology, soils/substrate, aspect/exposure, altitude/depth, temperature, and salinity.
- (3) **Pattern** includes changes along environmental and landform gradients such as ecotones and sequences.
- (4) **Natural areas** that have a wider range of species, habitats or communities or wider environmental variation due to ecotones, gradients, and sequences in the context of the ecological district, rate more highly under this criterion.

Attributes of diversity and pattern

- (5) An area that qualifies as a significant natural area under this criterion has at least one of the following attributes:
 - (a) at least a moderate diversity of indigenous species, vegetation, habitats of indigenous fauna or communities in the context of the ecological district:
 - (b) presence of indigenous ecotones, complete or partial gradients or sequences.

C Rarity and distinctiveness criterion

- (1) Rarity and distinctiveness is the presence of rare or distinctive indigenous taxa, habitats of indigenous fauna, indigenous vegetation or ecosystems.

Key assessment principles

- (2) **Rarity** is the scarcity (natural or induced) of indigenous elements: species, habitats, vegetation, or ecosystems. Rarity includes elements that are uncommon or threatened.
- (3) **The list of Threatened and At Risk species** is regularly updated by the Department of Conservation. Rarity at a regional or ecological district scale is defined by regional or district lists or determined by expert ecological advice. The significance of nationally listed Threatened and At Risk species should not be downgraded just because they are common within a region or ecological district.
- (4) **Depletion of indigenous vegetation or ecosystems** is assessed using ecological districts and land environments.
- (5) **Distinctiveness** includes distribution limits, type localities, local endemism, relict distributions, and special ecological or scientific features.

Attributes of rarity and distinctiveness

- (6) An area that qualifies as an SNA under this criterion has at least one of the following attributes:
 - (a) provides habitat for an indigenous species that is listed as Threatened or At Risk (Declining) in the New Zealand Threat Classification System lists:

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- (b) an indigenous vegetation type or an indigenous species that is uncommon within the region or ecological district:
- (c) an indigenous species or plant community at or near its natural distributional limit:
- (d) indigenous vegetation that has been reduced to less than 20 per cent of its pre-human extent in the ecological district, region, or land environment:
- (e) indigenous vegetation or habitat of indigenous fauna occurring on naturally uncommon ecosystems:
- (f) the type locality of an indigenous species:
- (g) the presence of a distinctive assemblage or community of indigenous species:
- (h) the presence of a special ecological or scientific feature.

D Ecological context criterion

- (1) Ecological context is the extent to which the size, shape, and configuration of an area within the wider surrounding landscape contributes to its ability to maintain indigenous biodiversity or affects the ability of the surrounding landscape to maintain its indigenous biodiversity.

Key assessment principles

- (2) Ecological context has two main assessment principles:
 - (a) the characteristics that help maintain indigenous biodiversity (such as size, shape, and configuration) in the area; and
 - (b) the contribution the area makes to protecting indigenous biodiversity in the wider landscape (such as by linking, connecting to or buffering other natural areas, providing 'stepping stones' of habitat or maintaining ecological integrity).

Attributes of ecological context

- (3) An area that qualifies as an SNA under this criterion has at least one of the following attributes:
 - (a) at least moderate size and a compact shape, in the context of the relevant ecological district:
 - (b) well-buffered relative to remaining habitats in the relevant ecological district:
 - (c) provides an important full or partial buffer to or link between, one or more important habitats of indigenous fauna or significant natural areas:
 - (d) important for the natural functioning of an ecosystem relative to remaining habitats in the ecological district.

EXPOSURE DRAFT – NOT GOVERNMENT POLICY

Appendix 2: Specified highly mobile fauna

Scientific name	Common name	Ecosystem	Threat category
<i>Anarhynchus frontalis</i>	ngutu parore/wrybill	coastal/riverine	Threatened (Nationally Vulnerable)
<i>Anas chlorotis</i>	pāteke/brown teal	wetland/riverine	At Risk (Recovering)
<i>Anas superciliosa superciliosa</i>	pārerā/grey duck	wetland/riverine	Threatened (Nationally Critical)
<i>Anthus novaeseelandiae novaeseelandiae</i>	pīhoihoi/NZ pipit	forest/open	At Risk (Declining)
<i>Apteryx australis</i> "northern Fiordland"	northern Fiordland tokoeka	forest/open	Threatened (Nationally Vulnerable)
<i>Apteryx australis australis</i>	southern Fiordland tokoeka	forest/open	Threatened (Nationally Endangered)
<i>Apteryx haastii</i>	roa/great spotted kiwi	forest/open	Threatened (Nationally Vulnerable)
<i>Ardea modesta</i>	kotuku/white heron	wetland/riverine	Threatened (Nationally Critical)
<i>Botaurus poiciloptilus</i>	matuku/bittern	wetland/riverine	Threatened (Nationally Critical)
<i>Bowdleria punctata stewartiana</i>	mātātā/Stewart Island fernbird	wetland/riverine	Threatened (Nationally Vulnerable)
<i>Bowdleria punctata punctata</i>	koroātito/South Island fernbird	wetland/riverine	At Risk (Declining)
<i>Bowdleria punctata vealeae</i>	mātātā/North Island fernbird	wetland/riverine	At Risk (Declining)
<i>Calidris canutus rogersi</i>	huahou/lesser knot	coastal/riverine	Threatened (Nationally Vulnerable)

EXPOSURE DRAFT – NOT GOVERNMENT POLICY

<i>Chalinolobus tuberculatus</i>	pekapeka/long-tailed bat	forest/open	Threatened (Nationally Critical)
<i>Charadrius bicinctus bicinctus</i>	pohowera/banded dotterel	coastal/riverine	Threatened (Nationally Vulnerable)
<i>Charadrius obscurus aquilonius</i>	tūtiriwhatu/northern NZ dotterel	coastal/riverine	At Risk (Recovering)

Scientific name	Common name	Ecosystem	Threat category
<i>Charadrius obscurus obscurus</i>	tūtiriwhatu/southern NZ dotterel	coastal/riverine	Threatened (Nationally Critical)
<i>Chlidonias albostrigatus</i>	tara pirohe/blackfronted tern	coastal/riverine	Threatened (Nationally Endangered)
<i>Egretta sacra sacra</i>	matuku moana/reef heron	coastal/riverine	Threatened (Nationally Endangered)
<i>Falco novaeseelandiae ferox</i>	kārearea/bush falcon	forest/open	At Risk (Recovering)
<i>Falco novaeseelandiae novaeseelandiae</i>	kārearea/eastern falcon	forest/open	At Risk (Recovering)
<i>Falco novaeseelandiae</i> "southern"	kārearea/southern falcon	forest/open	Threatened (Nationally Vulnerable)
<i>Gallirallus australis greyi</i>	North Island weka	forest/open	At Risk (Recovering)
<i>Gallirallus philippensis assimilis</i>	moho pererū/banded rail	wetland/riverine	At Risk (Declining)
<i>Haematopus finschi</i>	tōrea/South Island pied oystercatcher	coastal/riverine	At Risk (Declining)
<i>Haematopus unicolor</i>	tōrea tai/variable oystercatcher	coastal/riverine	At Risk (Recovering)

EXPOSURE DRAFT – NOT GOVERNMENT POLICY

<i>Himantopus novaezelandiae</i>	kakī/black stilt	wetland/riverine	Threatened (Nationally Critical)
<i>Hydroprogne caspia</i>	taranui/Caspian tern	coastal/riverine	Threatened (Nationally Vulnerable)
<i>Hymenolaimus malacorhynchos</i>	whio/blue duck	riverine	Threatened (Nationally Vulnerable)
<i>Larus bulleri</i>	tarāpukā/black-billed gull	coastal/riverine	Threatened (Nationally Critical)
<i>Larus novaehollandiae scopulinus</i>	tarāpunga/red-billed gull	coastal/riverine	At Risk (Declining)
<i>Limosa lapponica baueri</i>	kuaka/eastern bartailed godwit	coastal/riverine	At Risk (Declining)
<i>Mystacina tuberculata aupourica</i>	pekapeka/northern short-tailed bat	forest/open	Threatened (Nationally Endangered)
Scientific name	Common name	Ecosystem	Threat category
<i>Mystacina tuberculata rhyacobia</i>	pekapeka/central short-tailed bat	forest/open	At Risk (Declining)
<i>Mystacina tuberculata tuberculata</i>	pekapeka/southern short-tailed bat	forest/open	At Risk (Recovering)
<i>Nestor meridionalis meridionalis</i>	kākā/South Island kākā	forest/open	Threatened (Nationally Vulnerable)
<i>Nestor meridionalis septentrionalis</i>	kākā/North Island kākā	forest/open	At Risk (Recovering)
<i>Nestor notabilis</i>	kea	forest/open	Threatened (Nationally Endangered)
<i>Petroica australis australis</i>	kakariwai/South Island robin	forest/open	At Risk (Declining)
<i>Phalacrocorax varius varius</i>	kāruhiruhi/pied shag	coastal/riverine	At Risk (Recovering)

EXPOSURE DRAFT – NOT GOVERNMENT POLICY

<i>Podiceps cristatus australis</i>	kāmana/southern crested grebe	wetland/riverine	Threatened (Nationally Vulnerable)
<i>Poliiocephalus rufopectus</i>	weweia/NZ dabchick	wetland/riverine	At Risk (Recovering)
<i>Porzana pusilla affinis</i>	koitareke/marsh crake	wetland/riverine	At Risk (Declining)
<i>Porzana tabuensis</i>	pūweto/spotless crake	wetland/riverine	At Risk (Declining)
<i>Sterna striata striata</i>	tara/white-fronted tern	coastal/riverine	At Risk (Declining)
<i>Sternula nereis davisae</i>	tara iti/NZ fairy tern	coastal/riverine	Threatened (Nationally Critical)
<i>Thinornis novaeseelandiae</i>	tuturuatu/NZ shore plover	coastal/riverine	Threatened (Nationally Critical)
<i>Xenicus gilviventris</i> “northern”	pīwauwau/northern rock wren	forest/open	Threatened (Nationally Critical)
<i>Xenicus gilviventris</i> “southern”	pīwauwau/southern rock wren	forest/open	Threatened (Nationally Endangered)

Appendix 3: Principles for biodiversity offsetting

The following sets out a framework of principles for the use of biodiversity offsets. These principles represent a standard for biodiversity offsetting and must be complied with for an action to qualify as a biodiversity offset.

1. **Adherence to effects management hierarchy:** A biodiversity offset is a commitment to redress any more than minor residual adverse effects and should be contemplated only after steps to avoid, minimise, and remedy adverse effects are demonstrated to have been sequentially exhausted.
2. **When biodiversity offsetting is not appropriate:** Biodiversity offsets are not appropriate in situations where biodiversity values cannot be offset to achieve a net gain outcome, and if biodiversity values are adversely affected, they will be permanently lost. This principle reflects a standard of acceptability for demonstrating, and then achieving, a net gain in biodiversity values. Examples of where an offset would be inappropriate include where:

EXPOSURE DRAFT – NOT GOVERNMENT POLICY

- (a) residual adverse effects cannot be offset because of the irreplaceability or vulnerability of the indigenous biodiversity affected:
 - (b) effects on indigenous biodiversity are uncertain, unknown, or little understood, but potential effects are significantly adverse:
 - (c) there are no technically feasible options by which to secure gains within acceptable timeframe.
3. **Net gain:** The biodiversity values to be lost through the activity to which the offset applies are counterbalanced and exceeded by the proposed offsetting activity, so that the result is a net gain when compared to that lost. Net gain is demonstrated by a like-for-like quantitative loss/gain calculation of the following, and is achieved when the ecological values at the offset site exceed those being lost at the impact site across indigenous biodiversity:
 - (a) types of indigenous biodiversity, including when indigenous species depend on introduced species for their persistence; and
 - (b) amount; and
 - (c) condition.
4. **Additionality:** A biodiversity offset achieves gains in indigenous biodiversity above and beyond gains that would have occurred in the absence of the offset, such as gains that are additional to any minimisation and remediation undertaken in relation to the adverse effects of the activity.
5. **Leakage:** Offset design and implementation avoids displacing activities that are harmful to indigenous biodiversity to other locations.
6. **Landscape context:** Biodiversity offset actions are undertaken where this will result in the best ecological outcome, preferably close to the impact site or within the same ecological district, and consider the landscape context of both the impact site and the offset site, taking into account interactions between species, habitats and ecosystems, spatial connections, and ecosystem function.
7. **Long-term outcomes:** Biodiversity offsets are managed to secure outcomes of the activity that last at least as long as the impacts, and preferably in perpetuity.
8. **Time lags:** The delay between loss of indigenous biodiversity at the impact site and gain or maturity of indigenous biodiversity at the offset site is minimised so that the calculated gains are achieved within the consent period.
9. **Science and mātauranga Māori:** The design and implementation of a biodiversity offset is a documented process informed by science and mātauranga Māori where available.
10. **Stakeholder participation:** Opportunity for the effective and early participation of stakeholders is demonstrated when planning for biodiversity offsets, including their evaluation, selection, design, implementation, and monitoring.

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11. **Transparency:** The design and implementation of a biodiversity offset, and communication of its results to the public, is undertaken in a transparent and timely manner.

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EXPOSURE DRAFT – NOT GOVERNMENT POLICY

Appendix 4: Principles for biodiversity compensation

The following sets out a framework of principles for the use of biodiversity compensation. These principles represent a standard for biodiversity compensation and must be complied with for an action to qualify as biodiversity compensation.

1. **Adherence to effects management hierarchy:** Biodiversity compensation is a commitment to redress more than minor residual adverse impacts, and should be contemplated only after steps to avoid, minimise, remedy, and offset adverse effects are demonstrated to have been sequentially exhausted.
2. **When biodiversity compensation is not appropriate:** Biodiversity compensation is not appropriate where indigenous biodiversity values are not able to be compensated for, for example because:
 - (a) the indigenous biodiversity affected is irreplaceable or vulnerable; or
 - (b) effects on indigenous biodiversity are uncertain, unknown, or little understood, but potential effects are significantly adverse; or
 - (c) there are no technically feasible options by which to secure proposed gains within acceptable timeframes.
3. **Scale of biodiversity compensation:** The values to be lost through the activity to which the biodiversity compensation applies are addressed by positive effects to indigenous biodiversity, (including when indigenous species depend on introduced species for their persistence), that outweigh the adverse effects on indigenous biodiversity.
4. **Additionality:** Biodiversity compensation achieves gains in indigenous biodiversity that are above and beyond gains that would have occurred in the absence of the compensation, such as gains that are additional to any minimisation and remediation undertaken in relation to the adverse effects of the activity.
5. **Leakage:** The design and implementation avoid displacing activities or environmental factors that are harmful to indigenous biodiversity in other locations.
6. **Landscape context:** Biodiversity compensation actions are undertaken where this will result in the best ecological outcome, preferably close to the impact site or within the same ecological district. The actions consider the landscape context of both the impact site and the compensation site, taking into account interactions between species, habitats and ecosystems, spatial connections, and ecosystem function.
7. **Long-term outcomes:** Biodiversity compensation is managed to secure outcomes of the activity that last as least as long as the impacts, and preferably in perpetuity.

EXPOSURE DRAFT – NOT GOVERNMENT POLICY

8. **Time lags:** The delay between loss of indigenous biodiversity at the impact site and gain or maturity of indigenous biodiversity at the compensation site is minimised.
9. **Trading up:** When trading up forms part of biodiversity compensation, the proposal demonstrates that the indigenous biodiversity values gained are demonstrably of higher indigenous biodiversity value than those lost. The proposal also shows the values lost are not to Threatened or At Risk species or to species considered vulnerable or irreplaceable.
10. **Financial contributions:** Financial contributions are only considered when there is no effective option available for delivering indigenous biodiversity gains on the ground. Any contributions related to the indigenous biodiversity impacts must be directly linked to an intended indigenous biodiversity gain or benefit.
11. **Science and mātauranga Māori:** The design and implementation of biodiversity compensation is a documented process informed by science and mātauranga Māori where available.
12. **Stakeholder participation:** Opportunity for the effective and early participation of stakeholders is demonstrated when planning for biodiversity compensation, including its evaluation, selection, design, implementation, and monitoring.
13. **Transparency:** The design and implementation of biodiversity compensation, and communication of its results to the public, is undertaken in a transparent and timely manner.

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Appendix 5: Regional biodiversity strategies

1. The purpose of a regional biodiversity strategy is to promote the landscape-scale restoration of the region's indigenous biodiversity.
2. To achieve its purpose, the regional biodiversity strategy of a region must:
 - (a) set out a landscape-scale vision for the restoration of the region's indigenous biodiversity; and
 - (b) recognise and provide for Te Rito o te Harakeke; and
 - (c) provide for resilience to biological and environmental changes, including those associated with climate change; and
 - (d) recognise biological and physical connections within, and between, the terrestrial environment, water bodies, and the coastal marine area; and
 - (e) support the achievement of any national priorities for indigenous biodiversity protection; and
 - (f) record:
 - (i) the actions and methods intended to promote the maintenance and restoration of indigenous biodiversity, and increase in indigenous vegetation cover, in the region;
 - (ii) actions that will be undertaken by local or central government;
 - (iii) actions that the community, including tangata whenua, will be supported or encouraged to undertake; and
 - (iv) how those actions will be resourced.
 - (g) specify milestones for achieving the strategy's purpose; and
 - (h) specify how progress on achieving the strategy's purpose is to be monitored and reported on and measures to be taken if milestones are not being met.
3. A regional biodiversity strategy may also:
 - (a) include measures that are intended to implement other objectives, such as biosecurity, climate mitigation, amenity, or freshwater outcomes, where those measures also contribute to protection and restoration of indigenous biodiversity; and
 - (b) identify areas intended for restoration in accordance with clause 3.21; and
 - (c) identify areas in which indigenous vegetation cover is proposed to be increased, in accordance with clause 3.22.
4. The following must be taken into account when developing a regional biodiversity strategy:

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- (a) opportunities to engage the community, including tangata whenua, in conservation and, in particular, to connect urban people and communities to indigenous biodiversity:
- (b) opportunities for partnerships with the QEII Trust, Ngā Whenua Rāhui and others:
- (c) considering incentive opportunities specific to Māori lands:
- (d) co-benefits, including for water quality and freshwater habitats, carbon sequestration and hazard mitigation:
- (e) alignment with strategies under other legislation.

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NATIONAL POLICY STATEMENT FOR INDIGENOUS BIODIVERSITY

Draft Implementation Plan



Ministry for the
Environment
Manatū Mō Te Taiao



Te Kāwanatanga o Aotearoa
New Zealand Government

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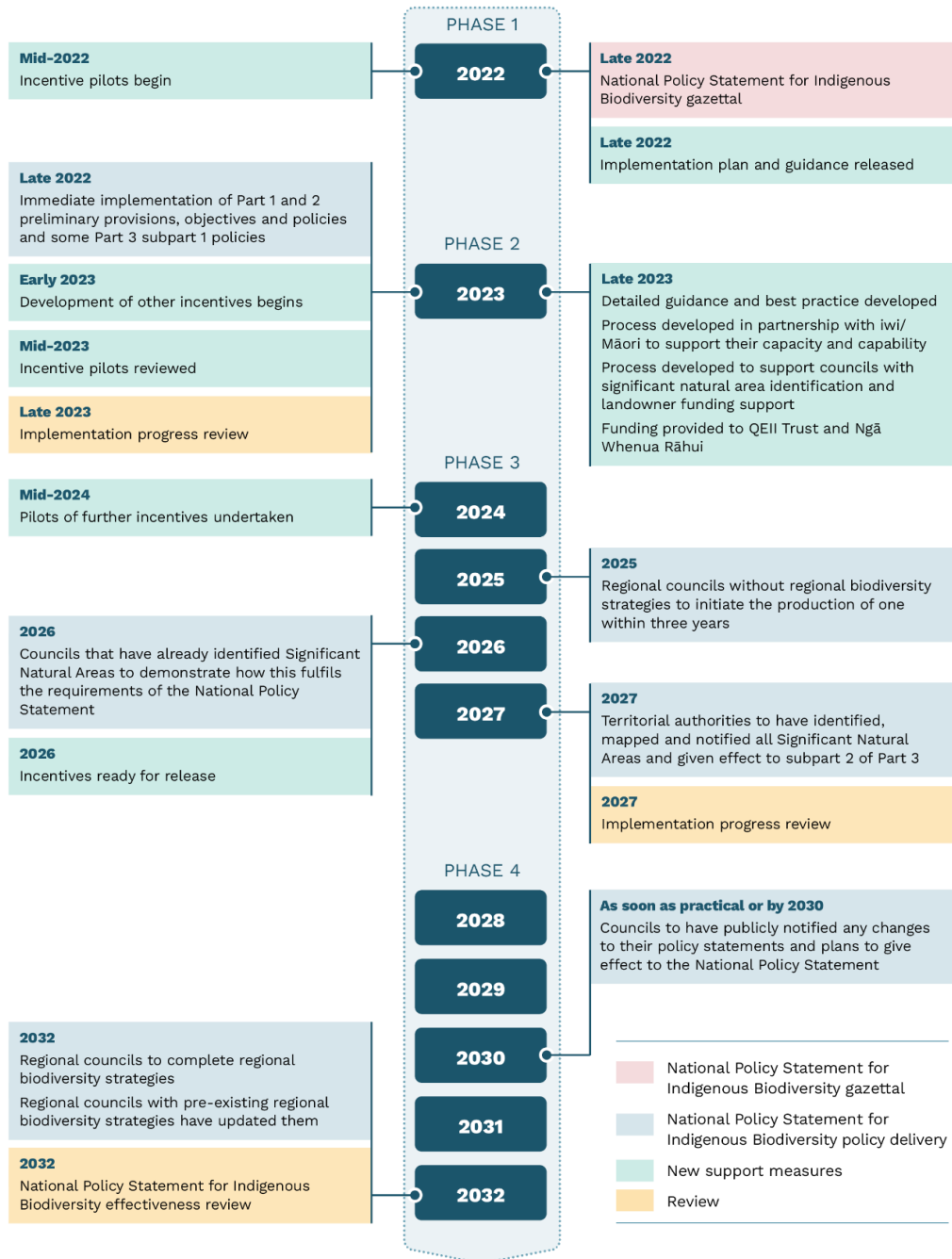
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Implementation timeline



Introduction

Purpose

The National Policy Statement for Indigenous Biodiversity (NPSIB) provides a regulatory framework to drive better outcomes for New Zealand's unique indigenous biodiversity. However, the success of the NPSIB is contingent on its implementation – turning the policy into action.

Initial implementation of the NPSIB will be phased over 10 years. This plan covers the first 10 years of the NPSIB from gazettal through to the completion of the first wave of policy implementation. It provides information on implementation timeframes, roles and what support measures will be available.

The purpose of this draft is to outline expectations for implementation and provide a starting point for further discussions and work with iwi/Māori and stakeholders through the NPSIB exposure draft period and beyond.

The wider context

The NPSIB is one of many initiatives that contribute to improving outcomes for New Zealand's indigenous biodiversity. It works alongside these other initiatives, providing clarity to local government on its requirements to manage indigenous biodiversity under the RMA.

Some of the key related initiatives are discussed below. [Appendix 1](#) provides a more comprehensive overview.

Resource Management System Reform

This Government is undertaking a comprehensive review of the resource management system. This review is examining the broader and deeper changes that are needed to support the transition to a more productive, sustainable and inclusive economy. As the review is currently underway, it is difficult to provide clarity about how biodiversity management and the NPSIB will fit into the future resource management system. However, it is intended that the policy intent of existing national direction will carry over to the new system, including the proposed NPSIB.

Te Mana o Te Taiao – Aotearoa New Zealand Biodiversity Strategy implementation

[Te Mana o te Taiao – the Aotearoa New Zealand Biodiversity Strategy](#) (ANZBS) and NPSIB are mutually supportive. The NPSIB, its implementation, and broader supporting measures fall under the canopy of ANZBS and are important to achieving some of its goals. The NPSIB implementation measures proposed in this plan align with the ongoing ANZBS implementation programme and will be reflected in the ANZBS action plan.

Essential Freshwater

The Essential Freshwater package introduced rules and regulations to stop further degradation and bring New Zealand's freshwater resources, waterways and ecosystems to a healthy state within a generation. National Environmental Standards for Freshwater and a National Policy Statement for Freshwater Management (NPSFM) will prevent further loss and degradation of freshwater habitats and introduced controls on some high-risk activities. These came into force on 3 September 2020.

The proposed NPSIB would promote the restoration of all wetlands in terms of indigenous vegetation. The NPSFM also contains policies for maintaining or improving ecosystem health, which include protection of habitat and aquatic species. This complements the proposed NPSIB, which focuses on maintaining and improving terrestrial indigenous biodiversity.

The core decision-making concept Te Mana o te Wai in the NPSFM is consistent with the decision-making concept Te Rito o te Harakeke in the proposed NPSIB. Both recognise that the health of the environment is integral to our wellbeing.

NPSIB implementation

The policies presented in the NPSIB must be primarily implemented by local authorities, but they cannot do it alone. The implementation process will include wide involvement from iwi/Māori, landowners, industry, local and central government, and many other groups and organisations.

While some councils have advanced biodiversity work programmes, others will take longer to ramp up. For most councils, the NPSIB will require additional budget and resources for implementation. Alongside implementation of NPSIB policies, local and central government and other organisations will support landowners, iwi/Māori and councils. Funding has been secured from Budget 22 to enable central government support. This support will be critical to successfully implement the NPSIB. Sections 3 and 4 provide an overview of support measures.

Objectives

- **Improve biodiversity outcomes** – effective NPSIB implementation contributes to improving condition and extent of species, habitats and ecosystems throughout New Zealand.
- **Partner with tangata whenua** – we work together with our Treaty partners; implementation measures support the aspirations of iwi, hapū and whānau and help strengthen the role of tangata whenua in management of and decision-making for indigenous biodiversity.
- **Grow existing relationships with stakeholders and councils** – implementation provides an opportunity to strengthen existing relationships and support stakeholders and councils to design and deliver effective biodiversity management.
- **Support and incentivise biodiversity protection** – acknowledge the good work of landowners and support their efforts to protect and maintain biodiversity on their land.
- **Integrate biodiversity actions with other national direction** – integrate implementation with other national direction to optimise our efficiency, prevent duplication and encourage innovative implementation pathways.

Timeframes and phasing

This plan covers the initial policy and implementation cycle of the NPSIB from gazettal to 10 years after commencement, at which point all core policies will be implemented.

In the short-term, each council will need to understand NPSIB requirements and review and/or plan Significant Natural Areas (SNA), taonga and highly mobile fauna identification and mapping programmes in partnership with iwi/Māori and landowners. In the medium and long term, councils should be consistently applying NPSIB requirements through comprehensive biodiversity work programmes, working in partnership with iwi/Māori, landowners, communities, industry and government agencies.

To simplify the timeline, implementation has been split into four phases:

- Phase 1 – Lead up to NPSIB gazettal Up to gazettal
- Phase 2 – The first year Year 1
- Phase 3 – SNA provisions Years 2–5
- Phase 4 – Ongoing implementation Years 6–10

Table 1 provides a summary of what will be delivered in each phase. It reflects both policy implementation timing (see NPSIB Part 4: Timing of the NPSIB) and delivery of support measures. Note that local authorities and other organisations may develop and deploy further support measures through the implementation period that this plan does not capture.

Table 1: NPSIB implementation phases and descriptions

Phase	Description	Timeframe
1. Lead up to NPSIB launch	<p>Begin regional coordinator, data platform, and innovation fund pilots.</p> <p>Launch of the NPSIB package, implementation plan, and initial guidance.</p>	Up to gazettal
2. The first year	<p>Part 1 and 2 preliminary provisions and the objectives and policies have immediate effect</p> <p>Policies in NPSIB Part 3 subpart 1 to be implemented immediately following commencement:</p> <ul style="list-style-type: none"> • Te Rito o te Harakeke and tangata whenua as kaitiaki • integrated approach • social, economic and cultural wellbeing • resilience to climate change • precautionary approach. <p>Roll out of central government implementation support measures:</p> <ul style="list-style-type: none"> • develop detailed guidance • develop direct support for iwi/Māori • provide funding to assist councils with SNA identification • provide funding to assist council funding to landowners • conclude and review pilots. <p>Ministry for the Environment (the Ministry) undertakes end-of-phase implementation progress review.</p>	First year following commencement
3. SNA provisions	<p>Delivery of the following NPSIB subpart 2 provisions (councils):</p> <ul style="list-style-type: none"> • SNA identification and mapping and scheduling completed within 5 years of commencement • all territorial authorities (TAs) have SNAs notified in district plans or policy statements • regional councils without a regional biodiversity strategy must begin developing one. <p>The Ministry undertakes end-of-phase implementation progress review.</p>	2–5 years following commencement

Phase	Description	Timeframe
4. Ongoing implementation	<p>Councils notify changes to policy statements and plans that give effect to the NPSIB within 8 years of commencement.</p> <p>TAs review and update SNA schedules every 10 years.</p> <p>Regional biodiversity strategies developed for all regions within 10 years of commencement.</p> <p>The Ministry undertakes an effectiveness review of the NPSIB.</p>	6–10 years following commencement

Roles during implementation

Table 2 outlines the roles that relevant organisations, groups and individuals will have during NPSIB implementation.

Table 2: Roles during NPSIB implementation

Organisation	Role
Ministry for the Environment (the Ministry)	Responsible for administering and reviewing the NPSIB, monitoring and reporting on implementation progress and providing key support measures, including guidance. The Ministry may provide other support to assist iwi/Māori, landowners, councils and others.
Territorial authorities (TAs)	Responsible for implementing relevant NPSIB policies by partnering with iwi/Māori, landowners and others. TAs may assist landowners and others with implementation.
Unitary authorities	Responsible for implementing NPSIB policies relevant to TAs and regional councils by partnering with iwi/Māori, landowners and others. Unitary authorities may assist landowners and others with implementation.
Regional councils	Responsible for implementing relevant NPSIB policies by partnering with iwi/Māori, landowners and others. Regional councils may assist TAs, landowners and others with implementation.
Iwi/Māori	Work in partnership with councils to implement Te Rito o te Harakeke; SNAs on Māori land; and taonga identification and mapping. As kaitiaki, iwi/Māori may take a strengthened role in resource management processes for indigenous biodiversity management and decision-making.
Landowners	Work in partnership with councils to map SNAs and implement other relevant requirements where necessary. Landowners need to be enabled in their roles as stewards of the natural environment.
Other organisations and groups	May assist landowners, councils and others with implementation.
Industry associations	May provide advice, guidance and general support for members.
Crown agencies	Responsible for ensuring Crown land and public conservation land is managed according to regional and local requirements. Agencies may assist iwi/Māori, landowners and others with implementation through associated Government programmes and projects. All agencies will work together to align with Government work programmes.

Implementation support measures

Implementation support will be an essential part of rolling the NPSIB out across New Zealand.

Existing support measures

There is already a lot of great work happening across New Zealand, including many organisations who protect, maintain and restore biodiversity.

Biodiversity management is already a requirement for local government. Landowners can access support measures, although they vary from district to district. These include, but are not limited to:

- provision of ecological advice and expertise
- various aspects of guidance for protection, maintenance and restoration of biodiversity
- rates remission for protected land
- council biodiversity funding for protection, maintenance or restoration of biodiversity
- central government funding through various funds and initiatives (see table 5 – Summary of existing central government funds, Appendix 2)
- Queen Elizabeth II National Trust (QEII) Open Space covenants
- Ngā Whenua Rāhui funding
- support for community/biodiversity hubs
- additional development rights provisions in city/district plans.

New support measures

Central government provides support through several contestable and targeted funds that promote and enable biodiversity protection, maintenance and restoration. However, we recognise the need for additional support for indigenous biodiversity and specifically to implement the NPSIB. Funding has been secured from Budget 22 to enable additional central government support.

A suite of new support measures will be deployed by central government as part of the NPSIB package. These include:

- guidance and examples of best practice
- direct support to involve iwi/Māori in NPSIB processes
- increasing council biodiversity funds to support indigenous biodiversity on private land
- direct support to assist councils with SNA identification and mapping
- pilots of new biodiversity incentives / support measures and exploration of further measures.

Further detail on these measures is provided in table 3.

Councils and other organisations are likely to deploy additional measures to support implementation of the NPSIB. Additionally, it is expected that the ANZBS work programme will deliver broader biodiversity support measures in the medium- to long-term (eg, a comprehensive national monitoring framework).

Key central government investment that supports the protection, maintenance and restoration of indigenous biodiversity

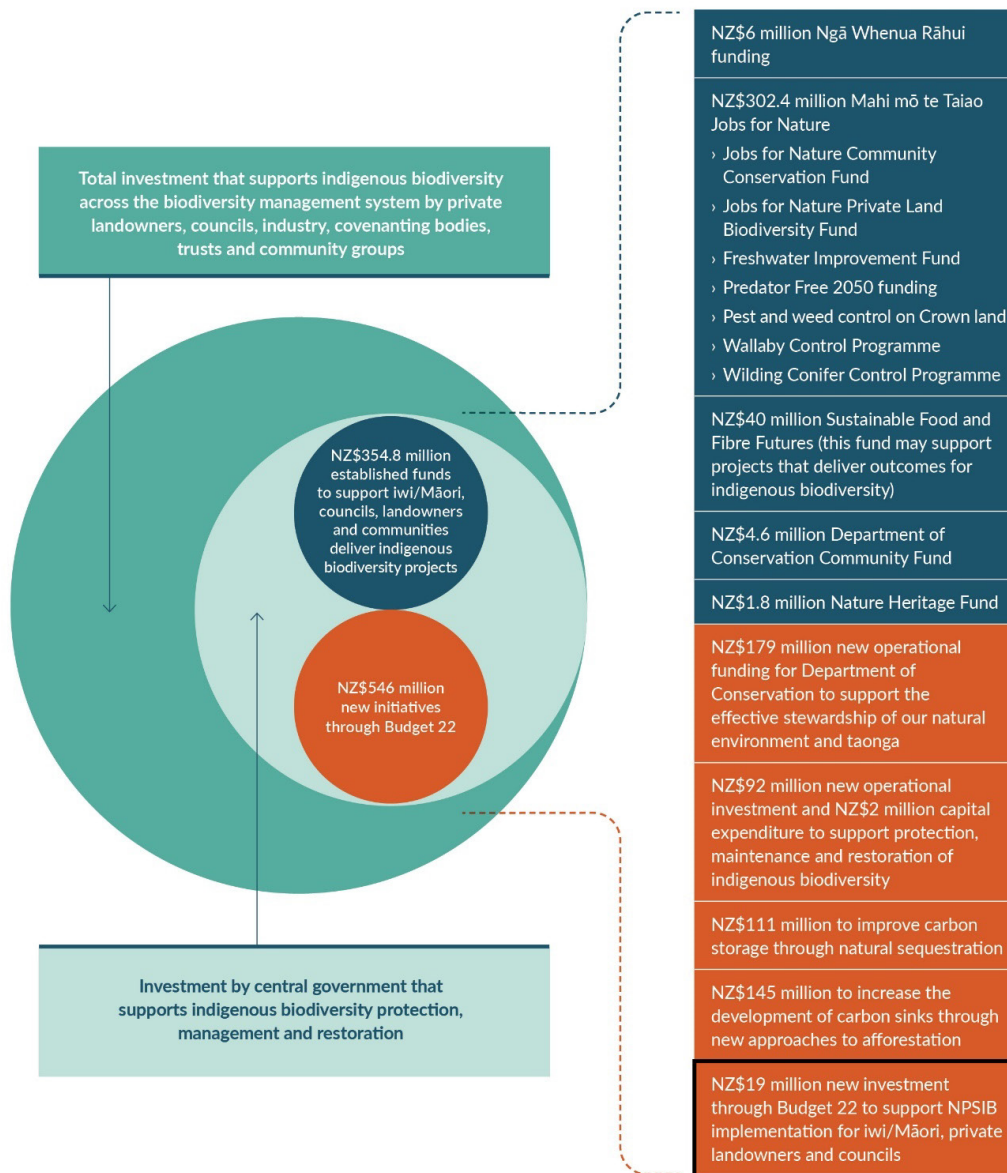


Table 3: Summary of NPSIB support measures and timing

Support measure	Delivered by	Funded by	Timing
Existing support measures			
Support provided by councils	<ul style="list-style-type: none"> • Provision of ecological advice and expertise • Guidance for protection, maintenance and restoration of biodiversity • Rates remission for land protected for biodiversity purposes • Funding for projects that protect, maintain or restore biodiversity • Support for community/biodiversity hubs 	Councils	Existing (varies by district)
Support provided by third parties	<ul style="list-style-type: none"> • Queen Elizabeth II Trust Open Space covenants • Provision of funding, advice and other support from various Trusts, organisations and funders 	Various third-party providers	Existing
Industry support	<ul style="list-style-type: none"> • Industry-specific guidance on local requirements • Industry accreditation and incentive programmes 	Industry	Existing
Central government support	<ul style="list-style-type: none"> • Ngā Whenua Rāhui funding • Various targeted and contestable funds (see table 5 – Summary of existing central government funds, Appendix 2) 	Central government (various agencies)	Existing

Support measure		Delivered by	Funded by	Timing	
New support measures					
NPSIB guidance and best practice	Further guidance will provide more detail on NPSIB policies and specific methods to implement them. Guidance will need to be accessible to multiple audiences and provide both general and technical information to support implementation.	<ul style="list-style-type: none"> Summary sheets / quick reference guides (various media) on NPSIB policies and implementation Develop policy interpretation guidance 	Ministry for the Environment	Departmental baselines	Phase 1, at gazettal
		<ul style="list-style-type: none"> Detailed technical guidance and case studies to assist implementation 	Ministry for the Environment	Departmental baselines	Phase 2, first year after gazettal
Direct support for iwi/Māori	Thorough, well-informed engagement with iwi/Māori will be a key part of implementing the NPSIB. The NPSIB explicitly requires iwi/Māori to be involved in NPSIB processes. However, many iwi have limited capacity or capability to engage in RMA processes.	<ul style="list-style-type: none"> Provide training (eg, workshops) and training to enhance iwi/Māori capacity to be involved in NPSIB processes Provide financial support for iwi/Māori to attain technical expertise to fully engage in NPSIB processes 	Ministry for the Environment in partnership with iwi/Māori	Budget 22	Phase 2, first year after gazettal
		<ul style="list-style-type: none"> Set up a Māori Biodiversity Wānanga to allow discussions around biodiversity; co-governance approaches to the protection, restoration, expansion and ongoing use of native ecosystems and species; and what is needed to support indigenous approaches to biodiversity action. This will help Māori fully participate in implementing the proposed NPSIB and any complementary and supporting measures 	Ministry for the Environment in partnership with iwi/Māori	Departmental baselines	Phases 2 & 3
Direct support to councils	Promote clear messaging through communications support	<ul style="list-style-type: none"> Provide councils with limited communications support to ensure consistent messaging for all who are affected by the NPSIB 	Ministry for the Environment	Departmental baselines	Phase 2, first year after gazettal

Support measure		Delivered by	Funded by	Timing	
	Financial support for SNA identification	<ul style="list-style-type: none"> Provide financial assistance to councils for SNA identification, specifically those councils that have not undertaken SNA assessment already 	Ministry for the Environment in partnership with councils	Budget 22	Phase 2, first year after gazettal
Support for landowners	Council funding and grants for biodiversity have been successful at a local government level. Additional central government support will allow councils to increase the amount available for landowner support.	<ul style="list-style-type: none"> Provide financial assistance to councils to increase support to landowners via existing programmes 	Ministry for the Environment in partnership with councils	Budget 22	Phase 2, first year after gazettal
Other measures to support landowners and community groups	Develop measures to support and incentivise landowners to protect, maintain and restore biodiversity beyond the traditional non-repayment grant schemes.	<ul style="list-style-type: none"> Fund a Regional Biodiversity Coordinator position to support the community to improve biodiversity. This will be trialled in two regions where a coordination collective already operates 	Ministry for the Environment in partnership with councils and community hubs	Prime Minister's Emerging Priorities Fund Budget 22 for expansion	One-year pilot completed in Phase 2
	Three initiatives will be piloted across several regions over an initial one-year period and reviewed upon completion. If successful, the pilots could be extended and implemented in further regions.	<ul style="list-style-type: none"> Implement a digital platform that connects resources and users for better biodiversity outcomes. This will test if a centralised digital platform can support increased biodiversity action and if such a platform would help improve access to support for landowners with an SNA. This will be trialled in two regions Set up an innovation fund to allow groups to test innovative ideas without having to meet rigid, outcome-focused criteria. This will be trialled in the same regions as the regional coordination support so that the coordinator role can assist with applications and awareness 	Ministry for the Environment	Prime Minister's Emerging Priorities Fund Budget 22 for expansion	One-year pilot completed in Phase 2

Support measure		Delivered by	Funded by	Timing	
	Further develop initiatives and partnerships to support and incentivise biodiversity protection, maintenance and restoration.	<ul style="list-style-type: none"> Undertake work to understand current gaps in the biodiversity system, specifically for potential biodiversity markets which measures / values biodiversity gains 	Ministry for the Environment	Prime Minister’s Emerging Priorities Fund Budget 22 for continuation	Phases 2 and 3
		<ul style="list-style-type: none"> Government will continue to explore other support measures and incentives through research and partnerships. Other initiatives may be developed based on findings 	Ministry for the Environment	Budget 22	Phases 2 and 3
Align NPSIB implementation with other central government initiatives	Link with other workstreams, frameworks and institutions.	<ul style="list-style-type: none"> Continue to explore and use relevant links with other workstreams, frameworks and institutions which align with the NPSIB. This will occur across all Government work, particularly climate change, conservation, primary industries and biosecurity 	Central government	Departmental baselines	Ongoing throughout life of NPSIB

Monitoring and review

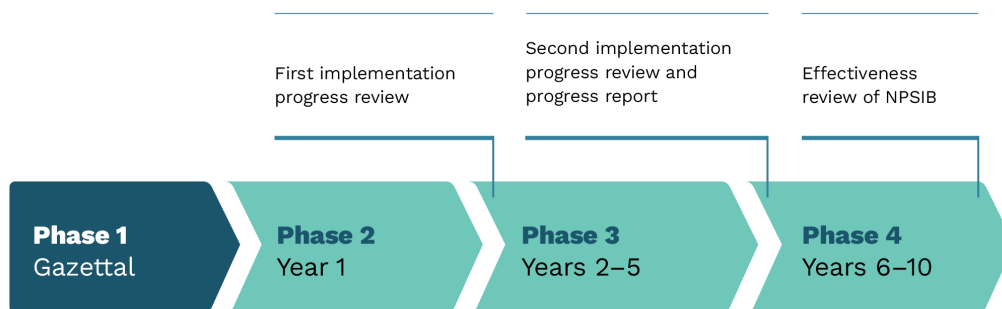
Monitoring is a key aspect of this plan. It will be important to check progress regularly and ensure reporting is frequent enough to allow adaptation, if required.

The Ministry will review and report progress against this plan at the end of phases 2 and 3. These reviews will capture:

- councils' progress on implementing NPSIB provisions
- progress on the development and deployment of support measures outlined in this plan
- other Government initiatives or support measures that will assist with NPSIB implementation that are not outlined in this plan.

Where implementation actions need to be modified, this will be undertaken following the review. Other reviews may be needed when appropriate – for example, to improve alignment with other significant work programmes, such as the ANZBS.

A NPSIB effectiveness review will be undertaken at the end of phase 4. It is important to distinguish between the implementation progress reviews outlined above and the NPSIB effectiveness review. An effectiveness review is a statutory evaluation undertaken to gain a greater understanding of the impacts of the NPSIB and determine whether the NPSIB is on track to meet its objectives.



Central oversight of implementation will ensure that the work taking place to implement the NPSIB is progressing according to plan. This will align with governance and implementation arrangements for ANZBS when it is in place.

Appendix 1 – Related initiatives and instruments

Table 4: Links with other national direction and initiatives

Initiative or instrument	Link with proposed NPSIB
<p>National Policy Statement for Freshwater Management (NPS-FM)</p> <p>National Environmental Standards for Freshwater (NES-F)</p>	<p>Under the NPS-FM, no further loss of natural wetlands is permitted, and the NES-F has introduced tighter controls on certain activities that damage inland and coastal wetlands. The proposed NPSIB would promote the restoration of indigenous vegetation in wetlands.</p> <p>The NPS-FM also contains policies for maintaining or improving ecosystem health, which include protection of habitat and aquatic species. This complements the proposed NPSIB, which focuses on maintaining and improving terrestrial indigenous biodiversity.</p> <p>The core decision-making concept Te Mana o te Wai in the NPS-FM is consistent with the decision-making concept Te Rito o te Harakeke in the proposed NPSIB. Both recognise that the health of the environment is integral to our wellbeing.</p>
<p>New Zealand Coastal Policy Statement (NZCPS)</p>	<p>The NZCPS concerns managing the coastal environment. The coastal environment overlaps with the proposed NPSIB. The NZCPS list of protected indigenous biodiversity largely aligns with the NPSIB, and it is anticipated that councils will apply both policies in the terrestrial component of the coastal environment. If there is a conflict, the NZCPS takes priority.</p>
<p>National Policy Statement on Urban Development (NPS-UD)</p>	<p>The NPS-UD recognises open space as one of the features of a quality urban environment. The proposed NPSIB includes policies to restore indigenous vegetation in depleted areas, including urban areas. Areas of land identified as SNAs under the proposed NPSIB can be considered ‘no go areas’ for urban development, as described in the NPS-UD.</p>
<p>National Policy Statement for Renewable Electricity Generation (NPS REG)</p>	<p>Renewable electricity development can have adverse effects on indigenous biodiversity. The proposed NPSIB would manage these effects and allows a consenting pathway for specified infrastructure (including renewable electricity generation which is important for the national electricity supply) in SNAs, while protecting the most significant habitats and ecosystems.</p>
<p>National Policy Statement for Electricity Transmission (NPSET)</p>	<p>The NPSET requires councils to recognise and provide for electricity transmission networks. Electricity transmission activities can result in adverse effects on biodiversity. The proposed NPSIB would manage these effects and allows a consenting pathway for nationally significant infrastructure (including the national grid) in SNAs, while protecting the most significant habitats and ecosystems.</p>
<p>National Environmental Standards for Electricity Transmission Activities (NESETA)</p>	<p>The NESETA are regulations that support the NPSET and set out a framework of permissions and consent requirements for operation, maintenance and upgrading of existing electricity transmission lines. They set out which activities are permitted, subject to conditions to control environmental effects. These regulations complement the proposed NPSIB as the NESETA already provides for more stringent management in natural areas. The NESETA prevails over the NPSIB; it requires consent for activities that affect vegetation in SNAs.</p> <p>The need for guidance on consents under the NESETA that fulfil the proposed NPSIB objectives will be considered. There may be future reviews of each instrument to determine whether adverse effects consented inside natural areas under the NESETA meet the proposed NPSIB objectives.</p>

Initiative or instrument	Link with proposed NPSIB
<p>National Environmental Standards for Plantation Forestry (NES-PF)</p>	<p>The NES-PF are regulations under the RMA which aim to maintain or improve the environmental outcomes associated with plantation forestry and to increase the efficiency and certainty of managing plantation forestry activities. This is achieved through a single set of regulations under the RMA that apply to foresters throughout New Zealand. The NES-PF applies to any forest of at least 1 hectare that has been planted specifically for commercial purposes and will be harvested.</p> <p>The NES-PF regulations cover eight core plantation forestry activities that have potential environmental effects. Two relate to indigenous biodiversity: indigenous bird nesting for specific species and clearance of indigenous vegetation.</p> <p>The NPSIB provisions manage indigenous biodiversity in SNAs located in plantation forests. The NPSIB provisions prevail because the NES-PF allows councils to be more stringent than the NES-PF in their plans to protect SNAs.</p>
<p>The Biosecurity Act 1993 and Biosecurity 2025</p>	<p>New Zealand’s biosecurity system helps protect our economy, environment and people from unwanted pests and diseases. Our biosecurity system is underpinned by the Biosecurity Act 1993 (the Act). The Act provides the legal framework for the Ministry for Primary Industries and other organisations to help keep harmful organisms out of New Zealand. It also provides the framework for responding to and managing organisms if any make it into the country, including pest management plans developed by regional councils. The Biosecurity Act is currently being reviewed because of increasing pressures on the biosecurity system.</p> <p>Biosecurity 2025 provides an overarching strategic direction for the biosecurity system. Working groups have developed five work plans to inform the development of an Implementation Plan. The Implementation Plan provides guidance and specific actions through 2025 and beyond.</p> <p>The proposed NPSIB interacts with the biosecurity system. Proposed council plans to enable indigenous biodiversity to adapt to a changing climate include managing and reducing biosecurity risks. The principles guiding the content of proposed regional biodiversity strategies ensure they provide a single and comprehensive record of all areas targeted for protection, enhancement and restoration, including actions taken under other legislation such as the Biosecurity Act 1993.</p>
<p>National Planning Standards</p>	<p>The two main purposes of the planning standards are to require national consistency across resource management plans and support the implementation of national policy statements, national environmental standards or other regulations made under the RMA. The first set of National Planning Standards, gazetted in April 2019, focused on the core elements of plans (that is, their structure and format, along with standardising common definitions and improving their electronic accessibility). With this foundation in place, it will be easier for future standards to include other national directions.</p> <p>We remain open to the possibility that a planning standard may be required to support components of the proposed NPSIB.</p>
<p>Mahi mō te Taiao Jobs for Nature</p>	<p>Jobs for Nature is a NZ\$1.22 billion programme that manages funding across multiple central government agencies to benefit the environment, people and the regions. It is part of the COVID-19 recovery package. The programme is intended to run for four years.</p> <p>The funding is being used to create nature-based work activities, including:</p> <ul style="list-style-type: none"> • vegetation planting for freshwater and biodiversity restoration • fencing waterways both on public and private land • pest and plant control (including wilding pines and wallabies) • fish passage remediation • skills training to support career development in environmental management. <p>Funding recipients include local government, iwi, charitable trusts, community catchment groups, community groups, and private companies.</p>

Initiative or instrument	Link with proposed NPSIB
	While Jobs for Nature does not directly implement the NPSIB, many of the projects and activities it enables contribute to the outcomes sought by the NPSIB.
Proposed National Policy Statement for Highly Productive Land (NPS-HPL)	The proposed NPS-HPL requires the identification and management of land for primary production. It does not intend for the absolute protection of highly productive land or that there should be no net loss of such land. Rather, the aim is to require local authorities to consider the value of this resource in their region/district, both now and in the future.

Appendix 2 – Established central government support measures

Table 5: Summary of existing central government funds

Existing funding	Funding purpose and activities it supports	Annual funding	Total funding
Ngā Whenua Rāhui	<p>This fund aims to protect the remaining indigenous biodiversity on land owned by Māori. It provides protection for Māori landowners through 25-year renewable kawenata. The agreements provide the long-term benefits of protecting Papatūānuku; indigenous biodiversity; and historical, spiritual and cultural values on Māori-owned land. Following recent legislative change, land subject to a Ngā Whenua Rāhui kawenata is non-rateable as of 1 July 2021.</p> <p>See Ngā Whenua Rāhui: Funding for information on how to apply to Ngā Whenua Rāhui.</p>	NZ\$6 million	NZ\$6 million per year
Sustainable Food and Fibre Futures	<p>This fund supports initiatives that make a difference to New Zealand's food and fibre sectors. Projects that bring biodiversity into farm systems may be eligible for funding. There are four funding categories from small grants (up to NZ\$100,000) to a partnership (over NZ\$5 million).</p> <p>See Sustainable Food and Fibre Futures Funding and rural support NZ Government for information on how to apply to Ngā Whenua Rāhui.</p>	NZ\$40 million	NZ\$40 million
DOC community fund	<p>The DOC Community Fund supports practical projects aimed at conserving New Zealand's indigenous biodiversity. Projects focus on protecting and restoring our natural habitats and halting the decline of and restoring healthy, sustainable populations of our native species.</p> <p>This fund supports a range of conservation activities and relatively small grants (NZ\$40,000 average) to leverage community involvement for biodiversity (eg, predator control, weed control, species protection projects) on public and private land. The fund is oversubscribed each year (usually receives applications worth NZ\$20 to 30 million annually).</p> <p>See DOC Community Fund: Apply for funding for information on how to apply to Ngā Whenua Rāhui.</p>	NZ\$4.6 million	NZ\$4.6 million
Nature Heritage Fund	The Nature Heritage Fund protects indigenous ecosystems through a sustainable and	NZ\$1.8 million	NZ\$1.8 million

Existing funding	Funding purpose and activities it supports	Annual funding	Total funding
	<p>interacting system of protected areas. It does this by purchasing land or through covenanting, leasing, accords or management agreements if left in private ownership. The Fund typically protects two to five areas annually.</p> <p>See Nature Heritage Fund: Apply for funding for information on how to apply to Ngā Whenua Rāhui.</p>		
Mahi mō te Taiao Jobs for Nature	<ul style="list-style-type: none"> The Jobs for Nature programme allocated additional one-off funding in 2021 to support iwi/Māori, landowners, community groups and councils to deliver positive outcomes for indigenous biodiversity. Jobs for Nature Community Conservation Fund – supporting community-led biodiversity projects on public and private land. This went to 27 projects with 61% of them on private land. Jobs for Nature Private Land Biodiversity Fund – supporting groups of private landowners to restore and enhance indigenous ecosystems on private land, while providing employment. This went to 22 projects, including regional council projects to support protection and restoration of SNAs. Freshwater Improvement Fund – supports the management of lakes, rivers, streams, groundwater and wetlands. Projects related to terrestrial biodiversity restoration including reduction of sediment eroding into the land and wetland and estuary restoration. Funding has been provided to the national Wilding Conifer Control Programme and a programme to address wallaby control Funding has also been allocated to Predator Free 2050 and pest and weed control on Crown land. 	<p>Not an annual fund</p> <p>Not an annual fund</p> <p>Not an annual fund</p> <p>Not an annual fund</p> <p>Not an annual fund</p>	<p>NZ\$16 million (over 4 years)</p> <p>NZ\$18 million (over 4 years)</p> <p>NZ\$55 million additional funding</p> <p>NZ\$100 million for wilding conifers NZ\$27.4 million for wallaby control</p> <p>NZ\$76 million to Predator Free 2050 (over 4 years)</p> <p>NZ\$10 million to pest control on Crown land (over 4 years)</p>
Total funding		NZ\$52.4 million	NZ\$354.8 million



21 July 2022
Document: 3079866

Ministry for the Environment
PO Box 10362
Wellington 6143

Attention: Feedback Analysis Team

Submission on the National Policy Statement for Indigenous Biodiversity

Introduction

1. The Taranaki Regional Council (the Council) thanks the Ministry for the Environment (MfE) for the opportunity to provide feedback on the exposure draft on the *National Policy Statement for Indigenous Biodiversity* (NPS-IB) and the *National Policy Statement for Indigenous Biodiversity Draft Implementation Plan* (draft implementation plan).
2. The Council makes this submission in recognition of:
 - its functions and responsibilities under the *Resource Management Act 1991* (RMA), the *Biosecurity Act 1993*, and under the *Local Government Act 2002*;
 - its responsibilities and costs to be incurred by the Council to give effect to the NPS-IB;
 - its regional advocacy responsibilities whereby it represents the Taranaki region on matters of regional significance or concern; and
 - the significant programmes and activities carried out by the Council to protect indigenous biodiversity in Taranaki.
3. The Council has also been guided by its Mission Statement across all of its various functions, roles and responsibilities, in making this submission.
4. The Council notes that Government's goal of maintaining and enhancing indigenous biodiversity is consistent with the Councils' own Mission Statement, which reads as follows:

"To work for a thriving and prosperous Taranaki by:

- *Promoting the sustainable use, development and protection of our natural and physical resources.*
- *Safeguarding Taranaki's people and resources from natural and other hazards.*

- *Promoting and providing for significant services, amenities and infrastructure.*
- *Representing Taranaki's interests and contributions regionally, nationally and internationally."*

General comments

5. The Council is supportive of the overall intent of the NPS-IB and efforts made to involve community and tangata whenua in the maintenance, protection and enhancement of indigenous biodiversity in Aotearoa. Notwithstanding that, the Council has significant concerns around the workability of some NPS-IB provisions and on the adequacy of the Government's leadership, support and resourcing set out in the implementation plan.
6. The Council provides the following specific comments.

Significant Natural Areas

7. The Council generally supports the criteria set out in Appendix 1 of the NPS-IB for identifying significant natural areas (SNAs) and believes it will promote greater consistency across district plans in relation to their identification.
8. The Council further supports the adoption of the hierarchical approach to managing adverse effects on SNAs of new subdivision, use and development (Clause 3.10) of the NPS-IB. Council suggests that the hierarchical approach (Clause 3.10 (3)) should promote more consistent and effective management of adverse effects on biodiversity within SNAs.
9. Notwithstanding the above, the Council notes the following concerns and reliefs sought to SNA provisions:
 - Clause 3.8(3) states that "*...If requested by a territorial authority, the relevant regional council must assist the territorial authority in undertaking its district-wide assessment*". It is the Council's view that this requirement is extremely ambiguous and potentially derogates away from the roles and responsibilities of territorial authorities to map and identify SNAs. The clause does not state to what extent and in what form regional councils must assist districts in undertaking their SNA assessments. The Council is not currently resourced for the potential consequences of this clause. It is the Council's view that regional and district councils should be able to support each other in accordance with our respective roles, responsibilities and expertise and that the way in which this is done can be determined by discussion and agreement between the councils involved. We also support the Te Uru Kahika view that these discussions are best progressed as part of the Triennial Agreement process. The Council recommends that Clause 3.8(3) be amended to require that local authorities within each region, as part of their triennial agreement, agree on:
 - a. how each authority intends on meeting its obligations under the NPS-IB;

- b. how the work in delivering the NPS-IB is to be resourced and funded; and
 - c. the range of assistance that territorial authorities expect to request from the regional council under the 'must assist' clause.
- It is recommended that the default position (i.e. in the absence of an agreed position in the triennial agreement) is that the regional council, if called to assist, is entitled to recover the costs of that assistance from the relevant district council.
- Clause 3.8(5), combined with a new SNA definition, creates a 'gap' where any area that becomes known to meet Appendix 1 criteria, but was not mapped in a district plan, is not recognised as an SNA. This will have significant implications for the ability of consenting processes to protect new SNAs between plan changes, i.e. new unmapped SNAs might be identified between plan changes and do not have the same levels of protection. The Council therefore believes further consideration must be given (i.e. to amending the clause to be similar to the 2019 version of the draft NPS-IB) to having regular and timely plan changes for adding any area that has been identified as an SNA (e.g. every 2 years).
- Appendix 1(C)(4) "*Depletion of indigenous vegetation or ecosystems is assessed using ecological districts and land environments*". The Council note that the depletion of indigenous ecosystems is more accurately assessed using potential ecosystems or habitat mapping. The Council also notes that most of the North Island has now been mapped using the Singers and Rogers method, with some modifications this method could be used as a national standard. The Council recommends that the Singers and Rogers method be used in this clause.
- Appendix 1(C)(4) "*Depletion of indigenous vegetation or ecosystems is assessed using ecological districts and land environments*". The Council notes that land environments information is out of date (currently based on 2012 aerial imagery) and there is usually a significant lag between LCDB updates and nationally revised Threatened Environment classifications. The Council therefore seeks that Government invest in revising, updating and improving these national datasets at least every 5 years as data becomes available.
- Appendix 1(C)(6)(d), states "...*indigenous vegetation that has been reduced to less than 20 percent of its pre-human extent in the ecological district, region, or land environment*". The Council recommends that this clause be amended from 'indigenous vegetation' to either 'indigenous vegetation type or ecosystem type'.

Relief sought:

- a) Amend Clause 3.8(3) to require the local authorities within each region to agree as part of their triennial agreement, how each authority intends meeting its obligations under the NPS-IB.
- b) Amend Clause 3.8(5) to read "...*At least every two years after completing the requirements of subclause (6), every territorial authority must notify a plan change, where practicable, to add any area that has been identified as an SNA*".
- c) That Guidance state that the Singers and Rogers method be used in the assessment and mapping of potential ecosystems or habitat pursuant to Appendix 1 (4).
- d) Seek that Government invest in revising, updating and improving these national

- datasets at least every 5 years as data becomes available.
- e) Amend references in Appendix (C)(6)(d) to “indigenous vegetation” to “indigenous type or ecosystem type”.

Taonga species

10. The Council notes that in accordance with clause 3.19 of the NPS-IB, there are requirements on territorial authorities to work with tangata whenua to determine the indigenous species, populations and ecosystems in the district that are taonga. Local authorities must work together with tangata whenua to protect both acknowledged and identified taonga as far as practicable.
11. The Council supports enabling tangata whenua to ‘drive’ the process of identifying taonga and understand the need to describe the location of indigenous species that are taonga within planning instruments. However, the Council has significant concerns with identifying ecosystems as ‘acknowledged’ and ‘identified taonga’.
12. Clause 3.19(1) of the NPS-IB states that “*Every territorial authority must work together with tangata whenua (using an agreed process) to determine the indigenous species, populations, and ecosystems in the district that are taonga; and these are acknowledged taonga.*”
13. The Council notes that the term ‘ecosystems’ has a very broad definition and there is likely to be differing opinions and understandings between councils, iwi and hapū as to what the NPS-IB is trying to be achieve here and what should be identified as taonga. For example, the Council notes that at different times, through various planning processes, some iwi/hapu have identified all biodiversity, including all rivers and wetlands and the coastal marine area, as taonga. The Council recommends deleting references to ecosystems in clause 3.19(1) as being too open ended and uncertain in their application.
14. The Council further seeks that Government prepare comprehensive guidance and direction to support council and tangata whenua interpretation of clause 3.19 of the NPS-IB. The preparation of comprehensive and timely advice is particularly pertinent should current requirements to map or describe the location of populations and ecosystems identified as taonga be retained.

Relief sought:

- f) Amend Clause 3.19(1) to delete references to ecosystems or, should Government decline to make the amendment, seek comprehensive guidance and advice on implementing requirements to map or describe the location of taonga populations and ecosystems.

Highly mobile fauna areas

15. The Council notes that in accordance with clause 3.20 of the NPS-IB, “*Every regional council must record areas outside SNAs that are highly mobile fauna areas, by working together with tangata whenua (in the manner required by clause 3.3), territorial authorities in*

its region, and the Department of Conservation". There are a number of issues with this as currently written.

16. The proposed definition of *'highly mobile fauna area means an area outside an SNA that is identified under clause 3.20 as an area used by specified highly mobile fauna'*. However, this definition is problematic in that the term 'used' would result in the unintended 'capture' of a significant number of areas not otherwise identified as SNAs.
17. The Council seek that the definition be amended to refer to "regularly used" (i.e. for breeding, feeding, or roosting purposes) to avoid capturing transient use. The Council further notes that there is also no specification of the minimum size of the space. The Council acknowledges such detail might not be appropriate in the NPS-IB itself but seeks that guidance be prepared to assist in the interpretation and application of this clause, including a minimum specification of size and space.
18. The Council further notes that councils are unlikely to have the necessary data and species management understanding to determine needs to maintain viable populations at landscape scales and across natural ranges. As Council has noted in its previous submission, we believe that the Government, through the Department of Conservation (DOC), should have lead responsibility for mapping and providing the relevant datasets for highly mobile fauna provisions to local government. It is the Council's strong view that the Crown has a leadership role to play in biodiversity protection (that extends beyond policy development) and is better placed to undertake the exercise of surveying and mapping of highly mobile fauna areas across New Zealand. Council acknowledges that there is a significant cost to doing this but it will ensure better national oversight, a more efficient and higher quality mapping process in line with Government expectations, and avoids the current cost shifting by Government to councils (although noting councils are likely to still have a supporting role).
19. DOC is the lead central government agency for conservation. DOC is the administering agency for the *Conservation Act 1987*, which is an Act to promote the conservation of New Zealand's natural and historic resources. DOC is also the administering agency for the *Wildlife Act 1953*. Under that Act, the Minister has the explicit powers to "... prepare and carry out wildlife surveys" (section 41(a)), "...coordinate the policies and activities of departments of state, local authorities and public bodies in relation to the protection...and conservation of wildlife" (section 41(c)) and "...conduct wildlife research work, and collect and disseminate wildlife information" (section 41(d)). The Council wishes to highlight that DOC already maintain significant information on highly mobile fauna, they have the capacity and experience in assessing and identifying highly mobile fauna, plus the work of identifying and updating highly mobile fauna areas can be more easily incorporated and/or aligned with DOC's review of the threat classification of highly mobile fauna species.
20. Rather than devolving mapping responsibilities to councils, and the associated risks of inter-regional inconsistencies and overlap with DOC's role and responsibilities, the Council seeks that the Government, take ownership of this issue and resource the generation of a nationally robust and consistent dataset of highly mobile fauna areas

(plus other biodiversity related information) across New Zealand that councils can then adopt and put into their plans.

21. The Council provides qualified support for Appendix 2 subject to minor amendments that:
- align with DOC's updated classification for New Zealand birds (refer [Conservation status of birds in Aotearoa New Zealand, 2021](#));
 - align with a new threatened category (which is 'threatened nationally increasing' that replaces 'at risk recovering');
 - ensures Appendix 2 and associated lists are regularly reviewed and updated (possibly every five years to align with the current Threat Classification review cycle) to ensure it remains accurate and protects the necessary species; and
 - include additional species noting that the current list has missed seabird species that use land to breed and appear to meet the criteria of Highly Mobile Threatened fauna. It is recommended that the list is reviewed and updated to at least be current with existing published datasets, including adding Threatened and At Risk (declining) ground nesting seabirds.
 - include the following additional species to Appendix 2: Long tailed cuckoo, Yellow-crowned parakeet/Kākāriki, Black petrel/Tāiko, Hutton's shearwater/ Kaikōura tītī, and Blue penguin/Kororā.

Relief sought:

- g) Amend definition of highly mobile fauna areas to refer to areas regularly used for feeding, breeding and/or roosting.
- h) Prepare guidance to be prepared to assist in the interpretation and application of clause 3.20, including a minimum specification of size and space for identifying highly mobile fauna areas.
- i) That the Crown be responsible for undertaking the surveying and mapping of highly mobile fauna areas across New Zealand.
- j) Update Appendix 2 to align with the most recent threat classifications of highly mobile fauna, include a requirement that it be updated every five years, and to include other relevant species.
- k) Update Appendix 2 to include the following additional species: Long tailed cuckoo, Yellow-crowned parakeet/Kākāriki, Black petrel/Tāiko, Hutton's shearwater/ Kaikōura tītī, and Blue penguin/Kororā

Restoration

22. The Council notes that like other regional councils Taranaki has undertaken a regional prioritization process using ecosystem mapping and zonation. This process remains a useful and consistent approach to prioritizing the full range of ecosystems. This approach is used by other regional councils and it is recommended that this approach be explicitly recognised in the NPS-IB as an appropriate method.

23. Clause 3.21(1) states that “...*Local authorities must include objectives, policies, and methods in their policy statements and plans to promote the restoration of indigenous biodiversity, including through reconstruction of areas*”. The Council notes that reconstruction is not something we have previously done much of or see as being a focus. Occasionally projects are led by the community and we have specialised technical input. However, the Council recommends deleting references in clause 3.21(1) to reconstruction whereby it is given the same priority level as restoration.
24. The Council questions clause 3.21(2)(b) and seeks clarity on the definition of ‘threatened and rare ecosystems’. Is this information derived using potential ecosystem mapping and zonation prioritization process? There is increasing confusion around these terms. Statistics NZ refers to ‘71 rare ecosystems’ of which 45 are ‘threatened’. Landcare Research refers to ‘naturally uncommon ecosystems’. It is unclear in 3.21(2)(b) if this also relates to historically common ecosystem types that are now less than 10% of their pre-European extent and therefore considered ‘Threatened’ under the IUCN rating system.
25. The Council notes that clause 3.21(2)(d) is inconsistent with the definition of a ‘natural wetland’ in the *National Policy Statement for Freshwater Management (NPS-FM)* but am unclear as to whether this is intentional. A wetland is also defined in the RMA 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*”. Therefore wet pasture is arguable being targeted in clause 3.21(2)(d) plus the now drained peatlands and swamp forests around Eltham that have historically been converted to pastureland. If that was not the intention, Council seeks that relevant terms in the NPS-IB are aligned with terms in the NPS-FM.
26. Clause 3.21(2)(e) states “...*any national priorities for indigenous biodiversity protection*” The Council requests clarification on what are the national priorities for indigenous biodiversity. Does it refer to those expressed in the current national priorities list prepared by DOC and MfE “*Protecting our Places: Introducing the national priorities for protecting rare and threatened native biodiversity on private land*”, or is this something new?

Relief sought:

- l) Recommended that the zonation approach is recognised in the NPS-IB or supporting guidance as the appropriate method for prioritising restoration areas.
- m) Seek clarification as to whether 3.21(2)(d) references to the RMA definition of wetland is deliberate. If not, seek that references to wetlands in the NPS-IB be amended and aligned with the ‘natural wetlands’ definition set out in the NPS-FM.
- n) In relation to clause 3.21(2)(e), seek clarification in guidance on what the national priorities for indigenous biodiversity protection are.

Increasing indigenous vegetation cover

27. The Council questions the *vires* of restoration targets noting that sections 30 and 31 functions of the RMA only require councils to maintain (and not enhance) indigenous biodiversity. It is the Council's contention that clause 3.22 of the NPS-IB is imposing a statutory requirement on councils that extends beyond what currently exists in the RMA.
28. The Council is further concerned with the alignment with other (sometimes conflicting) national directives.
29. Clause 3.22 requires all councils everywhere to meet a 10% restoration target for vegetation cover in urban environments. Council notes that the *National Policy Statement on Urban Development* definition for 'urban areas' only includes those urban areas with a population over 10,000 people). Clause 3.22(3)(b) further states "...consider setting targets of higher than 10% for *other areas*, to increase their percentage of indigenous vegetation cover; and". The Council questions what the definition of 'other areas' is, if not classified as 'urban environment' or 'non-urban environment'.
30. The Council also suggests that urban restoration targets may be difficult to reconcile with *National Policy Statement on Urban Development* directives to make land available for urban development and intensification. Although a wider issue than what can be addressed under this process, the Council strongly urges better alignment by Government between their national policy statements and national environmental standards and, as far as is practicable, avoid the differing treatment of different land uses simply because they are covered by a different national policy instrument (e.g. *National Policy Statement for Urban Development*, *National Environmental Standard for Plantation Forestry* and the *National Policy Statement for Freshwater Management*).
31. The Council also seeks clarity on the spatial scale at which the 10% indigenous vegetation cover is to be calculated (e.g. whether the land environment (LENZ), ecological district, ecological region or ecosystem type are to be used) and the intended timeframe for the targets. For example, in Taranaki, if this clause applied to Ecological Districts, the Foxton and Manawatu Plains would require significant land use change to meet the 10% target. The scale of application will make a difference for implementation, resourcing and indeed future land use in the region.
32. The Council seeks the ability to set regional targets for different parts of each region in the relevant planning document and the Biodiversity Strategy. The targets would need to be consistent with the overall objective of no further decline but would allow for flexibility to reflect the issues that exist in each part of the region.
33. The Council seeks a priority-based staged implementation approach to the NPS-IB that focuses on where protection efforts (time and resources) can most effectively be applied. As it is currently written clause 3.22(4) does not focus on threatened or rare ecosystems, instead the restoration targets relate to indigenous vegetation cover more generally including all areas referred to in clause 3.21(2), ensuring species richness as well as restoration at a landscape scale across the region.

Relief sought:

- o) Seek better alignment between national directives, noting that restoration targets set out in clause 3.22 may conflict with objectives in other national policy statements such as the *National Policy Statement for Urban Development*.
- p) Seek clarification (potentially in the form of guidance) as to the definition of 'non-urban environment' and 'other areas' referred to in clause 3.22(3).
- q) Seek that the NPS-IB allow regional targets to be set for different parts of each region in relevant planning documents, including the Biodiversity Strategy.
- r) Seek the adoption of a priority-based staged implementation approach to the NPS-IB.

Regional biodiversity strategies

- 34. The Council is opposed to mandatory regional biodiversity strategies (notwithstanding it has already prepared and is implementing its own non statutory biodiversity strategy). In particular, the Council is concerned about the introduction of another planning process and another tier of planning despite already significant pressures on the capacity of the sector to deal with other national initiatives and resource management reform.
- 35. Clause 3.18(1) of the NPS-IB further states that "...regional councils must prepare a regional biodiversity strategy in collaboration [emphasis added] with territorial authorities, tangata whenua, communities, and other stakeholders." The Council notes that collaboration infers more than consultation. There is a risk that the outcome of collaborative decision making processes could impose unbudgeted costs on councils to give effect to priorities demanded by external parties that have not been vetted through long term planning processes and where those parties do not have to directly bear the costs or consequences of their demands.
- 36. It is also unclear what the relationship is (and purpose) of regional biodiversity strategies with other planning instruments including long term plans, regional policy statements, regional plans and district plans. At first glance there seems to be considerable overlap with other planning instruments.
- 37. If the Government insists on persisting with mandatory regional biodiversity strategies, the Council recommends minor amendments to Appendix 5(3) to allow regional councils to include other relevant biodiversity related information as optional content.

Relief sought:

- s) Opposed to clause 3.23 and the requirement that regional councils must prepare a regional biodiversity strategy in accordance with Appendix 5 and in collaboration with territorial authorities, tangata whenua, communities, and other stakeholders.
- t) If clause 3.23 and Appendix 5 are retained, seek a new clause to Appendix 5(3) to allow regional councils to include other relevant biodiversity related information as optional content.

Monitoring

38. The Council supports monitoring of indigenous biodiversity. However, Council consider that emphasis should be placed on regional implementation of a national monitoring framework, rather than the development of individual monitoring plans for each region and district. This would ensure national consistency in data collection and enable national reporting of overall ecosystem health.
39. Clause 3.25 will create a significant piece of work for regional councils. The Council notes there needs to be national consistency and regional implementation (which will require more staff or a roving pan-regional team).
40. The Council believes the Government must play a greater role in this area (see further comments below). The Council notes that successful implementation of this (and other clauses of the NPS-IB) will require cross-agency data sharing agreements, including between local and central government. However, securing such arrangements have proved challenging in the past. As part of the implementation plan, the Council recommends that support measures and initiatives are included to facilitate and/or coordinate data sharing agreements.

Relief sought:

- u) Seek that emphasis be placed on regional implementation of a national monitoring framework.
- v) Seek that the Government play a lead role in national and regional monitoring requirements noting that successful monitoring will require cross-agency data sharing agreements, including between local and central government.

Active management

41. Reliance on regulation such as the NPS-IB will not reverse the decline in indigenous biodiversity occurring nationally. A package of interventions is required to address the biodiversity challenge, both regulatory and non-regulatory, and there must be a greater focus by the Government on actively managing the threats associated with biodiversity decline. Active management almost always requires working alongside people, whether they're individual landowners or communities. It means taking proactive and positive measures, such as fencing, pest and weed control or planting, to protect and enhance indigenous biodiversity.
42. When you get people involved with biodiversity management, they invariably expand their knowledge about our native flora and fauna, and value it more highly. There is much research to suggest that working alongside people gets more effective results than forcing behavioural change through regulations, which at best can only ever achieve passive protection of biodiversity. The Council therefore seeks that the Government place more emphasis on non-regulatory interventions (i.e. fund a package of support, grants and incentives). More could be done by the Government with respect to providing incentives to landowners but also there is so much more that

could be done for protecting and restoring biodiversity and the health of ecosystems on large tracts of public conservation land. While the focus on predators is commendable, effective large scale control of herbivores (deer, goats, pigs, rabbits/hares) is vital for maintaining these areas and reducing pressure on smaller fragmented ecosystems on private land.

43. This Council understands the concept of active management well. We are leaders in this area, with a long history of developing and implementing work programmes that are landscape in scale with strong community buy-in. However, the Council is concerned that the NPS-IB and associated regulation, without appropriate and complementary non-regulatory measures, will cut across and cause harm to the good work being done by landowners on the ground. If the Government is serious about actually halting the decline then much more thought is required here.

Relief sought:

- w) Seek that greater focus by the Government on actively managing the threats associated with biodiversity decline

Mapping Requirements

44. NPS-IB implementation will be difficult and costly for councils, in the wider context of other national direction that will need to be implemented over the next three years, e.g. Essential Freshwater Package, Three Waters, resource management reform and local government reform.
45. It is the Council's contention that mapping requirements are one area where the Government would be better-off taking a lead (with councils taking the lead in administering and monitoring the NPS-IB).
46. For territorial authorities, there are requirements to evaluate, identify and map (clauses 3.8(4)) significant natural areas using suitably qualified ecologists. Territorial authorities must also make or change their district plans to include maps or a description of the location of indigenous species and ecosystems that are taonga (clause 3.9 and 3.19).
47. For regional councils, there are requirements to record highly mobile fauna areas outside SNAs (clause 3.20). Also of note are requirements under the *National Policy Statement for Freshwater Management* to identify and map inland natural wetlands.
48. The Council strongly seeks that the Government develop and maintain national datasets that map indigenous biodiversity across New Zealand. The Council would suggest that such datasets could then be made available to councils for them to be adopted and inserted into their plans as appropriate, e.g. similar in concept to the Government's Erosion Susceptibility Classification maps released to support the implementation of the *National Environmental Standards for Plantation Forestry*.

49. This would be equitable as it represents national information to give effect to national direction and to address a national issue. It also represents an opportunity for Government to show they are a partner in the implementation of the NPS-IB.
50. This would be efficient in that it is likely to be less costly than devolving this task to a large number of councils around New Zealand to individually undertake the exercise – despite their variable size, expertise and capacity to undertake the exercise and/or the cost and capacity of the consultancy sector to support the exercise.
51. This would also be more reliable in that it would ensure national alignment across New Zealand and avoid local variations in the identification of SNAs etc.
52. One added attraction of councils adopting a nationally authorised dataset is that it will reduce the challenges and costs incurred by councils when identifying and incorporating mapped areas in their plans. Despite assertions in the previous section 32 evaluation report to the contrary, our experiences of district and regional planning processes under the RMA are that proposed plans and the identification of SNAs are regularly and frequently challenged through the schedule 1 RMA planning process in relation to arguments over the implementation of national policy directions with significant added costs incurred by all parties.

Relief sought:

- x) Seek that the Government develop and maintain national datasets that map indigenous biodiversity as required by the NPS-IB.

Information requirements

53. Clause 3.24 has the potential to be extremely onerous on councils, consent applicants and ecologists as it applies to all indigenous biodiversity matters. The Council recommends that MfE provide thorough and timely guidance on the scope of clause 3.24(1) ‘in relation to an indigenous biodiversity matter’ and the thresholds of effects that the activity would potentially have before triggering this requirement.
54. The Council also note that it is currently unclear what is meant by clause 3.24(1)(a) “...qualified and experienced ecologist”. As it is currently written it will potentially limit who can undertake consent reporting, this will have further implications for availability of ecologists to undertake this work. The Council recommend that this clause be revised to ‘suitably qualified ecologist’, which is also consistent with other clauses of the NPS-IB.
55. Further guidance is also required with regards to clause 3.24(2)(e) which states ‘include mātauranga Māori and tikanga Māori assessment methodology, where relevant; and’. The Council firstly note that this method of assessment can only be done by tangata whenua, and recommend that the wording be revised to read “...include information provided by tangata whenua on mātauranga Māori and tikanga Māori”.

Relief sought:

- y) Seek that the Government develop specific guidance addressing the thresholds triggering clause 3.24 requirements.
- z) Amend clause 3.24(1)(a) to refer to “suitably qualified ecologist”.
- aa) Amend clause 3.24(2)(e) to read “...include information provided by *tāngata whenua* on *mātauranga Māori* and *tikanga Māori*”.

Capacity and capability

- 56. The Council does not currently have the resources to deliver the work and obligations required under the NPS-IB. However, this is not just about the need for additional funding. Giving effect to the NPS-IB requires trained and experienced staff across council sections. This will include ecologists, business information technology support staff (GIS, data management), and communications, policy analysts, consents officers and iwi liaison officers. The Council seek Government support to recruit and train staff at the level required by the NPS-IB.
- 57. There is a risk that the outcome of collaborative decision making processes could also impose significant unbudgeted costs on councils to give effect to priorities demanded by external parties that have not been vetted through LGA planning processes and where those parties do not have to directly bear the costs or consequences of their demands.
- 58. Significant unbudgeted costs and demands are similarly going to be placed on Treaty partners and stakeholders. The Council wish to specifically highlight expectations on *tāngata whenua*, including costs and resourcing required to define *Te Rito o Harakeke*, identify *taonga* species, and in being involved in the various additional planning processes.

Relief sought:

- bb) Note that giving effect to NPS-IB will be imposing significant demands and costs on local authorities (and others) and that there is likely to be capacity issues across the sector to deliver on aspects of the NPS-IB.

Implementation plan

- 59. Getting the system right means ensuring there is strong governance, leadership and accountability, and that there is effective coordination between central and local government plus other participants. The Council is concerned that the NPS-IB relies solely on local government to deliver national policy directions.
- 60. It is the Council’s firm view that Government writing policy and simply directing others to take action and ‘passing on’ the costs does not constitute real leadership. The Council strongly believes that a package of interventions, both regulatory and non-regulatory, are required to address the challenges.
- 61. The implementation of the NPS-IB will be difficult and costly for councils, especially in the wider context of other national direction that will need to be implemented over the next three years. New requirements for regional planning and policy development

with the implementation of the NPS-IB include giving effect to Te Rito o te Harakeke (clause 3.2), assisting with the identification of SNAs (clause 3.8(3)), plan changes relating to the identification of identified taonga, the recording of highly mobile fauna species (clause 3.20), the setting of restoration targets (clause 3.22), the development and implementation of the regional biodiversity strategies (Clause 3.23), and monitoring by regional councils (Clause 3.25). In addition to the above, councils also have the onerous task of reviewing current planning frameworks to align with the NPS-IB requirements.

62. The Council is therefore seeking that the Government provide meaningful support and resourcing for the implementation of the NPS-IB, such as revising, updating and improving relevant national datasets on a regular basis.
63. Clause 3.8(3) of the NPS-IB states; *'(3) If requested by a territorial authority, the relevant regional council must assist the territorial authority in undertaking its district-wide assessment'*. Council supports measures in the draft implementation plan for financial support for Significant Natural Area (SNA) identification but would seek that regional councils also be eligible for additional funding. The draft implementation plan ignores the significant costs and resourcing required by other clauses within the NPS-IB such as the mapping of highly mobile fauna.
64. In addition to financial assistance, much more non-financial investment from the Government will be needed for the overall successful implementation of the NPS-IB. The Council seeks that the Government place more emphasis on non-regulatory interventions (i.e. meaningfully fund a package of support, grants and incentives). The Council notes that the detailed information on Government support and funding will not be developed until late 2023 and is currently lacking in the implementation plan. The Council seeks that MfE develop a stronger and more meaningful implementation plan which details financial support to offset some of the major costs to the sector of implementing the NPS-IB. The guidance and examples of best practice promised by MfE will be critical in the implementation and it is crucial that it cannot be delayed.

Relief sought:

- cc) Seek a commitment from the Government to a significant investment in non-regulatory interventions that include a package of meaningful support, grants and incentives to support the active management and protection of indigenous biodiversity on privately-owned land.
- dd) Seek that the Government revise, update and improve relevant national datasets, including national datasets that map indigenous biodiversity required by the NPS-IB.

Conclusion

65. The Council again thanks MfE for the opportunity to comment on the exposure draft for the NPS-IB.

66. The Council is supportive of the overall intent of the NPS-IB and efforts made to involve community and tangata whenua in the maintenance, protection and enhancement of indigenous biodiversity in Aotearoa. Notwithstanding that, the Council has significant concerns around the workability of some NPS-IB provisions and, in particular, the adequacy of the Government's leadership, support and resourcing set out in the implementation plan.
67. The Council looks forward to continuing to work with MfE and the government to successfully implement the NPS-IB.

Yours faithfully,
S J Ruru
Chief Executive



per: D R Harrison
Director - Operations



Date: 26 July 2022

Subject: **Report on advocacy and response activities for 2020/21 and 2021/22**

Approved by: A D McLay, Director - Resource Management
S J Ruru, Chief Executive

Document: 3084770

Purpose

1. The purpose of this memorandum is to report to the Committee on advocacy and response activities for the 2020/21 and 2021/22 years.

Executive summary

2. The Long Term Plan and applicable Annual Plans have a level of service in relation to advocacy and response activities of approximately 20 submissions made on policy initiatives proposed by other agencies.
3. In the 2020/21 year, the Council made 16 submissions and in 2021/22 it made 15. These numbers compare to 22 submissions made in 2019/2020.
4. Senior Council staff were also involved in various working parties or other fora locally or in Wellington and elsewhere to advise on policy development.
5. The net effect of the Council's wide-ranging advocacy and response activities has been in the majority of cases to make policy proposals more relevant, pragmatic and cost-effective for the region.

Recommendations

That the Taranaki Regional Council:

- a) receives the memorandum *Report on Advocacy and Response activities for 2020/21 and 2021/22*
- b) notes that in 2020/21 and 2021/22 the Council made a total of 31 submissions on the policy initiatives of other agencies
- c) notes that senior staff were also involved in various working parties or other fora on central and local government policy development and review projects.

Background

6. The 2021/2031 Long-Term Plan has the following level of service for advocacy and response activities for that financial year:

"Level of service

Effective advocacy on behalf of the Taranaki community on matters that affect the statutory responsibilities of the Council or that relate to matters of regional significance, which are of interest or concern to the people of Taranaki.

Target

Approximately 20 submissions made per year, with evidence of successful advocacy in most cases."

7. Under 'What we plan to do' in 2022/2023 the Annual Plan states:

"Advocacy and response

Assess the implications of policy initiatives proposed by other agencies including discussion documents, proposed policies, strategies, plans and draft legislation, and respond within required timeframes."

8. Effective advocacy on behalf of the Taranaki community on matters that affect the statutory responsibilities of the Council or that relate to matters of regional significance, which are of interest or concern to the people of Taranaki, is an important area of work for the Council.
9. The amount of effort that is put into advocacy and response work is determined, largely, by those proposing policy changes or draft legislation, or otherwise seeking responses to various initiatives. As a result, the number of Council submissions or responses made in any one year may be above or below the level of service indicated in the Long Term Plan and Annual Plan.
10. Priority responses are accorded to those policy proposals or responses sought that are related directly to the Council's core statutory obligations, or where we have particular knowledge or experience that will be of benefit to those proposing the change or seeking a response.

Submissions made

11. The Council made 15 submissions to policy proposals or initiatives by various agencies in 2020/2021 and 16 submissions in 2021/22. This compares with 26 submissions made in 2018/2019 and 22 in 2019/2020.
12. As noted above, the number of submissions prepared in any given year is largely dictated by what policy development is being carried out by others. It was noticeable that there were less new Government policy initiatives emerging throughout the reporting period, which may be in part attributable to a carry-over of the impact of the Government's focus on COVID-19 matters.
13. That said, as noted in the summary of key themes for each year, below, some very significant matters were released for comment in this period. Their significance arguably more than offsets the reduced number of submissions.
14. The number of submissions made over the last 6 years are shown in Figure 1 below.

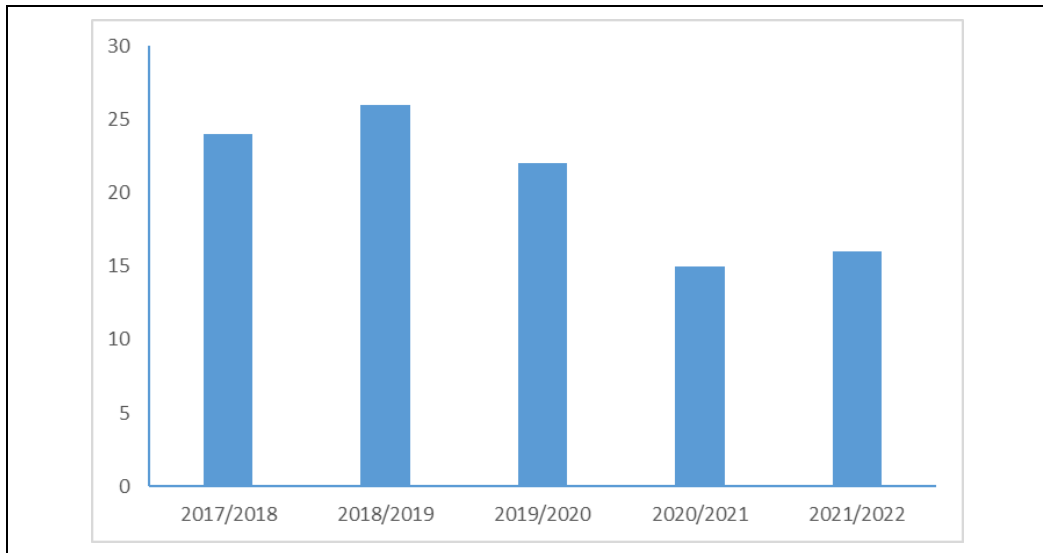


Figure 1: Number of submissions made by year

15. It is noted that Council submissions were made with input from staff across the Council and with input from Councillors. All submissions were made within the required timeframes.
16. The full list of submissions made in 2020/2021 and 2021/2022 are shown in Tables 1 and 2, in the Appendix to this Memorandum.
17. During the reporting period, work was undertaken on a number of central government policy initiatives.
18. The key theme that emerged in those policy initiatives in 2020/21 was climate change. Over the period, submissions were made on numerous climate related policy initiatives from across central government, including:
 - 18.1. The Draft Advice from the Climate Change Commission. That report contained an extensive review of emissions sources and equally extensive recommended courses of action to address them. Responding to the Draft Advice was a highly resource intensive exercise, not least due to the 800+ pages in the main report and many hundreds more in the supporting information. Officers from across Council were involved in our submission, which supported the goals of reducing climate impacts, but had serious questions about the proposed strategies.
 - 18.2. Proposals for Phasing Out the Use of Fossil Fuels for Process Heat. Although there are limited sites impacted by the planned phase out in the region, officers were keen to ensure that the proposals were practicable and implementable.
 - 18.3. Transport Emissions – Pathway to Net Zero 2050. The Ministry of Transport’s policy document largely echoed the transport focused sections of the Climate Change Commission’s draft advice, with similar submissions made by officers.
19. For 2021/22 the focus changed to a combination of legislative reform and key topics within the overall freshwater implementation space. Of particular note in this period were:
 - 19.1. Submissions on the exposure draft on the Natural and Built Environments Bill. This Bill, which will replace the Resource Management Act 1991 when enacted, is

a key part of setting the scope and nature of the Council's activities over the coming years. Officers made an extensive submission in the Council's name, as well as contributing to a Mayoral Forum submission with the three Taranaki territorial authorities.

- 19.2. Submissions on Essential Freshwater topics in the period included on farm plans, wetlands definitions and the proposed revised regulations on intensive winter grazing. Most of these policy changes are still being finalised (for example, consultation is currently underway on an exposure draft for changes to wetlands provisions). Ministry for the Environment engaged directly with officers on our suggested intensive winter grazing changes, which are reflected in the final regulations.
20. One topic that has remained consistently prominent across the period is transportation, with approximately one third of all submissions being transport related. Many of those have been made in the name of the Regional Land Transport Committee, or have built on national level transport group submissions. This prominence is likely to continue in the next period, with both national and regional/district level policies being planned.
21. On occasion, the Council has also had direct input into submissions made by regional council convened Special Interest Groups on specific topics or Local Government New Zealand submissions made on behalf of the local government sector as a whole.
22. Experienced senior Council staff were also involved in various working parties or other fora locally or in Wellington and elsewhere to advise on policy development. These included policy development work or advice in areas as diverse as flood hazards, the oil and gas industry, and biodiversity.
23. In addition, Council staff respond to many other requests for advice or comment on policy matters.
24. It is sometimes difficult to determine, given the processes adopted, whether the submissions or responses have made a difference to the policy or other matters under consideration. In some cases there is no formal feedback that the submissions were successful (or not), while in others no or limited feedback is provided. Senior council staff receive anecdotal feedback on submissions that was very positive, and that changes in policy have been made as a result or other actions taken in recognition of the matters raised. The substantive changes made by the Government on their Action for Healthy Waterways package that align with reliefs sought in the Council's submission is particularly noted.
25. The Council's reputation and experience as being a successful regulator and policy developer is well recognised and its views valued. The net effect of the Council's wide-ranging advocacy and response activities has been in the majority of cases to make policy proposals more relevant, pragmatic and cost-effective for the region. The work has contributed to the Council's community outcomes of a sustainable and prosperous Taranaki.

Revised Approach to Submissions

26. During the first half of the 2022 calendar year, officers made a decision to change the focus of the approach to submissions.
27. Over the past few years, officers have noted a trend of a high volume of policy papers being released from Wellington that are based around extensive documents, multiple questions and short turnaround times on the submission. Experience also indicates that,

in many instances, there appear to be limited changes made to the initial consultation documents in light of the range of submissions received.

28. For example, the Draft Emissions Reduction Plan was released in October 2021 with a six week window for submissions. The consultation document was 130 pages long and contained 114 questions that Ministry for the Environment (MfE) wanted responses on.
29. In light of this experience with consultation processes, and given the other operational demands that Council faces, officers have made a call to be more focused in our submission efforts. That approach will look primarily to engage directly only in consultations that are related to our core business or to core legislative changes that impact our operations. We will also look to make greater use of Mayoral Forum submissions, to work with the other Taranaki councils to draft regional level submissions.
30. Opportunities to share our submissions with tangata whenua have also been explored.
31. The net result is likely to be that the Long Term Plan and Annual Plan submission targets are not met across the medium term.

Financial considerations—LTP/Annual Plan

32. This memorandum and the associated recommendations are consistent with the Council's adopted Long-Term Plan and estimates. Any financial information included in this memorandum has been prepared in accordance with generally accepted accounting practice.

Policy considerations

33. This memorandum and the associated recommendations are consistent with the policy documents and positions adopted by this Council under various legislative frameworks including, but not restricted to, the *Local Government Act 2002*, the *Resource Management Act 1991* and the *Local Government Official Information and Meetings Act 1987*.

Iwi considerations

34. This memorandum and the associated recommendations are consistent with the Council's policy for the development of Māori capacity to contribute to decision-making processes (schedule 10 of the *Local Government Act 2002*) as outlined in the adopted long-term plan and/or annual plan. Similarly, iwi involvement in adopted work programmes has been recognised in the preparation of this memorandum.

Community considerations

35. This memorandum and the associated recommendations have considered the views of the community, interested and affected parties and those views have been recognised in the preparation of this memorandum.

Legal considerations

36. This memorandum and the associated recommendations comply with the appropriate statutory requirements imposed upon the Council.

Appendix One – Submissions Made in 2020/21 Year

Recipient Organisation	Signatory	Submission Title	Focus Area	Comments
Ministry of Transport	TRTC	Response to proposed approach to speed management. Land Transport Rule: Setting of Speed Limits	Transport	
Ministry for the Environment	TSWMC	Submission on Reducing the Impact of Plastic on Our Environment	Waste	Submitted by NPDC on behalf of TSWMC
Ministry for the Environment	TRC	Comments on applications for referral under the COVID-19 Recovery (Fast-track Consenting) Act 2020 - Kapuni Green Hydrogen Project	Regional Development	
Standards New Zealand	TRC	NZS8409 - Application of Agrichemicals Submission	Air Quality	
Waikato Regional Council	TRTC	Submission on Waikato Draft Regional Land Transport Plan 2021-2051	Transport	
Climate Change Commission	TRC	Submission on Climate Change Commission Draft Advice	Climate Change	
Climate Change Commission	TRTC	Transport-focused submission on Climate Change Commission Draft Advice	Climate Change	
Horizons Regional Council	TRTC	Submission on Horizons Draft Regional Land Transport Plan 2021	Transport	

Recipient Organisation	Signatory	Submission Title	Focus Area	Comments
Ministry for the Environment	TRC	Submission on Phasing out Fossil Fuels in Process Heat	Climate Change	
Ministry for Business Innovation and Employment	TRC	Submission on Sustainable Freedom Campng	Transport	Minor operational submission - circulated to P&P between meetings
Ministry for the Environment	TRC	Feedback on Draft Essential Freshwater Interpretation Guidance: Wetlands Definition 2021	Wetlands	Submission to MfE for the wetlands definition guidance
Ministry for Primary Industries	TRC	Submissions on the proposed changes to the registration conditions applied to the Vertebrate Toxic Agent Brodifacoum	Pest toxins	Very closely aligned with overall Regional Sector submission
Ministry of Transport	TRC	Submission on Transport Emissions - Pathway to Net Zero 2050	Climate Change	
Waka Kotahi NZ Transport Agency	TRTC	Submission on Land Transport Rule: Setting of Speed Limits 2021	Transport	
Ministry of Transport	TRC	Submission on Public Transport Operating Model review	Transport	

Appendix Two – Submissions Made in 2021/22 Year

Recipient Organisation	Signatory	Submission Title	Focus Area	Comments
Infrastructure Commission	TRC	Submission on Infrastructure for a Better Future	Infrastructure (general)	
Environment Select Committee	Mayoral Forum	Submission on Natural and Built Environments Bill Inquiry	RMA Reform	
Environment Select Committee	TRC	Submission on Natural and Built Environments Bill Inquiry	RMA Reform	
Internal Affairs	TRC	Changes to Maori ward and constituency processes	Representation	
Maritime NZ	TRC	Submission on MARPOL Annexe VI	Pollution/Marine Area	
Maori Affairs Select Committee	TRC	Submission on Ngati Maru (Taranaki) Claims Settlement Bill	Iwi Relations	
MNZ	TRC	Submission on the Implementation Strategy for the Marine Oil Spill Response Strategy	Pollution/Marine Area	

Recipient Organisation	Signatory	Submission Title	Focus Area	Comments
MBIE	TRC	Submission on regulations supporting Crown Minerals Act decommissioning provisions	General support but changes to operations	
Ministry for the Environment	TRC	Submission on Freshwater farm plan regulations	Freshwater	
Ministry for the Environment	TRC	Submission on Stock exclusion regulations: proposed changes to the low slope map	Freshwater	
Ministry for the Environment	TRC	Submission on the Managing our wetlands; A discussion document on proposed changes to the wetland regulations	Freshwater	
Ministry for the Environment	TRC	Submission on Managing Intensive Winter Grazing	Fresh Water	
Ministry of Transport	TRTC	Submission on Road User Charges (RUC) System Review	Transport	
Horizons Regional Council	TRC	Submission on Draft Regional Public Transport Plan 2022-32	Transport	
New Plymouth District Council	TRC	Feedback on NPDC's Interim Speed Management Plan	Transport	



Date: 26 July 2022

Subject: **Review of Cat Management Options Report**

Approved by: D Harrison, Director - Corporate Services
S J Ruru, Chief Executive

Document: 3086208

Purpose

1. The purpose of this memorandum is to present for Members' information the report *Review of Cat Management Options* following a request for feral cats to be considered for inclusion in the *Pest Management Plan for Taranaki 2018* (the Plan).
2. The report is attached in Appendix I.

Executive summary

3. Following a community forum on cat control the Taranaki Regional Council (the Council) received a request to develop a regional feral cat management strategy.
4. Following this request, the Council commissioned Place Group to complete a scoping report.
5. The scoping report builds on a 2020 report by the New Zealand Cat Management Strategy Group.
6. The report identifies potential options and a draft high-level methodology for developing a regional cat management strategy.
7. Noting that the control of cats is a very emotive topic, any progress needs to be taken carefully with the involvement of key stakeholders and district councils along the way.
8. Preparations have begun for a councillor workshop in the new year as part of the interim review of the Plan. Further development of the potential creation of a cat management strategy can be discussed before opening up for public submissions.

Recommendations

That the Taranaki Regional Council:

- a) receives this memorandum entitled *Review of Cat Management Options Report*
- b) receives the *Review of Cat Management Options Place Group Report*
- c) notes officers have begun preparations for a councillor workshop to review current pest management policies in early 2023.

Background

9. The Taranaki Biodiversity Trust *Wild for Taranaki* held a feral cat control forum for its members in November 2021. The forum sought members' guidance to inform advocacy for progressing cat control within the Taranaki region.
10. Council officers presented at the feral cat control forum explaining the need for national co-ordination and alignment of legislation before any recommendations could be made to include cats in the Plan with rules requiring their control.
11. An outcome of the forum was that *Wild for Taranaki* would request the Council to develop a Regional Cat Management Strategy along with district councils, the Department of Conservation and interested parties.
12. *Wild for Taranaki* suggested that a regional cat management strategy would include the following element:
 - defining feral cats
 - require microchipping and de-sexing
 - other practical measures to protect native wildlife.
13. Council officers agreed to prepare a report to scope what a regional cat strategy might look like but noted that any strategy would be non-regulatory and for rules to apply its Plan would need to be reviewed as part of a statutory process.
14. In order to explore the issues and options better, this Council commissioned a scoping report to investigate what such a strategy could look like.

Issues

15. The control of cats is complex and contentious issue with the slightest mention receiving heated feedback from individuals and organisations, both for and against. It is certain to provoke negative feedback from parts of the Taranaki community.
16. Any decision to progress a Regional Cat Management Strategy will require collective courage by all four Taranaki councils with proactive and ongoing education and communication to the wider community. If regulation via plan rules is required, then Council (or others) would develop a pest management plan under the *Biosecurity Act 1993* (BSA) or review the current one.

Discussion

17. The National Cat Management Strategy Group (NCMSG) formed in November 2014 to develop a national overarching strategy for responsible, compassionate, and humane cat management in New Zealand through a collaborative and proactive approach.
18. Local Government New Zealand, the Morgan Foundation; the New Zealand Companion Animal Council; the New Zealand Veterinary Association; NZVA Companion Animal Veterinarians; and the Society for the Prevention of Cruelty to Animals are members with the Ministry for Primary Industries and Department of Conservation providing advice.
19. NCMSG published a report in August 2020 (Appendix II) that has struggled to gain traction. This report comprehensively covers the impact of feral and domestic cats on biodiversity and pastoral practices. These impacts have not been covered in the Place Group review, rather the report has been used to inform the review project.

20. The Place Group review identifies:
 - Potential options to manage cats at a regional level based on recommendations in the NZCMMSG report
 - Key considerations for cat management based on a review of international literature and recommendations from Manaaki Whenua - Landcare Research
 - A high level methodology to develop a cat management strategy for the Taranaki region which tests and incorporates options outlined in the NCMSG report and key considerations identified in the literature review
 - A recommended potential programme structure to oversee development of the strategy and implementation of options.
21. While the review discusses the use of cat categories used in the NCMSG report it does not attempt to define feral cats in a way needed for inclusion in the Plan. Such a change would require a definition of owned cats including micro chipping and de-sexing.

Options

22. The review identifies key options for managing cats that are directly in the control of, or able to be led by the Council, including:
 - Identification of sensitive wildlife areas within the region
 - Amending the RPMP to include feral cats
 - Establishment of regional cat management advisory committees/groups to guide management
 - Development of strategic partnerships among organisations with an interest in cat management
 - Development of education programmes and public engagement
 - Implementation of best practice cat management for feral and stray cats
 - Monitoring and evaluation of programmes.

Next Steps Plan

23. Councillors will be aware that the interim review of the Plan is due this financial year.
24. Officers have commenced preparations for a councillor workshop in early 2023 where a decision on proposing the inclusion of cats in the Plan or alternatively amend the Taranaki Regional Council Biosecurity Strategy with a focus on non regulatory programmes.
25. It should be noted that support from district councils through changes to bylaws is likely to be required.

Financial considerations—LTP/Annual Plan

26. This memorandum and the associated recommendations are consistent with the Council's adopted Long-Term Plan and estimates. Any financial information included in this memorandum has been prepared in accordance with generally accepted accounting practice.

Policy considerations

27. This memorandum and the associated recommendations are consistent with the policy documents and positions adopted by this Council under various legislative frameworks including, but not restricted to, the *Local Government Act 2002*, the *Resource Management Act 1991* and the *Local Government Official Information and Meetings Act 1987*.

Iwi considerations

28. This memorandum and the associated recommendations are consistent with the Council's policy for the development of Māori capacity to contribute to decision-making processes (schedule 10 of the *Local Government Act 2002*) as outlined in the adopted long-term plan and/or annual plan. Similarly, iwi involvement in adopted work programmes has been recognised in the preparation of this memorandum.
29. Note: All eight iwi are members of Wild for Taranaki with representatives attending the forum that initiated the report.

Community considerations

30. This memorandum and the associated recommendations have considered the views of the community, interested and affected parties and those views have been recognised in the preparation of this memorandum.

Legal considerations

31. This memorandum and the associated recommendations comply with the appropriate statutory requirements imposed upon the Council.

Appendices/Attachments

Document 3087246: Review of Cat Management Options Place Group Report

Document 3086952: New Zealand National Cat Management Strategy Group Report 2020

Review of Cat Management Options

Addressing the impacts of feral and domestic cats on biodiversity on a regional scale



Image: Creative Commons Licence

Prepared for:



Version: 1.0
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Contact: hannah@placegroup.co.nz

PLACE GROUP environmental planning

Hannah Palmer



This report was authored by Hannah Palmer of Place Group Ltd. The following people kindly contributed to this report by agreeing to provide information to the author:

Steve Ellis, Environment Services Manager - Taranaki Regional Council

A draft of this report was also formally reviewed by Angus McKenzie of Place Group Ltd and Steve Ellis of Taranaki Regional Council.



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1. Introduction

1.1. Purpose

Local biodiversity groups and the Taranaki branch of Forest and Bird have recently requested the Taranaki Regional Council (TRC) review its Regional Pest Management Plan to include feral and stray cats as a pest species. In response to this request, the purpose of this report is to explore potential options for managing feral and domestic cats within the Taranaki region, along with the steps involved to develop a regional cat management strategy which may implement one or more of the identified options.

Cat management is an issue that continues to be raised across New Zealand, and the recommendations contained in this report are likely to be of interest to other Regional Councils.

1.2. Scope

In 2020 the New Zealand Cat Management Strategy Group (NZCMSG) released their report outlining recommendations and supporting evidence to achieve humane management of cats in New Zealand to protect both cat welfare and the environment.

This report builds on the NZCMSG report by:

- Reviewing the recommendations contained in the 2020 report to determine which recommendations can be refined for potential implementation in the Taranaki region (Appendix A); and
- Undertaking a further review of international literature to identify any other novel methods or considerations that may be appropriate to implement within the Taranaki Region.

Given that the 2020 NZCMSG Report comprehensively covers the impact of feral and domestic cats on biodiversity and pastoral practices, these impacts have not been covered further in this report.

1.3. Structure of the report

This report includes analysis on the following:

- Potential options to manage cats at a regional level based on recommendations in the NZCMSG report (see Appendix A).
- Key considerations for cat management based on a review of international literature and recommendations from Manaaki Whenua - Landcare Research.
- A high level methodology to develop a cat management strategy for the Taranaki region which tests and incorporates options outlined in Appendix A and key considerations identified in the literature review.
- A recommended potential programme structure to oversee development of the strategy and implementation of options.
- Next steps for implementation.



2. Managing cats at a regional level - potential options

2.1. New Zealand Cat Management Strategy Group Report 2020

The NZCMSG¹ was formed in November 2014 to develop a national overarching strategy for responsible, compassionate, and humane cat management in New Zealand through a collaborative and proactive approach (NZCMSG, 2020). The resulting report, released by the group in 2020, recognises that:

- Cat management is a complex and emotive issue involving many stakeholders and interested parties; and
- The approach to effective management therefore needs to be multifaceted.

Containing 13 overarching recommendations which set out a mix of local, regional and national options for feral and domestic cat management, the report provides a starting point for formulating a response to the actual and potential negative impacts of feral and domestic cats.

Given that different stakeholders have the ability to implement or influence different parts of the overall solution to cat management outlined by the NZCMSG, any response, whether it be at a local, regional or national level will need to be well structured and highly collaborative to be successful.

2.1.1. Assessment of NZCMSG recommendations for regional implementation

Table 1 in Appendix A briefly sets out the overarching recommendations of the NZCMSG report, which we have grouped into the following seven categories:

- Government leadership and legislation
- Governance and partnerships
- Education
- Public engagement
- Best practice cat management
- Protection of sensitive wildlife areas for effective cat management
- Monitoring and evaluation

¹ The NZCMSG consists of eight national organisations that have an interest in cat management including: Local Government New Zealand, the Morgan Foundation, the New Zealand Companion Animal Council, the New Zealand Veterinary Association, NZVA Companion Animal Veterinarians, and the Society for the Prevention of Cruelty to Animals. The Ministry for Primary Industries is an observatory member and the Department of Conservation is a technical advisory member (NZCMG, 2020).



Analysis is provided in Appendix A on whether the recommendations in each category can be modified for implementation at a regional level. This analysis concludes that the majority of recommendations can be implemented with some refinements.

Key recommendations/options for managing cats that are directly in the control of, or able to be led by TRC include:

- Identification of sensitive wildlife areas within the region.
- Amending the Regional Pest Management Plan (RPMP) to include feral and stray cats.
 - Initially, the most suitable programme under the National Policy Direction for Pest Management 2015 for feral and stray cats is likely to be a site-led programme to protect sensitive wildlife areas. Consideration of a pest agent rule under the Biosecurity Act 1993 for domestic cats may also help support restoration efforts for these areas. See Appendix A for further detail around Environment Southland's cat management programme.
- Establishment of regional cat management advisory committees/groups to guide management.
- Development of strategic partnerships among organisations with an interest in cat management.
- Development of education programmes and public engagement.
- Implementation of best practice cat management for feral and stray cats.
- Monitoring and evaluation of programmes.

With the exception of amending the RPMP, the majority of recommendations that TRC could implement are non-regulatory. Analysis shows that for cat management to be most effective, a multi-faceted solution addressing the impacts of feral, stray and domestic cats on wildlife needs to be implemented. This will take a high degree of cross-sectoral collaboration, and should also involve elements of citizen science and community engagement.

A recommended programme structure which incorporates multi-party membership, is set out in section 3.1 below. This programme structure could be utilised to oversee the development of a regional cat management strategy and implementation of pilot programmes under the strategy. A high level roadmap for the development of a regional strategy is outlined in section 3.

2.2. Review of international literature - key considerations for cat management

In addition to the recommendations contained in Appendix A, a review of cat management programmes undertaken in Australia, Canada and the United States has identified some key considerations for those seeking to manage cat populations. These are outlined below (with the majority coming from Australia), and may warrant further exploration when developing responses.

2.2.1. Use cat categories to inform management approaches

The majority of literature reviewed separated cats into categories to inform appropriate management responses. At a broad level, three categories were identified - Feral cats, stray cats and



domestic cats. The NZCMSG Report further delineated these categories by breaking down stray cats into socialised and unsocialised groupings. Other countries have followed a similar line e.g. some municipalities in Canada distinguish between (Canadian Federation of Humane Societies, 2017):

Owned (Indoor): Cats belonging to a household that are kept primarily indoors or outside under supervision in a confined environment;

Owned (Outdoor): Cats belonging to a household who roam outdoors beyond the control of the householder;

Homeless (At-Large): Cats who are stray due to being lost or abandoned. May be considered loosely owned or cared for by one or several people. Can become feral if they lose contact with people;

Homeless (Sheltered): Previously owned or at-large cats surrendered or brought to an animal shelter.

Feral (Managed): Cats living in an independent colony and provided food and shelter directly by a caretaker, receiving medical assistance when required and having some degree of human contact. Managed colonies are often overseen by a trap-neuter-return programme.

Feral (Independent): Cats that do not belong to a household and have not had any human contact, surviving independently of human involvement.

The Department of the Environment for the Australian Government note in their 'Threat abatement plan for predation by feral cats - 2015' that it is important to identify the category of cat causing the most damage to wildlife, as this will determine the appropriate management response. For example "Where domestic cats are the primary cause, management is likely to concentrate on owners and consist of promoting responsible ownership through education and local or state/territory legislation. For feral cats, the focus is on reducing numbers or inhibiting predation through the use of mechanical, chemical or biological methods. Management of stray cats often requires a combination of technical and social approaches" (Department of the Environment, 2015).

Distinguishing between cat categories can be difficult, however communication of the following characteristics in public engagement material may assist management responses and helping people to know what to do:

Domestic cat

- Friendly and approachable, often walks upright with tail in the air
- Will often vocalise or purr when touched
- Generally well-kept

Stray cat

- Unkempt, unclean and dishevelled coat
- Thinner, malnourished
- May approach you and walk with tail high, showing friendliness
- May vocalise through meowing or purring when touched
- Tend to be visible to people during the day, seeking out food and shelter



Feral cat

- Clean fur and appears generally well-kept
- Often larger than domestic cats
- Long hair is uncommon - mostly short-haired
- More active at night
- Hostile and scared of people - will always avoid human contact when approached
- Male feral cats are often muscular and may have scars from fighting, may also have a coarse, spiky coat, broad head and thick neck.
- Will not vocally communicate
- Often move in stealth mode, body crouched low to the ground, tail down and eyes scanning for threats - hyper vigilant behaviour is exhibited.

It is important to note in public engagement material that feral, stray and domestic cats are all the same species (*felis catus*). The difference between the categories is dependent on a cat's level of socialisation and interaction with humans. Cats may move between categories. However, once a cat has lost interaction with humans for an extended period of time and becomes feral, it is very unlikely that this cat will be able to be re-socialised.

2.2.2. Understand species relationships and predator/prey interactions

When designing a control programme for feral cats it is important to have a full understanding of the landscape, species present, and the potentially complex ecological interactions to avoid unintended flow-on effects. For example a reduction in the number of feral cats may result in an increase in rabbit, rat or mice populations - prey which feral cats may have otherwise preyed on (Department of the Environment, 2015). This finding was also supported by Jones (2019) who notes that "*biodiversity benefits of removing cats from a system should be compared to the risk of ecological release of smaller predators, such as rats, resulting from their removal*" (p. 5.). A multi-species approach to management which accounts for these predator/prey relationships may therefore be required to avoid unintended outcomes on native species.

2.2.3. Assess feasibility of programme objectives

Assessing feasibility of programme objectives is critical to success. While total eradication of feral cats from the region may be a strong desire, current limitations in tools, resources and funding is likely to render such a goal unattainable (Department of the Environment, 2015). Determining key areas within the region containing high value biodiversity and designing a programme around protecting these areas is recommended. This not only allows proof of concept to be established, but may assist in getting key stakeholders and the community involved in management as they become invested in protecting an area in their 'backyard'. It is possible that for small areas e.g. reserves, peninsulas, or islands, eradication of feral cats may be achievable. Many examples of feral cat



eradication from islands have been documented worldwide.² However it should be noted that an eradication goal will be very labour intensive.

2.2.4. Address research gaps

In 2019, Manaaki Whenua - Landcare Research completed a paper for New Zealand's Biological Heritage National Science Challenge on 'Identifying tools and knowledge gaps to support the control of non-PF2050-targeted small mammalian predators' (Jones, 2019). Part of this paper dedicated to feral cats, highlights key gaps for further research. These include:

- Development of a humane, cat specific, reliable, passive kill trap that can function in a range of New Zealand environments, excludes native non-target species, and requires minimal operator input. Such a trap could also have tag-reader technology included to exclude microchipped cats.
- Bait stations designed specifically for cats. Australian researchers have developed and are currently trialling the Felixer grooming trap. This trap uses a discriminatory sensor arrangement and algorithm to identify species before spraying targets with a measured dose of 1080 gel and resets automatically after firing. Further information on the Felixer trap is provided below.
- Continued development of PAPP as a tool for feral cat control including exploring the option for aerial control.
- Development of long-life cat lures. With large home ranges and low densities, feral cats may not encounter baits immediately after they are laid. This can increase the cost of control with more frequent baiting required.
- Exploration of novel lures specific to cats which deploy novel scent, sound and visual lures using artificial intelligence and associated technology.
- Access to cheap, easily available camera traps for monitoring feral cats and development of a standard protocol for monitoring.
- Quantification of ecological threats posed by cats.
- Estimates of cat densities and how these vary with landscape type to guide control strategies.

As our Australian counterparts have been undertaking considerable research into feral cat management, Manaaki Whenua also recommended regular liaison with Australian pest managers and researchers to share research findings, control tool developments and knowledge so as to not duplicate efforts.

A 2017 paper by Kikillus *et al* also notes large gaps in research pertaining to the management of urban cats in New Zealand. Many of the recommendations in the paper by Kikillus have been touched on in our report and the NZCMSG Report, however Kikillus *et al* emphasise the importance of addressing citizen science and working with the community to develop cat management strategies (Kikillus et al, 2017).

² Tasman and Macquarie Islands - Australia, Marion Island - South Africa, Ascension Island - United Kingdom, San Nicolas - USA, Little Barrier - New Zealand, Baltra - Ecuador (Parks, Fisher, Robinson & Aguirre-Muñoz, 2014).



To reflect these recommendations, a research arm or Technical Advisory Group has been incorporated into the proposed programme structure. This group also includes a social science research component to guide effective community action. It is anticipated that this resource could be shared between regions to create efficiencies.

2.2.5. Monitoring & Surveillance

Several recent innovations in monitoring tools may prove useful for managing feral cats. These include the use of eDNA to detect the presence or absence of cats in an area, and apps such as FeralScan to assist with monitoring and control efforts.

Environmental DNA or eDNA technology is a sensitive and cost-effective technique that can be used to trace native and introduced species, and pests through collecting an environmental sample such as water, soil or scats. Australian company EnviroDNA has developed an eDNA probe to detect feral cats on islands or in arid areas, with a view to using this tool as a part of cat eradication programmes as another tool for monitoring (EnviroDNA, n.d). Targeted eDNA species detection allows more effective detection of invasive species incursion events and monitoring of range expansions (EnviroDNA, n.d). Hair snares and deployment of 'Sticky Wickets' can also be used to collect DNA for analysis to detect the presence of feral cats in an area (Johnston and Algar, 2020).

As an aside, if using eDNA methods, programme managers should take note of the recent research undertaken by the Bio-Heritage National Science Challenge on eDNA extraction methods. This research identified a single DNA extraction method that accurately detects species present in a wide range of environments. If a standardised approach to extraction is adopted by all those who collect eDNA samples, results will be able to be more reliably compared across regions and biases quantified leading to more accurate ecological data (BioHeritage Challenge, n.d).

FeralScan is an Australian app very similar to Find-A-Pest, Trap.nz, CatchIt and EcoTrack (Predator Free NZ Trust, n.d.). However the advantage of this app is that it integrates the functions of the abovementioned apps into one. FeralScan is a free resource which can be used to document pest animal activity, communicate the problem to other people, and identify priority areas for pest control. Users can print maps, view and export pest records, and see where other people in their local area are also reporting pest animals (PestSmart, n.d.) Specific updates have been made to the app for feral cats allowing users to map sightings, record impacts (such as predation of native species) or other problems, and to document where control has been undertaken. Information submitted can help land managers to identify the scale of the problem and to identify effective solutions for humane control (FeralCatScan, n.d.). The app can be used by individuals, community groups and government agencies, and FeralScan offers a customisation service (PestSmart, n.d.).

2.2.6. Control options

In reviewing international literature, Australia appears to be leading the way in innovative control options. Arid Recovery, an independent not-for-profit organisation running a 12,300ha wildlife reserve in South Australia notes the following innovations in control tools (Arid Recovery, n.d.):



- Remote trap-checking systems which use solar-powered communication boxes to send text messages if a trap goes off.
- Trialling of new lures, the most effective being cat urine and chicken oil. Fried chicken also had reasonable success. Electronic devices emitting a meowing noise have also been trialled.
- Eradicat and Curiosity brand baits which contain a smell favoured by cats and a cat-specific toxin had mixed success when trialled at Arid Recovery. Most success was recorded when cats were hungry due to a low abundance of live prey nearby, as this is their preference.
- Felixer - control tool developed and patented by consultancy Ecological Horizons and commercialised by Australian not-for-profit company Thylation.
 - Humane, and automated through solar power, Felixers use an array of range-finder sensors to distinguish cats from non-target wildlife, humans and vehicles. When sensors recognise a cat's gait and shape as it walks past the Felixer, the trap is triggered to squirt a 1080 gel onto the cat. Cats have a fastidious urge to groom, which means they lick the 1080 gel off their fur making the Felixer a very effective and targeted device (Pickrell, 2022). The Felixer also has an advantage in that it doesn't rely on cats scavenging or entering a cage trap, and it gets around the issue of traditional baiting and trapping which are not particularly effective methods when there's plenty of food around (Pickrell, 2022).
 - The Felixer can hold up to 20 cartridges of 1080 gel and can be left at site unattended for up to five months at a time, making it a good long-term solution (Pickrell, 2022).
 - Trials have shown that the Felixer successfully distinguishes between target and non-target species. Results from a comprehensive efficacy trial at Arid Recovery undertaken in 2018 demonstrated a 66% reduction in feral cat activity within 2 months of deployment. 72 cats were successfully targeted (but no bilbies, birds, quolls, rabbits, bettongs and only one non-target kangaroo).
 - Each time the range interceptors of the Felixer are intercepted, the Felixer takes photographs and the inbuilt and updateable algorithm determines whether the intercept was from a target or non-target, and will only fire upon a target. Each image is labelled with whether the Felixer was fired or not, and date, time, temperature, battery power, lure played, and detailed accounts of the sensor activations are also recorded. All of this information can be used by site managers and the Felixer management team to optimise performance (Arid Recovery, n.d.).
 - Felixers are available for lease in Australia from 1 October 2022. Contacts for further information can be found here <https://thylation.com/contact-us/>

Compulsory cat confinement/containment is also method making headway in parts of Australia, to address the impacts of domestic cats on wildlife. In Canberra, a recent law has been passed requiring that all new cats obtained after 1 July 2022 must be contained. For cats owned prior to this date, a grandfathering clause will apply exempting them from compulsory containment where their owners do not live in a cat containment suburb (ACT Government, 2021). There is a burgeoning market both here and in Australia for containment options which include outdoor cat runs/houses, and rotating attachments which fit onto boundary fences preventing cats from escaping. This method has been employed as part of a suite of control measures which include legislative change at the national and local level in Australia.



The NZCMSG Report does address cat containment, however the method was not viewed favourably citing lack of monitoring data and ethical questions to be resolved before implementation. The majority of references used in this section of the NZCMSG Report date back to 2012, however as cat containment is a relatively new concept it will be important to keep up to date with any results to come out of Canberra.

2.2.7. Cutting-edge research

In a very recently published paper for the Australian Geographic, scientists Dr Katherine Moseby and Dr John Read outline cutting-edge research and trials which they have been involved in to address the feral cat population in Australia (Pickrell, 2022). Briefly, these include:

- Assisted evolution - releasing cats into sections of predator-proof sanctuaries to accelerate natural selection and stimulate learning among native animals. This has been a six year trial undertaken at Arid Recovery. Dr Moseby notes *“We started off with just one cat, then added a few more....we add cats, we take cats out, we monitor the population.”* Results from this trial showed that there was some loss among bilbies and bettongs, however over time population-level changes started to occur. When cat-exposed and cat-naive bilbies were put into another enclosure with feral cats, those with a history of exposure were much more likely to survive (Moseby as cited in Pickrell, 2022). *“Behaviourally, they’re (bilbies) are getting harder to approach. They’re getting more vigilant, spending more time under vegetation cover and have faster escape behaviour. We’re also seeing the hind feet of burrowing bettongs getting bigger, as well as their overall size”* (Moseby as cited in Pickrell, 2022). Proof of concept has been determined in other trials too, however it will be some years before it will become apparent whether these genetic changes have been passed down through generations. These results have also been documented in the *Journal of Applied Ecology 2019*.
- Gene-drive technologies - Genetically modifying cats to only produce male offspring, a trait which would eventually be passed on to all offspring of modified cats spreading across the entire feral cat population. This has been demonstrated in the lab with fruit flies and mosquitoes, and the Australian Wildlife Conservancy has partnered with CSIRO to explore the development of gene drives to control feral cats. This will require many years of research and has significant ethical barriers to overcome, however gene technologies may represent the greatest chance of addressing predator problems (Pickrell, 2022).

2.2.8. Education and social licence - community action

Land managers and communities in Australia are grappling with very similar issues in relation to wicked problems concerning pest management and community perceptions. One issue is the management of wild dogs. Like cats, this topic is highly emotive with people holding disparate views on control. A detailed report outlining case studies of community action for wild dog management in three Australian jurisdictions, has made a series of recommendations to support efforts to improve collective community action for wild dog control (Howard, et al 2016). Whilst the issues concerning wild dogs are slightly different to feral cats, these recommendations are still a worthwhile consideration when developing programmes to energise community groups into taking ownership of



cat management, or to increase social licence for control. Briefly these recommendations are (Howard, et al 2016):

- *In collaboration with the affected community:*
 - *Develop options for long-term resourcing of community development and engagement processes;*
 - *Build community governance skills such as leadership, group management and conflict resolution;*
 - *Maintain and extend support for community governance through networks of external coordinators and facilitators;*
 - *Reconsider assumptions about non-participation and develop strategies that are realistic about the capacity for individuals to take action;*
 - *Develop skills in facilitation, communication and active listening;*
 - *Adopt and implement participatory planning processes;*
 - *Recognise different types of knowledge as valid and develop fair and equitable processes to integrate these;*
 - *Develop community defined criteria of success and adapt accountability requirements accordingly;*
 - *Redesign funding agreements to enable adaptive management through formative and summative evaluation.*

The report also emphasises that blending natural science expertise in control technology and wildlife ecology with social science expertise in human dynamics and community development is key to success. *“Achieving collective wild dog management at the landscape scale is a complex objective that cannot succeed if the technical is prioritised over the social, or vice versa.”* (Howard et al, 2016, p. 43). This statement is likely equally applicable to cat management in the New Zealand context. As such, a social research component has been included as part of the Technical Advisory Group outlined in the programme structure in section 3.1 of this report.

3. Roadmap for developing a regional cat management strategy

In considering the recommendations in the NZCMSG Report and the key findings from literature reviewed as part of this report, the following outlines a high level roadmap to develop a regional cat management strategy.

It is recommended that pilot projects are trialled as part of any strategy before expanding to a regional basis, and these will form part of a cat management programme. This will keep objectives targeted and achievable, allow issues to be addressed, and for key learnings from these projects to be used in refining a model for regional rollout.

Step 1	Undertake a stakeholder identification exercise to inform programme group membership. The programme structure should be cross-sectoral given the nature of
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	cat management, those with vested interests and the differing abilities of groups to implement different management options.
Step 2	<p>Set the following for the programme structure:</p> <ul style="list-style-type: none"> ● Roles and responsibilities ● Memorandum of understanding ● Terms of reference
Step 3	Identify high level objectives and priorities for the region in relation to cat management as well as pilot project sites.
Step 4	<p>Undertake public engagement to understand test public attitudes and perception towards cat management and to refine step 3.</p> <p>To increase public awareness of roaming ranges and potential impacts of domestic cats, it may be worthwhile repeating and expanding the study undertaken by Dr Kikillus and Masters student Mya Gaby in 2013. This citizen science study saw 10 cats wear GPS camera collars for several hours a day over a two week period in neighbourhoods nearby to wildlife sanctuary Zealandia. The aim of this study was to get a better understanding of behaviour and predation impacts of domestic cats (Victoria University, 2013). A similar study was also undertaken on an international scale with 925 domestic cats being tracked in six countries. This study concluded that domestic cats have a large ecological impact (Kays et al, 2020).</p>
Step 5	<p>Develop action plans for pilot project area(s). If communities are going to take ownership of any part of the management response, it is highly recommended that these groups are empowered and brought on the journey early. The recommendations set out in section 2.2.8 provide a good starting point for factors to consider, with further detail contained in the corresponding report (see Howard et al, 2016). Action plans should also cover:</p> <ul style="list-style-type: none"> ● An assessment of landscape type and tenure within the pilot project area(s) to inform the mix of management options. ● Baseline monitoring of the pilot project area(s). ● Identification of the category of cat causing most damage to wildlife. ● Objectives for the pilot project e.g. protection of nesting birds - these will also inform the timing of any control operations. For example considerations may include when feral cats might be prey switching to native species due to a drop off in rats/mice/rabbits, or undertaking operations mid-winter when food sources are low. Important to also consider when feral cats are pregnant and lactating to minimise animal welfare issues of leaving kittens behind to die slowly of starvation (KiwiCoast, 2020). ● Options to achieve pilot project objectives. Consider what regulatory support might be needed as well as operational options, and which options are suited to different cat categories. This will also inform who is best suited to lead different parts of the response. ● Identification of barriers to success and any research gaps which need to be addressed.

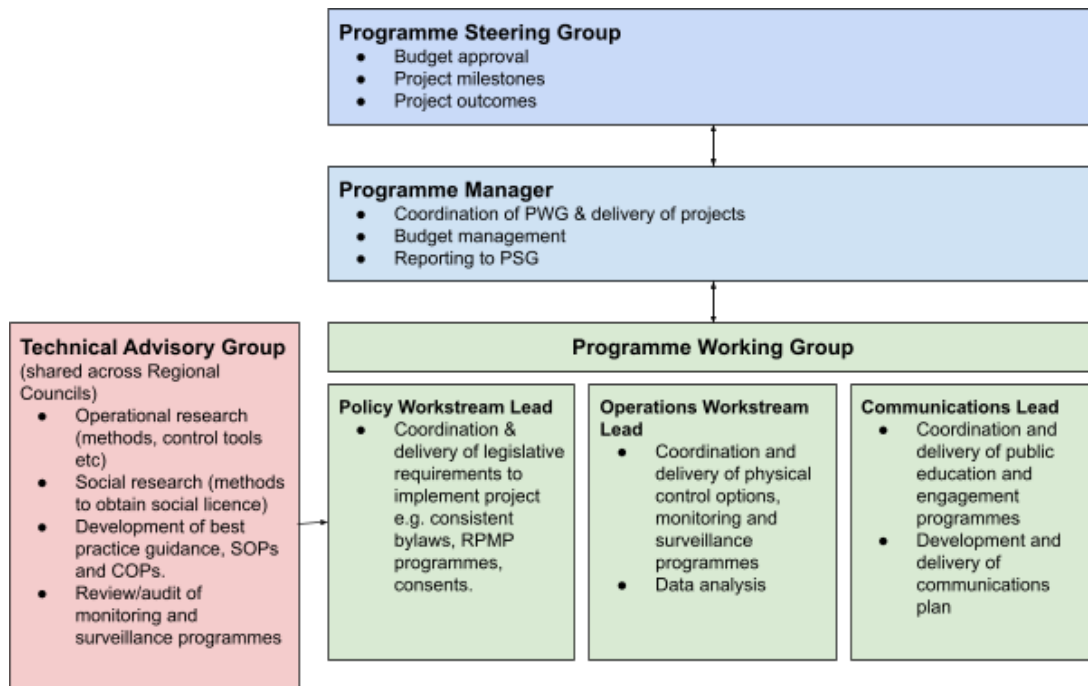


	<ul style="list-style-type: none"> • Performance indicators for each pilot project linked to objectives. • A plan for delivery - this should include priority and timeframe for actions, outputs, outcomes and who is responsible for delivery of each component of the plan. A RACI matrix may be helpful for determining who is responsible and accountable for actions and who needs to be consulted or kept informed. This step should also involve consideration of how best to empower stakeholders and the community to help achieve the objectives of the pilot project(s). • Monitoring - which includes cat population indicators as well as indicators of biodiversity recovery.
Step 6	Test the action plans with stakeholders and the community, and refine if necessary.
Step 7	Assess available budget against identified options in the action plan and refine if necessary.
Step 8	Implement action plans and provide regular updates to stakeholders, community and interested parties.
Step 9	Undertake monitoring as per action plans and share findings with stakeholders, community and interested parties - this improves social licence.
Step 10	Evaluate the programmes and adapt as necessary. Consider factors that may have influenced the outcomes when undertaking this assessment.

3.1. Recommended programme structure

The following potential programme structure could be utilised to develop and implement a regional strategy and resulting pilot projects. This structure has been developed on the basis of the recommendations contained in the literature reviewed as part of this report (including the NZCMSG Report), as well as our knowledge and experience of successful national and regional programmes in the New Zealand biosecurity sector.





4. Next Steps

Place Group Ltd are happy to assist TRC with the development of a regional cat management strategy and pilot projects for protecting high value biodiversity sites. Suggested next steps are:

- An inception meeting to discuss findings of this report and to scope key stakeholders within the region who may be able to assist in strategy development.



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Table 1: Review of NZCMSG options and feasibility for implementation by Taranaki Regional Council (TRC). Note 'green' indicates feasible for TRC to implement and 'orange' indicates where TRC can take an advocacy or support role.

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Recommendation category	Options	Regulatory	Non-regulatory	Feasible for implementation by Taranaki Regional Council?	Commentary
<p>Overarching recommendation</p> <p>All legislation and plans to manage feral and domestic cats:</p> <ul style="list-style-type: none"> ● Must recognise cats are sentient beings under Animal Welfare Act 1999; ● Be informed by science and ethics to: <ul style="list-style-type: none"> ○ promote of the value of cats to enhance the human-cat bond, advance responsible ownership, break down barriers preventing ownership, and reduce cat surrender and abandonment; and ○ determine the most humane approaches to stray and feral cat management. ● Use improved categories of cats to inform cat management. The following cat population categories provide the basis for a management framework: <ul style="list-style-type: none"> ○ Feral cats; and ○ Domestic cats; <ul style="list-style-type: none"> ■ Companion (owned) cats; and ■ Stray cats; <ul style="list-style-type: none"> ● Socialised stray cats (managed and unmanaged); and ● Unsocialised stray cats (managed and unmanaged). 		Yes	Yes	Yes	These overarching recommendations are appropriate to underpin any work programmes developed to manage cats, and provide a starting point for agreeing common ground between stakeholders and interested parties.
<p>Government leadership and legislation</p>	<p>Government takes leadership of developing a national integrated, one welfare approach to toxoplasmosis management to:</p> <ul style="list-style-type: none"> ● ensure consistent vaccine coverage for farmed animals; ● support research into toxoplasmosis vaccine development for humans and animals; ● develop tools to measure the risk of toxoplasmosis on all farmed animal species, wildlife, and human health; ● ensure implementation of integrated pest management on farms (e.g. rodents and feral cats) including: rodent 	Yes	Yes	<p>No - However, Regional Councils may like to provide support for the initiatives outlined in the NZCMSG Report through advocacy to central government for a nationalised approach.</p> <p>These initiatives could be further supported in the regions through the collaborative development of consistent best practice cat management guidelines which include consideration of toxoplasmosis risk, and</p>	<p>The national response to toxoplasmosis management in farmed animals should be led by the Ministry for Primary Industries.</p> <p>Mitigating the risk of toxoplasmosis to marine wildlife is currently being led by the Department of Conservation through the development of a Toxoplasmosis Action Plan which focuses on Māui and Hector's Dolphins.</p> <p>The DOC Toxoplasmosis Action Plan notes that feral cat control in trial catchments and research into effective cat-owner behaviour change approaches is required. https://www.doc.govt.nz/globalassets/documents/conservation/threats-and-impacts/toxoplasmosis/toxoplasmosis-action-plan.pdf</p>

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	control, and improvement of food and water hygiene; and <ul style="list-style-type: none"> ensure implementation of action plans to mitigate the risks of toxoplasmosis on marine wildlife. 			options for mitigation.	
	Develop new National Cat Management Act	Yes		No - However, TRC may advocate to central government	Creation of a National Cat Management Act will allow for mandated, comprehensive, and consistent implementation of nationwide humane management of all cat populations in New Zealand. An appropriate national legislative framework should include: Measures to protect the welfare of cats (particularly where lethal management methods are used); Measures to mandate responsible cat ownership and caretaking.
	Align bylaws promoting cat registration for owned cats	Yes		Yes - TRC may support the District Councils to establish or align bylaws which require owned cats to be registered and desexed.	Registration establishes ownership of a cat and allows local government to monitor and enforce other animal specific laws such as limits on cat numbers, breeding regulation, mandatory identification and desexing. Of all local authority bylaws pertaining to cat management and ownership, Palmerston North City Council has the most restrictive bylaw in place pertaining to cat ownership. Passed in 2018, this bylaw sets limits on the number of cats able to be kept on a premises, and requires cats born after 1 July 2018 to be registered, microchipped and desexed. Most other bylaws relating to cats are based on action upon receipt of complaint. Taranaki region has three Local Authorities within its jurisdiction - New Plymouth District Council, Stratford District Council and South Taranaki District Council. The bylaws for each Council differ in relation to requirements set for cat management. New Plymouth District Council Bylaw 2008: Limit on number of cats to be kept = 5, unless written approval obtained from an Authorised Officer (excludes breeders who meet conditions). Stratford District Council: No reference to cats in The keeping of Animals and Poultry Bylaw. South Taranaki District Council Keeping of Animals Bylaw 2018: No person shall provide sustenance, harbourage or comfort to semi domesticated or feral animals (including cats) so as to cause them to become a nuisance to other persons. If cats become a nuisance, Council may intervene. Penalties for offences against bylaws are set out under section 242(4) of the Local Government Act 2002.
	List as a pest in the Regional Pest Management Plan (RPMP).	Yes		Yes	Inclusion of cats in the RPMP would enable clear objectives and measures to be set to manage cats within the region, and would afford Authorised Persons powers under the Biosecurity Act 1993 to implement programmes. Clear definitions of cat categories would be required.

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					<p>To be included as a pest in an RPMP, compliance with the requirements of the National Policy Direction for Pest Management 2015 would need to be met.</p> <p><i>Example:</i></p> <p>The RPMP for Southland lists several categories of cats for control, providing an example of what can be done in a regulatory environment at a regional level. In this RPMP, Bengal cats are listed as progressive containment pests, feral cats as site-led pests on Rakiura, and domestic cats are included as pest agents on Rakiura.</p> <p>In regards to Bengal cats, the Southland RPMP includes rules requiring an exemption to be sought from the Regional Council to own/hold a Bengal cat. A condition of this exemption being that the cat is desexed and microchipped, and that the person holding the cat is not travelling to or living on Rakiura. In addition, the RPMP sets a reporting requirement for any suspected or confirmed sightings of Bengal cats within the Southland region.</p> <p>Rakiura is mapped in the RPMP and identified as a site for inclusion in the site-led programme. In this programme populations of feral cats are to be sustainably controlled. Rules prohibit the keeping, holding, enclosing or otherwise harbouring of feral cats on the island; and pest agent rules on the island prohibit the keeping or holding of any domestic cat unless desexed and microchipped. Release of any domestic cat into the wild is an offence under Section 154N (19) of the Biosecurity Act 1993.</p>
Governance & partnerships	Establish a national cat management advisory committee		Yes	Yes - this group could be refined for roll out at a regional level.	<p>"A National Cat Management Advisory Committee should oversee research, operationalise management plans, and coordinate and oversee evaluation of management strategies. Funding and support from government and other stakeholder groups will be necessary to achieve this. An important component of the National Cat Management Advisory Committee will be the use of research to inform ongoing humane cat management strategies, including national allocation of resources, coordination, and priority setting."</p> <p>The above considerations can be incorporated into roles outlined in the proposed programme structure set out in section 3.1 of our report.</p>
	Establish local cat management advisory groups		Yes	Yes	<p>"Local governments should consider establishing cat management advisory groups with terms of reference that include:</p> <ul style="list-style-type: none"> • introducing and monitoring cat management plans in coordination with national mandatory requirements; • consulting with key local stakeholders and communities, and • identifying key metrics to evaluate the effectiveness of cat management plans." <p>The above considerations can be incorporated into roles outlined in the recommended programme structure set out in section 3.1 of our report.</p>
	Development of strategic partnerships among organisations with an interest in cat management		Yes	Yes	<p>"Humane and effective cat management requires all stakeholders to work collaboratively, including the adoption of MOUs between major stakeholders. This collaboration will require ongoing communication and involvement of all cat stakeholders in decision making processes."</p>

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					The above can be incorporated into the recommended programme structure set out in section 3.1 of our report.
Education	Undertake education on the negative impacts of cats, the importance of responsible ownership, and options to humanely and effectively manage different categories of cats in New Zealand.		Yes	Yes	<p>"The approach needs to be coordinated and collaborative involving key stakeholders such as Regional and District Councils, Department of Conservation, animal welfare organisations, breeders/sellers, veterinarians, conservation groups, and the farming sector to ensure consistent messaging."</p> <p>Coordination and delivery of public education can be incorporated into the recommended programme structure set out in section 3.1 of our report.</p>
Public engagement	Develop public engagement strategies to understand community support for cat management and facilitate human behaviour change		Yes	Yes	<p>"Public engagement is needed to understand the diverse values, beliefs, attitudes, and social norms related to cats. Public engagement can also include activities to educate and support human behaviour change including:</p> <ul style="list-style-type: none"> • Responsible Cat Ownership; and • Humane non-lethal and lethal control of stray and feral cats." <p>Coordination and delivery of public engagement can be incorporated into the recommended programme structure set out in section 3.1 of our report.</p>
	Prioritise community engagement to determine the most appropriate strategies for cat management and promote sustainable outcomes for all interested parties.		Yes	Yes	<p>"Effective and humane cat management will require identifying and engaging local community members with an interest in cat management based on their relationships with cats."</p> <p>Coordination and delivery of public engagement can be incorporated into the recommended programme structure set out in section 3.1 of our report.</p>
Best practice cat management	Integrate best practice cat management nationally for all cats.		Yes	Yes - this recommendation can be refined for roll out at a regional level.	<p>"Feral and domestic cat management should be integrated to ensure no gaps in responsibilities, laws, and initiatives. Individual cat movement between different populations is fluid, therefore, a coordinated and multifaceted approach through the development of a national cat management plan is needed to address all sources of cats in a population. This management plan should provide a framework for best practice management for companion, stray, and feral cats, and include:</p> <ul style="list-style-type: none"> • the development of relevant Codes of Practice and Standard Operating Procedures for national cat management methods, to ensure consistency in cat management practices; and • the development of an auditing programme to promote compliance with best practice cat management." <p>The above can be implemented at a regional level and exploration of this task would sit with the Policy Lead outlined in the recommended programme structure set out in section 3.1 of our report.</p>
	Best practice responsible cat ownership	Yes		Yes - Although this more logically fits with District Councils, Regional Councils can play a role in assisting with responsible cat ownership.	<p>"Responsible cat ownership should include:</p> <ul style="list-style-type: none"> • mandatory identification (microchipping) and desexing of all cats prior to puberty and the regulation of breeding; and • implementation of cat containment (mandatory in sensitive wildlife areas)." <p>The above could be considered by District Councils within the region as part of a bylaw review.</p> <p>Implementation of cat containment for domestic cats in sensitive wildlife areas</p>

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					<p>could potentially be brought in as a site-led programme rule as part of an RPMP programme. Domestic cats would need to be declared as a 'Pest Agent' in accordance with the Biosecurity Act 1993 to enforce a rule.</p> <p>Any such rule relating to cat containment could potentially fall within Section 73(5)(h) of the Biosecurity Act which states that 'A plan may include rules for all or any of the following purposes:... requiring the occupier of a place to take specified actions to eradicate or manage the pest or a specified pest agent on the place'.</p> <p>Promotion of responsible cat ownership can also form part of the roles outlined in the recommended programme structure set out in section 3.1 of our report.</p>
	Best practice stray cat management		Yes	Yes - these recommendations can be implemented on a regional basis. However it is noted that effective development and rollout will take a high degree of collaboration.	<p>"The intention of stray cat management is to humanely and effectively reduce the population of unowned cats. Stray cat management should include the development and implementation of:</p> <ul style="list-style-type: none"> • best practice Stray Cat (including colonies) Management Guidelines. Guidelines should include managed and targeted trap-neuter-return (mTNR) programmes; • a managed stray cat registry; and • nationwide programmes for stray cat carers about responsible cat management with an emphasis on desexing, identification, and appropriate health care of managed stray cats." <p>Development of management guidelines would be a good fit for the 'Technical Advisory Group -TAG' role outlined in the recommended programme structure set out in section 3.1 of our report. Programmes for stray cat carers around responsible cat ownership could be implemented by Communications Lead in conjunction with the TAG.</p>
	Best practice cat management in sensitive wildlife areas		Yes	Yes	<p>"Sensitive wildlife areas are not suitable for mtTNR programmes.</p> <p>Where mtTNR is inappropriate due to proximity of a sensitive wildlife area, the NCMSG supports trap and rehome as a strategy to manage stray cats. Where no other humane and non-lethal approaches are available the NCMSG reluctantly acknowledges that trap and humane killing methods for stray cats may be necessary to protect vulnerable native species. These methods are only acceptable if they are carried out in accordance with best practice guidelines to safeguard cat welfare."</p> <p>The above recommendations should be taken into account when developing collaborative best practice guidelines for cat management.</p>
Protection of sensitive wildlife areas for effective cat management	Identify sensitive wildlife areas nationwide.	Yes		Yes - these recommendations can be implemented on a regional basis.	<ul style="list-style-type: none"> • "Implementation of comprehensive and humane removal of cats from within those areas is required. • Cats should be permanently removed and excluded from future re-inhabitation." <p>The most appropriate method to achieve this in the region is likely through development of a site-led programme in the RPMP, as one method to identify a 'site' for this programme is through mapping. Environment Southland's RPMP provides a good example of this type of programme and targets both feral and domestic cats.</p>
Monitoring and	Robust monitoring and evaluation		Yes	Yes	"Evaluation of cat management strategies is needed to determine their

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<p>evaluation</p>	<p>are integrated into all cat management strategies to identify problems and solutions.</p>				<p>effectiveness and inform changes to ongoing cat management plans at the national and local level and should include:</p> <ul style="list-style-type: none"> ● evaluation measures and processes for data collection agreed upon by all stakeholders; ● positive and negative outcomes publicly reported to ensure transparency; ● assessment of the effect of owned and stray cat management strategies on feral cat numbers and their impacts on wildlife; ● cat management strategies that are adapted and improved as new evidence becomes available; and ● creation and implementation of a centralised national database to track relevant cat management statistics.” <p>This role is likely to fit within the scope of the TAG outlined in the recommended programme structure set out in section 3.1 of our report.</p>
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New Zealand National Cat Management Strategy Group Report



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Executive Summary

The National Cat Management Strategy Group (NCMSG) recognises the intrinsic value of cats as complex and sentient beings, their value as a companion animal in New Zealand, and their value to communities, and New Zealand society. The NCMSG also recognises the importance of balancing the needs of cats, cat owners, and cat carers with the potential negative impacts of cats on communities, other species, and ecosystems. The New Zealand National Cat Management Strategy Report outlines recommendations and supporting evidence to achieve humane management of cats in New Zealand to protect both cat welfare and our unique environment.

Improved categorisation of cats which reflect the complexity of cat overpopulation are needed for successful management. The companion, stray, and feral cat categories have limited the ability to effectively manage cats in the past, particularly grouping all 'stray' cats together; this category should include better differentiation among stray cats to inform management strategies. The divisions within each of the proposed categories in this report will enable effective and legal management of different types of cat populations, whilst also providing added safety for previously unprotected cats.

The National Cat Management Strategy Group has assessed the existing literature and available resources concerning feral and domestic cat management strategies and taken into consideration feedback from stakeholder consultation to devise evidence-based recommendations for parties undertaking cat management in New Zealand.

Efforts to manage cats in New Zealand should be monitored and evaluated to determine their effectiveness in controlling cat populations and providing benefits to local wildlife. Robust evaluation of cat management programmes will provide much needed information for other governments, cat advocates, and environmental organisations that undertake steps to address problems with cat overpopulation.

Cat management is complex, and the interests of all parties should be considered in decision-making. There is no 'one solution' for humane cat management and environmental protection; instead, different solutions are needed for different contexts. Humane and effective cat management requires all stakeholders to work together to ensure the diverse values associated with cats (including the intrinsic value of cats as sentient beings, their companionship, and the value of New Zealand's biodiversity) remain the guiding motivation for action.

Key recommendations of the NCMSG for effective and humane cat management:

1. Acknowledge that all cats are sentient.

All legislation and plans to manage feral and domestic cats:

- Must recognise cats are sentient beings under the Animal Welfare Act 1999;
- Be informed by science and ethics to:
 - promote of the value of cats to enhance the human-cat bond, advance responsible ownership, break down barriers preventing ownership, and reduce cat surrender and abandonment; and
 - determine the most humane approaches to stray and feral cat management.
- Use improved categories of cats to inform cat management. The following cat population categories provide the basis for a management framework:
 - Feral cats; and
 - Domestic cats;
 - Companion (owned) cats; and
 - Stray cats;
 - Socialised stray cats (managed and unmanaged); and
 - Unsocialised stray cats (managed and unmanaged).

2. Community education programmes about the negative impact of cats are enacted to:

- reduce nuisance behaviour;
- reduce the risk of disease transmission; and
- reduce the negative impacts of cats on biodiversity.

3. Government leadership in developing a national integrated, one welfare approach to toxoplasmosis management to:

- ensure consistent vaccine coverage for farmed animals;
- support research into toxoplasmosis vaccine development for humans and animals;
- develop tools to measure the risk of toxoplasmosis on all farmed animal species, wildlife, and human health;

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- ensure implementation of integrated pest management on farms (e.g. rodents and feral cats) including: rodent control, and improvement of food and water hygiene; and
- ensure implementation of action plans to mitigate the risks of toxoplasmosis on marine wildlife.

4. Sensitive wildlife areas are identified and protected from cats.

Sensitive wildlife areas should be identified nationwide for effective cat management. Subsequently, implementation of comprehensive and humane removal of cats from within those areas is required. Cats should be permanently removed and excluded from future re-inhabitation.

5. Integrate best practice cat management nationally for all cats.

Feral and domestic cat management should be integrated to ensure no gaps in responsibilities, laws, and initiatives. Individual cat movement between different populations is fluid, therefore, a coordinated and multifaceted approach through the development of national cat management plan is needed to address all sources of cats in a population. This management plan should provide a framework for best practice management for companion, stray, and feral cats, and include:

- the development of relevant Codes of Practice and Standard Operating Procedures for national cat management methods, to ensure consistency in cat management practices; and
- the development of an auditing programme to promote compliance with best practice cat management.

Best practice responsible cat ownership

Responsible cat ownership should include:

- mandatory identification (microchipping) and desexing of all cats prior to puberty and the regulation of breeding; and
- implementation of cat containment (mandatory in sensitive wildlife areas).

Best practice stray cat management

The intention of stray cat management is to humanely and effectively reduce the population of unowned cats. Stray cat management should include the development and implementation of:

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- best practice Stray Cat (including colonies) Management Guidelines. Guidelines should include managed and targeted trap-neuter-return (mtTNR) programmes;
- a managed stray cat registry; and
- nationwide programmes for stray cat carers about responsible cat management with an emphasis on desexing, identification, and appropriate health care of managed stray cats.

Best practice cat management in sensitive wildlife areas

Sensitive wildlife areas are not suitable for mtTNR programmes.

Where mtTNR is inappropriate due to proximity of a sensitive wildlife area, the NCMSG supports trap and rehome as a strategy to manage stray cats. Where no other humane and non-lethal approaches are available the NCMSG reluctantly acknowledges that trap and humane killing methods for stray cats may be necessary to protect vulnerable native species. These methods are only acceptable if they are carried out in accordance with best practice guidelines to safeguard cat welfare.

6. Consistent legislation, approach, and commitment to cat management from Government

The enactment of a National Cat Management Act will allow for mandated, comprehensive, and consistent implementation of nationwide humane management of all cat populations in New Zealand and ensure that enforcement can occur under the legislation.

The enactment of a National Cat Management Act will allow for the creation and implementation of local cat bylaws to assist with the humane management of cats.

7. Incremental change to legislation

Changes in cat management under legislation should be incremental to allow public education, acceptance, and compliance with new requirements. It will likely be necessary to mandate components of the plan in order to make it effective. These changes must come from central and local government and be implemented locally.

8. Develop public engagement strategies to understand community support for cat management and facilitate human behaviour change

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Public engagement is needed to understand the diverse values, beliefs, attitudes, and social norms related to cats. Public engagement can also include activities to educate and support human behaviour change including:

- Responsible Cat Ownership; and
- humane non-lethal and lethal control of stray and feral cats.

9. Robust monitoring and evaluation are integrated into all cat management strategies to identify problems and solutions.

Evaluation of cat management strategies is needed to determine their effectiveness and inform changes to ongoing cat management plans at the national and local level and should include:

- evaluation measures and processes for data collection agreed upon by all stakeholders;
- positive and negative outcomes publicly reported to ensure transparency;
- assessment of the effect of owned and stray cat management strategies on feral cat numbers and their impacts on wildlife;
- cat management strategies that are adapted and improved as new evidence becomes available; and
- creation and implementation of a centralised national database to track relevant cat management statistics.

10. Establish a national cat management advisory committee.

A National Cat Management Advisory Committee should oversee research, operationalise management plans, and coordinate and oversee evaluation of management strategies. Funding and support from government and other stakeholder groups will be necessary to achieve this. An important component of the National Cat Management Advisory Committee will be the use of research to inform ongoing humane cat management strategies, including national allocation of resources, coordination, and priority setting.

11. Establish local cat management advisory groups.

Local governments should consider establishing cat management advisory groups with terms of reference that include:

- introducing and monitoring cat management plans in coordination with national mandatory requirements;

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- consulting with key local stakeholders and communities, and
- identifying key metrics to evaluate the effectiveness of cat management plans.

12. Development of strategic partnerships among organisations with an interest in cat management

Humane and effective cat management requires all stakeholders to work collaboratively, including the adoption of MOUs between major stakeholders. This collaboration will require ongoing communication and involvement of all cat stakeholders in decision making processes.

13. Prioritise community engagement to determine the most appropriate strategies for cat management and promote sustainable outcomes for all interested parties.

Effective and humane cat management will require identifying and engaging local community members with an interest in cat management based on their relationships with cats.

The National Cat Management Strategy Group

The National Cat Management Strategy Group (NCMSG) formed in November 2014 to develop a national overarching strategy for responsible, compassionate, and humane cat management in New Zealand through a collaborative and proactive approach.

The NCMSG consists of eight national organisations that have an interest in cat management including: Local Government New Zealand, the Morgan Foundation; the New Zealand Companion Animal Council; the New Zealand Veterinary Association; NZVA Companion Animal Veterinarians; and the Society for the Prevention of Cruelty to Animals. Ministry for Primary Industries is an observatory member and Department of Conservation is a technical advisory member.

The NCMSG recognises the positive benefits and value of cat ownership, and supports responsible cat ownership, while acknowledging the problems associated with cat overpopulation and feral cats. The NCMSG advocates that all efforts to manage cats should be humane, whether they are owned as companions, live in communities as strays, or inhabit wild places as ferals.

The NCMSG also recognises challenges with effectively managing cats which is undermined by a lack of reliable data on the number of cats that are owned, stray, and feral, and how cats are lethally and non-lethally managed.

Cat management is complex, and the interests of all parties should be considered in decision-making. Collaboration between diverse national stakeholder organisations in the NCMSG, and many others not yet involved, is the key to addressing these important issues. There is no 'one solution' for humane cat management and environmental protection; instead, different solutions are needed for different contexts.

This report was developed by the NCMSG to guide future decision-making for cat management in New Zealand that is both humane and effective.

Purpose of the National Cat Management Strategy Group

To proactively address the positive and negative impact of cats in New Zealand.

To develop a humane national cat management strategy through a collaborative and proactive approach that recognises the significant positive benefits of cat ownership, whilst also acknowledging the concerns about the impact cats have in New Zealand.

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To encourage education of the public about the benefits of responsible cat ownership.

To lobby local and central government to enact useful legislation that facilitates sustainable humane cat management.

Strategic vision of the National Cat Management Strategy Group

By 2025, cats in New Zealand are valued, responsibly owned, and humanely managed to protect their welfare and our unique environments.

Strategic goals and outcomes

The following section discusses the strategic goals and outcomes of National Cat Management Strategy Group and provides the framework for this report.

Table 1: New Zealand national cat management strategic goals and outcomes

Strategic Goal	Strategic Outcomes
<p>1. Human approaches to cat management protects their welfare.</p>	<p>1. The intrinsic value of cats as sentient beings is recognised by people in New Zealand.</p> <p>2. Companion cats in New Zealand are responsibly owned.</p> <p>3. The benefits of cat ownership are recognised by people in New Zealand.</p> <p>4. When required, only humane management practices are used to control all cats.</p>
<p>2. The negative impacts of all cats on the community, our shared urban, rural, and wild environments are recognised, understood better defined.</p>	<p>5. The effects of domestic cats on human health are recognised, understood, and addressed.</p> <p>6. Nuisance behaviours of owned cats in communities are understood and reduced.</p> <p>7. Potential impacts of cat predation on our unique environment are understood and reduced.</p>

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	<p>8. The effects of all cats on New Zealand pastoral industries and the marine environment are recognised, understood, and addressed.</p> <p>9. There are no cats in sensitive wildlife areas.</p>
<p>3. Humane and effective cat management is achieved through a multifaceted and integrated national management plan.</p>	<p>10. There are no feral cats in New Zealand.</p> <p>11. There are no stray cats in New Zealand.</p> <p>12. All owned cats are desexed, microchipped, and contained.</p>
<p>4. Humane management for all cats is supported through a comprehensive legislative, regulatory, and educative framework.</p>	<p>13. Responsible agencies are identified to implement legislative and regulatory requirements.</p> <p>14. A National Cat Management Act is enacted.</p> <p>15. Local legislation supports national legislation for cat management.</p> <p>16. An educative framework focuses on public engagement on humanely and effectively managing all cats in New Zealand.</p>
<p>5. Cat management strategies in New Zealand are evaluated to ensure they are effective and humane.</p>	<p>17. An ethics framework is used to help monitor and evaluate cat management activities.</p> <p>18. An adaptive framework is used to monitor and evaluate cat management activities.</p> <p>19. Robust data collection and management to inform cat management activities.</p>
<p>6. Humane and effective cat management is achieved through multi-stakeholder collaboration.</p>	<p>20. New Zealand government takes an active role in supporting multi-stakeholder oversight of cat management strategies.</p> <p>21. Local New Zealand governments coordinate community cat management activities and liaising with national cat management activities.</p>

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	<p>22. Organisations representing conservation groups, animal welfare, veterinary medicine, and industry take an active role in cat management.</p> <p>23. Individuals, including people who do and do not provide care to cats, take an active role in cat management.</p>
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National Cat Management Stakeholders

National Cat Management Strategy Group Members

CAV
LGNZ
NZCAC
MF
NZVA
RNZSPCA

Abbreviations

CAV – NZVA Companion Animal Veterinarians
DOC – Department of Conservation
LGNZ – Local Government New Zealand
MPI – Ministry for Primary Industries
MF – Morgan Foundation
NZCAC – New Zealand Companion Animal Council
NZVA – New Zealand Veterinary Association
RNZSPCA - Royal New Zealand Society for the Prevention of Cruelty to Animals

National Cat Management Strategy Group Technical Advisors

DOC

National Cat Management Strategy Group Observers

MPI

Interested parties

Academics
AgReserach
Animal welfare groups
Cat groups
Environmental groups
Federated Farmers
Landcare New Zealand
New Zealand public (both cat owning and non-cat owning)
Predator Free NZ Trust
Regional and Territorial Authorities

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1. Introduction

New Zealand is home to millions of cats that have great value to people, communities, and to New Zealand society. Cats can also pose a significant threat to wildlife and create a complex animal management problem that include ethical concerns about the euthanasia of thousands of healthy domestic cats and kittens every year, moral stress for the people involved, financial costs to organisations that manage unwanted domestic and feral cats, environmental and biodiversity costs, potential for disease spread, community nuisance, and welfare concerns for cats.

Currently, there is no national strategy for cat management in New Zealand. Considerable efforts have been made to address cat overpopulation and the adverse impacts of feral cats; however, the complexity of the problem makes effective cat management challenging. A new strategic approach to cat management is needed to mitigate the serious negative consequences of the owned, stray, and feral cat problem in New Zealand. New approaches to addressing cat management will require an understanding of the cat populations and stakeholders involved and a critical assessment of previous management strategies.

2. Human approaches to cat management should protect cat welfare

A strategic goal of the National Cat Management Strategy Group is that all domestic cats have a life worth living.

2.1. The value of cats

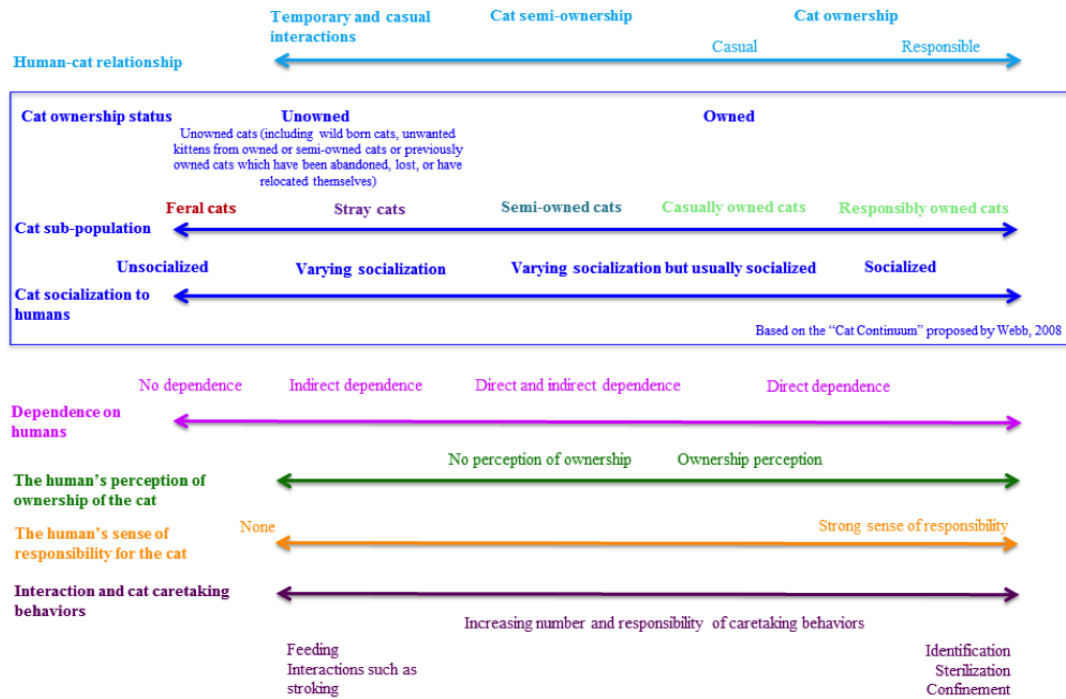
A strategic outcome of the National Cat Management Strategy Group is that the intrinsic value of cats as sentient beings is recognised by New Zealanders.

Cats have a long history of a mutually beneficial relationship with humans dating back almost 10,000 years (Driscoll et al., 2007, 2009; Haye et al., 2004; Turner, 2000). Cats provide useful contributions to human societies, such as pest control, and they are important as peoples' companions (Driscoll et al., 2007, 2009; Lipinski et al., 2008). Humans may provide various forms of care to cats including food, shelter, medical care, and social companionship, but human-cat relationships are diverse (Adamelli et al., 2005; Zito, 2015). In addition to cats' extrinsic value because of their importance to people, cats also have intrinsic value as complex and sentient beings. The sentience of animals, including cats, is formally recognised in the Animal Welfare Act 1999 (Animal Welfare Act 1999, a(i)).

Cats can be grouped into various population categories which make up a larger, interconnected network called a 'meta-population' (Alberthsen et al., 2013b; Jarman et al., 1993; Marston et al., 2009; Miller et al., 2014a; Miller et al., 2014b; Slater, 2001; Toukhsati et al., 2007; Webb, 2008). In the scientific and popular literature on cat overpopulation and management, the terms used to categorise cats into different populations are inconsistently applied and result in confusion (Hughes et al., 2002; Slater, 2001; Toukhsati et al., 2007). These terms share a common basis: they describe some aspect of a cat's relationship with humans, whether the cat is 'owned', confined, socialised, or dependent on humans (Haspel et al., 1990; Levy et al., 2003a; Levy et al., 2003b; Moodie, 1995; Marston et al., 2009; Toukhsati et al., 2007; Webb, 2008; Zasloff et al., 1998).

The 'meta-population' is a similar concept to the cat continuum described in Australia (Webb, 2008; Zito, 2015a), which also includes elements pertaining to the human-cat relationships involved, such as the human's perception of ownership of the cat and feelings of responsibility for the cat, association time, attachment, caretaking and interaction behaviours, and the cat's dependence on humans. This concept is illustrated in Figure 1. Relationships are portrayed in this figure as linear, but in reality, are multidimensional and interactive, making cat management very challenging.

Figure 1: The human-cat continuum



(The cat population terminology in these figures differ slightly from those used in New Zealand and in this document. Semi-owned cats are equivalent to managed stray cats and stray cats are equivalent to unmanaged stray cats.)

The different populations/categories of cats inform how management strategies can more effectively target the source of the problem cats. For example, desexing programmes that aim to reduce reproduction will have little impact on cats that do not have an owner or carer who is willing to facilitate the desexing process (Alberthsen, 2014).

The cat population categories most used are described by Moodie (1995) and the Animal Welfare (Companion Cat) Code of Welfare 2018:

- Feral cat: a cat that is not a stray cat and that has none of its needs provided by humans. Feral cats generally do not live around centres of human habitation. Feral cat population size fluctuates largely independently of humans, is self-sustaining, and not dependent on input from the companion cat population.
- Stray cat: a companion cat that is lost or abandoned or born stray, and that is living as an individual or in a group (colony). Stray cats have many of their needs indirectly supplied by

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humans and live around centres of human habitation. Stray cats are likely to interbreed with the un-desexed companion cat population.

- Companion cat: a cat that lives with humans as a companion and is dependent on humans for its welfare.

The NCMMSG recommends that these terms are redefined to better capture the cat categories that exist in New Zealand, and how they are managed.

The stray cat population includes a sub-population of cats largely ignored in management strategies to date but make a significant contribution to unwanted cat numbers: managed stray cats that are fed or cared for by people (Levy et al., 2014; Toukhsati et al., 2007; Zito et al., 2015). These managed stray cats have been termed 'semi-owned cats' in the literature; a precise definition was described by Zito et al., (2015b) as a cat that is fed or cared for often or always for at least one month by a person who does not perceive ownership for the cat. Some managed stray cats are part of a group of cats cared for intentionally by humans; these are often termed 'colony cats'. These cats all have a human carer who may be the target of initiatives to address this source of cats but need a different management approach than cat owners. Cat carers and cat semi-owners do not consider themselves to be cat owners and so are unlikely to comply with regulations and other measures directed at cat owners. Therefore, it is necessary to address this cat population and associated cat carers with strategies specifically designed for this group.

The cat population categories in this report include:

- Feral cat: a cat that is unowned, unsocialised, and has no relationship with or dependence on humans.
- Domestic cat:
 - Companion (owned) cat: a cat considered owned by a person, sociable, and directly dependent on humans.
 - Stray cat: an unowned cat, of varying sociability, interactions with, and dependence on humans. This category is subdivided into:
 - Socialised stray cat: this category includes managed and unmanaged socialised stray cats.
 - Unsocialised stray cat: this category includes managed and unmanaged unsocialised stray cats.

Managed stray cats may be socialised or unsocialised cats. This category includes but is not limited to cats referred to as:

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- Colony cat: a managed stray cats within a specific cat colony.
- Semi-owned: a managed stray cat of varying sociability but usually socialised to humans; this type of cat interacts with people regularly and is directly or indirectly dependent on specific humans but is not part of a cat colony.

In this document the term domestic cat is used to refer collectively to all cats with some dependence (direct or indirect) on humans including cats in the stray and companion (owned) categories.

2.2. Responsible domestic cat ownership

A strategic outcome of the National Cat Management Strategy Group is that all domestic cats in New Zealand are responsibly owned.

The Animal Welfare Act 1999 (the Act) establishes the fundamental obligations relating to the care of animals in New Zealand. The Act allows for the development of Codes of Welfare which expand on the basic obligations of the Act by setting minimum standards and recommending best practice for the care and management of animals. Codes of Welfare also reference regulations issued under the Act. Regulations impose enforceable requirements on owners and persons in charge of animals. The Animal Welfare (Companion Cats) Code of Welfare 2018, issued under the Act, provides detailed information relating to the care and husbandry of companion cats. For more information on New Zealand Legislation, see appendix 1.

Although the Animal Welfare (Companion Cats) Code of Welfare makes only limited mention of stray cats, responsible cat ownership applies to all people who provide care for them.

Responsible owners acknowledge 'ownership' of their cat and provide care that fulfils the five domains of animal welfare (Mellor, 1994; 2004; 2015; 2016a,b) which link the provision of care related to nutrition, environment, health, and behaviour with a cat's mental state (see Figure 2: The Five Domains of Animal Welfare).

Responsible owners ensure that their cat(s) are microchipped and where practical are equipped with a collar and tag for identification purposes (AVMA, 2016; NZCAC, 2018; NZVAa, 2018). They also ensure their cat(s) is desexed before it is able to start reproducing (before reaching puberty) (NZCAC, 2018; NZVAa, 2018). Pre-pubertal desexing is associated with health and behavioural benefits for the individual cat, in addition to helping address urban animal management and overpopulation problems.

Cat ownership is a commitment for a cat's lifetime, the average lifespan of a desexed companion cat is 14-16 years (NZVAa, 2018). Finding an appropriate cat involves careful deliberation and reflection on what qualities will suit the cat to the owner's home and lifestyle (AVMA, 2016; NZCAC, 2018). Owners should provide appropriate health care for their cat in accordance with veterinary advice and support. Cats require both preventive and therapeutic health care (e.g. vaccinations, parasite control, and treatment and monitoring of health problems) (NZVAa, 2018), and adequate socialisation, training, exercise, and mental stimulation appropriate to their age, breed, and health status (AVMA, 2018; NZCAC, 2018).

Cat ownership also requires an investment of time and money for food, containment, and provision of care when the owner is away (AVMA, 2016; NZCAC, 2018; NZVAa, 2018). Cat owners should be prepared to provide alternative arrangements for the cat if, for some reason, it is no longer possible for the owner or carer to look after the cat (NZCAC, 2018). Cat owners should be prepared to ensure their cat's well-being in the case of an emergency or disaster, including assembling an animal specific evacuation kit (AVMA, 2016, NZCAC, 2018; NZVAa, 2018). Cat owners should also be able to recognise decline in a cat's quality of life, and decisions should be made in consultation with a veterinarian regarding appropriate end-of-life care (e.g. palliative care, hospice, euthanasia) (AVMA, 2016).

2.2.1. Reducing cat surrender and abandonment

The frequent surrender of companion cats, to animal shelters, reduces the number of placements available for stray cats needing homes. A detailed review of cat surrender is beyond the scope of this paper, but it is extensively documented in the literature (e.g. Casey et al., 2009; DiGiacomo, 1998; Kass, 2005; Marston, 2009; Miller et al., 1996; Rinzin et al., 2008; Salman et al., 1998; Salman et al., 2000; Shore et al., 2005). Internationally, many animal welfare organisations have made significant progress in tackling this issue through initiatives including, adoption counselling incorporating advice on pet-friendly accommodation (e.g. RSPCA Queensland [RSPCA Australia, 2016]), provision of financial aid to help potential surrenders care for their cat such as food banks (e.g. the Sacramento Pet Food Bank, Bi-state Pet Food Pantry, and Project Maddie in the USA [Sacramento Pet Food Bank, 2011; Project Maddie, 2014]), and low-cost cat health care (e.g. from organisations such as the Lort Smith Animal Hospital in Australia and The Humane Society of the United States HSUS [Lort Smith, 2014; The Humane Society of the United States, 2014]). Such initiatives have a positive impact in reducing the number of companion cats surrendered to shelters.

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Figure 2: The Five Domains of animal welfare

Physical/Functional Domains							
Survival-Related Factors				Situation-Related Factors			
1: Nutrition		2: Environment		3: Health		4: Behaviour	
Restrictions on: Water intake Food intake Food quality Food variety Voluntary overeating Force-feeding	Opportunities to: Drink enough water Eat enough food Eat a balanced diet Eat a variety of foods Eating correct quantities	Unavoidable/imposed conditions Thermal extremes Unsuitable substrate Close confinement Atmospheric pollutants: CO ₂ , ammonia, dust, smoke Unpleasant/strong odours Light: inappropriate intensity Loud/otherwise unpleasant noise Environmental monotony: ambient, physical, lighting Unpredictable events	Available conditions: Thermally tolerable Suitable substrate Space for freer movement Fresh air Pleasant/tolerable odours Light intensity tolerable Noise exposure acceptable Normal environmental variability Predictability	Presence of: Disease: acute, chronic Injury: acute, chronic; husbandry mutilations Functional impairment: due to limb amputation, or lung, heart, vascular, kidney, neural or other problems Poisons Obesity/leanness Poor physical fitness: muscle de-conditioning	Little or no: Disease Injury Functional impairment Poisoning Body condition appropriate Good fitness level	Exercise of 'agency' impeded by: Invariant, barren environment (ambient, physical, biotic) Inescapable sensory impositions Choices markedly restricted Constraints on environment-focused activity Constraints on animal-to-animal interactive activity Limits on threat avoidance, escape or defensive activity Limitations on sleep/rest	'Agency' exercised via: Varied, novel, engaging environmental challenges Congenial sensory inputs Available engaging choices Free movement Exploration Foraging/hunting Bonding/reaffirming bonds Rearing young Playing Sexual activity Using refuges, retreat, or defensive attack Sleep/rest sufficient
Affective Experience Domain							
5: Mental State							
Negative Thirst Hunger (general) Hunger (salt) Malnutrition malaise Bloated, over full Gastrointestinal pain	Positive Wetting/quenching pleasures of drinking Pleasures of different tastes/smells Pleasure of salt taste Masticatory pleasures Postprandial satiety Gastrointestinal comfort	Negative <i>Forms of discomfort:</i> Thermal: chilling, overheating Physical: joint pain, skin irritation Physical: stiffness, muscle tension Respiratory: e.g. breathlessness Olfactory Auditory: impairment, pain Visual: glare/darkness eye strain Malaise from unnatural constancy	Positive <i>Forms of comfort:</i> Thermal Physical Respiratory Olfactory Auditory Visual Variety-related comfort	Negative Breathlessness Pain: many types Debility, weakness Sickness, malaise Nausea Dizziness Physical exhaustion	Positive Comfort of good health and high functional capacity Vitality of fitness	Negative Anger, frustration Boredom, helplessness Loneliness, isolation Depression Sexual frustration Anxiety, fearfulness, panic, anger Neophobia Exhaustion	Positive Calmness Engaged, in control Affectionate sociability Maternally rewarded Excitation/playfulness Sexual gratification Secure/protected/confident Likes novelty Energised/refreshed
Welfare Status							

The Five Domains model adapted to highlight survival-related and situation-related factors and their associated physical/functional domains, and examples of aligned negative or positive affects assigned to the mental domain. The overall affective experience in the mental domain equates to the welfare status of the animals. Note that an animal exercises 'agency' (Domain 4: behaviour) when it engages in voluntarily, self-generated and goal-directed behaviours (Mellor et al. 2015).

It is thought that abandoned cats may add to stray cat populations (Richards, 2004), although there is no reported evidence within the scientific literature to confirm this. It is an offence under the Act to desert an animal in circumstances in which no provision is made to meet its physical, health, and behavioural needs. Whilst this might be easy to prove in relation to kittens who cannot fend for themselves, it can be very difficult to enforce in relation to the abandonment of owned adult cats since they can survive without human intervention. Including an abandonment offence under new cat management legislation may improve the ability for such cases to be investigated and enforced by officers warranted under this legislation. Cat abandonment can be associated with many different circumstances, including but not limited to, the following:

- tenants moving out of a rental property/home leaving their cat behind
- tenants with companion cats being unable to find a rental property that permits cats
- when the human-cat bond is not established thereby devaluing the relationship
- the cat is not microchipped (as this means the cat cannot be traced back to the owner who abandoned the cat).

Further guidance on factors of responsible cat ownership can be found in the Code of Welfare (Companion Cat) 2018 on the Ministry for Primary Industries' website:

<https://www.mpi.govt.nz/dmsdocument/1413-companion-cats-animal-welfare-code-of-welfare-2007>

2.2.2. The benefits of cat ownership

A strategic outcome of the National Cat Management Strategy group is that the benefits of cat ownership are recognised by New Zealanders.

New Zealand has one of the world's highest rates of cat ownership, with 44% of New Zealand households owning at least one cat (NZCAC, 2016). Benefits associated with having a companion cat include social enablement (Giles-Corti et al., 2005; Zimolag et al., 2009), companionship (Castelli et al., 2001; Siegel et al., 1999), improved quality of life for the elderly (Senepa et al., 2004; Zasloff, 1996), enhanced ability to cope with grief and stress (Rohlf et al., 2005), specific health benefits (Allen et al., 2001; Anderson, 2004; Anderson et al., 1992; Friedmann et al., 1995; Janevic et al., 2007; Jennings, 1997; Qureshi, 2009; Straede, 1993), and general health benefits (Headey, 1999; Grabka et al., 2007),

and benefits to children's health and development (Caprilli et al., 2006; Frederick, 2003; Gagnon et al., 2004; Nagengast et al., 1997; Platts-Mills, 2002; Robbins, 2006; Russell, 2003; Wu et al., 2002), especially in nurturing and social skills (Melson, 2003; Triebenbacher, 1999).

Cats also provide benefits to society as working animals, for example, on farms and as occupational therapy animals (D'Arcy, 2011; Hasselman, 2013; Rijken et al., 2011). Although the impact of cats on ecosystems is generally considered to be negative, cats may also have positive impacts on ecosystems. Cats can control pest species such as rodents and rabbits, which in large numbers may cause considerable environmental damage (Bergstrom, 2009).

2.2.3. Using humane management practices to control all cats.

A strategic outcome of the National Cat Management Strategy Group is that when required, only humane management practices are used to control all cats.

When cats are lethally controlled, they should be humanely treated and killed using effective and generally accepted strategies. Although considered pests, feral cats are covered by the same declaration of sentience under the Animal Welfare Act 1999 as companion cats. There are also offences for wilful and reckless ill-treatment of wild animals or animals in a wild state under the Act that could be applied if a feral cat is treated inhumanely.

There is a statutory seven day holding period for stray cats that must be enacted by an appropriate delegated authority for stray cats as required by the Animal Welfare Act 1999 (for example, the SPCA). This can pose significant welfare issue for unsocialised stray cats as they may become extremely stressed when confined in an animal shelter or pound. If there are immediate health or welfare issues for the cat, they are unsocialised or aggressive, which makes treatment or care unreasonably stressful for the cat and dangerous for personnel, then cats may be humanely killed before the statutory seven day holding period is finished (New Zealand Government 1999; NZVA, 2016).

3. The need to manage cats in urban, rural, and wild environments

3.1. The impact of domestic cats on human communities

A strategic goal of the National Cat Management Strategy Group is minimising the negative impact of cats on the community and our shared environment, both urban and rural. This can be achieved through effective and humane management of cats, in both urban and rural areas.

3.1.1. Zoonotic disease

A strategic outcome of the National Cat Management Strategy Group is that effects of cats on human health are recognised, understood, and addressed.

Though many positive influences of cats on human health are documented, cats may also pose a risk to people through the transmission of zoonotic diseases (diseases of animals transmissible to humans).

Ringworm and flea infestation are common cat zoonoses in New Zealand. Ringworm is a fungal skin infection frequently transmitted from animals, including cats, to humans (Chermette et al., 2008), particularly children (Gräser et al., 2018; Havlickova et al., 2008). The primary agent in cats is *Microsporum canis*, although *Trichophyton* species are also implicated (Chermette et al., 2008; Thompson, 1999). Cats with clinical lesions pose a risk of *M. canis* transmission to humans, however, cats can be asymptomatic carriers of *M. canis* (Cafarchia et al., 2006; Ihan et al., 2016) with great variation (0-88%) likely related environment and management factors (Mignon & Losson, 1997). Flea infestation of cats and subsequent environmental contamination with flea larvae and eggs can result in flea bites and flea bite allergy in humans, with women and children being most affected.

Inadvertent ingestion of intestinal roundworm eggs (*Toxocara cati* or *T. cati*) from faecal contamination of the environment by cats (particularly sand pits, gardens where children play) can result in visceral larva migrans (Fakhri et al., 2018; Woodhall et al., 2014). This is a syndrome of organ inflammation associated with the migration of worm larvae through the body. In some cases, migration of the larvae through the body can cause permanent loss of eyesight (Woodhall et al., 2014). The larval stages of some hook worm species infecting cats (*Ancylostoma spp.*, *Uncinaria stenocephala*) can migrate through human skin resulting in cutaneous larva migrans (Bowman et al., 2010), although this is extremely rare in New Zealand (Manning et al., 2006). Transcutaneous infection with hookworm usually causes localised irritation of the feet and, occasionally, more generalised

illness (Bowman et al., 2010). Humans can also be affected by mites from cats with *Cheyletiella* spp. being the primary agent (Stalleoster et al., 2008).

Cat bites and scratches pose a health risk to humans through the inoculation of feline oral bacteria in bite wounds creating localised pain and infection. Cat bites and scratches can also result in the transmission of the bacteria, *Bartonella henselae*, which is the causative agent of cat scratch fever (or cat bite fever; Breitschwerdt et al., 2010). This infection can result in flu-like clinical signs, including fever and lymph node swelling and, in some cases, serious disease and is most common in children and adolescents (Chomel et al., 2006; Florin et al., 2008).

Cats are the only definitive host of the protozoa *Toxoplasma gondii*, responsible for causing the disease, toxoplasmosis (Stelzer et al., 2019). Cats can shed millions of infectious oocysts in their faeces into the environment, however, this only occurs during the first 2-3 weeks after the cat is first infected or, occasionally, if an infected cat becomes immunocompromised later in life (Dubey et al., 2009). Oocysts can persist in the environment for 18 months or longer.

Infection of humans occurs through two main pathways: ingestion of oocysts directly from the environment (for example, from garden soil, sand pits, and unwashed vegetables) or from tissue cysts in improperly cooked meat (Dubey, 2006). In most humans, infection is mild and self-limiting but in immunocompromised people, generalised infection can occur and lead to neurological disease (Dubey, 2006). Pregnant women with no previous exposure to *T. gondii* organism are at increased risk of complications of toxoplasmosis including foetal infection causing abortion, still birth, or birth of children with central nervous system defects and other permanent damage (Cook et al., 2000). Reported prevalence of human infection with toxoplasmosis vary as low as 4% in Korea to as high as 92% in Brazil, with infection more common in warmer climates (Dubey, 2016). Additionally, there are reported decreases in seroprevalence in the US and some countries in Europe (Cressy & Lake, 2014; Dubey, 2016). Seroprevalence in New Zealand has been reported between 20-40%, which is consistent with Australia, Chile, some parts of Europe, Africa, Middle East, and India (Cressy & Lake, 2014).

There are also a number of gastrointestinal infections (for example, *Giardia*, *Cryptosporidia*, *Campylobacter*, *Salmonella* etc.) and other infectious diseases (for example, *Chlamydia* spp.) that can represent a zoonotic risk to those in contact with animals, including cats, or their faeces (Tzannes et al., 2008).

Cat zoonoses can be managed, therefore, emphasis should focus on educating people about who is most at risk of transmission of zoonotic disease, and how to reduce risk largely through simple husbandry and hygiene measures, and providing good health care to cats, including:

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- Regular parasite control for cats (including deworming and flea control) as directed by a veterinarian;
- Vaccination of cats and small ruminants to reduce the environmental load of *T. gondii* (EFSA, 2013);
- Good hygiene practices; particularly encouraging children to wash their hands after playing in sand pits, playgrounds, and the garden, and after touching cats;
- Prompt collection and disposal of cat faeces from litter trays and the environment. Pregnant women should avoid emptying cat litter trays and wear gloves when handling litter or soil;
- Sandpits and other play areas should be covered when not in use where practical; and
- Veterinary advice should be sought immediately for any unwell cat.

Ingestion of toxoplasma tissue cysts in improperly cooked meat is the most common mode of human toxoplasmosis infection, people preparing and eating meat should ensure that separate utensils and cutting boards are used to prepare raw meat and other foods, that the meat is thoroughly cooked and that any utensils, cutting boards, crockery and other items that have been in contact with raw meat are thoroughly washed. Improvements in *T. gondii* control can minimise harms for the welfare of animals in addition to human harms and is discussed in more detail in section 3.2

3.1.2. Nuisance behaviours

A strategic outcome of the National Cat Management Strategy Group is for nuisance behaviours of owned cats in communities are understood and reduced.

Many normal cat behaviours can be considered a nuisance by some people, including defecation and digging in gardens, fighting, noise and spraying. Occasionally cats cause nuisance by damaging property and the existence of unwanted stray cats on private property can also be a source of nuisance.

Cat predation on wildlife is another cat behaviour that causes considerable community concern. Many communities take steps to protect native mammals and invertebrates through the removal of predators, however, are limited in preventing predation by companion cats. This is particularly a problem during the fledgling period for birds and where the cats live in proximity to areas containing other vulnerable native wildlife. Additionally, backyard pets including small mammals such as rabbits and guinea pigs, aviary birds and fowl can be stalked, disturbed, harassed and even killed by cats (e.g. Stewart, 2014; NZVA CAV personal communication December 9, 2019).

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Existing response to nuisance problem

Nuisance is the main mechanism used by Local Authorities to manage cat numbers under existing Animal Bylaws (See appendix 2: Council Bylaws pertaining to cats). The following table outlines Local Authorities with bylaws in place that limit cat numbers allowed to be kept on a property or by an individual in place:

Table 2 Local Authority Bylaw limiting the number of cats allowed to be kept on a property or by an individual

Local Authority	Number of Cats
Buller District Council	3
Carterton District Council	3
Hastings City Council	4
Far North District Council	5
Invercargill City Council	3
Kaipara District Council	5
Manawatu District council	4
Marlborough District Council	4
Masterton District Council	3
New Plymouth District Council	5
Palmerston North City Council	3
Rangitikei District Council	3
Ruapehu District Council	4
South Waikato District Council	5
South Wairarapa District Council	3
Southland District Council	5
Tararua District Council	3

Local Authorities that do not manage cats have traditionally argued that the lack of complaints about cats demonstrates that the nuisance caused by cats does not warrant action. However, in a survey conducted by the Wellington City Council, 45% of respondents had been “bothered by cat behaviours, including digging and toileting in gardens and lawns, attacking and killing wildlife and other people’s pets, fighting, getting into rubbish, stealing property and producing unwanted kittens” (Wellington City Council 2016). In areas where complaints to local councils are low it could be that these complaints are received by animal welfare organisations rather than local councils.

Approaches to deterring cats from properties to reduce nuisance include both evidence-based and anecdotal methods. Evidence-based approaches include:

- Physical excluders such as fencing can be effective when designed correctly (Moseby et al., 2006; Robley et al., 2007). Existing fences can be modified with attachments at the that exclude cats including roller bars, netting, and plastic or metal sheeting.
- Ultrasonic deterrent devices are available, but the effectiveness of these devices varies (Crawford et al., 2018; Mills et al., 2000; Nelson et al., 2006).

Anecdotal approaches used to deter cats from digging include lining newly planted areas with chicken wire and laying large flat river rocks. Motion activated sprinklers are considered effective at deterring cats (Halls, 2013), but there is no research available to support this claim. Chemical or spray deterrents are a popular product available in stores, but these options have not been well studied. At least one study in The Netherlands found seven different sprays to be ineffective in deterring toileting behaviour, and for some, acted as an attractant for cats (Schilder, 1991). Mothballs are toxic to cats (and dogs; Norkus, 2018), and may attract cats, therefore are not recommend. Similarly, citrus peels are recommended as cat deterrents (Mills et al., 2000), however, citrus is toxic to cats (Plumlee, 2012).

3.2. The impact of all cats on pastoral industries

A desired outcome of the National Cat Management Strategy Group is that negative impacts of cats on New Zealand's pastoral industries are recognised, understood, and addressed. The presence of cats (feral and domestic) in New Zealand impacts pastoral industries through the transmission of disease to grazing species. The most important disease of concern in New Zealand is the protozoal infection toxoplasmosis. *T gondii* is one of the most successful parasitic organisms globally and is widespread throughout New Zealand. This protozoal parasite can infect all warm-blooded animals (reviewed by Stelzer et al., 2019). Cats living on farms is a risk factor for transmission of toxoplasmosis to livestock including pigs, sheep, goats, chickens and other poultry, cattle, horses and other equids, and deer (Gotteland et al., 2014; Kijlstra et al., 2004; Simon et al., 2017; Stelzer et al., 2019). Globally, sheep are commonly infected with *T gondii* (Dubey, 2009b; Stelzer et al., 2109). In New Zealand, between 85% to 61% were positive for *T. gondii* depending on the titre concentration (Dempster et al., 2011). Although this study did not include a representative sample, authors found a high degree of exposure

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across flocks in all regions (West Coast was not included in the study) and a higher level of exposure to *T gondii* for flocks on the North Island compared to the South Island (Dempster et al., 2011).

The welfare problems related to toxoplasmosis are a result of physical health problems from infection and co-occurrence with other disease (Stelzer et al., 2019). Based on the Five Domains Model, health is a functional aspect of welfare and poor health can lead to negative mental impacts on an animal (Mellor et al., 2015). For example, respiratory problems, including laboured breathing, as a result of toxoplasmosis can lead to a negative mental state of breathlessness (Beausoleil & Mellor, 2014). Table 3 below lists studies describing negative impacts to animal health as a result of toxoplasmosis per animal species.

Table 3: Animal welfare-related impacts of *T gondii* (adapted from Seltzer et al., 2019)

Study	Animal	Welfare-related problems	Country
Klein et al., 2010	Pigs	co-occurrence of other disease leading to respiratory problems, morality, multi-systemic wasting syndrome; fever, depression.	Germany
Li et al., 2010	Pigs	anorexia and depression	China
Jiang et al., 2013	Pigs	high fever, dyspnoea, subcutaneous haemorrhage, abortion, enlargement and necrosis of liver and spleen	China
Hou et al., 2018	Pigs	Poor mental state, fever, dyspnoea	China
Kim et al., 2009	Pigs	fever, anorexia, neurological signs, mortality	China
Olinda et al., 2016	Pigs	apathy, dyspnoea, and poor general condition, mortality	Brazil
Basso et al., 2013	Pigs	Weight loss, fever, anorexia	Switzerland
Buxton et al., 1982; Buxton et al., 1988; Castano et al., 2016; Dubey, 1981; Esteban-Redondo et al., 1999; McColgan et al., 1988	Sheep	Fever, lack of appetite in ewe	Experimental

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Buxton & Losson, 2007	Sheep-lambs	weakness	N/A
Burrells et al., 2018; Costa et al., 1977; Esteban-Redondo et al., 1999; Munday, 1978; Rommel et al., 1966; Stalheim et al., 1980; Wiengcharoen et al., 2011	Cattle	Parasetemia	Experimental
James et al., 2017; Schale et al., 2018	Horses	Co-occurrence with equine protozoal myeloencephalitis (EPM)	US
Dubey, 1985; Dubey & Desmonts, 1987; Sposito Filha et al., 1992	Horses, ponies	Mild fever	Experimental

Chickens, turkeys, ducks, and geese rarely show clinical signs or show no clinical signs of infection after of *T gondii* (Stelzer et al. 2019).

Globally, toxoplasmosis has been linked with abortions in pigs, sheep, and goats (Dubey, 2009b; Stelzer et al., 2019). Toxoplasmosis infection can result from the dam's ingestion of oocysts, from infected dam to foetus in utero, from infected ram to dam through semen, and from infected dam to offspring through milk (Stelzer et al., 2019). In New Zealand pastoral industries, toxoplasmosis infection poses economic impacts on livestock industries, related to abortion in sheep (Dempster et al., 2011) and deer (Patel et al., 2019). Infection with *T gondii* is the second most common cause of abortion in sheep (Beef and Lamb New Zealand, 2016), and in 2014, toxoplasmosis cost the sheep industry in the Hawke's Bay region of New Zealand approximately \$18 million (Walker, 2014). The costs of toxoplasmosis to the farming industry are incurred through:

- loss of lambs through abortion, either low level insidious losses or large-scale abortion storms;
- the birth of weak non-viable lambs that fail to thrive and subsequently die;
- culling of fertile ewes that are assumed to be barren through undetected abortions; and
- the cost of vaccination of ewes to reduce the impact of the disease.

Faecal contamination of the environment by cats is the primary source of infection for pastoral species; these animals may ingest both oocyst-contaminated feed and water (Dubey, 2009b; Stelzer et al., 2019). For omnivorous species, such as pigs, consuming rodents infected with *T gondii* is also a transmission pathway (Kijlstra et al., 2004; Stelzer et al., 2019). Some studies have found no relation

or a protective factor between presence of cats and risk of *T gondii* transmission, indicating that cats alone may not be a risk factor; rather preventing feed and water contamination through proper farm hygiene is recommended to reduce transmission of *T gondii* to farmed animals (Stelzer et al., 2019).

A single-dose vaccine for toxoplasmosis available in New Zealand is an effective tool for reducing ewe abortions and foetal loss (Dempster et al., 2011; Dubey, 2009b). Vaccination of animals such as sheep may be an effective strategy for reducing zoonotic transmission of toxoplasmosis to humans (Innes et al., 2019). While the removal of feral and stray cats from farming communities may reduce the risk of toxoplasmosis, it will not prevent the disease altogether as companion cats will continue to act as reservoirs for the disease. Additionally, rodent population control is required for reducing the risk of toxoplasmosis on farm as rodents are an important link in the transmission of toxoplasmosis to previously uninfected cats or directly to animals such as pigs (Kijlstra et al., 2004). *T gondii* highlights the interconnection between animal welfare, human wellbeing, and the environment. Improving control of *T gondii* will benefit animals and reduce the risks to human health. Therefore, it will be important to educate the public, particularly people with companion cats, about this disease and their part in reducing the risk of *T gondii* transmission.

3.3. The impact of cats on biodiversity

A strategic goal of the National Cat Management Strategy Group is the protection of our native species and ecosystems is enhanced through the humane management of cats.

A desired outcome of the National Cat Management Strategy Group is that there are minimal negative impacts of cats on native species in New Zealand.

Cat predation on New Zealand's native species, including native birds, lizards, frogs, and invertebrates is well documented. Cats have a significant negative impact on rare and threatened native bat and bird species, particularly birds that rest, feed, or nest on the ground or in low vegetation (Farnworth et al., 2013b; Fitzgerald et al., 1985; Fitzgerald, 1988; Gillies et al., 2003; Gordon et al., 2010; Norbury et al., 2008; van Heezik et al., 2010).

Cat predation may represent a significant cause of mortality for some bird species in urban locations (Baker et al., 2005; Greenwell et al., 2019). Cats commonly kill sick, old, and injured birds, fledglings, and those that fall from nests (Baker et al., 2008; Dierschke, 2003; Møller & Erritzoe, 2000). As a result, cat predation may represent a compensatory rather than additive form of mortality in birds, although

this likely varies with cat and prey density, prey species, and location. Where large numbers of birds are killed, cats likely kill a combination of individuals with poor and good long-term survival chances, not just those birds with poorer long-term survival chances (Baker et al., 2008). For New Zealand birds that have not co-evolved with mammalian predation pressure, cats have a greater negative impact on members of a species that are not considered vulnerable (e.g. fledglings; Farnworth et al., 2013b).

Where the urban predation rates are low, the impact of cats on birds may not be correspondingly low. Sub-lethal effects of cats on birds (primarily mediated through fear) may depress bird populations enough that low predation rates simply reflect low numbers of birds (Beckerman et al., 2007). This may also be the case with other targeted species such as lizards, frogs, and invertebrates.

Cats also prey on introduced species of small mammals, birds, lizards, frogs, and invertebrates that may have a significant negative impact on native wildlife. Cat management measures may result in increased numbers of these species and a correspondingly increased negative impact on native wildlife. This dynamic should be considered and addressed when planning cat management programmes (Farnworth et al., 2013b; Robley, 2004).

Any cat with outdoor access may prey on wildlife (including companion cats) but their prey varies depending on their location (Farnworth et al., 2013b; Gillies et al., 2003). Regardless of whether the species targeted is native or non-native and the effect on wildlife numbers, there can be negative welfare impacts on predated wildlife (Jessup, 2004).

T gondii transmission also impacts New Zealand's native wildlife. *T gondii* infection is a known cause of mortality of the critically endangered Hector's dolphins (*Cephalorhynchus hectori*; Roe et al., 2013). *T gondii* infection is also a potential factor influencing reproductive failure in New Zealand sea lions (Michael et al., 2016). In addition, *T gondii* has been found in shellfish (Putignani et al., 2011) but the significance is not yet clear.

T gondii can also impact birds. *T gondii* has been determined as the cause of death in four cases of native New Zealand birds including kereru, North Island kiwi, and North Island kaka (Howe et al., 2014), paradise shelduck, and red-crowned kākāriki (Hunter & Alley, 2014).

Effective cat management and mitigation of negative impacts of cats on native wildlife is an important component of maintaining New Zealand's native biodiversity. This includes management of feral and domestic cat populations.

3.3.1. Identifying and protecting sensitive wildlife areas from all cats

A strategic outcome of the National Cat Management Strategy Group is that sensitive wildlife areas are identified and protected from negative impacts from all cats.

Identifying sensitive wildlife areas will help determine where cat management will be most ecologically valuable. Organisations such as DOC and Queen Elizabeth II Trust and local authorities have programmes which identify and protect sites of high biodiversity (Predator Free New Zealand, 2016). The Greater Wellington Regional Council Key Native Ecosystems programme manages pests and threats at high biodiversity sites across the Wellington region, many in urban areas. The growing abundance of native species in those urban areas (Landcare Research, 2015) demonstrates the benefits of local pest control. The management of cats would complement existing pest control in these areas and greatly reduce the risk of predation for vulnerable native species.

Islands from which feral cats and other predators have been eradicated provide examples of what can be achieved when the impacts of introduced predators on native species are removed:

- Within six years of the eradication of feral cats and rats from Raoul Island, five locally extinct seabird species were breeding again on the island (black-winged petrel; Kermadec petrel; wedge-tailed shearwater; sooty terns; red-tailed tropicbird). Spotless crakes and the Kermadec parakeets had recolonised the island from nearby predator free islands (Bellingham et al., 2010; Veitch et al., 2011).
- After cats were removed from Mangere Island in the Chatham Islands, Forbes parakeets and white-faced storm petrels recolonised the island (Bell et al., 2003; DOC, 2001). Chatham Island snipe were successfully reintroduced from Rangatira Island (Dowding et al., 2001).
- After cats were eradicated from Motuihe Island in the Hauraki Gulf tuatara were successfully introduced to the island (DOC, 2016).
- On Hauturu (Little Barrier Island), kokako, and tieke (saddleback) were released following cat eradication and have subsequently bred successfully (Bellingham et al., 2010). There was also an increase in the number of black petrels breeding on the island (Bellingham et al., 2010). However, the eradication of cats from Hauturu also highlighted the need to control other predators. Whilst the eradication of cats reduced cat predation of adult Cook's petrels, there was an increase in predation of Cook's petrel chicks and eggs by kiore (Polynesia or Pacific rat; Imber et al., 2003). Cook petrel breeding success increased once kiore were eradicated from the island in 2004 (Bellingham et al., 2010).

- Following the eradication of cats and rats from Tuhua in 2000 the island has become a safe haven for threatened bird species from the mainland. North Island robins, Pateke (brown teal) and North Island brown kiwi have been released on the island and all appear to be establishing successful breeding populations (Bellingham et al., 2010). Orange Fronted Parakeets/ kākārīki were also successfully introduced during 2009/10 (DOC, 2011).

The removal or exclusion of predators from sensitive wildlife areas ensures the safety of vulnerable native species in that area. Maintaining low numbers of cats or total elimination requires ongoing management at such sites. For example, 479 cats have been removed from the 1700 ha Pukaha/Mt Bruce buffer area in the northern Wairarapa since 2008. With continued intensive management of the site, the total number of cats captured fluctuates between 50 to 90 cats per annum, with a total of 79 captured and humanely killed in 2014/15 (pers comm Simon Kelton, DOC, 2016). Predator exclusion fences such as the fence surrounding Wellington's urban sanctuary Zealandia can be useful in preventing reinvasion of excluded species, however, they are expensive to build and maintain, and are restricted by land use and geography. Unfenced mainland islands such as Pukaha, which use intensive trapping and poisoning to protect the site, struggle with re-invasion (pers comm Simon Kelton, DOC, 2016).

Urban and suburban habitats may serve as an important habitat for birds and other native animals (Angold et al., 2006; Tratalos et al., 2007; Pennington et al., 2008; Seewagen & Slayton 2008; Longcore et al., 2009). Sites which retain native species (such as bush, wetland or coastal remnants) are often found on urban fringes and in rural locations and may also be near housing and development (Farnworth et al., 2013b). Introduced birds and mammals are prevalent in built up areas and some of these species such as rats, mice, rabbits, and introduced bird species are commonly targeted by cats (Farnworth et al., 2013b; Gillies et al., 2003). In areas where vulnerable, native wildlife persist, the presence of cats will likely exacerbate local species decline and, consequently, cat management is necessary in these areas to mitigate these negative effects. If it is determined that cats should be managed to protect native wildlife, then this should be part of a comprehensive predator control programme that targets multiple species of mammalian predators (Farnworth et al., 2013b).

3.3.2. Public education on the negative impacts of cats on biodiversity

A desired outcome of the National Cat Management Strategy Group is that the public understand the potential impacts of cat predation on New Zealand's unique environment.

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The impact of feral cats on wildlife is well documented (Clancy et al., 2003; Clarke & Pacin, 2002; Jochle & Jochle, 1993; Patronek, 1998; Woods et al., 2003) and generally accepted by the public, however, the impact of companion cats on wildlife is less well recognised and accepted (Loss et al., 2018). A study in New Zealand found that members of the public were mostly concerned about impacts from feral cats, unmanaged strays, and colony cats on native and non-native wildlife (Walker et al., 2017). While prey intake of feral cats is approximately four times that of a companion cat, cats that receive food (directly or indirectly) from humans in the urban environment still hunt (Farnworth et al., 2013b). Although companion cats vary in their hunting activity levels and patterns, unrestricted, outdoor access facilitates predation of wildlife (Farnworth et al., 2013b; Lloyd et al., 2013). In addition to the negative impact of predation on wildlife, all cats can transmit the protozoal disease toxoplasmosis to wildlife causing mortality and morbidity in native species (Howe et al., 2014).

Conservation programmes aimed at mitigating companion cat predation of wildlife should include properly designed communication campaigns to give the programmes the best chance at altering cat-owner behaviour. Campaigns should use veterinarians to advocate messages to emphasise the benefits to companion cats of being inside and the positive impact on the owner (MacDonald et al., 2015). In addition, people who perceive higher risk associated with cats being outside have more negative attitudes toward cats being allowed outside (Gramza et al., 2016). For those cat owners who keep their cat outside, a campaign should focus on social norms highlighting the positive actions of others bringing their cats inside (MacDonald et al., 2015).

Diverse stakeholders are needed in a conservation campaign aimed at mitigating companion cat predation of wildlife (for example, government, conservation groups, community groups, veterinarians, and animal welfare organisations). All stakeholders involved should promote accurate and consistent information. Better evidence of the impacts of companion cats on native biodiversity in urban areas and the benefits of appropriate cat management to mitigate these negative impacts is useful for designing education and communication campaigns for cat owners. Fact sheets, social media, online video servers, and interactive forums could be used to communicate the negative impacts of cats on wildlife, mitigation strategies, and the benefits of cat management for the welfare of both cats and wildlife.

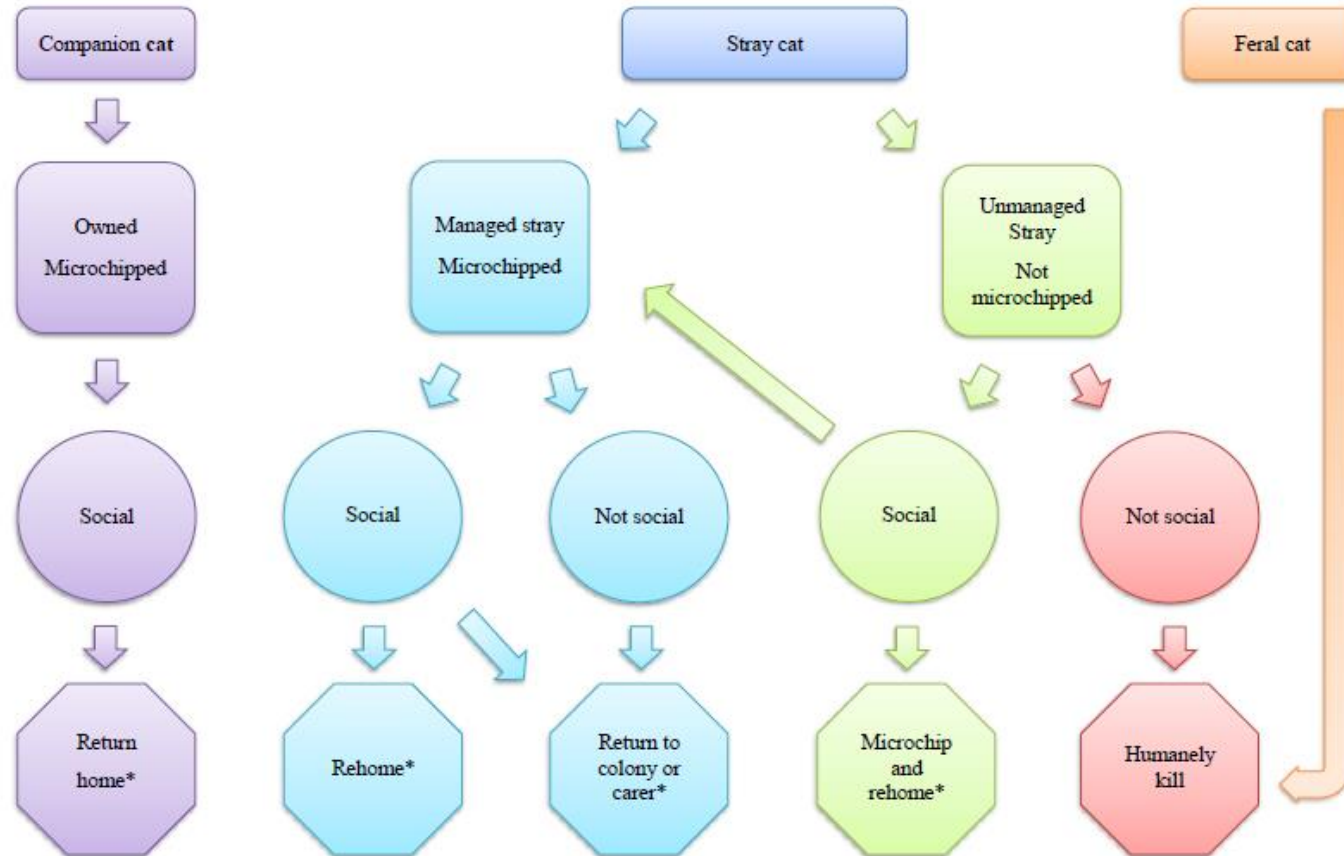
Containment of cats is not yet commonly considered an important component of responsible cat ownership in New Zealand. However, containing cats is an effective strategy to prevent wildlife predation outside of the owner's property. This strategy is further discussed in Section 4.3.2.

4. Approaches to effective and humane cat management

Effective and humane cat management will require an approach that considers the type of cat, the context requiring management, and the people involved. A strategic goal of the National Cat Management Strategy Group is that humane cat management is achieved through a multifaceted and integrated national management plan.

Effective and humane cat management will also require determining the nature of the human-cat relationship to identify the most appropriate cat category. For example, distinguishing between 'owned' companion cats and managed stray (semi-owned) cats is a key component in the deciding what initiatives are appropriate to individual cat management situations. Figure 3: Cat management flow chart for cats found free roaming based on proposed cat population categories describes how different approaches to managing free roaming cats that are feral, stray, or companion.

Figure 3: Cat management flow chart for cats found free roaming based on proposed cat population categories



*Indicates all options should require containment in sensitive ecological areas.

4.1. Managing feral cats

An outcome of the National Cat Management Strategy Group is that there are no feral cats in New Zealand. This aligns with the strategic goal to minimise the negative impact of cats on native species in New Zealand.

A feral cat lives in the wild and is self-sustaining, and has none of its needs provided for by humans. Feral cats are found in most terrestrial habitats from sea level to alpine areas, but generally do not live around centres of human habitation (Alberthsen, 2014; Gillies et al., 2005; Webb, 2008). Feral cats are distributed throughout all main islands of New Zealand and are also present on several outlying islands (Parkes et al., 2014). Densities of feral cats vary widely and are largely dependent on the availability of prey (Gillies et al., 2005). Feral cats are generalist predators (Farnworth et al., 2013b) and, while they predominantly prey on rats and rabbits (Gillies et al., 2005), they may also prey upon native bats, birds, reptiles, insects, and amphibians (Farnworth et al., 2013b). New Zealand's native species are poorly adapted to respond to predation by cats, as they evolved in the absence of mammalian predators. Consequently, low numbers of feral cats can have a significant impact on native species (Farnworth et al., 2011).

Feral cat control to protect New Zealand's native species falls under two broad categories:

- Sustained control as part of wider predator control programmes (mustelids, possums, hedgehogs and rodents): this type of control occurs on an annual basis to manage ongoing reinvasion of feral cats living outside the area. Examples of sustained feral cat control operations include kiwi protection in Northland, shore bird protection at breeding sites (e.g. Chatham Islands), and Otago and Grand skink protection (e.g. Otago).
- Specific eradication of feral cats from offshore islands and fenced sanctuaries: examples include the eradication of feral cats from Raoul Island, Rangitoto & Motutapu Islands and Little Barrier Island (Campbell et al., 2011), and from the Zealandia and Maungatautari fenced sanctuaries (Burns et al., 2012).

The techniques used to control feral cats in both situations are similar, but in eradication programmes, the control efforts undertaken are more intensive. Adequate high-level resourcing and financing is required for successful intensive predator management programmes.

4.1.1. Techniques used to control feral cats

Control techniques currently used to for feral cats in New Zealand include poisoning, trapping, and shooting. The relative humaneness, effectiveness, and practicality of all methods of feral cat control should be considered using the most current science and best practices. A brief explanation of techniques is given below but the reader is advised to refer to detailed and up to date information, such as that produced and regularly updated by DOC (DOC 2011 a,b,c; DOC 2016), and PestSmart (Centre for Invasive Species Solutions, 2016), and by the defunct National Pest Control Agencies (NPCA) (National Pest Control Agencies 2015a,b,c,d; see <https://www.bionet.nz/library/npca-publications/> for these publications). For all techniques listed below, there is variability within and between methods for how humane they are in controlling feral cat populations; this variability is discussed in each section.

Shooting

Lethally controlling animals by shooting is often considered a relatively more humane practice than other methods of control (Fisher et al., 2015; Littin et al., 2014). A humane shooting is one that should result in the least amount of time between when the animal is shot and until it is insensible and dead (Aebischer et al., 2014; Sharp, 2012b; Stokke et al., 2018). Evaluating the humaneness of shooting in the field is challenging because a shooter must evaluate the time to death from a distance (Hampton et al., 2015), animals vary in size which affects the time to death, and animals flee after being shot (Stokke et al., 2018).

Oftentimes, an animal's flight distance after it has been shot is evaluated as a measure of the accuracy of a shooting (Hampton et al., 2015; Stokke et al., 2018). At least one study has attempted to define the relationship between time of death and flight distance to develop practical guidelines that hunters can use in the field to evaluate if they have humanely killed an animal (Stokke et al., 2018). However, these types of evaluation tools are new, and not well tested in the field, therefore, hunters should rely on current best practices for humanely shooting animals. Targeting an animal's brain, or lungs and heart is considered to bring about the quickest death (Sharp, 2012; Stokke et al., 2018). However, distance between the shooter and animal impacts the probability that an animal is killed when shot (e.g. the closer the distance, the higher probability of a more humane kill; Aebischer et al., 2014; Hampton et al., 2015). Additionally, the more comfortable and less rushed a shooter feels, increases the probability a shot will kill an animal (Aebischer et al., 2014). Best practices for ensuring a more humane shooting include:

- Shooting must be performed by shooters who are trained, experienced, and skilled;

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- The animal can clearly be identified and seen before shot;
- The correct firearm, ammunition, range and shot placement is used;
- Any wounded animal is promptly killed (Sharp, 2012); and
- If lactating cats are killed, then efforts should be made to find and humanely kill the surviving offspring (Sharp, 2012).

Due to a feral cat's behaviour to avoid humans, shooting them as a management technique is likely to be more successful when the cat is unaware of the person (Fisher et al., 2015). Shooting feral cats tends to be either opportunistic (during the day) or by spotlighting (at night), and can be useful as a supplementary technique to trapping, primarily to target specific trap-shy animals (Parkes et al., 2014) or to kill cats caught in traps (Fisher et al., 2015; Sharp & Saunders, 2012).

Trapping

Trap types include kill traps and live-capture traps (such as leg-hold and cage traps). Trap use in New Zealand is regulated by the Animal Welfare Act 1999 (New Zealand Government 1999). The Act sets specific requirements for the sale and use of traps and devices. For example, traps intended to live-capture must be inspected every 24 hours and within 12 hours of sunrise each day the traps are set beginning immediately after the day the traps are first set. Traps are not required to be approved under the Animal Welfare Act. A trap can be developed and sold until the point that it is regulated against (if required) – examples of such regulation are the Animal Welfare (Leg-hold Traps) Order 2009 and the Animal Welfare (Glueboard Traps) Order 2009.

Trappers should aim to minimise pain and distress when determining the method of killing cats. The method used should cause irreversible loss of consciousness and death as quickly and painlessly as possible. The choice of method depends on the confidence and skill of the operator, the species and age of the animal, the situation, and if the method is appropriate in the situation (NPCA 2015a). Three types of traps commonly used in New Zealand to manage feral cats include:

- Kill traps which rely on bait to lure a cat into the trap; the trap is triggered when the cat touches the bait. The trap kills a cat without need of human intervention.
- Leg-hold traps which catch a cat by its leg and hold it until the cat is killed by a trap operator. An effective leg-hold trap must catch and restrain a cat while minimising injuries. The use of leg-hold traps is restricted through the Animal Welfare Act 1999 and the Animal Welfare (Leg-hold Traps) Order 2007 (New Zealand Government 2007).

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- Cage traps which use bait to lure cats into a device that they cannot escape; the door of the cage closes when a cat touches the bait or steps on a treadle to close the door of the cage. The cat remains in the cage until the trap operator returns and either releases or kills it.

If a person is required to kill animal that has been trapped, methods used should ensure the death is as quick as possible to minimise welfare harms to the animal (AVMA, 2013b; 2019; DOC 2011a, b, 2016; NPCA; 2015). Human safety concerns should also be considered with any method chosen. Killing by a veterinarian may be an option. In all cases, death should be confirmed afterwards and, if there is any doubt that the animal is dead, all methods should be followed by a secondary method to ensure death occurs. Drowning is never an acceptable kill method.

The Animal Welfare Act 1999 gives the National Animal Welfare Advisory Committee (NAWAC) a role in outlining and promoting best practice in the hunting and killing of wild animals (including pests). NAWAC can also recommend the issue of regulations to restrict or prohibit certain traps or devices on animal welfare grounds. NAWAC has developed a guideline for assessing the animal welfare impacts of traps (NAWAC, New Zealand 2011) and manufacturers can opt to have their traps tested for welfare performance. The NPCA provide best practice guidelines for the use of kill traps to help trap operators undertaking feral cat control (NPCA, 2015a) or with leg-hold traps (NPCA, 2015b).

Traps can be assessed for their welfare performance to determine whether they have demonstrated they result in a more humane death (for lethal traps) or capture (for non-lethal traps). NAWAC has created assessment guidelines using criteria that evaluate traps based on time to insensibility and death (lethal traps) and severity of injury (non-lethal traps); traps either pass or fail assessment (NAWAC, 2011). These assessments are available to inform trap operators of which traps will minimise the negative welfare impacts (Bionet, n.d.).

Poisoning

This technique involves placing poison bait on the ground or in a bait station. It can be used for all feral cat densities and in all types of habitat. The use of poisons to control cats is strictly regulated in New Zealand. Currently there are two poisons (Vertebrate Toxic Agents) registered for use in the control of feral cats in New Zealand: sodium fluoroacetate (1080) and para-aminopropiophenone/4-aminopropiophenone (PAPP). The use of poisons can be effective in reducing feral cat populations, however, the relative humaneness of this technique varies due to the severity and duration of symptoms a cat experiences after ingestion (Littin et al., 2014; MAF, 2010).

4.2. Managing stray cats

Effective cat management should include strategies for domestic cat populations which include stray cats and companion cats. An outcome of the National Cat Management Strategy Group is that there are no stray cats in New Zealand. This aligns with the desired outcome that there is no adverse effect of cats on native species in New Zealand.

Stray cats live in and around human habitation, may or may not be socialised to people and may not have an identifiable owner. A proportion of these cats were likely previously owned (but strayed or were lost) or may have been unwanted kittens of owned or stray cats (Casey et al., 2009; Marston et al., 2009). Stray cats often depend on resources supplied indirectly and unintentionally by humans (Aguilar et al., 2012; Alberthsen 2014; Finkler et al., 2012). Stray cats make up a significant proportion of unwanted cats in urban areas and entering animal shelters (Alberthsen, 2014; Marston et al., 2009; Zito, 2015).

There are limited methods to reduce stray cat populations:

- Limiting the flow or contribution of cats from the owned and feral cat populations to the stray cat population;
- Reducing the number of stray cats through removal of cats (by non-lethal or lethal methods);
or
- Reducing the number of stray cats by controlling reproduction of stray cats.

Limiting access to food resources (intentionally provided food and unintentionally provided food such as rubbish) will also assist in the control of stray cat populations.

4.2.1. Limiting flow of cats into the stray cat population

Significantly reducing or eliminating the contribution of feral cats to the stray cat population can likely only be achieved through greatly reducing the numbers of feral cats or eliminating feral cats entirely. Control methods and management strategies for feral cats are described in detail elsewhere (Biosecurity Tasmania 2016; Commonwealth of Australia 2015 a,b; Denny et al., 2010; Sharp et al., 2012;) but a summary and assessment are provided for this report in the previous section (Control of feral cats).

Limiting the flow of companion cats into the stray cat population involves preventing reproduction, supporting long-term responsible care of cats, reducing cat abandonment, and preventing cats roaming and subsequently straying and becoming lost.

4.2.2. Reducing the number of stray cats

Permanent removal of cats from the stray cat population

Adoption

An adoption programme for stray cats involves removing the cats from the stray population by either trapping them (trap and remove) or capturing them without a trap (usually for more social cats) and then finding permanent homes for them through an adoption programme. However, there is a limited capacity to absorb stray cats into the companion cat population because of oversupply of surrendered companion cats needing adoption and easily obtained cheap or free cats from other sources. Stray cat adoption is compounded by the higher cost of buying desexed kittens/cats while undesexed kittens can be obtained very cheaply and easily. Animal shelters generally desex cats prior to rehoming as a matter of policy to limit cat numbers but some private rescue groups, and many council pounds, rehome un-desexed cats, which can contribute to cat overpopulation.

Increased adoptions of cats, including stray cats, can be achieved through measures such as: creative marketing and advertising campaigns; off-site adoption centres; adoption drives; and improving the accessibility and attractiveness of adoption centres (Fournier, 2004; Lord et al., 2014; Marsh, 2010; Zito et al., 2015a).

Some stray cats are not of suitable temperament or socialisation status for rehoming to 'normal' domestic homes (Hurley & Levy, 2013; Levy, 2012), and alternative rehoming routes (for example, barn or farm cat placements) or other options (for example, managed targeted trap-neuter-return programmes) should be explored for these cats.

Despite the range of strategies used by welfare organisations to increase adoptions of cats, the available information shows large numbers of cats that are categorised as 'stray' are euthanased in shelters. This indicates that strategies to increase adoption of semi-owned and unowned cats alone are not enough to have a significant positive impact on the outcome for many stray cats. However, widespread availability of low-cost adoption of desexed kittens/cats from all welfare/rescue groups could help address problems associated with the wide availability of undesexed kittens that can be obtained very cheaply and easily. Offering low cost adoption of desexed kittens/cats from all welfare/rescue groups would mean a more level playing field between welfare/rescue groups and other sources of kittens/cats and would result in fewer intact cats and, consequently, fewer unplanned litters of kittens.

Cat sanctuaries

Cat sanctuaries provide long term homes for stray cats in a confined area. These facilities are expensive to build and maintain (Lloyd & Hernandez, 2012) and tend to fill up very quickly; they can only care for a relatively small number of animals for an extensive period. Cat sanctuaries can provide a high level of care to cats and a valuable service to the community, however, many close each year due to insufficient funds, disease outbreaks, or an inability to properly care for the cats in the existing confined space.

Sanctuaries, and other long-term animal sheltering facilities, generally result in poor animal welfare. The confinement, and large number of cats in small rooms or areas, cause physical and psychological stress to the animals and put them at high risk of disease.

Care-for-life sanctuaries are recognised as the most expensive and least efficient method of population management. Most sanctuary programmes that permanently house many cats also have an active TNR programme because the sanctuaries are filled (Levy et al., 2004).

Trapping programmes

There are two potential outcomes for cats that are trapped and permanently removed from the population: a live outcome where cats are rehomed through adoption ('trap and remove' in this document; see above), or a lethal outcome where trapped cats are killed (called 'trap and kill' in this document).

Trapping and subsequent humane killing is generally considered to be a relatively humane method of controlling cat populations compared to other lethal methods. However, the ethics of this approach are questionable and controversial. Despite being considered more humane than other methods of killing cats such as poisoning, the use of humane traps cannot fully alleviate the significant welfare risks associated with trapping cats. Welfare outcomes are affected by a range of factors including the type of trap used, positioning of a trap with regard to environmental exposure, frequency of checking, potential for injury during escape attempts and distress caused by containment (Robertson, 2007). Any trapping should be undertaken in compliance with an agreed code of practice and standard operating procedures. Trap and kill also has minimal impact on non-target species and pose less danger to humans and pets than other lethal methods (Palmer, 2014).

Domestic cat-trapping programmes should comply with a welfare code of practice and procedures to ensure humane measures are undertaken. The NPCA (2015c) provide guidelines for monitoring and

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control of feral and stray cat trapping. However, these are best practice guidelines and are not mandatory or enforceable. The NPCA (2015d) provide a user guide to legislation relating to terrestrial pest control to help contractors and control agency staff understand their statutory responsibilities. In contrast to New Zealand, some councils in Australia require trapping be conducted by authorised officers who set up, monitor, and remove trapped cats (usually individual cats that are causing a nuisance) to a local cat management facility (RSPCA Australia 2017). There are benefits in adopting a similar approach to achieve consistency and minimise welfare risks associated with trapping which may help gain greater community acceptance for trapping programmes.

Many approaches to trap and kill result in minimal overall reduction in cat numbers, because a small percentage of cats are affected by these programmes, and the limited capacity of shelters and pounds to remove unwanted cats (Hatley, 2003; Levy, 2012; Levy et al., 2013). Low-level culling of feral cats in Australia led to an increase in cat numbers (Lazenby et al., 2015). Similarly, traditional trap and kill efforts (undertaken by animal control agencies or through animal welfare organisations, when members of the public trap and bring unowned cats into animal shelters) are effectively low-level culling, and unlikely to result in significant long-term improvement in wildlife predation, spread of disease, public health, or cat welfare. Computer-based modelling consistently predicts failure of lethal control methods to eliminate cat populations unless high removal rates are achieved for long periods; these conditions are considered unrealistic in urban areas (Andersen et al., 2004; Budke & Slater 2009; Foley et al., 2005; McCarthy et al., 2013; Schmidt et al., 2009). One simulation model estimated that over 82% of cats in a population of 200 cats would need to be removed over 4,000 days to eliminate a population (McCarthy et al., 2013). Other estimates for effective removal rates range from over 50% of the female population (Andersen et al., 2004), or 55-60% in the absence of immigration (Nutter, 2005). Models predict that colonies can be kept small by very high-level culling every one or two years, but that this will not lead to long-term reduction in the numbers of cats as colonies will re-establish due to immigration (Nutter, 2005).

Eliminating the source of food on which cats rely is an important component for the success of a lethal cat removal programme. If this is not done, then immigration into the area for a source of food reduces the likelihood that the programme will be successful (Winter, 2004).

Some trapping programmes include rehoming of suitable cats on a small-scale (e.g. individual trapping of nuisance cats), but this may be problematic on a large-scale due to extra resources required, unless local community support was available (RSPCA Australia, 2017).

Successful trap and kill programmes can be difficult to implement and involve significant investments of resources. The effort required to eradicate cats from geographically isolated islands with intensive lethal control methods including trapping, shooting and poisoning is high. The mean effort to eradicate feral cats from six large islands was 543 ± 341 person-days per 1000 ha of island over 5.2 ± 1.6 years (Parkes et al., 2014).

Trapping activities in peri-urban and urban areas should consider the difficulty in implementing a programme that can remove sufficient numbers of cats, and the evidence that less than optimum removal rates may actually increase cat numbers (Lazenby et al., 2015). Eradication methods should be continuously applied due to immigration and introduction of cats into the population through abandonment and new litters from remaining cats (Hatley, 2015).

Controlling reproduction of stray cats

Desexing options

Surgical ovariohysterectomy (or ovariectomy) and castration remain the mainstay and gold standard for inducing permanent sterility in cats to manage cat populations and provide other health and behavioural benefits (Murray et al., 2008). Vasectomy/hysterectomy has been assessed as a theoretical alternative to castration/ovariohysterectomy (McCarthy et al., 2013), but there is not yet adequate field evidence to support the use of vasectomy/hysterectomy alone. There are cat welfare concerns, as cats that have undergone vasectomy/hysterectomy are still hormonally intact and more likely to fight and roam resulting in injury, disappearance, or death. Intact cats are also more prone to display the nuisance behaviours that can result in cat impoundment and euthanasia (Nutter, 2005).

The development of a successful, safe, low-cost, single-dose, lifelong, non-surgical sterilant that is effective for cats of both sexes and is amenable to delivery in a field setting would revolutionise cat population management. There have been many advances in this area over the last ten years and there is active research continuing into potential methods including immunocontraception with a single-administration vaccine against gonadotropin releasing hormone (GnRH), long-term therapy with GnRH agonists administered in controlled-release devices, targeting cells in the brain or gonads with cytotoxins, gene therapy which leads to protein expression that suppresses reproduction and gene silencing of peptides essential to reproduction (Johnston et al., 2015).

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Recently geographic information systems (GIS) have been used to identify specific areas that disproportionately contribute kittens to shelter intakes (Reading et al., 2014), areas of high concentrations of stray cats (Aguilar et al., 2012), and unmanaged cat colonies (Aguilar et al., 2013). Use of GIS can help focus targeted desexing and education campaigns (Aguilar et al., 2012; Reading et al., 2014) and used to assess the efficacy of implemented programmes (Reading et al., 2014).

Trap neuter and return (TNR) programmes

Trap neuter return (TNR) programmes involve trapping, desexing, vaccinating stray cats and then returning them to where they live. As part of TNR programmes young kittens and friendly adults are often removed and placed for adoption if homes are available. TNR is a non-lethal option for stray cats that are otherwise usually killed because they are poorly socialised to people or there are not enough homes available to rehome them. TNR is a humane method for cat population management by many organisations (AVMA, 2017; BC SPCA, 2017; Levy et al., 2003a; RSPCA UK 2014).

Indicators used to assess the success of TNR programmes include:

- Decrease in cat colony size;
- Reduction in nuisance complaints relating to the cats; and
- Reduction in stray cat intakes into local animal shelters and animal control facilities.

Using these measures, there are variable reports of the success of TNR as a cat management tool (Jones & Downs, 2011; Kilgour et al., 2016; Levy et al., 2014; Slater 2015). Some studied cat colonies managed with TNR have declined in numbers (Levy et al., 2003a; Natoli et al., 2006), but other studies report an increase in cat numbers over time (Castillo, 2003; Gunther et al., 2011); an increase in population is particularly evident when there are high rates of immigration into the colony from strays or abandoned owned cats (McCarthy et al., 2013; Miller et al., 2014, Natoli et al., 2006). In many places, legislation is already in place to discourage abandonment, but enforcement is difficult to achieve (Robertson, 2007).

Population modelling suggests that 75-80% of adult breeding cats in a colony need to be desexed to result in a decrease in the cat population (Foley et al., 2005; McCarthy et al., 2013; Miller et al., 2014). However, the percentage of cats that need to be desexed to result in population reduction will depend on many factors including the mean lifespan of cats in the colony, migration rates, population density, urbanisation, climate, availability of resources, and other environmental factors (Boone, 2015; Kilgour et al., 2016; Miller et al., 2014; Schmidt et al., 2009).

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The majority of published studies on TNR are from the USA (Centonze et al., 2002; Levy et al., 2003a; Levy et al., 2004; Stoskopf et al., 2004; Weiss et al., 2013) and most are from overseas (Finkler et al., 2011a; Kilgour et al., 2016; Natoli et al., 2006; Tan et al., 2017).

An increasing body of evidence suggests that long-term TNR programmes can effectively reduce free-roaming cat populations, especially those programmes that include an adoption programme, monitoring, and desexing of new cats arriving into the colony (Hughes & Slater 2002; Kilgour et al., 2016; Levy et al., 2003a; Stoskopf & Nutter, 2004).

Table 4: Review of TNR studies

Study	Location	Methodology	Time	Effect
Actual population decreases				
Hughes & Slater, 2002	USA	TNR university campus, concurrent adoption for cats and kittens	2 years	Decrease in in number of cats and kitten intake and complaints to university pest services.
Levy et al., 2003a	USA	TNR on university campus, concurrent adoption programme	11 years	66% decrease in cat population; no kittens born after 4 th year; 47% of cats adopted. Some immigration of cats into the colony (strays and abandoned cats) occurred, but the new cats were desexed or adopted before they could reproduce.
Nutter, 2005; Stoskopf & Nutter, 2004	USA	TNR and control colonies with no desexing	2 years	All TNR colonies stabilised; mean population decline 36% in TNR colonies; 47% mean increase in control colonies. Seven year follow up found TNR colonies stabilised and were declining in size while non-TNR control colonies increased in size and had high turnover of cats. One TNR colonies became extinct after 31 months, and the other colonies reduced to five or less cats. Both TNR and control colonies had consistent low-level immigration.
Natoli et al., 2006	Italy	Long-term TNR; 86% of original cats desexed	6 years	Overall decrease from 1655 to 1293 cats; 55 colonies had decrease in colony size, 20 remained stable in size, 28 had increase in size. The overall number of cats/colonies decreased over the study period from a median of 12 (range 4-50) to a median of 10 (range 2-40). TNR colonies controlled over a longer period (three, four, five or six years) decreased in size (by 16, 29, 28, and 32% respectively) whereas those TNR colonies controlled for two years or less increased in size (13%). The mixed programme success was likely due to constant abandonment of cats into the colonies keeping the numbers high.

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Levy et al., 2014	USA	TNR, 54% of population desexed; concurrent adoption programme	2 years	Per capita shelter intake was 3.5-fold higher and euthanasia was 17.5-fold higher in the non-target area. Shelter cat intake from the target area decreased by 66% compared to a decrease of 12% in the non-target area. Only 0.5% of cats admitted to the TNR clinic in the study were euthanased due to health issues and only 0.3% cats died peri-operatively. Study also included a concurrent nuisance counselling programme for residents.
Johnson & Cicirelli, 2014	USA	TNR; 10,080 cats desexed	4 years	Number of cats and kittens impounded by city decreased by 29.1%, and euthanasia in the animal shelter decreased from 47% to 23%. Euthanasia of cats in the shelter due to upper respiratory disease decreased by 99% and the number of dead cats collected from the streets decreased by 20%.
Tan et al., 2017	Australia	Questionnaire on TNR activities	2.2 years	Cats in TNR programmes were fed once or twice daily and provided with some prophylactic health care. 69% of the cats in the colonies were desexed, and the median colony size decreased from 11.5 cats to 6.5 cats. In many Australian jurisdictions, TNR is illegal, which may have contributed to the small study sample (53 participants); results should be interpreted with caution.
Swarbrick & Rand, 2018	Australia	TNR university campus, adoption/rehoming	9 years	78% reduction of campus cat population where TNR activities took place; 30% rehomed or returned to owner, 30% dead or euthanased, 29% disappeared.
Kreisler et al., 2019	USA	TNR, adoption, euthanasia, vaccination, deworming	23 years	55% decrease in the free-roaming cat population; 80% decrease in number of visits to the colony veterinary clinic; increase in average age of active cat population from 16.6 months to 43.8 months; retrovirus prevalence decreased by .32% per year.
Zito et al., 2019	Manurewa, Auckland	TTNR pilot; 84% desexed and returned, 5% euthanased for health reasons, and 10% rehomed.	1 year	At local shelter near project site: 39% decrease in incoming adult strays; 17% decrease in incoming juvenile strays; 34% decrease in underage euthanasia; 7% decrease in unsocialised stray cats sterilised and returned; 47% decrease in unsocialised adult and juvenile stray cat euthanasia.

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Actual population increases				
Neville, 1989	UK	TNR	4 years	Population fluctuated between 19 and 17, but no declines. There is a lack of details on this study, therefore, results should be interpreted with caution.
Castillo & Clarke, 2003	Florida	TNR	1 year	Population increased for colonies due to immigration of new cats dumped at the highly visible colony sites.
Castillo & Clarke, 2003	Israel	TNR and control colonies compared for immigration, emigration, and kitten survival.	1 year	Number of adults increased in TNR colony due to higher immigration and lower emigration than control; kitten survival increased in TNR colony. Number of adults in control colony decreased. Immigrant cats entering the TNR cat colonies were not desexed during the study period which may have contributed to the increase in colony size.
Simulated population changes				
Foley et al., 2005	USA	Population modelling	10 years; 7 years	Inconsistent reduction in per capita growth, the population multiplier, or the proportion of female cats that were pregnant.
Nutter, 2005	N/A	Population modelling of TNR	12.8 years	Elimination of a cat population with annual neutering rate of 75-85% per.
Andersen et al., 2004	N/A	Population modelling of TNR		Effective control of cat population with 75% desexing of female cats.
Budke & Slater, 2009	N/A	Population modelling of non-surgical compared to surgical contraception.	3 year	Stabilisation of the cat population size would require surgical desexing of over 51% of both adult and juvenile female cats annually. Once the population stabilises, approximately 14% of the total female population would require desexing annually or having 71% of the total female population and 81% of adult female population sterilised at all times to maintain a stable population.

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Schmidt et al., 2009		Population modelling of TNR using different capture and immigration rates	25 years	With no immigration into the colony, the cat population size decreased 46%. Similar effect on population modelling occurred with lethal control programme.
McCarthy et al., 2013		Population modelling of lethal control, TNR, and 'trap-vasectomy-hysterectomy-return' (TVHR)		TVHR was superior to both lethal control and TNR in reducing cat population based on a decrease in feral cat populations at lower capture rates compared to lethal control or TNR. Cat days in the environment (one way of assessing possible cat impact on wildlife) were also predicted to decrease more rapidly with increased capture rates for TVHR).
Miller et al., 2014b		Population modelling of TNR compared to 'trap and kill'.		TNR can stabilise and reduce cat populations and be effective compared to the traditional 'trap and kill'. The model assumed that trapping efficiencies for 'trap and remove' and TNR were identical potentially understating the effectiveness of TNR.
Dias et al., 2017	Brazil	Population modelling of current sterilisation rate, 100% annual sterilisation of intact females, annual removal of cats to mainland, and latter two strategies combined; interviews with island residents on behaviours; estimations of free-roaming cat population size and density	50 years	Total population of cats on island was estimated at 1287; modelling the current sterilisation rate led to a 34.3% increase in population after 50 years; modelling the 100% sterilisation rate of intact females led to a 31.2% increase in population; modelling the removal of cats required an annual removal rate of 11.7% to stabilise the population; modelling the combined annual removal and 100% sterilisation of females required a removal rate of 9.2% to stabilise the population.

Health risks to cats and TNR

In addition to concerns about the efficacy of TNR, other concerns relate to the health and welfare of cats that are desexed and returned to colonies. Anthropogenic pressures on the health, behaviour, and lifespan of the cats concern many cat welfare advocates (Finkler et al., 2011b; Jessup, 2004; Levy et al., 2003; McManus et al., 2014). Some evidence indicates there are higher rates of kitten morbidity and mortality in high-density free-roaming cat populations have been found (Izawa & Ono 1986; Gunther & Terkel 2002; Gunther et al., 2011; Mirmovitch, 1995, Nutter et al., 2004). The two most common outcomes for colony cats are disappearance from the colony or death, most often due to motor vehicle trauma (Nutter, 2005).

Another concern about the welfare of colony cats is they are at high risk of infectious disease and may pass infectious diseases to the owned population of cats. Cat populations are likely to be contiguous groups where individuals may transition from one group to another (Kikillus et al., 2017). Companion cats that are allowed to roam may be at an increased risk of exposure to FIV through their interactions with stray and feral cats (Tran et al., 2019). Many studies indicate the baseline health status and infection rate of FIV (Feline Immunodeficiency Virus), FeLV (Feline Leukaemia Virus), *Cryptosporidium spp.*, *Giardia spp.*, and *Toxocara cati* of colony cats in many studies are similar to those of both feral and owned cats (Lee et al., 2002; Levy & Crawford 2004; Levy et al., 2006; Luria et al., 2004; Nutter, 2005;). However, there is evidence that stray cats are at greater risk of infectious disease including:

- A higher incidence of FIV in feral cats compared to companion cats (Norris et al., 2007; Nutter, 2004).
- A recent New Zealand study reported the seroprevalence for FIV was 14% among cats entering an animal shelter in Auckland, and the prevalence of FeLV antigen-positive cats was 1% (Gates et al., 2017).
- Older studies in New Zealand, reported a prevalence of FIV infection from 6.8% in healthy cats and 27% in sick cats, and the prevalence FeLV infection in cattery populations between 4.4 and 11% (Jones & Lee, 1981; Jones et al., 1995; Swinney et al., 1989).
- Feral cats had higher seroprevalence of *Bartonella henselae* and *Toxoplasma gondii* compared to owned cats in some studies, likely related to greater exposure of feral cats to the vectors or hosts of these organisms (Dubey, 1973; Nutter, 2005).
- One study of urban 'feral' cats in Brazil found fleas were present on 28% of the cats, and *Haemobartonella felis*, piroplasmas (*Cytauxzoon spp.* or *Babesia spp.*) and FIV infected 38%, 47% and 21% of the cats respectively. No cat was found to be infected by *Dirofilaria immitis* or FeLV (Mendes-de-Almeida et al., 2004).

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Infectious conditions of cats will vary in different countries and locations which affects the welfare of those cats; the local conditions require careful evaluation if a TNR programme is to be considered for cat management. The accumulation in the environment and effect of ectoparasites and other pathogens carried by cats and other species, must also be considered (Longcore et al., 2009); these include fleas, *Haemobartonella felis*, *Rickettsia* spp, *Coxiella* spp (Akucowich et al., 2002; Chomel et al., 1996; Shaw et al., 200), hookworms, roundworms (Anderson et al., 2003; Dubn'a et al., 2007; Uga et al., 1996) and *Toxoplasma gondii* (Dubey, 1973).

The capture, transportation, and surgery of cats associated with TNR has the potential to cause distress to cats and, additionally, some cats will be pregnant when desexed. However, it is possible to minimise distress during the TNR procedure and to safely desex pregnant females (Association of Shelter Veterinarians' Veterinary Task Force to Advance Spay-Neuter, 2016; Levy et al., 2002).

Gunther et al. (2015) raised concerns about the welfare of free-roaming cats living in highly developed and crowded cities in Israel based on the high number of public complaints related to cat injuries and distress. Higher incidences of welfare problems were associated with higher levels of breeding and numbers of kittens. The authors suggested that controlling the reproduction of the cats, thereby reducing the number of births (and associated parturition dangers) and number of kittens (as kittens tend to suffer high mortality), could have the potential to reduce the welfare concerns associated with free-roaming cats (Gunther et al., 2015). The location of the cat colony and its proximity to areas that are high risk environments for cats (such as busy roads) had the potential to affect the morbidity, mortality and quality of life of the cats in the colony. Therefore, in the interests of animal welfare, the location of the colony should be considered when assessing its suitability for a TNR programme.

A study in New Zealand found stray cats in managed cat colonies had good welfare, of a comparative level to owned cats, and unmanaged stray cats' quality of life scores were fair-to-good (Zito et al., 2019). In a number of studied TNR colonies, only a small proportion of the cats trapped needed to be euthanased due to debilitating conditions (Wallace & Levy, 2006). In addition, desexed free-roaming female cats have been found to have reduced cortisol levels and aggression compared to intact free-roaming female domestic cats (Finkler & Terkel, 2010). This suggests that the welfare of the individual cat is improved by desexing, likely due to reduced social and reproductive pressures; evidenced by lower aggression of the desexed females.

Other evidence has shown that desexed cats in colonies lived significantly longer than their non-desexed counterparts (Nutter, 2005), and the morbidity rate for cats in colonies significantly decreased with increased desexing rate (Gunther et al., 2016). Since the welfare of free-roaming cats

has been associated with the amount of care that is provided to them (Slater, 2007), the care provided to the cats in a cat colony likely affects animal welfare-related outcomes (Gunther et al., 2015).

Cost is another frequently cited concern about TNR programmes. These programmes require substantial investments of both time and money, but these costs diminish overtime as the proportion of desexed cats in the colony increases and fewer cats require desexing (usually only new immigrant arrivals; Hughes & Slater, 2002). Although no studies were found that compared the cost of TNR to lethal management programmes, both would require significant investment if properly implemented.

TNR programmes may be a useful cat management tool in urban areas where time and resources will allow the long-term reduction and eventual extinction of cat colonies (Stoskopf & Nutter 2004). The evidence in the literature suggests factors that contribute to the success of a TNR programme, in addition to high levels of desexing in the targeted area include:

1. Immigration of cats is prevented or minimised

Immigration into the colony should be prevented or reduced to control cat numbers. Cats that join the colony should be desexed or adopted before they can reproduce (Guttilla & Stapp, 2010; Paterson, 2014). Immigration can be minimised by implementing public education programmes aimed at improving responsible cat ownership and implementing TNR programmes where geographical boundaries prevent introduction of cats into the programme area.

2. The cat population is continually monitored

Cat numbers and arrival of new cats into colonies should be monitored so that new arrivals can be promptly adopted or desexed (Gunther et al., 2016).

3. Researchers are active participants

Dedicated teams who implement the TNR programme with strict attention to detail are important for TNR success. Successful TNR programmes have been implemented with participation of the research team (Hughes & Slater, 2002; Levy et al., 2003).

4. Cat adoption is an integral part of the programme

Adoption is an important part of successful TNR programmes (Levy et al., 2003; Stull, 2007). Combining adoption with TNR can offset immigration into colonies and help reach the removal threshold necessary for population decline (Andersen et al., 2004).

5. Carers/semi-owners are involved

Involving cat semi-owners/cat carers in a TNR plan can provide support and access to cat colonies, help to maintain positive public perceptions of a programme, and encourage community support and engagement (Ash & Adams 2003; Centonze & Levy 2002; Haspel & Calhoun, 1990; Kilgour et al., 2017; Zito et al., 2015c).

6. The cat colony is well-managed, and the programme is adequately resourced over the long-term

Successful cat colony management requires good communication and trust building with all stakeholders, and the engagement and involvement of all participants (Gunther et al., 2016; Kilgour et al., 2017). TNR programmes require long-term commitment and resourcing to achieve their aims (Kilgour et al., 2017; Levy et al., 2003). Colony selection for TNR should assess the risk to cat welfare and communities related to infectious disease and environments.

7. Stakeholders understand the programme and its aims

Successful TNR includes the public having access to information about the impacts of cats on wildlife and human health, the need for TNR, and how TNR works.

8. Programme outcomes are properly evaluated and reported

Assessment of a TNR programme should include accurate documentation of the targeted cat population prior to management efforts and throughout the study (Kilgour et al., 2017).

9. The programme does not conflict with wildlife management priorities

TNR programmes are unsuitable in locations adjacent to sensitive wildlife areas where wildlife protection is a priority (Guttilla & Stapp, 2010). Although TNR can lead to stabilisation and extinction of a cat colony over time, there is considerable variation in how long it may take due to multiple factors (Stoskopf & Nutter, 2004; see Table 4). Therefore, TNR is unsuitable when acute issues (e.g. significant cat impacts on threatened or endangered species) require rapid extinction of a cat colony (Stoskopf & Nutter, 2004), and there are other humane options.

TNR can improve cat health and reduce cat-related conflict with the local community by reducing cat nuisance behaviours (e.g. aggression) in desexed animals (Finkler & Terkel, 2010; Gunther et al., 2016; Kilgour et al., 2016). Maintaining a small number of desexed cats in a community can be beneficial for

controlling rodents (Kilgour et al., 2016), as rats and mice represent a high proportion of urban cat prey in some countries (Barratt, 1997; Tschanz et al., 2010).

If TNR is considered for managing stray cats, managed and targeted TNR (mtTNR) should be used. The mtTNR programme is designed to systematically and comprehensively desex the majority of stray cats in the targeted area. Public education and stakeholder involvement are actively solicited as a critical component of the programme. Specific conditions must be met for the use of mtTNR including:

- Best practice mtTNR guidelines are followed.
- Desexed cats are ear tipped and identified with a microchip and (where possible and practical) external identification.
- Cats are returned to a person or group who takes responsibility for their care.
- Cats are registered on a stray cat register.
- mtTNR is not used in sensitive wildlife area, or exclusion and buffer zones around such areas.

4.2.3. Education programmes and support for stray cat carers

Stray cat carers are key stakeholders in the cat overpopulation problem (Alberthsen, 2014; Toukhsati et al., 2007; Zito, 2015, Zito et al., 2015b). Feeding of stray cats by human carers or semi-owners is a significant factor influencing stray cat numbers entering animal shelters and, in the community (Zito, 2015). Therefore, semi-owner engagement in potential solutions is important for successful management of cat populations. Education campaigns designed to acknowledge and connect with the perceptions and emotions of cat semi-owners are likely more effective at redirecting this behaviour than eliminating it (Zito, 2015a). Cat semi-owners are likely more amenable to non-lethal than lethal cat management strategies, since they are attached to the cats they care for and feel protective of them (Centonze et al., 2002; Zasloff et al., 1998; Zito, 2015a, c). Consequently, efforts to curtail the contribution of semi-ownership to unwanted cat numbers should concentrate on encouraging and facilitating more responsible caretaking, in particular, desexing, regardless of whether the semi-owner accepts ownership for the cat (Finkler et al., 2011a, b; Toukhsati et al., 2007; 2012a).

Targeted desexing campaigns involve proactively encouraging and facilitating individual carers of stray cats to have the cats desexed. This differs from TNR in that specific individual cats are desexed that are not part of a colony but rather are cared for by specific people who consent to having the cat desexed and returned to them (a semi-owner).

Desexing initiatives for stray cats should be priced for anyone to access to these services to encourage stray cat carers to desex the cats in their care. These programmes can be (and are already on a limited

basis) run by animal shelters, animal welfare organisations, local government, and private veterinarians. The success of such programmes is likely increased by implementing education campaigns targeted at stray cat carers (or semi-owners), community engagement campaigns, and providing assistance for cats to be transferred to the veterinary surgery (e.g. volunteer support to pick up and drop off cats).

Acceptance of ownership is not necessary to achieve the goal of reducing the contribution of semi-owned cats to unwanted cat numbers and improving cat welfare. The goal is not to encourage cat semi-ownership but rather, where people are already feeding stray cats, provide support (particularly to desex their cats) in the interests of improving cat welfare, preventing the birth of unwanted cats, and reducing cat numbers over time, as long as certain conditions are met.

4.3. Managing companion (owned) cats

Responsible ownership of companion cats is an important component of managing the cat meta-population, ensuring cat welfare, and contributing to a harmonious relationship between animals, the community and the environment through reduced wildlife predation. An outcome of the National Cat Management Strategy Group is that all owned cats are responsibly owned, including desexed, microchipped, and contained at home.

4.3.1. Responsible cat ownership

Responsible cat ownership encompasses a range of pre-acquisition and maintenance factors as discussed in section 2.2 of this report. Companion cat owners sit along an ownership spectrum from casual to responsible with 'casual cat owners' engaging in fewer management practices than 'responsible owners' (Centonze et al., 2002; Marston, 2009; Toukhsati et al., 2007). Effective companion cat management should include strategies that promote and facilitate components of responsible cat ownership which positively impact upon the cat meta-population including:

- Reduction in surrender and abandonment of companion cats (previously discussed in section 2.2.1)
- Limits on number of cats owned (see section 5.2.1)
- Containment (also termed confinement)
- Identification (e.g. microchipping)

- Registration (where required)
- Desexing

4.3.2. Cat containment

Containment of companion cats is important for a number of reasons including preventing cats from roaming, preventing unwanted reproduction, preventing wildlife predation, minimising community nuisance, minimising disease transmission, and reducing the risk to the cat of being injured or killed from traffic, fighting, dogs or human cruelty (Lloyd et al., 2013; Toukhsati et al., 2012b). Keeping cats fully contained (inside the house +/- a fully contained outdoor enclosure) is common in the United States and increasing in Australia (e.g. Elliot et al., 2019 report 46.5% of owners engage 24 hr containment), yet in New Zealand only 7.8% of cats are estimated to be confined indoors (Gates et al., 2019). Community acceptance for cat containment varies; some studies show broad support (Elliot et al., 2019; Lloyd & Hernandez, 2012; Sherwood et al., 2019; Toukhsati et al., 2012b) and others a lack of support, or even opposition (Sharp et al., 2012; Travaglia & Miller, 2018). New Zealand studies report 41% - 48% of interviewees support confinement to the owner's property at certain times; night-time confinement being the most supported, and non-cat owners show higher support than owners (Gates et al., 2019; Linklater et al., 2019; Woolley and Hartley, 2019; Walker et al., 2017). Containment techniques likely to result in higher effectiveness for conservation (e.g., 24-hr cat confinement) are less likely to be adopted by cat owners and are not often supported by veterinarians (Linklater et al 2019).

Targeted information that can increase the understanding of risk associated with cats being outside, may prove more useful in the adoption of cat containment to mitigate risk (Gramza et al., 2016; McLeod et al., 2017). In a recent New Zealand study, suburban owned cats fitted with individual cameras were found to engage in a high frequency of potentially life threatening behaviours including road crossings, encounters with other cats, consumption of potentially toxic substances, and exploration of storm drain systems and house roofs (Bruce et al., 2019). Similar risk behaviours have been documented for owned cats in the United States (Lloyd et al. 2013). Cats are observed to have larger home ranges at night than during the day (Metsers et al., 2010) and therefore may be more at risk if allowed to roam at night. GPS tracking of cats reveals they often travel much greater distances than owners are aware, and owners place increased importance on day-time confinement after learning the extent of travel (Roetman et al., 2018).

Restricting roaming behaviour through containment will also serve the dual purpose of protecting wildlife, however campaigns designed to encourage containment will be more successful if they concentrate on the welfare benefits to cats, or a combination of welfare benefits for cats and wildlife, rather than solely concentrating on the benefits in terms of wildlife protection (Wooley and Hartley, 2019; Hall et al., 2016; Toukhsati et al., 2012b; McLeod et al., 2015a; McLeod et al., 2017). Cat containment (indoors or to the owner's property), when proposed as a solution to the issue of cat predation on wildlife, received low support (25%) from New Zealand cat owners (Wooley and Hartley, 2019) reinforcing the need to concentrate on how containment benefits individual cat welfare. Messaging framed through a 'cat benefit' lens elicited changes in Australian cat owner's containment intentions and adoption of behaviour (McLeod et al., 2017).

Cats hunt mostly during the day (Metsers et al., 2010) and may kill wildlife and mate within the confines of their owner's property, consequently the effects of containment will be limited unless cats are required to be contained indoors or within an enclosure/on a leash when outside 24 hours/day. Furthermore, compliance with regulations relating to the confinement of cats at night is largely unknown although it has been reported to vary between 32–80% in Australia (Toukhsati et al., 2012) making assessment of its effectiveness difficult.

Cat containment may result in negative health and welfare issues for cats, e.g. obesity, stress and stress-related health and behavioural issues (Herron & Buffington, 2010; Zoran & Buffington, 2011). Cat owners should provide their contained cats with an appropriate enriched environment and diet to mitigate potential problems and ensure their cats well-being (Ellis, 2009; Herron & Buffington, 2010). Owners also perceive a number of barriers to containment including: confidence that they can effectively contain their cat; relevant knowledge and skills to keep their cat contained; belief that containment will diminish their cat's quality of life; belief the cats' physical and psychological needs cannot be met in a contained space; belief that it is unethical to keep a cat contained; and perceived financial capacity to implement containment, i.e. for outdoor containment strategies (Crowley et al., 2019; Wooley and Hartley 2019; et al., 2015; McLeod et al., 2017). To overcome these barriers and ensure well-being in areas where cat containment regulations are proposed, cat owners should be aware of how to provide a suitable and enriched environment for their cats and the benefits of this for cat welfare (McLeod et al., 2017; Lloyd & Hernandez, 2012; Toukhsati et al., 2012b). Transitioning cats from an outdoor lifestyle to an indoor lifestyle can be challenging, whereas anecdotally cats that are habituated to an indoor or contained lifestyle from an early age seem to cope better. More evidence to help determine how best to help cats and cat owners transition to and manage containment and ensure good cat welfare would be of great benefit.

Where owners are unable to confine their cats, promotion of effective methods to reduce predation is of benefit. Bells on collars are relatively ineffective in preventing overall predation (Calver et al., 2011; Crowley et al., 2019). However, a specially designed 'cat bib' does reduce predation, and cats tolerate this device well (Calver et al., 2007). A colourful, cat-specific anti-predation collar cover worn around the neck on a break-away collar (Birds Be Safe), has also been demonstrated to reduce predation (Hall et al., 2015).

There are a few areas in Australia where full or partial containment of cats is required. In these areas, cats are often required to be on a leash or within an enclosure. For example, in the Australian Capital Territory (ACT) a 24-hour containment regulation is in place across sixteen suburbs (Domestic Animals Act, Section 81). Anecdotally, no cat attacks on wildlife have been reported to the RSPCA ACT since the enactment of this regulation (RSPCA, 2018). Rates of compliance with containment regulations in Australia is not known.

Additionally, the requirement to contain cats within the confines of their owner's property may not prevent cats from killing wildlife on the property and presents a limitation to the effectiveness of cat containment. Other issues that are associated with cat containment regulations include:

- potential negative impacts of containment on cat health and behaviour
- inadvertent trapping of owned cats that are not contained (or have escaped)
- possible increased owned cat surrender or abandonment due to the imposition of an added responsibility of cat ownership

4.3.3. Identification

Identification is a fundamental tool of animal management at a community level. Mandatory identification generally refers to a requirement to have cats microchipped from a specific age, or if the cat is being transferred from one owner to another. A microchip is a small glass or surgical acrylic cylinder, about the size of a grain of rice, with an electronic chip contained inside. This chip carries a 15-digit number. Microchips are designed to generate electricity in the antenna by electromagnetic induction using a low-radio-frequency-signal provided by the microchip scanner (Saito et al., 2010; Lord et al., 2010). This is known as Radio Frequency Identification (RFID) and when the microchip is activated by the scanner it transmits the unique, pre-programmed, 15-digit identification number. Microchipping is the preferred method of identification because the chip cannot be removed, dislodged or lost without surgical intervention (Goodwin et al., 2018).

The benefits of effective identification (microchipping) include:

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- If a cat is lost, the owner can be identified and contacted so the cat can be reclaimed.
- If an owned cat is found injured, the owner can be identified so that prompt and appropriate decisions can be made about the cat's medical treatment.
- If a cat is roaming and causing a nuisance, the owner can be identified and educated about their responsibilities, warned or penalised (subject to the local legislation and policies).
- If a cat does not have a microchip, the cat may be assumed to be an unmanaged stray. This means that appropriate decisions can be made according to the relevant legislation if the cat is injured or displaced.
- Microchipping also allows for tracing and identification of cats in the event of a natural disaster or disease outbreak.

Microchipping is a well-supported management tool for cats in New Zealand, with almost 80% of the general public in favour of a national requirement for mandatory microchipping (in addition to restriction of cat numbers and mandatory desexing; Walker et al., 2017), and 31.2% of cats are reported by their owners to already be microchipped (Gates, 2019). Microchipping is commonly used as a tool to distinguish owned or managed stray cats from feral cats in pest management plans at a local and regional level across New Zealand (see appendix 2: Table 10: NZ Regional Pest Management Plans – Summary for Cats).

Microchipping is documented to increase the success of cats being reunited with their owners. In a US study, 39% of microchipped cats were reported to be returned to their owners, compared to only 2% that were not microchipped (Lord et al., 2009). Similar findings have been reported in Australian studies where return-to-owner rates were 51% for microchipped cats compared to only 5% for non-microchipped cats (Lancaster et al., 2015). During the 2011 Christchurch earthquake, 85% of owners of microchipped animals were able to be contacted within 3 hours by the New Zealand Companion Animal Register (NZCAR), compared to only 25% of non-microchipped animals were reunited with their owners within a 7-day period (NZCAR, 2019).

Some stakeholders have concerns about the potential for microchips to fail and the resultant inability to identify microchipped cats. Although this is a valid concern, the failure rate of microchips is very low. Of all the microchips registered on the New Zealand Companion Animal Register (NZCAR), the recorded failure rate is 0.1%. In addition, this is most likely an overestimate; when microchips are reported/recorded as failed NZCAR is unable to distinguish between implanter error, true microchip failure, and microchip reader error. In many cases, microchip failure is listed as the cause, but implant error is the reason for failure (NZCAR, 2019). Implant error, particularly by untrained implanters, can

significantly impact on the failure rate. NZCAR does not allow registration of microchips from implanters without some form of implant qualification (NZCAR, 2019). Other reasons a microchip may appear to fail include migration of the chip within the animal, low battery level in scanners, low quality scanners, scanning too quickly and even, metal near the scanner (Lord et al., 2008).

The most common complication reported is the migration of the microchip. Research suggests that migration occurs in less than 0.6% of cases (Lord et al., 2010). Migration should not affect the scanner ability to read the microchip if a robust scanning technique is used.

The risk of tumour growth associated with the presence of the microchip under the animal's skin is also a concern with microchipping. There is no good evidence to suggest that cats implanted with a microchip are at a higher risk for developing a tumour; if microchips do cause the formation of tumours, the risk appears to be extremely low. Millions of animals have been microchipped around the world since the early 1990's yet to date there are only two case reports of cats (Daly et al., 2008; Carminato et al., 2011) and two case reports of dogs (Vascellari et al., 2004; Vascellari et al., 2006) developing tumours at, or adjacent to, the site of a microchip in the published literature. In the two cases of tumour development associated with microchips reported in cats, the microchip was adjacent to, not embedded in, the tumour (Daly et al., 2008; Carminato et al., 2011). In one of the reported cases, the cat had also received numerous vaccines in the same area on its body (Daly et al., 2008). Since tumour formation can be associated with a wide range of injectable agents, including vaccines (Srivastav et al., 2012; Day et al., 2015), it was not possible to determine the origin (Vaccine-Associated Feline Sarcoma Task Force, 2005). There has been one reported case of tumour development around a microchip in a dog (Vascellari et al., 2004). Another case was reported where the microchip was attached to, but not embedded in, the tumour and rabies vaccines had also been given in a similar area (Vascellari et al., 2006). Therefore, the tumour could not be directly linked to the microchip itself (Vascellari et al., 2006; AVMA, 2013). In the UK, the Microchip Advisory Group (MAG) monitors adverse events associated with microchipping. The British Small Animal Veterinary Association (BSAVA) released a report from the MAG in 2004 that showed that in the 13 years since establishment of the monitoring programme, only two tumours were reported despite microchip implantation in more than 3.7 million pets in the United Kingdom (AVMA, 2013).

In some cases, soft tissue tumours surrounding a microchip have been described in laboratory mice and rats (Blanchard et al., 1999; Elcock et al., 2001; Tillmann et al., 1997). However, mice and rats are more susceptible than other species to developing foreign body-induced tumours (AVMA 2013; Haifley & Hecht 2012). Therefore, it is not appropriate to extrapolate the findings associated with foreign body-induced tumours in mice to risk in other species (AVMA 2013; Haifley & Hecht 2012). It

is possible for neoplasia to be induced by any foreign substance inserted into the body for long periods (AVMA, 2013; Brand et al., 1976; Elcock et al., 2001; Vascellari et al., 2006;). The WSAVA Microchip Committee has concluded that the benefits of microchip implantation far outweigh the potential health risks, as development of tumours at microchip implantation sites appear to be a rare event (WSAVA, 2002).

Other complications associated with microchipping are extremely rare, but do exist, and include the inappropriate placement of a microchip into the spinal canal. Five case studies of this occurring are documented in the scientific literature, of which one describes the inappropriate and forceful implantation of the microchip into the spinal canal of a 2-year old cat (Platt et al., 2017).

Solely relying on microchipping as the only form of identification may limit the capacity to locate owners efficiently; microchips are not visible, require access to a microchip reader and rely on the information linked with the microchip being accurate. It is common for microchipped cats that are lost and entering shelters to have data associated with their microchip that is inaccurate; this makes reuniting cats with their owners difficult (Alberthsen 2014; Alberthsen et al., 2013a). An Australian study showed that 37% of stray but microchipped cats entering RSPCA QLD had inaccurate data associated with their microchip (Lancaster et al., 2015). Nearly half of the cats were registered to a previous owner and nearly one third had either incorrect or disconnected contact phone details associated with their microchip. As such, the addition of a collar and tag for companion or managed stray cats is of great benefit as they give a visual indication of a cat's ownership/management status and successfully help to reunite lost cats with their owners/carers prior to, or following, shelter admission (Alberthsen et al., 2013b; Lord et al., 2007; Lord et al., 2010). Collar use however does not appear to be a popular management technique with studies reporting collars to be worn by only approximately 1/3 of all owned cats in New Zealand (n=27.1%, Gates et al., 2019; 35.9%, Harrod et al., 2016). Reasons for not using collars are reported to include cat intolerance of collars, repeated collar loss and concern over collar safety (Harrod et al., 2016).

Mandatory identification

The introduction of mandatory cat identification (microchipping) has been associated with an increase in the reclaim rates of cats in the US (in combination with registration, and annual licensing (Lord et al., 2007; Lord et al., 2010) and in Australian Capital Territory (ACT) (Source: RSPCA ACT). Examples of countries with mandatory identification and supporting legislation include Australia, Canada and the United States of America. Where mandatory identification has been introduced, there is some variability in the age at which cats are required to be microchipped and whether a previously un-

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microchipped adult cat is required to be microchipped (see appendix 2). In addition, some localities also require external identification (usually a council registration tag if cats must also be registered in that locality). In New Zealand, bylaws mandating microchipping of cats exist in Wellington City, where all cats over the age of 12 weeks are required to be microchipped and registered on the NZCAR (Wellington Consolidated Bylaw 2008 Part 2: Animals, s4.1), and in Palmerston North, where all cats over 6 months of age and born after 1st of July 2018 are required to be microchipped and registered on the NZCAR (Palmerston North Animals and Bees Bylaw 2018; s8.7).

Potential issues that need consideration before the introduction of mandatory identification include:

- The (usually unintended) effect of an increase in impoundment and euthanasia of stray cats and cats who have owners who do not want to comply with the law.
- The tendency for these laws to be worded in a way which makes it illegal for someone to care for a stray cat without taking full ownership (for example, by registering and microchipping the cat). This discourages people from caring for stray cats and, if the person knows that the cat is likely to be killed if taken to a shelter, they may opt to do nothing (Zito, 2015).

4.3.4. Registration

Registration establishes ownership of a cat and allows the local government to monitor and enforce other animal specific laws such as limits on cat numbers, breeding regulation, mandatory identification, and desexing.

Mandatory registration of cats is uncommon worldwide but is required in some parts of Australia, Canada, and the USA. It is more common in places with laws to try and control rabies, as registration (licensing) is often driven by rabies control laws in these areas (see appendix 3: International examples of existing cat control specific legislation).

Recent research shows between 61%-76 % of New Zealanders consider registration to be important for owned cats, although cat owners are generally less supportive than non-owners (Gates et al., 2019; Walker et al, 2017). The benefits of mandatory registration may not be clear if it is implemented in addition to mandatory identification (e.g. microchipping). On the other hand, income from cat registrations could be allocated to support community initiatives such as desexing, microchipping or cat containment. Uptake of these initiatives could then provide useful measures to assess the impact of registration.

4.3.5. Mandatory desexing

Mandatory desexing reduces cat overpopulation and is a key aspect of responsible ownership of cats which has positive long-term health and behavioural benefits. New Zealand public support for the implementation of mandatory desexing is reported to be greater than 64% (Gates et al., 2019).

In July 2018, mandatory desexing was implemented for the first time in New Zealand by the Palmerston North City Council, and applies to all cats over six months of age, born after the 1st of July 2018: exemptions are in place for registered breeders (Palmerston North Animals and Bees Bylaw 2018; s8.7). Up until this time, reports of the implementation of legislated mandatory desexing have come predominantly from the USA and Australia where requirements differ in the various localities. Some localities in the USA require that rehoming agencies (e.g. pound, animal shelter) desex cats and kittens prior to placement in a new home. This may be in addition to mandatory desexing for owned cats or a stand-alone requirement (see appendix 3: International examples of existing cat control specific legislation).

Mandatory desexing requirements in place outside of New Zealand appear to only be monitored occasionally. Most commonly this seems to involve comparing data pre- and post- mandatory desexing introduction in the following areas:

- Shelter/pound cat admissions
- Shelter/pound cat euthanasia
- Cat adoptions
- Cat registrations (where this is mandatory)
- Cats returned to their owners from shelters (as mandatory desexing requirements are commonly introduced in combination with mandatory identification and/or registration requirements)
- Animal management costs

In Australia, some data were collected in 2007 to assess the impact of mandatory desexing when it was introduced in 2001 in the Australian Capital Territory (ACT). There is only one shelter for cats (RSPCA ACT) in the ACT and a handful of rescue organisations that deal with relatively small numbers of animals (Australian Veterinary Association Centre for Companion Animals in the Community, 2007). Overall, no positive impact associated with the introduction of the legislation was demonstrated. Trends in cat intake and euthanasia in the RSPCA ACT shelter paralleled those in New South Wales (NSW) (which has no mandatory desexing legislation) and Australia as a whole.

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Legislative mandatory desexing will be of benefit in areas where a high number of cats entering animal shelters/pounds are unwanted kittens from owned cats or owned adult cats surrendered as a result of unwanted breeding. Responsible cat owners, who can afford desexing, already do so (although some do so only after the cat has had one litter of kittens). One of the main contributing factors to the continued high cat intakes into shelters is likely to be the failure to increase the desexing rate of cats living in low-income households (Marsh, 2010) and stray cats that have a carer (Toukhsati et al., 2007; Zito, 2015). In New Zealand, 93.2% of cats are reported by their owners to be desexed, with the most common reason for not desexing being cost and general feeling it isn't necessary (Gates et al., 2019). In the US and Australia, 90% of desexed cats live in higher income households (Marsh, 2010; Toukhsati et al., 2007). Cat surrender has been associated with a lower socio-economic status (Zito, 2016a) and several studies have identified lower desexing rates among owner-surrendered cats (Alberthsen, 2014; Alberthsen et al., 2013b; Marston et al., 2009; Alberthsen et al., 2013b). These findings suggest there is a need to develop more innovative strategies for targeted promotion of desexing and provision of avenues for accessing affordable care (Gates et al., 2019).

Accessible desexing schemes

There are anecdotally reported success stories for free/low cost/subsidised desexing programmes. Examples include:

- Snip 'n' Chip, free desexing and microchipping scheme (SPCA New Zealand, 2019)
- National Desexing Network, Australia (Animal Welfare League of Queensland 2017)
- Operation Wanted, Royal Society for the Prevention of Cruelty to Animals Queensland (RSPCA QLD), Australia (Royal Society for the Prevention of Cruelty to Animals Queensland 2017)
- The Gold Coast City Council subsidised desexing scheme as part of the Australian Getting to Zero (G2Z) initiative (Animal Welfare League of Queensland 2017)
- New Hampshire's Animal Population Control Program, USA (Target Zero 2016)
- First Coast No More Homeless Pets in Jacksonville, Florida, USA (Target Zero 2016)

Characteristics common to successful desexing initiatives are:

- Programmes help caretakers with a genuine need. Several criteria are used to decide who can access these desexing programmes including income targeting, geographic targeting, and programmes for senior citizens.

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- Programmes are affordable for poverty-stricken caretakers and caretakers with poverty-level incomes.
- Programmes are accessible to caretakers, including consideration of transportation of cats to the surgery location. Options to address this include providing services through a network of private veterinary clinics, a mobile surgical unit, or transport of cats to a fixed-site clinic. Ancillary services such as transportation for cats to and from surgery appointments are crucial in assisting low-income cat owners (Target Zero, 2016).
- Programmes have enough funding to desex large numbers of animals from indigent households every year for several years. It has been reported that desexing five pets from indigent households every year for every 1,000 residents will significantly reduce local animal shelter intake and euthanasia rates. However, if the programme cannot sustain that volume over the long term the progress it has made can quickly be reversed (Marsh, 2012).
- Time-limited desexing programmes that are available to all cat owners, broad scale high profile promotion and incentives are likely to increase uptake (pers comm Mandy Paterson, RSPCA QLD, 2016).

Pre-pubertal desexing

The 'traditional' age of desexing cats is six months of age. Unfortunately, this allows cats to reach reproductive maturity before they are desexed (Clark et al., 2012; Joyce et al., 2011; Zanowski, 2012); cats may reach reproductive maturity as early as three and a half months of age (Farnworth et al., 2013a; Little, 2001). Delayed desexing of owned cats is reported to result in the production of unwanted litters of kittens (Alberthsen et al., 2013b). Despite the high rate of desexed companion cats in New Zealand, the age at which these cats are desexed and if they had a litter of kittens before desexing is unknown and may impact upon meta-population numbers. Eight percent of owners of un-desexed cats in New Zealand consider it important for the cat to have one or more litters (Gates et al., 2019). In Australia, between 12-20% of cats have a litter before they undergo the desexing procedure (Jupe et al., 2017) with less than 50% of cats under two years of age desexed compared to more than 93% aged over two years desexed (Johnson & Calver, 2014). It is likely the situation is similar in New Zealand. Cats are prolific breeders and many owners are unaware that their cat may reach puberty by four months of age, which is well before the traditional desexing age of six months (Jupe et al., 2017). A high number of well socialised kittens from owned litters are surrendered to shelters (Animal Welfare League of Queensland, 2010; Marston et al., 2009; New et al., 2000) and although many may be from stray cats with carers, a proportion are likely to be from owned companion cats producing

kittens before they are desexed (Marston et al., 2009). This can be addressed through the introduction of pre-pubertal desexing (sometimes termed 'early-age desexing' because it is performed earlier than the traditional six months of age) (Alberthsen et al., 2013b; Fournier, 2004; Johnson & Calver, 2014; Manning & Rowan, 1992). Pre-pubertal desexing is routine procedure for animal shelters; commonly kittens are desexed between six and eight weeks of age and when they are over one kilogram in body weight (Kustritz, 2007; Looney et al., 2008). For companion cats pre-pubertal desexing is normally carried out between three and five months of age (Leung et al., 2016). The AVMA endorses the recommendation of the Veterinary Task Force on Feline Sterilization Recommendations for Age of Spay and Neuter Surgery (2016) that companion cats not intended for breeding are desexed by 5 months of age. Multiple benefits from pre-pubertal desexing have been demonstrated for the individual cat, including faster surgical procedure with less trauma and stress for the individual animal, less associated complications and reduced recovery times (NZVAb, 2018; Howe, 1997), and benefits in terms of cat population management (Farnworth et al., 2013a; Joyce et al., 2011; Porters et al., 2014; Spain et al., 2004; Yates et al., 2013). Other benefits include decreased risk for mammary carcinoma, elimination of reproductive emergencies such as pyometra and dystocia, and potential decrease in behavioural problems linked with cat relinquishment (Veterinary Task Force on Feline Sterilization Recommendations for Age of Spay and Neuter Surgery, 2016).

Pre-pubertal desexing of cats is supported by national and international veterinary associations including; the New Zealand Veterinary Association (NZVA), American Veterinary Medical Association (AVMA), Australian Veterinary Association (AVA), and the British Veterinary Association (BVA) with the optimal age for owned companion cats considered to be four-five months in Australia and New Zealand (Jupe et al., 2017). However, this procedure is not yet universally accepted among New Zealand veterinarians working within the community where there are divided opinions on pre-pubertal desexing (Farnworth et al., 2013a; Yates et al., 2013) and concern about risk and long-term health complications (Jupe et al., 2017). Additionally, veterinary students in Australia and New Zealand are not commonly graduating with the knowledge and skills to perform pre-pubertal desexing (Jupe et al., 2017). The scientific literature supports that pre-pubertal desexing is a safe procedure which can be performed from 6 weeks of age (Howe, 2015), with no difference in health and behaviour outcomes for cats desexed under 12 weeks of age comparative to over 12 weeks of age (Howe et al., 2000; Spain et al., 2004), Veterinarians are an important link in communicating with cat owners and ensuring that owned kittens are desexed before reproductive maturity (Fournier, 2004; New et al., 2000; Stavisky, 2014; Welsh et al., 2014). Encouragement of veterinarians to accept this procedure and training to ensure that they are comfortable delivering this service is very important (Farnworth et al., 2013a;

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Yates et al., 2013). International reports suggest that the performance of pre-pubertal desexing is increasing, for example, 70% of veterinarians in British Columbia are reported to perform pre-pubertal desexing (Sherwood et al., 2019).

Table 5: Implications of Cat Management Strategies

Strategy	Implications for policy
Adoptions	Data on the adoption of unowned cats is inaccurate, as these data will include some semi-owned cats. Shelter and pound statistics on stray cats should be categorised into socialised, unsocialised, managed and unmanaged cat population categories to assist pathway planning for individual cats, understanding the cat populations contributing to shelter intakes, and devising effective strategies to reduce intake.
Cat Sanctuaries	Cat sanctuaries are neither a viable nor humane cat management tool, although they may be of limited use in some situations. Cat sanctuaries do not effectively address cat overpopulation and the money spent to house a few hundred cats could be used for programmes that are more effective.
Trapping	<p>Lethal control methods may eliminate cat populations with consistent and long-term high removal rates; however, this is unrealistic in urban areas due to community opposition; potential for owned cats to be mistakenly caught and killed; and lack of enough and sustained resources. Current indiscriminate trapping and killing of stray cats in urban areas is unlikely to result in long-term improvement for issues of concern, such as wildlife predation, spread of disease, public health, or cat welfare.</p> <p>Lethal control of feral cats is the only strategy included in this report for feral cats. Due to the nature of feral cats not being socialised, and the likelihood of their proximity to sensitive ecological areas, other options of management are neither humane nor appropriate.</p>
TNR	<p>TNR can effectively reduce cat numbers and nuisance and lead to the eventual extinction of cat colonies. When managed appropriately, cats in managed TNR colonies can have reasonable welfare. Substantial investments of both time and money are required for effective TNR programmes, although these costs diminish over time. TNR is not suitable in sensitive wildlife areas.</p> <p>Domestic and international evidence suggests the public would support TNR as an alternative to widespread lethal cat management in urban areas. Conservationists are concerned about the impacts of cats on wildlife, and although these concerns may be somewhat mitigated by improving the effectiveness of TNR programmes and specifying conditions on its use, they will likely persist.</p>
Education and support for cat carers	Education programmes targeting stray cat carers (semi-owners) are an important component of stray cat management and represent a change in the way that the community, animal welfare groups, and policy/law makers approach stray cat carers. It is prudent to accept that people will continue to feed stray cats despite attempts to stop this behaviour; efforts to engage stray cat carers in solutions to manage stray cat numbers and improve cat welfare, should allow people to continue to care for the cats. Targeted desexing programmes

	<p>for managed stray cats (semi-owned cats) will be valuable for reducing the number of unwanted kittens, reducing the number of stray cats (and likely reducing the impact of cats on wildlife), and improving the welfare of stray cats.</p>
Responsible cat ownership	<p>Responsible ownership of companion cats and managed stray cats is an important component of managing the cat meta-population.</p> <p>Reducing cat surrender through initiatives, which address situations that lead to surrender, are of great benefit and should be continued.</p> <p>The inclusion of an abandonment offence under new cat management legislation could improve the ability for cases of abandonment to be investigated and enforced by officers warranted under this legislation.</p>
Cat Containment	<p>Regulations that mandate 24-hour containment of cats are more likely to achieve the assumed goals of reducing wildlife predation, breeding of unwanted cats, reducing risk to cat welfare, and the occurrence of cat nuisance behaviour, than limited containment regulations.</p> <p>Cat owners and carers should be educated about the benefits containment brings for cat welfare, rather than the benefit to wildlife or community, to encourage compliance. Where containment is not mandated education about effective anti-predation measures should occur to mitigate the risk, cats pose to wildlife.</p> <p>After a containment regulation is introduced an increase in admissions, adoptions and euthanasia at shelters may be observed if wandering cats are trapped in breach of the containment regulations, or if containment laws deter people from owning cats. As such, containment regulations should be preceded by owner and carer education and facilitation of behaviour change towards appropriate cat containment solutions to help safeguard cat health and welfare and prevent surrender.</p>
Identification	<p>Mandatory identification (microchipping) is a useful management tool for cats because it facilitates timely and well-informed decision making about a cat's ownership/management status and the consequent prompt and appropriate action that should take place for each individual cat.</p> <p>Consideration should be given to the additional mandatory requirement for cats to display a collar and tag. To safeguard cat welfare, quick-release collars should be used. Ear-tipping should also be used as a distance visualisation method in stray cats.</p> <p>The impact of mandatory identification laws could be measured by monitoring the percentages of cats reunited with their owners or carers after being lost and comparing this to reclaim rates pre- and post- the introduction.</p>

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<p>Registration</p>	<p>Mandatory registration may be a useful tool to support other management practices such as limiting numbers per household, mandatory identification and desexing, and regulating breeding. Its implementation and administration could be expensive, and the cost of enforcement and monitoring may be prohibitive. However, resulting funds could be allocated to support low-cost desexing initiatives where needed.</p>
<p>Mandatory desexing</p>	<p>The implementation of mandatory desexing is likely to have a positive impact on cat management in terms of reducing cat overpopulation and in turn should result in a decrease in cat predation on wildlife and a decrease in animal shelter/control cat intake and euthanasia.</p> <p>Mandatory desexing will be most effective if cats are desexed before the onset of sexual maturity, measures are put into place to ensure desexing of cats is priced to be accessible, mandatory identification is also introduced, and legislation is adequately enforced.</p> <p>Formal assessment of the impact of national mandatory desexing should occur and would be a beneficial addition to the literature in the field of cat management.</p>
<p>Increasing public understanding of the importance of responsible cat ownership and facilitating behaviour change</p>	<p>Regulation is an important tool as it clearly defines what is acceptable regarding legal requirements. However, legislation alone is not an effective instrument for addressing cat population, nuisance and predatory issues. Education and community support programmes should be component of any strategy to manage cats.</p> <p>Given that domestic and feral cat issues are universal across New Zealand, a national cat management plan is needed to achieve greater consistency and collaboration with problem definition, solution development, resource sharing and impact evaluation to encompass all cat meta-populations.</p>

5. Humane and effective framework for cat management in New Zealand

A strategic goal of the National Cat Management Strategy Group is to support humane and effective cat management through an appropriate legislative, regulatory, and educative framework.

5.1. Current framework

A strategic outcome of the National Cat Management Strategy Group is for responsible agencies are identified to implement legislative and regulatory requirements. The Animal Welfare Act 1999 (the Act) is the main piece of legislation relating to the welfare of animals in New Zealand. It establishes the fundamental obligations relating to the care of animals. These duty of care obligations are written in general terms with more details found in the Codes of Welfare. Under the Act, owners and persons in charge of animals are required to meet the physical, health, and behavioural needs of the animals in their care in accordance with good practice and scientific knowledge.

However, the Act does not expand on these obligations; for example, it does not detail what constitutes an appropriate amount of food or water for a species (to include this information in the Act would make it a very lengthy and unwieldy document). Therefore, codes of welfare are produced to expand on the basic obligations of the Act by setting minimum standards and recommending best practice for the care and management of animals. Codes of Welfare also reference regulations issued under the Act. Regulations impose enforceable requirements on owners and persons in charge of animals. Codes of Welfare are produced for either a species, or function, (e.g. animals used in entertainment). The relevant code of welfare for cats is the Animal Welfare (Companion Cats) Code of Welfare 2018.

The current key legislation relating to cats and cat management in New Zealand are listed with links to the full documents in Table 6. In addition, the pertinent sections of each piece of legislation relevant to cat management are in appendix 1. The New Zealand Council Bylaws pertaining to cats are summarised in appendix 2, and examples of cat control legislation from other countries are provided in appendix 3.

Table 6: Key legislation relating to cats and cat management in New Zealand

The Animal Welfare Act 1999	www.legislation.govt.nz/act/public/1999/0142/latest/DLM49664.html
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Animal Welfare (Companion Cats) Code of Welfare 2018	www.mpi.govt.nz/protection-and-response/animal-welfare/codes-of-welfare/
Resource Management Act 1991	www.legislation.govt.nz/act/public/1991/0069/latest/DLM230265.html
Biosecurity Act 1993	www.legislation.govt.nz/act/public/1993/0095/latest/DLM314623.html
Conservation Act 1987	www.legislation.govt.nz/act/public/1987/0065/latest/DLM103610.html
Wildlife Act 1953	www.legislation.govt.nz/act/public/1953/0031/latest/DLM276814.html
National Parks Act 1980	www.legislation.govt.nz/act/public/1980/0066/latest/DLM36963.html
Local Government Act 2002	www.legislation.govt.nz/act/public/2002/0084/latest/DLM170873.html

5.2. Improving the legislative and regulatory approach

5.2.1. National Cat Act

A strategic outcome of the National Cat Management Strategy is implementation of a National Cat Management Act.

This will allow for mandated, comprehensive, and consistent implementation of nationwide humane management of all cat populations in New Zealand. An appropriate national legislative framework should include:

- Measures to protect the welfare of cats (particularly where lethal management methods are used);
- Measures to mandate responsible cat ownership and caretaking.

5.2.2. Bylaw Alignment with National Legislation

Limits on the number of cats

Limiting the number of cats that can be kept by an individual owner is an attempt to reconcile the conflicting interests of pet owners with property owners and cat nuisance issues. It is also sometimes discussed as a measure to manage overall cat numbers. Restricting cat numbers is likely to benefit cat welfare (as multi-cat households can be highly stressful environments for many cats), if cats are still able to benefit from living with compatible conspecifics.

New Zealanders show a high level (70%) of support for limits to be placed on the number of cats owned per household (Walker et al., 2017) and a number of local councils already impose a standard maximum limit of two to five cats per household (see section 3.1.2).

Restrictions on the number of cats allowed per household may also assist in preventing cases of animal hoarding and help prevent the establishment of kitten farms/mills. Where there are no strict cat containment regulations, having fewer cats should also result in lower predation.

There are no reports of assessment of specific outcomes for the restriction on the number of cats that can be kept.

Breeding regulation

Cat breeding regulation allows for the mandatory registration of breeders and the need for breeders to comply with a breeder welfare code. Regulations of this type may assist in addressing the problem of kitten farming/ kitten mills and other poor practices that compromise cat welfare and health. These regulations may have indirect benefits in reducing cat overpopulation and cat predation on wildlife, and in the promotion of responsible pet ownership. When implemented alongside ownership regulations, breeding regulations can also limit the number of breeding cats owned, litters born and require cat breeders to meet minimum standards of care and containment. Where breeding regulation is effectively enforced and includes breeder traceability and requirements for microchipping and prepubertal desexing of kittens may be significant.

<p>Limiting the number of cats allowed to be owned</p>	<p>Limiting the number of cats that can be kept is suited to managing the conflicting interests of cat owners and non-cat owners and may assist in reducing overall cat numbers when used in combination with other responsible pet ownership strategies. The requirements (or lack of) for cat containment will depend on whether this will also help reduce wildlife predation or community nuisance from roaming cats.</p>
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Breeding Regulation	Regulations on breeding need further evaluation to understand the overall impact on cat management. Breeder licensing may be beneficial in facilitating enforcement of mandatory desexing requirements as only registered breeders would be able to legally transfer ownership of entire cats. Breeding regulation may also be of use in trying to combat poor breeding practices that compromise cat welfare and health.
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5.3. Improving the educative approach

A strategic outcome of the NCMSG is for the development of an educative framework that focuses on public engagement on humanely and effectively managing all cats in New Zealand. An educative framework will include different approaches to cat management based on the cat category and community support.

5.3.1. Increasing responsible cat ownership

Responsible cat ownership comprises two different elements: firstly, and preferably, owners voluntarily doing the right thing and, secondly, enforcement of responsible cat ownership requirements through legislation.

Increasing public understanding of the importance and benefits of responsible cat ownership will involve consistent public messages, including messages about the legal requirements for cat owners; these messages need to come from government and animal welfare organisations, education programmes in schools and social marketing campaigns.

Progress has been made in increasing public understanding of the importance and benefits of responsible cat ownership, particularly in relationship to the impact of cats and cat caretaking practices on wildlife (Chaseling, 2001; Department of Sustainability and Environment, 1999; Perry, 1999). This is demonstrated by a recent survey of New Zealanders' (N=1011) attitudes towards cat predation and management. The majority (82-86%) of respondents expressed concern regarding the predation of native wildlife by feral and stray cats and a high number (69%) of respondents also expressed concern regarding predation by owned cats (Walker et al., 2017). Fewer participants (38-60%) were concerned about the predation of non-native wildlife by cats, suggesting a higher value placed on native species (Walker et al., 2017).

Successfully changing human behaviour about managing their companion cats will require and understanding of the behaviour, the audience, which type of action will best suit the behaviour

targeted, and the need for evaluation to determine if and why success is achieved (McLeod et al., 2019). Behaviour change is facilitated by changing attitudes and beliefs relating to cats and responsible cat caretaking. The Theory of Planned Behavior (Ajzen, 1985; 1991) can predict volitional human behaviours, including behaviours towards animals (Coleman et al., 1998; Rohlf et al., 2012; Toukhsati et al., 2012a). Modification of beliefs related to attitudes, social norms, and self-efficacy has the potential to change related behaviours (Coleman et al., 1998; Hsu et al., 2003). A 2012 Australian study about community attitudes towards cat containment and cat impacts on wildlife found agreement of approximately 63% (owners and non-owners) that wandering cats endanger or kill native wildlife (Toukhsati et al., 2012b). This study also found that 80% of cat owners contained their cat to a property at night but only 41.2% contained their cat to a property during the day (Toukhsati et al., 2012b), indicating an alignment of beliefs about cats and cat owner behaviour.

In a 2018 study, 512 Australian cat owners, who did not contain their cats, were randomly assigned to view one of three short video messages: one framed to highlight the negative impact of cats' on wildlife and biodiversity ('wildlife protection' frame), one framed to highlight the health and safety benefits of keeping cats contained ('cat benefit' frame), and a control message focused on general information about cats ('neutral' frame). The results revealed that both the 'wildlife protection' and 'cat benefit' messages increased owners' motivation to contain their cat and their beliefs that they could effectively contain their cat to achieve the desired outcomes (McLeod et al., 2018). Both studies (McLeod et al., 2018; Toukhsati et al., 2012b) demonstrate the relationship between beliefs and related behaviour; people who believed that cat containment was important (to protect their cats and wildlife) were most likely to contain their own cats or report intentions to implement a cat containment solution and adopt containment behaviour.

Traditional methods used by government to change community behaviours include legislation, regulation, penalties, taxes, and subsidies. However, these may not be as successful as other methods that improve cooperative community behaviour change (Head, 2008), such as education and community awareness programmes (Toukhsati et al., 2012a). A more collaborative and encouraging approach to engage stakeholders is a paradigm shift from more punitive and negative measures such as penalties and taxes.

Areas related to cat management that will require a change in community attitudes, beliefs, and subsequently behaviour include:

- A better understanding and acceptance of the intrinsic value of cats;
- The impact of cats and cat caretaking practices on wildlife;

- Acceptance of responsible ownership and care measures such as:
 - Cat containment
 - Pre-pubertal desexing
 - Desexing of stray cats being cared for by a non-owner
 - Cat identification (microchipping)

Awareness of the benefits to cats of the responsible ownership care measures listed above and other behaviours with positive impacts on cat welfare such as providing enrichment for cats, particularly contained cats (Toukhsati et al., 2012b). Presenting information in a logical, myth-debunking approach is typically the most common way to share information, however, a recent study found that more effective strategies to inspire behaviour change are underused including: choosing a trusted messenger to deliver the information, framing that emphasises loss rather than gains and local significance, and a focus on values, goals, social norms, and compelling stories can improve uptake of information for behaviour change (McLeod et al., 2017).

5.3.2. Public engagement on stray and feral cat management

Managing stray and feral cats will require a better understanding of the multiplicity of values, attitudes, and beliefs that people have for cats (Deak et al., 2019; McLeod et al., 2019). Recent reviews of this topic emphasise the key challenge to implementing and maintaining successful cat management is having the social license to do so (Deal et al., 2019; McLeod et al., 2019). Fuelling controversies in whether the public support feral cat management is confusion in determining if a cat is truly feral or stray (Deak et al., 2019). This is highlighted throughout this report as an important aspect of determining the most humane and effective programme for managing free-roaming cats, and subsequently, in improving public support of such activities. People have different connections to types of cats, which underscores the need to identify the values they attach to cats (Deak et al., 2019).

TNR as a strategy

Different factors influence people's support for TNR including: demographics, residential location (particularly rural vs urban), attitudes, ethics, values, and cat ownership (Ash & Adams, 2003; Kellert & Berry, 1980; Lauber 2007; Lord 2008; Lloyd & Hernandez, 2012; Lloyd & Miller, 2010). A New Zealand study found public preference for TNR as a management tool for stray cats (Walker et al., 2017). A number of studies overseas have also reported broad public support of TNR (Kellert & Berry, 1980; Lord, 2008) and a preference for non-lethal animal management in general (Agee & Miller, 2009;

Zinn et al., 1998); but others have reported mixed results and less support (Lohr & Lepczyk, 2014; Lloyd & Hernandez, 2012; Lloyd & Miller, 2010).

The diversity of views about TNR indicate the need to thoroughly consult different stakeholder groups when determining the best course of action for managing stray cats (Deak et al., 2019). At least one study with Australian members of the public found most respondents supported TNR, despite this not being the current government approach to cat management (Rand et al., 2019). The study also found that a barrier to supporting TNR are negative belief towards cats, thus, a desire to manage them lethally (Rand et al., 2019). However, more research on public attitudes to cat management in New Zealand would provide a better understanding of the social context; there may be differences between public opinion and the operating policy of local governments, animal control, and welfare organisations.

The factors that affect the potential efficacy of TNR (for example, the immigration rate and environment) vary considerably between different areas and countries (Kilgour et al., 2017). The definition of 'success' of a cat management programme is likely to differ for welfare organisations, conservation biologists, local government and policy makers (Longcore et al., 2009), which creates controversy (Dauphine & Cooper 2009; Kilgour et al., 2017). For welfare organisations and cat advocates, success is likely measured through improved cat health and welfare; a stable or reducing population; and reduced admissions and euthanasia of unowned cats in animal shelters (Neville, 1983; Longcore et al., 2009; Zaunbrecher & Smith, 1993). For conservation biologists, complete and rapid extinction of a cat colony and reduction or elimination of cat predation on wildlife is likely the measure of success (Jessup, 2004; Longcore et al., 2009; Nogales et al., 2004). For local government and policy makers, success will most likely be measured by reduction of nuisance complaints and conflicts involving cats, improved public opinion, and reduced cat management costs. It is important to note that no assessments of success of TNR programmes based on the impact of cats on wildlife have been reported. It is important that conservation scientists and advocates identify the environmental implications of using TNR and contribute this evidence to the assessment of this cat management tool (Longcore et al., 2009).

Lethal control as a strategy

It is important to consider socio-political and practical implications of a trap and kill programme for urban and peri-urban cat management (Hatley, 2003). It is difficult to ensure that unconfined, owned cats and semi-owned cats would be unaffected by such a programme (Robertson 2007). Furthermore, many members of a community may be opposed to lethal cat control programmes, particularly in

urban areas (Ash, 2001; Deak et al., 2019; Hurley, 2013; Levy et al., 2013; Marston et al., 2008; Paterson, 2014; Robertson, 2007; Walker et al., 2017; Wilken, 2012) and non-lethal cat control measures, or even inaction, are more often accepted (Liordosa et al., 2017; Lloyd & DeVore, 2010; Medina et al., 2016; Walker et al., 2017). Consequently, it is unlikely that implementation of intensive, high-level and large-scale culling would be accepted in most urban areas. Indeed, such programmes can meet fierce opposition, protests, and sabotage attempts (Hatley, 2003; Nealy-Brown, 2002; Nogales et al., 2013; Parkes et al., 2014; Sterba, 2002).

If an intensive and large-scale culling programme is considered, a pervasive, intense, and the continuing campaign to educate the public about the impacts of cats on wildlife and human health and the resulting need for culling would be necessary (Medina et al., 2016; Proulx, 1988). A public education campaign should be planned and implemented well before a culling operation commenced and would likely need to include public service announcements on television, radio, social media and in newspapers, and education in schools. It can be difficult to develop effective communication programmes; it is necessary to begin the development process with a clear understanding of target audiences, including their attitudes and beliefs (Fishbein & Ajzen, 2010; Jacobson, 2009). Changing public attitudes takes time and ideas need to be continually put before the public. In addition, local government programmes aimed at reducing immigration of cats into the unowned population would need to be strictly enforced (Hatley, 2003).

6. Ensuring cat management strategies are effective and humane

A strategic goal of the National Cat Management Strategy is to ensure effective strategies are used to manage all cats in New Zealand.

6.1. Monitoring and Evaluation of cat management

A strategic outcome of the National Cat Management Strategy is for cat management activities are monitored and evaluated to ensure effective outcomes.

Policies aimed at improving cat management included in a legislative and regulatory framework should be evaluated to assess effectiveness for cat management, humaneness, cost effectiveness, and potential for implementation and enforcement. Determination of which cat management strategies are the most effective whilst ensuring high welfare standards can minimise the need for lethal control of cats.

There are currently few formal assessments of the impact of specific cat management strategies on wildlife predation by cats, unwanted cat numbers, animal shelter intakes, shelter euthanasia numbers, and nuisance complaints. Reported data are either compilations of (sometimes diverse and inaccurate) data from different animal welfare organisations and animal control agencies or extrapolations from more local data from animal welfare organisations and animal control agencies. The few existing assessments relate to the impact of desexing initiatives (and TNR programmes in overseas countries) on animal shelter cat intake and euthanasia numbers and the increase in reclaim rates associated with identification of cats. Clear and measurable objectives are needed for initiatives and transparently report formal assessment based on the objectives.

6.1.1. Using ethical principles of animal management to guide action

Minimising tensions between concerns for protecting the welfare of cats, and the concerns for communities and the environment will require approaches that ensure transparency in decision-making that provides balanced concern for all stakeholders involved in managing populations of animals. An ethical framework to decide action towards animal population control can be useful for deciding and evaluating actions. Using both an ethical and evidence-based approach, Dubois et al. (2017) have created a framework for making decisions about animal population control based on the following questions:

- Can the problem be mitigated by changing human behaviour?
- Are the harms serious enough to warrant wildlife control?
- Is the desired outcome clear and achievable, and will it be monitored?
- Does the proposed method carry the least animal welfare cost and to the fewest animals?
- Have community values been considered alongside scientific, technical, and practical information?
- Is the control action part of a systematic, long-term management programme?
- Are the decisions warranted by the specifics of the situation rather than negative labels applied to the animals?

The Dubois et al. (2017) framework explicitly includes questions about humans first altering their actions, and questions how attitudes about the perceived value of an animal, or lack thereof, can influence decisions.

6.1.2. Using adaptive frameworks to manage cats

Transparency and empiricism in the decision-making process can be promoted using adaptive frameworks (Warburton & Norton, 2009). Adaptive frameworks are useful for cat management activities such as TNR that benefit from monitoring and evaluation including tools such as population modelling, population monitoring, and adaptive management are necessary to engage all stakeholders and improve effectiveness (Boone, 2015; Perry & Perry, 2008; van Heezik, 2010;). Implementation of standardised TNR approaches should be based on best-practice methods that are coordinated under an adaptive management framework, where monitoring data are regularly evaluated to improve the management programme.

Important strategies for evaluating management efforts for domestic cats should include metrics on the following (Adapted from Identifying Best Practice Cat Management in Australia; RSPCA Australia 2018):

- Overall numbers of stray cats
- Size of individual stray cat colonies
- Shelter/pound admissions of companion and stray cats
(socialised/unsocialised/managed/unmanaged)
- Shelter/pound euthanasia of companion and stray cats
(socialised/unsocialised/managed/unmanaged)
- Nuisance complaints about cats
- Wildlife injuries and deaths documented by veterinarians, wildlife carer groups and shelters
- Retention of companion cats
- Proportion of companion and stray cats desexed
- Community satisfaction and support for cat management
- Wildlife prey abundance

For stray cats, strategies such as adoption, TNR, and targeted desexing will be effective in reducing cat populations when they are combined. In addition, monitoring the number of stray cats desexed and adopted can provide useful evaluation of educational strategies targeted towards stray cat carers. It is important to include evaluation of the barriers to carers desexing the stray cats for which they provide care.

For companion cats, Table 7 sets out a series of measures that could be used to evaluate the overall success of cat management strategies, and measures specific to individual strategies. Evaluation of

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the success of cat management programmes should include pre- and post- implementation monitoring using specific measures such as those in the table.

Table 7: Evaluation of strategies to manage owned cats

Strategy	Measurable indicators	Effective at reducing cat overpopulation? *
Reducing cat surrender and abandonment	<ul style="list-style-type: none"> • Number of companion cats surrendered to animal shelters • Number of cat abandonment complaints received by SPCA inspectorate 	Yes – with help of animal welfare organisations and through enforcement and incorporation into cat management legislation
Containment	<ul style="list-style-type: none"> • Uptake of cat containment • Use of outdoor cat enclosures • Use of environmental enrichment for contained cats 	Potentially – if strict 24-hour containment in combination with mandatory identification and strategies to control stray cats
Mandatory identification	<ul style="list-style-type: none"> • Reclaim rates recorded by shelters, pounds and veterinarians • Number of microchips registered on the NZCAR 	Yes – especially if used with collar and tag requirements
Mandatory desexing	<ul style="list-style-type: none"> • Number of companion cats desexed before sexual maturity • Shelter/pound admissions of kittens • Shelter/pound euthanasia of kittens • Number of kittens/cats being sold/given away on trading platforms (e.g. Trade Me™ or other media) 	Potentially - if pre-pubertal desexing and aimed at desexing prior to sale/transfer/return and if adequately enforced
Targeted and affordable desexing	<ul style="list-style-type: none"> • Number of desexed cats from low income areas • Number of kittens/cats being sold/given away on trading platforms (e.g. Trade Me™ or other media) • Intake to shelters 	Yes
Pre-pubertal desexing	<ul style="list-style-type: none"> • Number of cats desexed prior to sexual maturity • Retention of adult cats desexed prior to sexual maturity 	Potentially – theoretically effective but not yet adequately assessed

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	<ul style="list-style-type: none"> • Age of mother cat when kittens are surrendered to animal shelters and pounds • Number of kittens/cats being sold/given away on trading platforms (e.g. Trade Me™ or other media) 	
Mandatory Registration	<ul style="list-style-type: none"> • Reclaim rates recorded by animal shelters and veterinarians • Cat registration numbers • Council income from cat registration (and application towards cat management initiatives) • Expenditure of cat registration income on supporting cat management initiatives (where councils allocate funds from registration to cat management initiatives) 	No – but may assist indirectly where funds are directed to cat management activities
Limiting cat ownership	<ul style="list-style-type: none"> • Number of hoarding complaints dealt with by SPCA inspectorate 	No – but may assist in reducing public nuisance from cats, kitten farms and resolving animal hoarding cases
Breeding regulation	<ul style="list-style-type: none"> • Number of breeding complaints dealt with by SPCA inspectorate • Number of kittens/cats being sold/given away on trading platforms (e.g. Trade Me™ or other media) 	No – except in specific kitten breeding circumstances
Educational strategies	<ul style="list-style-type: none"> • Support for cat management strategies • New Zealander’s preferences for and opinions about cat management; 	Yes – if applied to specific areas of need
Facilitation of behaviour change	<ul style="list-style-type: none"> • Support for cat management strategies 	Potentially - if encouraged and resourced at the national level

Modified from Identifying Best Practice Cat Management in Australia, (RSPCA Australia, 2018).

6.2. Collecting and managing data on cat management activities

A strategic outcome of the National Cat Management Strategy Group is that robust data collection and management inform cat management activities.

Successful long-term cat management will be assisted by the collection, analysis, and reporting of accurate data about different facets of cat management.

- The effect that desexing has on cat behaviour and how this might influence cat population dynamics. It is commonly theorised that desexed cats occupy space within a cat population and prevent other entire cats from entering that area but there is no data available to substantiate this theory (Miller et al. 2014b; Miller et al. 2014a);
- New Zealanders' attitudes towards, and interactions with, stray cats including the intentions of stray cat carers;
- Typical cat dispersal rates, dispersal rates under different conditions, and the survival rates of dispersing cats (Miller et al. 2014b; Miller et al. 2014a);
- Typical cat abandonment rates under different conditions and the socio-economic and attitudinal factors that contribute to higher abandonment rates and prevention of abandonment is needed (Miller et al. 2014b; Miller et al. 2014a).
- Determination of whether intensely managing cats within a small part of the meta-population or managing a larger part of the meta-population at lower intensity is more effective at controlling the cat population (Miller et al. 2014b; Miller et al. 2014a);
- Methods used to control cat populations including lethal and non-lethal approaches;
- Shelter statistics that correspond to cat management activities including intake, euthanasia, and adoption.

Data on cat management should be accessible to stakeholders with an interest in supporting, monitoring, and evaluating activities to ensure they are effective and humane.

7. Collaboration between government, NGOs, and the community

A strategic goal of the National Cat Management Strategy is that humane and effective cat management is achieved through multi-stakeholder collaboration. This will require identifying and understanding the different stakeholders and their relationships with and concerns regarding cats including: cat owners, cat carers, breeders, pet retailers and manufacturers, veterinarians, local and central government, animal welfare, and rescue organisations, animal control organisations, the farming community, conservation groups, and the general community.

7.1. New Zealand Government

A strategic outcome of the NCMSG is for the New Zealand government to take an active role in supporting multi-stakeholder oversight of cat management strategies. Relevant Ministries and the New Zealand government should take steps to address cat management in a holistic manner that addresses both feral and domestic cat management. Opportunities should be created for national consultative groups on feral cat control and domestic cat management to discuss common issues to encourage greater stakeholder collaboration, and integration of initiatives. This will help focus attention and resources to achieve greater success. Core areas of focus should be applied to cat management including science, action, and partnership. The New Zealand Government can facilitate collaborative research in areas specifically relating to feral cat control and domestic cat management, and integration of feral and domestic cat management.

7.1.1. Governmental agencies involved in cat management

Currently the agencies who should share some responsibility for cat management in New Zealand include:

- Department of Conservation
- Regional Councils
- Local Councils
- Ministry for Primary Industries
- Department of Internal Affairs
- Ministry for the Environment
- Approved Organisations
- Police

7.1.2. Legal reform

Legislation is often viewed as the key to resolving cat management issues but there are many reasons why mandating specific aspects of cat management can only provide part of the solution. The challenge is to identify which aspects will be most cost-effective and what other measures are required to provide an ethical, humane, and sustainable approach to cat management.

Current legislation relating to cat (domestic and feral) management is complex. Government plays an important role in reviewing and rationalising legislation to reflect best practice and community expectations to achieve consistent and effective change. This involves undertaking meaningful evaluation and public consultation.

7.1.3. Developing and sharing resources

Awareness and education are important for effective cat management and having one agency coordinate the development of materials will help ensure consistency and cost-effectiveness. An example of this is found in the Australian state of South Australia where there is a Dog and Cat Management Board, which has developed guidelines to assist councils to establish cat bylaws, and produce resource materials promoting responsible cat ownership; these can be used by all councils and other groups including veterinarians and animal welfare organisations. This could be a role fulfilled by a cat management task force or management board in New Zealand.

7.2. Local government

A strategic outcome for the NCMSG is for local New Zealand governments to coordinate community cat management activities and liaising with national cat management activities. Local government generally enforces domestic cat legislation and acts at the community level. Therefore, local government has a pivotal role to play in working with key community stakeholders including cat owners, cat carers, breeders, sellers, animal welfare organisations, veterinarians and conservation groups. Councils can play an important role in facilitating and coordinating community-based activities including accessible desexing schemes, promotion of responsible cat ownership, encouraging cat friendly rental accommodation and discouraging no-pet clauses in tenancy agreements, and supporting cat adoption drives. Enforcement of regulations is also important but is considered secondary to the other educative and support roles the council can pursue. Another critical role for council is to liaise and collaborate with grassroots community conservation groups to support and coordinate cat management activities.

Council cat management plans

In the absence of national law, some local councils, including Wellington City Council and Palmerston North City Council, have introduced by laws pertaining to cat management, but other New Zealand councils have few if any bylaws pertaining to cat management. If councils develop and submit a cat management plan, these plans can incorporate priority areas, education and support programmes (e.g. accessible desexing and microchipping schemes), research and evaluation activities. Councils in New Zealand undertaking this focus public attention on cats and this would complement a national cat management plan.

7.3. Organisations and professionals with an interest in cat management

A strategic outcome of the NCMMSG is for organisations representing conservation groups, animal welfare, veterinary medicine, and industry take an active role in cat management.

7.3.1. Conservation groups

In New Zealand, many conservation groups are involved in managing feral and domestic cats either directly (on privately owned land), or indirectly (through information given to supporters and the general public); this includes small local grass roots conservation groups. Conservation groups also have an important role in community engagement and in promoting and implementing good welfare practices in relation to cat management.

7.3.2. Animal welfare organisations

Animal welfare organisations manage unwanted cats brought to animal shelters and implement initiatives to address unwanted cats in the community. Welfare organisations play an important role in community education and engagement, including facilitating adoption drives, desexing programmes and promoting microchipping. Animal advocacy groups may also assist conservation groups and government with advice on addressing animal welfare risks associated with cat management programmes.

Many advocacy and rescue organisations in New Zealand contribute to the humane management of cats. Some are also involved in research (e.g. SPCA) and have a great reach within the community to facilitate formal studies.

7.3.3. Veterinarians

Veterinarians have a role to play in the management of cats including:

- Educating clients and the public about responsible cat ownership, cat impacts on wildlife, cat welfare and the need for cat management;
- Encouraging adoption of cats from welfare organisations and pounds;
- Supporting and implementing pre-pubertal desexing; and
- Supporting community initiatives such as accessible desexing programmes for cats

In addition, the New Zealand Veterinary Association plays a role in providing advice and assisting with cat management initiatives.

7.3.4. Cat breeders

Cat breeders play a role in educating buyers about responsible cat ownership and ensuring that all legal requirements and health requirements are met for cats and kittens sold. Responsible cat breeders have responsibilities including:

- Registering as a breeder;
- Complying with the Animal Welfare (Companion Cats) Code of Welfare;
- Desexing kittens before 4 months of age, unless sold to another registered breeder; and
- Complying with relevant regulations and legislation.

7.3.5. Pet retailers and manufacturers

The Pet Industry Association of New Zealand provides advice and assists with initiatives contributing to cat management. The roles of individual businesses that sell cats and cat accessories, food and equipment include:

- Educating clients and the public about responsible cat ownership, cat impacts on wildlife, cat welfare and the need for cat management;
- Supporting pre-pubertal desexing;
- Supporting community initiatives such as accessible desexing programmes and low-cost microchipping for cats;
- Selling only desexed, vaccinated, and microchipped kittens and cats from responsible breeders; and

- Supporting initiatives to rehome cats from animal shelters and pounds through their retail outlets.

7.4. Individuals with an interest in cat management

A strategic outcome of the NCMMSG is that individuals including people who do and do not provide care to cats take an active role in cat management.

7.4.1. Cat owners

Cat owners have an important role in cat management including:

- Adoption of cats from welfare organisations and pounds;
- Taking responsibility for their cat by providing appropriate care to maintain health and ensure good welfare;
- Preventing or mitigating the negative impact of their cat on wildlife through effective containment and/or anti-predation devices;
- Identification of their cat with a microchip and external identification;
- Desexing their cat before sexual maturity to avoid unwanted litters of kittens;
- Complying with the Animal Welfare (Companion Cats) Code of Welfare;
- Having any cats/kittens desexed prior to 4 months of age; and
- Compliance with relevant regulations and legislation.

7.4.2. Stray cat carers

Stray cat carers have a role in cat management including:

- Taking responsibility for the cats they care for, including providing appropriate health care and euthanasia when required. This should also include recognising the cats' potential to contribute to cat overpopulation and impact on wildlife;
- Mitigating the negative impact of the cats they care for on wildlife through the use of effective anti-predation devices;
- Desexing the cats they care for before the cats reach sexual maturity to avoid breeding;
- Supporting community initiatives to reduce the number of unwanted cats, such as accessible desexing programmes and TNR programmes;

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- Helping to educate other cat carers about the impact of cats on wildlife and what can be done to mitigate these impacts; and
- Identification of the cats they care for with a microchip and external identification.

7.4.3. People who neither own nor provide care for cats

People who neither own nor provide care for cats have a role to play in cat management including:

- Supporting community initiatives to reduce the number of unwanted cats, such as accessible desexing programmes and TNR programmes;
- Treating cats with kindness, care and respect; and
- Helping to educate cat owners and cat carers about the impact of cats on communities and wildlife, and what can be done to mitigate these impacts.

8. Conclusion

This report has presented a comprehensive multi-stakeholder approach to cat management in New Zealand that requires investment from all levels of government, use of effective and humane management strategies to reduce the number of cats, and incorporates monitoring and evaluation of management activities to determine decision-making.

Currently, there is no national strategy for cat management in New Zealand, despite the need to address the negative impacts that cats have on urban, rural, and wild environments, and the poor welfare outcomes for cats that are poorly or not at all managed. Protecting cat welfare and New Zealand's unique ecosystems do not have to come at a cost to each other. Effective and humane cat management will be successful in protecting both cats, people, and ecosystems when strategies are grounded in an understanding of cat populations and correspond to the multiplicity of values that cats hold in New Zealand.

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Appendix 1: Existing legislative, regulatory and educative framework relating to cat management in New Zealand

The Animal Welfare Act 1999 (current as at 7 October 2019)

Key sections of the Animal Welfare Act 1999 (the Act) that relate to cats have been included below for reference. A full version of the Act can be found online at <http://www.legislation.govt.nz/>

The purpose of the Act is described in the statute title as follows;

An Act-

(a) to reform the law relating to the welfare of animals and the prevention of their ill-treatment; and, in particular, —

(i) to recognise that animals are sentient:

(ia) to require owners of animals, and persons in charge of animals, to attend properly to the welfare of those animals:

(ii) to specify conduct that is or is not permissible in relation to any animal or class of animals:

(iii) to provide a process for approving the use of animals in research, testing, and teaching:

(iv) to establish a National Animal Welfare Advisory Committee and a National Animal Ethics Advisory Committee:

(v) to provide for the development and issue of codes of welfare and the approval of codes of ethical conduct:

(b) to repeal the Animals Protection Act 1960

Definitions: (section 2 of the Act: Interpretation)

Companion cats fall under the protection and enforcement of the Animal Welfare Act 1999 as it defines an animal in Section 2(1)(a)(i):

Animal—

(a) means any live member of the animal kingdom that is-

(i) a mammal

Owner is defined as:

-in relation to an animal, includes the parent or guardian of a person under the age of 16 years who-

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- (a) owns the animal; and
- (b) is a member of the parent's or guardian's household living with and dependent on the parent or guardian.

Person in charge is defined as:

-in relation to an animal, includes a person who has the animal in that person's possession or custody, or under that person's care, control, or supervision.

Part 1: Care of animals

9 Purpose

(1) The purpose of this Part is to ensure that owners of animals and persons in charge of animals attend properly to the welfare of those animals.

(2) This Part accordingly-

(a) requires owners of animals, and persons in charge of animals, to take all reasonable steps to ensure that the physical, health, and behavioural needs of the animals are met in accordance with both-

(i) good practice; and

(ii) scientific knowledge; and

(b) requires owners of ill or injured animals, and persons in charge of such animals, to ensure that the animals receive treatment that alleviates any unreasonable or unnecessary pain or distress from which the animals are suffering; and

(c) imposes restrictions on the carrying out of surgical procedures on animals; and

(d) provides for the classification of the types of surgical procedures that may be performed on animals; and

(e) specifies the persons or classes of persons who may perform each class of such surgical procedures; and

(f) specifies certain minimum conditions that must be observed in relation to the transportation of animals.

Obligations of owners and of persons in charge of animals

10 Obligation in relation to physical, health, and behavioural needs of animals

The owner of an animal, and every person in charge of an animal, must ensure that the physical, health, and behavioural needs of the animal are met in a manner that is in accordance with both—

- (a) good practice; and
- (b) scientific knowledge.

11 Obligation to alleviate pain or distress of ill or injured animals

(1) The owner of an animal that is ill or injured, and every person in charge of such an animal, must ensure that the animal receives treatment that alleviates any unreasonable or unnecessary pain or distress being suffered by the animal.

(2) This section does not—

- (a) limit section 10; or
- (b) require a person to keep an animal alive when it is in such a condition that it is suffering unreasonable or unnecessary pain or distress.

Offences

12 Animal welfare offences

A person commits an offence who, being the owner of, or a person in charge of, an animal, —

- (a) fails to comply, in relation to the animal, with section 10; or
- (b) fails, in the case of an animal that is ill or injured, to comply, in relation to the animal, with section 11; or
- (c) kills the animal in such a manner that the animal suffers unreasonable or unnecessary pain or distress.

14 Further animal welfare offences

(1) A person commits an offence who, being the owner of, or a person in charge of, an animal, without reasonable excuse, —

- (a) keeps the animal alive when it is in such a condition that it is suffering unreasonable or unnecessary pain or distress; or

(b) sells, attempts to sell, or offers for sale, otherwise than for the express purpose of being killed, the animal when it is suffering unreasonable or unnecessary pain or distress.

(2) A person commits an offence who, being the owner of, or person in charge of, an animal, without reasonable excuse, deserts the animal in circumstances in which no provision is made to meet its physical, health, and behavioural needs.

25 Penalties

A person who commits an offence against [section 12](#) or [section 14\(1\)](#) or section 14(2) or [section 21\(1\)](#) or section 21(2) or [section 22\(2\)](#) or [section 23\(1\)](#) or section 23(2) is liable on conviction,—

(a) in the case of an individual, to imprisonment for a term not exceeding 12 months or to a fine not exceeding \$50,000 or to both; or

(b) in the case of a body corporate to a fine not exceeding \$250,000.

Part 2: Conduct towards animals

27 Purpose

The purpose of this Part is to state conduct that is or is not permissible in relation to a species of animal or animals used for certain purposes—

(a) by prohibiting certain types of conduct; and

(b) by controlling the use and sale of traps and devices used to kill, manage, entrap, capture, entangle, restrain, or immobilise an animal.

Ill-treatment of animals

28 Wilful ill-treatment of animals

(1) A person commits an offence if that person wilfully ill-treats an animal with the result that—

(a) the animal is permanently disabled; or

(b) the animal dies; or

(c) the pain or distress caused to the animal is so great that it is necessary to destroy the animal in order to end its suffering; or

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(d) the animal is seriously injured or impaired.

(2) For the purposes of subsection (1)(d), an animal is **seriously injured or impaired** if the injury or impairment—

(a) involves—

(i) prolonged pain and suffering; or

(ii) a substantial risk of death; or

(iii) loss of a body part; or

(iv) permanent or prolonged loss of a bodily function; and

(b) requires treatment by or under the supervision of a veterinarian.

(3) A person who commits an offence against this section is liable on conviction, —

(a) in the case of an individual, to imprisonment for a term not exceeding 5 years or to a fine not exceeding \$100,000 or to both:

(b) in the case of a body corporate, to a fine not exceeding \$500,000.

28A Reckless ill-treatment of animals

(1) A person commits an offence if that person recklessly ill-treats an animal with the result that—

(a) the animal is permanently disabled; or

(b) the animal dies; or

(c) the pain or distress caused to the animal is so great that it is necessary to destroy the animal in order to end its suffering; or

(d) the animal is seriously injured or impaired.

(2) For the purposes of subsection (1)(d), an animal is **seriously injured or impaired** if the injury or impairment—

(a) involves—

(i) prolonged pain and suffering; or

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- (ii) a substantial risk of death; or
- (iii) loss of a body part; or
- (iv) permanent or prolonged loss of a bodily function; and

(b) requires treatment by or under the supervision of a veterinarian.

(3) A person who commits an offence against this section is liable on conviction, —

(a) in the case of an individual, to imprisonment for a term not exceeding 3 years or to a fine not exceeding \$75,000 or to both:

(b) in the case of a body corporate, to a fine not exceeding \$350,000.

29 Further offences

A person commits an offence who—

- (a) ill-treats an animal; or
- (b) pierces the tongue or tongue phrenum of an animal with a pig ring or similar thing or with any wire; or
- (c) keeps or uses a place for the purpose of causing an animal to fight, or for the purpose of baiting or otherwise ill-treating an animal, or manages or assists in the management of, any such place; or
- (d) is present, for the purpose of witnessing the fighting or baiting of an animal, at a place used or kept for the purpose; or
- (e) in any manner encourages, aids, or assists in the fighting or baiting of an animal; or
- (f) brands any animal in such a manner that the animal suffers unreasonable or unnecessary pain or distress; or
- (g) releases an animal, being an animal that has been kept in captivity, in circumstances in which the animal is likely to suffer unreasonable or unnecessary pain or distress; or
- (h) counsels, procures, aids, or abets any other person to do an act or refrain from doing an act as a result of which an animal suffers unreasonable or unnecessary pain or distress.

Ill-treating, hunting, or killing wild animals or animals in wild state

30A Wilful or reckless ill-treatment of wild animals or animals in wild state

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- (1) A person commits an offence if the person wilfully ill-treats a wild animal or an animal in a wild state.
- (2) A person commits an offence if the person recklessly ill-treats a wild animal or an animal in a wild state.
- (3) A defendant has a defence to a prosecution for an offence against subsection (1) or (2) if the defendant satisfies the court that the conduct alleged to constitute an offence is or is part of a generally accepted practice in New Zealand for the hunting or killing of wild animals of that type or animals in a wild state of that type.
- (4) In determining whether wilful or reckless ill-treatment of an animal has occurred, a court may treat an act or omission as lawful (and not subject to subsection (1) or (2)) if satisfied that—
 - (a) the act or omission was done in the course of performing functions for the purposes of another Act; and
 - (b) not to treat the act or omission as lawful would be contrary to the purpose and principles of that Act.
- (5) Nothing in subsection (1) or (2) applies to—
 - (a) a wild animal in captivity (other than in captivity in a safari park); or
 - (b) the accidental or inadvertent killing or harming of an animal; or(c) any act or omission necessary to protect a person's life or safety.
- (6) Nothing in subsection (1) or (2) affects section 179 or 181.
- (7) A person who commits an offence against subsection (1) is liable on conviction, —
 - (a) in the case of an individual, to imprisonment for a term not exceeding 5 years or to a fine not exceeding \$100,000, or to both:
 - (b) in the case of a body corporate, to a fine not exceeding \$500,000.
- (8) A person who commits an offence against subsection (2) is liable on conviction, —
 - (a) in the case of an individual, to imprisonment for a term not exceeding 3 years or to a fine not exceeding \$75,000, or to both:
 - (b) in the case of a body corporate, to a fine not exceeding \$350,000.

30B Hunting or killing

(1) Nothing in this Act makes it unlawful to hunt or kill—

(a) any animal in a wild state; or

(b) any wild animal or pest in accordance with the provisions of—

(i) the Wildlife Act 1953; or

(ii) the Wild Animal Control Act 1977; or

(iii) the Conservation Act 1987; or

(iv) the Biosecurity Act 1993; or

(v) any other Act; or

(c) any other wild animal or pest; or

(d) any game animal in accordance with the provisions of the Game Animal Council Act 2013;

or

(e) any fish caught from a constructed pond.

(2) Subsection (1) is subject to sections 30A and 30C to 30E and Part 6.

30D Captured animals

(1) If a person has in captivity an animal captured in a wild state (not being an animal that has been captured for the purpose of facilitating its imminent destruction), this Act applies in relation to that person as the person in charge of that animal.

(2) If a person has in captivity an animal captured in a wild state (not being an animal caught by fishing) for the purpose of facilitating its imminent destruction, section 12(c) applies in relation to the killing of that animal.

(3) Nothing in subsection (1) or (2) applies in relation to a wild animal that is hunted and captured in a safari park.

(4) Nothing in section 30B applies to any wild animal or pest that is farmed or kept as a pet (other than a pest fish that is caught from a freshwater fish farm by a recreational fisher).

30E Certain provisions relating to traps and devices not excluded

Sections 30B and 30C do not restrict the application of sections 34 and 36.

Traps and devices

34 Restrictions on use of traps and devices to kill, manage, entrap, capture, entangle, restrain, or immobilise animals

A person commits an offence who, without reasonable excuse and for the purpose of killing, managing, entrapping, capturing, entangling, restraining, or immobilising an animal, —

- (a) uses a prohibited trap or a prohibited device; or
- (b) uses a restricted trap or a restricted device in contravention of any provision of an Order in Council made under section 32.

35 Restrictions on sale of traps and devices

(1) A person commits an offence who, without reasonable excuse, sells, attempts to sell, or offers or exposes for sale, a prohibited trap or a prohibited device.

(2) A person commits an offence who, in selling a restricted trap or a restricted device, contravenes, without reasonable excuse, any provision of any Order in Council made under section 32.

Inspection of traps

36 Obligations relating to traps

(1) A person who, for the purpose of capturing alive a mammal, bird, reptile, or amphibian, sets a trap or causes a trap to be set must—

- (a) manually inspect that trap, or cause a competent person to manually inspect that trap, within 12 hours after sunrise on each day the trap remains set, beginning on the day immediately after the day on which the trap is set; or
- (b) manually inspect that trap, or cause a competent person to manually inspect that trap, within 24 hours after the capture of an animal in the trap, but this paragraph applies only if—
 - (i) the person monitors the trap with an electronic monitoring system (such as a system of capture sensors and a wireless communication network) that is maintained by the person and that is reliable; and

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(ii) the monitoring system operates in such a way that it promptly communicates the fact that an animal has been captured in the trap and enables the person to meet the person's obligations under subsection (2) within that 24-hour period.

(2) A person who, for the purpose of capturing alive a mammal, bird, reptile, or amphibian, sets a trap or causes a trap to be set must—

(a) remove, or cause to be removed, any live animal found in that trap; or

(b) attend properly to the care of the animal or, without delay, kill the animal.

(3) A person who, without reasonable excuse, fails to comply with subsection (1) commits an infringement offence.

(4) A person who, without reasonable excuse, fails to comply with subsection (2) commits an offence and is liable on conviction, —

(a) in the case of an individual, to a fine not exceeding \$5,000; or

(b) in the case of a body corporate, to a fine not exceeding \$25,000.

Penalties

37 Penalties

A person who commits an offence against [section 29](#) or [section 31\(1\)](#) or [section 34](#) or [section 35\(1\)](#) or section 35(2) is liable on conviction,—

(a) in the case of an individual, to imprisonment for a term not exceeding 12 months or to a fine not exceeding \$50,000 or to both; and

(b) in the case of a body corporate, to a fine not exceeding \$250,000.

Part 7: Provisions relating to administration

120 Purpose

The purpose of this Part is to—

(a) specify the criteria for an organisation to be declared as an approved organisation; and

- (b) provide for the appointment of inspectors and auxiliary officers; and
- (c) specify the powers and duties of approved organisations in relation to animals in their custody; and
- (d) specify the powers of inspectors and auxiliary officers, including their powers of search and their powers in relation to animals.

Powers in relation to injured or sick animals

138 Destruction of injured or sick animals (other than marine mammals)

(1) If an inspector, auxiliary officer, or a veterinarian finds a severely injured or sick animal (other than a marine mammal), and in his or her opinion, the animal should be destroyed because reasonable treatment will not be sufficient to make the animal respond and the animal will suffer unreasonable or unnecessary pain or distress if it continues to live, he or she must, as soon as possible, —

(a) consult with the owner of that animal, if that owner can be found within a reasonable time; and

(b) if the owner asks for a second opinion from a veterinarian as to whether that animal should be destroyed, allow the owner to obtain that second opinion.

(2) If—

(a) the owner of a severely injured or sick animal cannot be found within a reasonable time; or

(b) the owner of a severely injured or sick animal—

(i) does not, on being found, agree to the destruction of the animal; and

(ii) does not obtain within a reasonable time a second opinion from a veterinarian as to whether the animal should be destroyed, —

the inspector, or auxiliary officer, or veterinarian, as the case may be, must, without delay, destroy that animal or cause it to be destroyed.

(3) If the owner of a severely injured or sick animal is found and consulted under subsection (1), and agrees that the animal should be destroyed, —

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(a) the inspector, auxiliary officer, or veterinarian, as the case may be, must, without delay, destroy that animal or cause it to be destroyed; or

(b) the owner of that animal must, without delay, destroy that animal or cause it to be destroyed.

(4) If the owner obtains a second opinion under subsection (1)(b), and the veterinarian giving that opinion agrees that the animal should be destroyed, —

(a) the inspector, auxiliary officer, or veterinarian as the case may be, must, without delay, destroy that animal or cause it to be destroyed; or

(b) the owner of that animal must, without delay, destroy that animal or cause it to be destroyed.

(5) Where, under this section, an inspector, auxiliary officer, or veterinarian destroys an animal or causes it to be destroyed, he or she may dispose of the carcass in such manner as he or she thinks fit.

139 Destruction of impounded animals that are diseased, injured, or sick

Despite section 138, if—

(a) an inspector, auxiliary officer, or veterinarian certifies in writing that an animal impounded in a pound under the Impounding or the Dog Control Act 1996 is so diseased, injured, or sick that it is in a state of continual suffering; and

(b) the territorial authority having jurisdiction over the pound is unable to find the owner of that animal within a reasonable time after the inspector, auxiliary officer, or veterinarian has given such a certificate, —

the territorial authority must, without delay, destroy that animal or cause it to be destroyed.

Disposal of animals in custody of approved organisations

141 Duties of approved organisation

(1) Where a person (other than the owner of an animal) gives that animal into the custody of an approved organisation and that approved organisation accepts custody of that animal, or where an approved organisation takes any animal into its custody, that approved organisation—

(a) must take reasonable steps to identify the owner of the animal; and

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(b) may take such steps as it considers necessary or desirable to prevent or mitigate any suffering of the animal.

(1A) Subsection (1B) applies if—

- (a) an owner of an animal, or a person acting as the agent of an owner of an animal, gives the animal into the temporary custody of an approved organisation; and
- (b) an arrangement exists for the return of the animal to the owner or the owner's agent; and
- (c) the owner or the owner's agent does not return to reclaim custody of that animal as agreed.

(1B) If this subsection applies, the approved organisation may sell, re-home, or dispose of (including destroy) the animal in any manner that an inspector or auxiliary officer acting for the organisation thinks fit if—

- (a) the approved organisation has taken reasonable steps to locate and contact the owner; and
- (b) either—
 - (i) the approved organisation has been unable to locate or contact the owner; or
 - (ii) the approved organisation has located and attempted to contact the owner, but the owner will not respond; and
- (c) the approved organisation has given the owner written notice of its intention to sell, re-home, or otherwise dispose of (including destroy) the animal in accordance with the provisions of subsection (3); and
- (d) the owner has not, within the period specified in the notice, reclaimed the animal and paid any costs incurred by the organisation and specified in the notice.

(2) Where the approved organisation cannot identify the owner of the animal, an inspector or auxiliary officer acting for the approved organisation may—

- (a) after the animal has been in the custody of the organisation for at least 7 days, —
 - (i) sell the animal; or
 - (ii) find a home for the animal; or

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(iii) destroy or otherwise dispose of the animal in such manner as the inspector or auxiliary officer thinks fit:

(aa) at any time, sell, re-home, or otherwise dispose of (including destroy) the animal in any manner that the inspector or auxiliary officer thinks fit if—

(i) the animal is wild or unsocialised; and

(ii) the animal is severely distressed; and

(iii) in the opinion of a veterinarian, the animal's distress is a direct result of being contained to the extent that it would be unreasonable and unnecessary to continue to contain the animal:

(b) at any time, in any case where the animal is diseased or is suspected of being diseased and the inspector or auxiliary officer has reasonable grounds to believe that the welfare of other animals in the custody of the approved organisation would be compromised if the organisation were to continue to hold that animal in custody, —

(i) sell the animal; or

(ii) find a home for the animal; or

(iii) destroy or otherwise dispose of the animal in such manner as the inspector or auxiliary officer thinks fit.

(3) Where the approved organisation both identifies the owner of the animal and knows the address of the owner of the animal, the approved organisation must give to the owner a written notice informing the owner that the approved organisation is holding the animal in its custody and that, unless the owner, within 7 days of the receipt of that notice, claims the animal and pays any costs incurred by the approved organisation in caring for the animal or in providing veterinary treatment to the animal (being costs that the approved organisation wishes to claim), the approved organisation may—

(a) sell the animal; or

(b) find a home for the animal; or

(c) destroy or otherwise dispose of the animal in such manner as the inspector or auxiliary officer thinks fit.

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(4) If the owner does not, within the period specified in the notice, claim the animal and pay any costs incurred by the approved organisation and specified in the notice, an inspector or auxiliary officer acting for the approved organisation may—

- (a) sell the animal; or
- (b) find a home for the animal; or
- (c) destroy or otherwise dispose of the animal in such manner as the inspector or auxiliary officer thinks fit.

(5) Where an animal is sold under subsection (1B), (2), or (4), the approved organisation must, after deducting any costs incurred by the approved organisation in caring for the animal or providing veterinary treatment to the animal, apply the proceeds of the sale towards the costs of the animal welfare work of the approved organisation.

(6) In this section, the term animal does not include—

- (a) a native animal; or
- (b) stock within the meaning of section 2(1) of the Impounding Act 1955.

142 Obligation to maintain register

(1) An approved organisation must record in a register the numbers and types of animals sold, re-homed, destroyed, or otherwise disposed of under section 141, and include in that register, in relation to each animal,—

- (a) particulars of the date when custody of the animal was obtained and of the date when the animal was disposed of; and
- (b) a record of whether the animal was sold, re-homed, destroyed, or otherwise disposed of.

(2) The records in relation to each animal must be kept for at least 1 year after the date on which the approved organisation obtained custody of the animal.

Animal Welfare (Companion Cats) Code of Welfare 2018

The obligations and restrictions on conduct towards cats stated in the Animal Welfare Act 1999 for cat owners and persons in charge are further described in the Animal Welfare (Companion Cats) Code of Welfare (hereafter the Code):

The Code's purpose is to give detail to the obligations and restrictions of the Act as they pertain to companion cats. It applies to, 'all persons responsible for the welfare of companion cats including cats in, breeding establishments, boarding catteries, animal welfare shelters and pet shops'.

The Code presents this detail in subject sections that include both; 'Minimum Standards', (what is required care and behaviour to stay in compliance with the Act); and 'Recommended Best Practice' (standards of care and conduct over and above the minimum required to meet the obligations in the Act. They are included for educational and information purposes only and may not be required by the Act at that point in time). Only the Minimum Standards have legal effect. They can be used as both a defence for those charged with an offence against the Act and as evidence to support a prosecution for an offence under the Act.

Minimum Standards: Animal Welfare (Companion Cats) Code of Welfare

Minimum Standard No. 1 – Food and Feeding

- (a) Kittens that have been weaned must be fed a minimum of twice a day.
- (b) Cats over the age of 6 months must be fed at least once a day.
- (c) Cats must receive adequate quantities of food and nutrients to enable each cat to:
 - (i) maintain good health; and
 - (ii) meet its physiological demands, including those resulting from pregnancy, lactation, growth, exercise and exposure to cold; and
 - (iii) avoid metabolic and nutritional disorders.

Minimum Standard No. 2 – Body Condition

- (a) When a cat's body condition score is "thin" as defined in Schedule II, 'Assessment of Body Condition of Cats', remedial action through veterinary attention or improved nutrition must be taken.
- (b) A cat's body condition score must not be allowed to fall below "thin" as defined in Schedule II, 'Assessment of Body Condition of Cats'.

Minimum Standard No. 3 – Water

Cats must have continuous access to water that is palatable and not harmful to health.

Minimum Standard No. 4 – Caged Cats (Other Than for Transport)

- (a) Caged cats must have sufficient room to enable them to stretch and move around freely, and must be provided with appropriate areas for feeding and toileting.
- (b) Caged cats must be provided with the opportunity to engage in play and exercise daily.

Minimum Standard No. 5 – Hygiene

- (a) Food and water bowls must be washed regularly to prevent contamination that may pose a threat to the health and welfare of the cat.
- (b) Cats kept indoors, and caged cats, must have access to a litter tray containing absorbent material.
- (c) Litter trays must be attended to regularly, with faeces and moisture-laden litter removed, to prevent contamination that may pose a threat to the health and welfare of the cat.

Minimum Standard No. 6 – Removal of Kittens from the Queen

Kittens made available for sale or rehoming requiring removal from the queen must be in

good health and must be at least 8 weeks of age, except where they have been orphaned and cannot be fostered to another queen or where early removal from the queen is deemed necessary by a veterinarian.

Minimum Standard No. 7 – Signs of Ill Health

(a) Cats which are observed by their owners or persons in charge to be showing:

- (i) signs of significant pain, suffering and distress; or
- (ii) signs of repeated straining over a continuous period of 30 minutes, as if to pass urine or faeces; or
- (iii) signs of rapidly deteriorating health must URGENTLY receive veterinary attention, be brought to the attention of an inspector under the Act (e.g. an SPCA inspector) or be humanely euthanased.

(b) Cats which are observed by their owners or persons in charge to be showing:

- (i) signs of chronic pain, suffering and distress; or
- (ii) signs of deteriorating health must receive veterinary attention, be brought to the attention of an inspector under the Act (e.g. an SPCA inspector) or be humanely euthanased.

Minimum Standard No. 8 – Injured Cats

Cats which are observed by their owners or persons in charge to be significantly injured must receive urgent veterinary attention, be brought to the attention of an inspector under the Act (e.g. an SPCA inspector) or be humanely euthanased.

Minimum Standard No. 9 – Use of Collars

Collars, where used, must be fitted to the cat in such a way that the risk of injury to the cat is avoided.

Minimum Standard No. 10 – Transportation

- (a) While being transported in a vehicle, cats must be carried in a secure container.
- (b) Cats being transported must have sufficient space within the container to stand,

turn around and rest normally.

(c) There must be adequate provision for ventilation in the form of multiple holes on at least three sides of the container.

(d) The interior of the container must be smooth, with no projections that could cause injury to the cat.

(e) Cats must not be left unattended in a vehicle when heat is likely to cause distress to the cat.

Minimum Standard No. 11 – Euthanasia

(a) When a cat is euthanased it must be carried out in such a way to ensure that death occurs quickly.

(b) Cats (including kittens) must not be killed by drowning.

Stray Cats and Cats Living in Colonies

With New Zealand reputedly having one of the highest rates of cat ownership in the world, it is not surprising that there are a correspondingly high number of stray cats in the community. These cats may breed and, where they have no contact with humans, their offspring may revert to a wild state over time.

Stray cats may live singly or may join colonies, particularly in urban environments where there is shelter (abandoned buildings, dense undergrowth, etc.) and a food source (rubbish tip, restaurant rubbish bins, etc.). Given the numbers of cats living in New Zealand, such colonies will probably always exist.

Often single stray cats, and cats living in colonies, are provided with food on an ad hoc basis by sympathetic individuals. In some instances, colonies are managed on a more formal basis (see 'Managed Colonies' below).

While a person who merely feeds cats in a colony is not the "person in charge" in terms of the Act, and therefore is not legally responsible for the cats in the colony, it should be noted that, where people trap cats in the colony in order to provide for their vaccination, desexing or care, they will have legal obligations as the "person in charge" (see "Trapping of Cats" below).

Managed Colonies

Some cat colonies in New Zealand are cared for by individuals under a management plan agreed with the landowner and/or the local council. Such a management plan should include means of identification; provision of food, water and access to shelter; a vaccination and parasite programme; provision of veterinary treatment; a desexing programme; and a long-term management strategy including continuity of care. Further information on management of cat colonies can be obtained from the SPCA.

Trapping of Cats

The Act (see section 36) provides that for any trapped cat, the following obligations apply:

- any traps set must be checked daily within 12 hours of sunrise, commencing from the day after the trap is first set; and
- any cats caught must be attended to without delay.

Where practicable, it is recommended when trapping stray cats and cats in colonies that traps be checked more frequently.

Any trapped cat must be provided with basic care to meet the requirements of the Act or be released if it is uninjured or be killed humanely if it is a feral cat. Any cat released back into a colony must be in sufficiently good health to be able to fend for itself, and have ongoing access to adequate food, water and shelter to meet its daily needs.

The Act (see section 141) provides that, where a stray cat is trapped and placed in the care of an approved organisation under the Act (such as the SPCA), that organisation must take reasonable steps to identify the owner of the cat, and may take steps to prevent or mitigate any suffering of the cat. If the owner of the cat cannot be identified then, after 7 days, the cat may be sold, found a new home or euthanased.

Other legislation applying to cat management

Resource Management Act 1991

This Act does not contain any specific reference to cats or feral cats.

Biosecurity Act 1993

This Act does not contain any specific reference to cats or feral cats.

The only section that could apply to all (including domesticated) cats is s.121(4) of Part 6 of the Act:

‘If the owner or person in control of any animal or the occupier of any place in which an animal is present fails to comply with a direction under this section, an inspector or authorised person may—

- (a) exercise any or all of the powers in subsection (1B); and
- (b) in the case of any animal or animals, —
 - (i) to the extent that it is necessary to enable those powers to be exercised (or exercised efficiently), capture, pen, or muster it or them or any of them; or
 - (ii) if for any reason it is not practicable to capture, pen, or muster it or them or any of them, kill or destroy it or them or any of them if the inspector or authorised person believes on reasonable grounds that it is necessary to do so for the purpose of controlling pests or unwanted organisms.’

Although cats are not specifically mentioned in the Act, feral cats are managed under Regional Pest Management Plans (RPMP) permitted by this law and administered by regional councils.

Part 5 of the Act details ‘pest management’ and states that: ‘The purpose of this Part is to provide for the eradication or effective management of harmful organisms...’

The definition of ‘pest’ under s.2 of the Act is ‘an organism specified as a pest in a pest management plan’.

The definition of ‘pest management plan’ is ‘a plan to which the following apply:

- (a) it is for the eradication or effective management of a particular pest or pests:
- (b) it is made under Part 5:
- (c) it is a national pest management plan or a regional pest management plan’

RPMPs are detailed under sections 68-78 of the Biosecurity Act and, when feral cats are listed within a plan, they are considered to be an unwanted organism under the Biosecurity Act 1993 (although there is lack of clarity as to whether they specifically fall within the actual definition of ‘unwanted organism’ within s.2 the Act).

Conservation Act 1987

This Act does not contain any specific reference to cats or feral cats. However, no animals (including cats) can be trapped, killed or taken from a conservation area without a permit:

Section 38(4): Every person commits an offence against this Act who, knowingly and without a permit in that behalf issued under subsection (1) or section 26ZZH, or knowingly and otherwise than in compliance with any conditions subject to which such a permit has been issued, —

- (a) discharges any hunting weapon on, into, or over any conservation area; or
- (b) molests or pursues any animal in a conservation area; or
- (c) captures, kills, poisons, tranquillises, traps, or immobilises by any means, any animal in a conservation area; or
- (d) has in possession in any conservation area any animal or animal product; or
- (e) whether or not any animal or animal product is taken, takes or uses in or over any conservation area any aircraft, dog, hunting weapon, net, poison, ship, snare, or vehicle, for the purpose of molesting, pursuing, capturing, killing, poisoning, tranquillising, trapping, or immobilising, by any means, any animal; or
- (f) takes any animal product in a conservation area; or
- (g) whether or not any animal product is taken, takes or uses in or over any conservation area any aircraft, dog, net, ship, or vehicle, for the purpose of taking any animal product; or
- (h) enters any conservation area with a hunting weapon, net, trap, or snare, or with poison; or
- (i) sets any net, trap, or snare, on any conservation area; or
- (j) allows any animal to molest, pursue, or kill, any animal, in a conservation area.

The definition of animals is broad and there is no exemption stated for pest species and cats are not specifically mentioned.

In addition, no animals (including cats) can be released into a conservation area:

Section 39(1) Every person commits an offence against this Act who knowingly, and without the authority of the Minister or the Director-General, —

- (c) liberates any animal on any conservation area

The responsible agency is the Department of Conservation.

Wildlife Act 1953

Under s.2, cats not living in a wild state fall into the definition of 'domestic animal' for the purposes of this Act:

'any cattle, sheep, horse, mule, ass, dog, cat, pig, or goat; but does not include any such animal that is living in a wild state, or any other animal not referred to in this definition notwithstanding that it may be living in a domestic state'

Feral cats fall under the definition of 'animal':

'any mammal (not being a domestic animal or a rabbit or a hare or a seal or other marine mammal) ...'

Feral cats also come under the definition of 'wildlife' within the Act:

'wildlife means any animal that is living in a wild state; and includes any such animal or egg or offspring of any such animal held or hatched or born in captivity, whether pursuant to an authority granted under this Act or otherwise; but does not include any animals of any species specified in Schedule 6 (being animals that are wild animals subject to the Wild Animals Control Act 1977).'

Feral cats are not listed under Schedule 6 of the Act, but 'cat' is listed under Schedule 5 as one of the species that is not protected under the Act. This means that any provisions granting protection within the Act would not apply to any cats, whether they are domestic, stray or feral.

Section 14(3) specifically states that you cannot take a cat onto a wildlife refuge:

'it shall not be lawful for any person, except as provided in subsection (2) or subsection (2A) or in subsection (2) of section 5 or pursuant to an authority granted under section 53 or section 54... [to] have in his possession or control in the wildlife refuge any dog or cat...'

Section 54(1) permits the Director-General to authorise hunting or killing of wildlife causing damage:

'The Director-General, on being satisfied that injury or damage to any person or to any land or to any stock or crops or to any chattel or to other wildlife has arisen or is likely to arise through the presence on any land of any animals (whether absolutely protected or not), and whether or not the land is a wildlife refuge or a closed game area, may authorise in writing the occupier of the land, or any officer or servant of the Department, or any other person, to hunt or kill, or cause to be hunted or killed, or to catch alive for any specified purpose any such animals, or to take or destroy the eggs of any such animals, subject to such conditions and during such period as may be specified in the authority.'

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This section applies to feral cats (given that they fall within the definition of 'wildlife').

The responsible agency is the Department of Conservation.

National Parks Act 1980

This Act is aimed at preserving animals that are indigenous to New Zealand and found within a national park.

This Act does not contain any specific reference to cats or feral cats. However, Section 4 states that 'introduced plants and animals shall as far as possible be exterminated' and feral cats are an introduced animal.

Section 5A(1) states that 'Notwithstanding anything in this Act or any other enactment, but subject to subsections (2) and (3), the Minister may authorise the introduction of any biological control organism to control wild animals or animal pests or plant pests in any national park.'

Section 60(1)(b) states that it is an offence to 'take any animal into or liberate any animal in any park.'

Section 60(4) states that it is an offence '(c) from outside a park, shoot at any animal or any other object or thing inside the park with any firearm' without being authorised by the Minister.

The responsible agency is the Department of Conservation.

Local Government Act 2002

The Local Government Act makes no reference to the words 'cat', 'cats', 'feral', or 'pest' or 'pests'.

The only place that that 'animal' is mentioned is under the ability to pass a bylaw that regulates the 'keeping of animals':

Part 8

Section 146:

Specific bylaw-making powers of territorial authorities

Without limiting section 145, a territorial authority may make bylaws for its

district for the purposes—

(a) of regulating 1 or more of the following:

(i) on-site wastewater disposal systems:

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- (ii) waste management:
- (iii) trade wastes:
- (iv) solid wastes:
- (v) keeping of animals, bees, and poultry:
- (vi) trading in public places:

Section 145 (which is referenced in Section 146) states that:

“A territorial authority may make bylaws for its district for 1 or more of the following purposes:

- (a) protecting the public from nuisance:
- (b) protecting, promoting, and maintaining public health and safety:
- (c) minimising the potential for offensive behaviour in public places.”

Appendix 2: Council Bylaws pertaining to cats

Table 8: NZ North Island Council Bylaws pertaining to cats

Council	Bylaw
Auckland Council	There is no specific reference to cats in the Animal Management Bylaw 2015 . There are no restrictions on the number of cats that you can keep on your property. The Animal Management Bylaw 2015 requires all animal owners to make sure their animals do not create a nuisance or health risk to anyone else.
Carterton District Council	The Wairarapa Consolidated Bylaw 2019 Part 6 Keeping of Animals, Poultry and Bees section 5 Keeping of Cats states: “5.1. No person shall keep, on any residential property in the district, more than three cats of age three months or more, for a period exceeding 14 days, without the permission of an authorised officer.” This consolidated bylaw was adopted by Carterton District Council, Masterton District Council and South Wairarapa District Council in June 2019.
Central Hawke's Bay District Council	There is no specific reference to cats in the Keeping of Animals, Poultry and Bees Bylaw 2018.
Bay of Plenty Regional Council	There is no bylaw in reference to keeping cats.
Far North District Council	The Keeping of Animals, Poultry and Bees bylaw 2007 states: “No person shall keep, or allow to be kept, more than 5 cats or kittens over the age of 3 months on any property zoned Residential, Commercial or Industrial, as prescribed in the Far North District Plan, without the written approval of the Council No person shall keep cats or kittens if in the opinion of the Council the keeping of such cats or kittens is, or is likely to become, a nuisance or annoyance to any person or potentially dangerous or injurious to health, or a danger to wildlife.”

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Gisborne District Council	There is no reference to cats in the <u>Keeping of Animals, Poultry and Bees Bylaw 2012</u> .
Greater Wellington Regional Council	There is no bylaw in reference to keeping cats.
Hamilton City Council	There is no reference to cats in the Hamilton City Animal Nuisance Bylaw 2013.
Hastings District Council	The Hastings District Council <u>Consolidated Bylaw 2016</u> states: A person must not keep, provide food to or provide shelter for, on any premises: (a) if the premises are a stand-alone self-contained residential unit, more than four cats over the age of six months; (b) if the premises are one of two self-contained residential units, more than two cats over the age of six months in each residential unit; (c) if the premises are one of three or more self-contained residential units, more than one cat over the age of six months in each residential unit; (d) subject to clause 10.4.7, if the premises are not used for residential purposes, more than four cats over the age of six months on those premises.
Hauraki District Council	There is no reference to cats in the Hauraki District Council Nuisance Bylaw 2019.
Hawke's Bay Regional Council	There is no bylaw in reference to keeping cats.
Horizons Regional Council	There is no bylaw in reference to keeping cats.
Horowhenua District Council	The Horowhenua District Council's Animal Nuisance and the Keeping of Pigs, Poultry and Bees Bylaw 2014 states: "No person shall keep cats and kittens where the number kept becomes offensive to the occupier of a neighbouring property, a threat to public health or an endangerment to neighbouring animals. If the keeping of any cats on a premises is, or is likely to become: a) A nuisance, b) Injurious or c) Hazardous

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	<p>To the health, property or safety of any person, then the Authorised officers may by, notice in writing, require the person who owns the premises to do all or any of the following:</p> <ul style="list-style-type: none"> a) Reduce the number of cats kept on the property b) Take other such precautions as may be considered necessary by the Authorised officer to reduce the effects as listed in subclauses (a) – (c) above.”
Hutt City Council	<p>The Hutt City Council Control of Animals Bylaw 2018 states:</p> <p>“2.1 All animals shall be kept in a manner that is not, or is not likely to become, a nuisance, dangerous, offensive, or injurious to health.</p> <p>2.2 All animals shall be kept in a manner that ensures they have adequate physical well-being through acceptable nutrition, environmental, health and behavioural stimulus, and adequate mental well-being.</p> <p>2.3 All domestic animals, other than domestic cats, found at large and not within their owner's property may be seized and impounded by an authorised officer.”</p>
Kaipara District Council	<p>The Kaipara District Council General Bylaws 2008 states:</p> <p>“No person without the written authority of Council shall keep more than five cats of an age greater than three months on any property zoned residential, commercial or industrial. In granting permission to keep more than five cats Council may set conditions as it seems fit to ensure that no nuisance shall arise to the public or any resident in the area.”</p>
Kapiti Coast District Council	<p>There is no reference to cats in the Keeping of Animals, Bees and Poultry Bylaw 2010.</p>
Kawerau District Council	<p>There is no reference to cats in the General Bylaw: Control of Stock, Poultry and Bees 2019.</p> <p>Pet animals such as cats, caged birds, pet rabbits and dogs are excluded from this bylaw.</p>
Manawatu District Council	<p>The Animal Bylaw 2019 Part 3 – Cats states:</p> <p>“10 Number of Cats on Premises</p>

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	<p>10.1 Any person Keeping cats must not Keep, on any one Rateable Property in the District, more than four cats over the age of three months.</p> <p>10.2 On a Rateable Property that contains more than one dwelling, no more than one cat over the age of three months per dwelling is allowed to be Kept.</p> <p>Clauses 10.1 and 10.2 do not apply to:</p> <p>(a) Any cats over the age of three months being kept for no longer than 14 days; and</p> <p>(b) Lawfully established Vets, SPCA or similar registered charities, and boarding premises.</p> <p>11 Cats becoming a Nuisance or Injurious to Health</p> <p>11.1 If, in the opinion of any Enforcement Officer, the Keeping of any cats on a Premises is, or is likely to become a Nuisance do all or any of the following:</p> <p>(a) reduce the number of cats kept on the Premises;</p> <p>(b) take other such precautions as may be considered necessary by the Council Officer to reduce the Nuisance effects.</p> <p>11.2 Compliance with a notice under clause 11.1 must take place within the time specified in such notice, not being less than 14 days.”</p>
<p>Masterton District Council</p>	<p>The Wairarapa Consolidated Bylaw 2019 Part 6 Keeping of Animals, Poultry and Bees section 5 Keeping of Cats states:</p> <p>“5.1. No person shall keep, on any residential property in the district, more than three cats of age three months or more, for a period exceeding 14 days, without the permission of an authorised officer.”</p> <p>This consolidated bylaw was adopted by Carterton District Council, Masterton District Council and South Wairarapa District Council in June 2019.</p>
<p>Matamata-Piako District Council</p>	<p>There is no reference to cats in the Consolidated Bylaw 2008: 6 Keeping of Animals (excluding dogs).</p>
<p>Napier City Council</p>	<p>The Animal Control Bylaw 2014 states:</p>

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	<p>“There is no limit to the number of cats permitted to be kept in any premises providing the cats are sufficiently cared for in accordance with the Animal Welfare (Companion Cats) code of welfare 2007, however catteries require resource consent under the District plan.</p> <p>If the keeping of cats causes an environmental health issue, the number of cats may be limited on a case by case basis at the discretion of the Regulatory Services Manager.”</p>
<p>New Plymouth District Council</p>	<p>The New Plymouth District Council Bylaw 2008: Animals states:</p> <p>“Keeping of cats or kittens</p> <p>7.1 No person shall keep five or more cats or kittens over six months of age within or by any household unit in an urban area except with the written approval of an authorised officer.</p> <p>7.2 Before granting any approval under clause 7.1, the authorised officer must be satisfied that:</p> <p>a) The cats or kittens will be adequately housed and that no nuisance will result; and</p> <p>b) Any other lawful requirements of the council have been satisfied including any relevant provisions of the New Plymouth District Plan.</p> <p>7.3 The approval of the authorised officer under clause 7.1 may include such terms and conditions as the authorised officer considers appropriate in the circumstances.</p> <p>7.4 Despite clause 7.1, a breeder of cats may keep more than five cats in the breeder’s cattery if the breeder and the cattery meet the following criteria:</p> <p>a) The breeder is a full voting member of the Taranaki Cat Club Incorporated; and</p> <p>b) The breeder holds a registered prefix granted to them by the New Zealand Cat Fancy; and</p> <p>c) The breeder’s cats are held in a cattery accredited under the Cattery Accreditation Scheme operated by the New Zealand Cat Fancy; and</p> <p>d) The number of cats held in the cattery must be no more than that for which the cattery is accredited; and</p>

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	<p>e) The cattery is operated to a high standard of hygiene at all times; and</p> <p>f) The cattery does not create a nuisance.</p> <p>7.5 Despite clause 7.1 a breeder may keep up to five free living cats in the breeder's household in addition to the number in their cattery.</p> <p>7.6 If, in the opinion of an authorised officer, any cattery creates a nuisance, or a health nuisance is caused by the keeping of cats or kittens (due to odour or accumulated faecal matter), the council may by written notice to the breeder, owner or occupier, as the case may be, require the breeder, owner or occupier to abate the nuisance.”</p>
Northland Regional Council	<p>There is no bylaw in reference to keeping cats.</p> <p>This regional council includes Far north, Kaipara and Whangarei district councils.</p>
Opotiki District Council	<p>There is no reference to cats in the Animals Bylaw 2008.</p>
Otorohanga District Council	<p>There is no bylaw in reference to cats.</p>
Palmerston North City Council	<p>The Palmerston North Animals and Bees Bylaw 2018 states:</p> <p>8. CATS ON PREMISES</p> <p>8.1 No person may keep more than three cats per dwelling on any private land in the urban area without a permit issued under this Bylaw.</p> <p>8.2 If the Council issues a permit to a person to keep more than three cats under clause 8.1 then the permit holder must comply with the conditions of that permit.</p> <p>8.3 No cats kept for breeding purposes shall be housed within 1.8 metres of the boundary of any adjoining property in the urban area unless the housing is within a dwelling house.</p> <p>8.4 The restrictions of clauses 8.1 and 8.3 shall not apply to kittens below the age of three months.</p> <p>8.5 Nothing in clause 8.1 applies to the SPCA or other animal shelter or a lawfully established veterinary clinic or cattery. 8.6 Nothing in clause 8 precludes the need for a resource consent under the District Plan.</p>

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	<p>8.7 Every person who keeps cats must ensure:</p> <p>a. Cats over six months of age are microchipped and registered with the New Zealand Companion Animals Register, or other Council approved microchip registry.</p> <p>b. Cats over six months are desexed (unless kept for breeding purposes and are registered with a nationally recognised cat breeders' body including New Zealand Cat Fancy Ltd. and Catz Inc.).</p> <p>8.8 Clause 8.7 applies to all cats born after 1 July 2018.</p>
Porirua City Council	<p>There is no bylaw in reference to keeping cats.</p> <p>Cats and dogs are excluded from the Porirua City Council General Bylaw 1991: Keeping of animals.</p>
Rangitikei District Council	<p>The Animal Control Bylaw 2019 states:</p> <p>"6. Cats</p> <p>6.1 No person shall keep more than three cats over three months of age on any household unit in any urban area, unless given a written dispensation by an enforcement officer.</p> <p>6.2 Clause 6.1 shall not apply to any veterinary clinic, SPCA shelter, or registered breeder as accredited under the Cattery Accreditation Scheme operated by the New Zealand Cat Fancy.</p> <p>Note: Boarding or breeding establishments for more than 15 cats require resource consent under the operative District Plan."</p>
Rotorua Lakes Council	<p>There is no bylaw in reference to keeping cats.</p>
Ruapehu District Council	<p>The Ruapehu Bylaw 2018 states:</p> <p>25 CATS</p> <p>25.1 No person or household shall keep more than 4 cats older than 6 months without a permit from Council.</p> <p>25.2 No person shall feed and/or attract feral cat(s) to their premises.</p>
South Taranaki District Council	<p>The Keeping of Animals bylaw 2018 states:</p> <p>"9.0 Encouraging nuisances by Feral or Semi Domesticated Animals (including Cats)</p>

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	<p>9.1 No person shall provide sustenance, harbourage or comfort to feral or semi domesticated animals so as to cause them to become a nuisance to other persons.</p> <p>9.2 Where feral or semi domesticated animal(s) cause a nuisance, the owner of the property from which such animals emanate shall be required to abate the nuisance caused by the animal(s). Actions may include but are not limited to:</p> <ul style="list-style-type: none"> a) claiming the animal(s) as a domestic owned pet and keep it in such a state as to abate any nuisance; b) permanently removing it so it no longer causes a nuisance to others; or c) The Council removing feral or semi-domesticated animals causing a nuisance, and claiming costs from the owner or person giving sustenance, harbourage or comfort.
<p>South Waikato District Council</p>	<p>The Keeping of Animals: Poultry and Bees Bylaw 2017 states:</p> <p>“7.2 Keeping of cats or kittens</p> <p>7.2.1 An authorised officer may impose a limit on the number of cats which may be kept on private land (such limit being not more than five) where:</p> <ul style="list-style-type: none"> (a) the Council has received a complaint about the number of cats kept on the private land; and (b) the officer considers that the number of cats creates or is likely to create a public health nuisance; and (c) the person keeping those cats fails to comply with any reasonable request of the officer to abate or prevent the nuisance created. <p>7.2.2 No person shall keep five or more cats or kittens over six months of age within, or adjacent to any household unit, in an urban area except with the written approval of an authorised officer.</p> <p>7.2.3 Before granting any approval under clause 7.2.1, the authorised officer must be satisfied that:</p> <ul style="list-style-type: none"> (a) The cats or kittens will be adequately housed and that no nuisance will result. (b) Any other lawful requirements of the Council have been satisfied including any relevant provisions of the District Plan.

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	<p>7.2.4 The approval of the authorised officer under clause 7.2.2 may include such terms and conditions as the authorised officer considers appropriate in the circumstances.</p> <p>7.2.5 Despite clause 7.2.1, a breeder of cats may keep more than five cats in the breeder's cattery if the cattery meets the following criteria:</p> <ul style="list-style-type: none"> (a) The breeder holds a registered prefix granted to them by the New Zealand Cat Fancy; (b) The breeder cats are held in a cattery accredited under the Cattery Accreditation Scheme operated by the New Zealand Cat Fancy Incorporated; (c) The number of cats held in the cattery must be no more than that for which the cattery is accredited; (d) The cattery is operated to a high standard of hygiene at all times; (e) The cattery does not create a nuisance. <p>7.2.6 Despite clause 7.2.1 a breeder may keep up to five free-living cats in the breeder's household, in addition to the number in their cattery.</p> <p>7.2.7 If, in the opinion of an authorised officer, any cattery has created a nuisance, or a health nuisance is caused by the keeping of cats or kittens (due to odour or accumulated faecal matter), the Council may by written notice sent to the breeder, owner or occupier, as the case may be, require the breeder, owner or occupier to abate the nuisance.</p> <p>7.2.8 It is the duty of the breeder, owner or occupier to abate the nuisance as required by any notice sent under clause 7.2.7.”</p>
<p>South Wairarapa District Council</p>	<p>The Wairarapa Consolidated Bylaw 2019 Part 6 Keeping of Animals, Poultry and Bees section 5 Keeping of Cats states:</p> <p>“5.1. No person shall keep, on any residential property in the district, more than three cats of age three months or more, for a period exceeding 14 days, without the permission of an authorised officer.”</p> <p>This consolidated bylaw was adopted by Carterton District Council, Masterton District Council and South Wairarapa District Council in June 2019.</p>
<p>Stratford District Council</p>	<p>There is no reference to cats in The keeping of Animals and Poultry Bylaw</p>

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Taranaki Regional Council	There is no bylaw in reference to keeping cats.
Tararua District Council	<p>The Keeping of Animals, Cat, Poultry and Bees Bylaw 2018 states: "8 CATS 8.1 No household shall keep more than three (3) cats where, in the opinion of an authorised officer acting on a complaint, the number becomes offensive to the occupier of a neighbouring property, a threat to public health, or an endangerment to neighbouring animals. 8.2 If the keeping of cats on a premises is, or is likely to become:</p> <ul style="list-style-type: none"> a. A nuisance, b. Injurious, or c. Hazardous <p>To the health, property or safety of any person then an authorised officer may, by notice in writing, require the person who owns the premises to do all or any of the following:</p> <ul style="list-style-type: none"> d. Reduce the number of cats kept on the premises, e. Require the cats to be neutered or speyed where permitted to do so in law, f. Take other such precautions as are deemed necessary and specified by the authorised officer to reduce the effects listed in sub-clauses a-c above. <p>It is the duty of the owner or occupier of the premises to abate the nuisance as required in the notice within the time period specified in that notice.</p>
Taupo District Council	Cats are excluded from the Animals Poultry and Bees Bylaw 2016.
Tauranga City Council	There is no reference to cats in The Keeping of Animals Bylaw 2018.
Thames-Coromandel District Council	Cats are excluded from the Animal Nuisance Bylaw 2019.
Upper Hutt City Council	There is no bylaw in reference to keeping cats.
Waikato District Council	There is no reference to cats in the Keeping of animals bylaw 2015.

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Waikato Regional Council	There is no bylaw in reference to keeping cats.
Waipa District Council	There is no bylaw in reference to keeping cats.
Wairoa District Council	There is no bylaw in reference to keeping cats.
Waitomo District Council	There is no bylaw in reference to keeping cats.
Wanganui District Council	<p>The Keeping of Animals, Poultry and Bees Bylaw 2015 states:</p> <p>“8. Cats</p> <p>8.1 There is no limit to the number of cats permitted to be kept on any Premise provided the cats are sufficiently cared for and the keeping of such cats does not cause, or is likely to cause a Nuisance.</p> <p>8.2 In the event of a Nuisance caused by the cats and upon written notice being served upon the owner by an Authorised Council Officer, it shall be the duty of the owner to do such work or reduce the number of cats to abate any Nuisance. In the case of neglect or refusal on the part of the owner to comply with, execute, or do such work or reduce the number of cats, the owner commits an offence under this Bylaw. In such a case Authorised Council Officers may remove such cats as they deem necessary to abate the Nuisance.</p> <p>8.3 Authorised Council Officers have delegated discretionary authority to impose a limit on the number of cats which may be kept on any Premise where:</p> <p>a) Council has received a complaint about the number of cats kept on the premise; and</p> <p>b) The Authorised Council Officer considers that the number of cats causes or is likely to cause a public health Nuisance; and</p> <p>c) The person keeping the cats fails to comply with any reasonable request of an Authorised Council Officer to abate or prevent the Nuisance created.”</p>
Wellington City Council	<ul style="list-style-type: none"> - The Wellington Consolidated Bylaw 2008 Part 2 Animals states: - “4. Cats

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	<ul style="list-style-type: none"> - The bylaw on microchipping cats was passed at the Environment Committee on 4 August 2016. The bylaw will come into place in early 2018, giving owners 18 months to meet the new requirement for cats to be microchipped. - 4.1 All domestic cats over the age of 12 weeks must be microchipped and the cat's microchip registered with New Zealand Companion Animal Register.
Western Bay of Plenty District Council	<p>There is no reference to cats in the Animal (excluding dogs) Bylaw 2019 other than:</p> <p>“No Person may cause or allow any Animal, except for cats or birds, kept within any Premises to escape or wander so as to be offensive or be likely to endanger any Person.”</p>
Whakatane District Council	<p>There is no reference to cats in the Control of Animals (excluding dogs), Bess and Poultry Bylaw 2018.</p>
Whangarei District Council	<p>There is no reference to cats in the Animals Bylaw 2017.</p>

Table 9: NZ South Island Council Bylaws pertaining to cats

Council	Bylaw
Ashburton District Council	There is no reference to cats in the Keeping of Animals, Bees, and Poultry Bylaw 2016.
Buller District Council	The NZS 9201: Part 13 The Keeping of Animals, Section 1306: The keeping of cats states: "1306.1 In areas other than those zoned rural, no person within the district shall allow or cause to remain or keep more than three cats of a greater age than six months, which are deemed to be annoying or troublesome to others. 1306.2 On receipt of a complaint signed by not less than three householders, the Council may, after investigation, serve a notice requiring a reduction of cat numbers. This bylaw section shall not apply to any premises approved for the business of boarding or breeding cats, or any veterinary practice or SPCA shelter."
Central Otago District Council	There is no reference to cats in the Bylaw's Part 4 : Keeping of Animals, Poultry and Bees.
Chatham Islands Council	There is no bylaw in reference to keeping cats.
Christchurch City Council	There is no bylaw in reference to keeping cats.
Clutha District Council	The is no reference to cats in the Clutha District Council Regulatory Bylaws 2018.
Dunedin City Council	There is no reference to cats in the Keeping of Animals (excluding dogs) and Birds Bylaw 2016 other than: "Every person keeping an animal, other than cats, pigeons, and doves, shall be responsible for ensuring that the animal is caged or otherwise restrained within the boundaries of the private land on which it is kept."
Environment Canterbury	There is no bylaw in reference to keeping cats.

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Environment Southland	There is no bylaw in reference to keeping cats.
Gore District Council	There is no reference to cats in the Keeping of Animals, Poultry and Bees Bylaw 2016.
Grey District Council	There is no reference to cats in the New Zealand Standard Model General Bylaws: The Keeping of Animals, Poultry and Bees 1999.
Hurunui District Council	There is no reference to cats in the Keeping of Animals in Settlement Areas Bylaw 2017.
Invercargill City Council	<p>The Invercargill City Council Bylaw 2013/2 – Keeping of Animals, Poultry and Bees states:</p> <p>“Keeping of Cats and Kittens</p> <p>8.1 The Director of Environmental and Planning Services may impose a limit on the number of cats and kittens which may be kept on private land, such limit being no more than three, where:</p> <p>(a) the Council has received a complaint about the number of cats kept on the private land; and / or</p> <p>(b) the number of cats is creating a nuisance or is likely to create a nuisance; and</p> <p>(c) the person keeping those cats fails to comply with any reasonable request of an Authorised Officer to abate or prevent the nuisance.</p> <p>8.2 The Invercargill City Council recommends the keeping of no more than three cats on any private property.”</p>
Kaikoura District Council	There is no bylaw in reference to keeping cats. The Kaikoura District Council website has information on responsible cat ownership: https://www.kaikoura.govt.nz/our-district/environment/biodiversity/
Mackenzie District Council	There is no bylaw in reference to keeping cats.
Marlborough District Council	<p>The Animals Bylaw 2017 states:</p> <p>8. Restrictions on keeping cats</p>

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	<p>(1) No person may keep on any land more than four cats over the age of 3 months without the prior written permission of Council.</p> <p>(2) Nothing in this bylaw applies to the SPCA or other animal shelter or a lawfully established veterinary clinic or cattery.</p>
Nelson City Council	There is no reference to cats in the Urban Environments Bylaw 225 2015.
Otago Regional Council	There is no bylaw in reference to keeping cats.
Queenstown Lakes District Council	There is no bylaw in reference to keeping cats.
Selwyn District Council	There is no bylaw in reference to keeping cats.
Southland District Council	<p>The Southland District Council’s The Keeping of Animals, Poultry and Bees Bylaw 2010 states:</p> <p>“2.3 An Environmental Health Officer may impose a limit on the number of cats which may be kept on a private land (such limit being not more than five) where:</p> <p>(a) the Council has received a complaint about the number of cats kept on the private land; and</p> <p>(b) the officer considers that the number of cats is creating a nuisance or is likely to create nuisance; and</p> <p>(c) the person keeping those cats fails to comply with any reasonable request of the officer to abate or prevent the nuisance.”</p>
Tasman District Council	There is no bylaw in reference to keeping cats.
Timaru District Council	There is no reference to keeping cats in the Timaru District Consolidated Bylaw 2018 Chapter 17 The Keeping of Animals, poultry and Bees.
Waimakariri District Council	There is no bylaw in reference to keeping cats.
Waimate District Council	There is no reference to cats in the Waimate District Consolidated Bylaw 2018.

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Waitaki District Council	<p>The Waitaki District General Bylaw 2018 states:</p> <p>“If, in the opinion of any Authorised Officer, the keeping of animals (including domestic companion cats) or birds on any Rateable Property or Dwelling house is, or is likely to become:</p> <ul style="list-style-type: none"> a. A nuisance; or b. Injurious; or c. Hazardous <p>to the health, safety or amenity of any persons or their property, then the Authorised Officer may by written notice require the owner or occupier of the Rateable Property or Dwelling house to do all or some of the following:</p> <ul style="list-style-type: none"> i) Reduce the number of animals or birds kept on the Rateable Property or Dwelling house; and/or ii) Take other precautions as may be considered necessary to reduce the effects listed in a. to c. of Bylaw 54.”
West Coast Regional Council	There is no bylaw in reference to keeping cats.
Westland District Council	There is no bylaw in reference to keeping cats.

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Table 10: NZ Regional Pest Management Plans – Summary for Cats

Council	Status	Definition	Rule
Auckland	Unowned Cat ¹ (<i>Felis catus</i>)	(a) Any cat which is not: (i) Microchipped, or otherwise identified with owner’s name and address; and (ii) Registered on the New Zealand Companion Animal Register b) which is within any site that contains a resident or breeding or roosting population of any regionally or nationally threatened bird, reptile or amphibian, and is in a rural area.	<ul style="list-style-type: none"> • Hauraki Gulf site-led programme 7.1.2.2: <ul style="list-style-type: none"> ○ Rule 7.1.2.2.1 No person shall move or allow to be moved any unowned cat to or among islands within the Hauraki Gulf Controlled Area. ○ Rule 7.1.2.2.2 No person shall bring any cat within 200m of any cat-free island within the Hauraki Gulf Controlled Area. Rule 7.1.2.2.3 All commercial transport operators moving goods or people to or among Hauraki Gulf Islands must attain and maintain Pest Free Warrant accreditation. ○ Rule 7.1.2.2.4 All persons intending to move a building to or among islands in the Hauraki Gulf Controlled Area must notify Auckland Council at least 10 working days prior to movement, to arrange inspection and approval by Auckland Council.

¹ Note: based on current knowledge of species distributions at time of writing, sites that meet these criteria are shown in Map 3. Note also cat control will only be undertaken on public land or on private land with consent of land occupier (see principle measures of achievement overleaf). Note: this programme does not prevent the continuing sale and distribution of cats within the region.

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			<ul style="list-style-type: none"> • Auckland region site-led control programme 7.7.4.1²: <ul style="list-style-type: none"> ○ Rule 7.7.4.1.1 No person shall abandon, or cause to be abandoned, any cat within the Auckland region. ○ Rule 7.7.4.1.2 No person shall feed any cat on any park within the Auckland region that contains a resident or breeding or roosting population of any threatened native bird, reptile or amphibian. • Rule 7.7.4.1.3 Any owner of a cat must ensure their cat does not enter an intensively managed site as defined by Map 10 (see ARC RPMP).
Bay of Plenty	Non-RPMP pest	Considered part of the region’s biosecurity framework but not subject to provisions in this RPMP.	None listed
Gisborne	Pest: feral cat	<p>Cats without a collar/harness or microchip that are found outside the Gisborne urban area or a rural ownership.</p> <p>They have none of their needs provided by humans and survive by hunting their food.</p>	<ul style="list-style-type: none"> • Where a Site Led Pest Management Programme has been declared, all occupiers shall on a complaints basis, and unless otherwise agreed between the neighbours and an authorised GDC staff member, control feral cat, act to significantly reduce the chance of these pests from their property re-infesting the adjacent property.
Wellington	Pest: pest cat	<p>Pest cat means any cat within the Wellington Region that is:</p> <p>(ii) Not microchipped in an area where microchipping is compulsory, and free-living, unowned and unsocialised, and has limited or no relationship with or dependence on humans, or</p>	<ul style="list-style-type: none"> • Rule 1. No person shall feed or provide shelter to pest cats on private or public land within the Wellington Region, without the permission of the occupier.

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		(iii) Not microchipped, or registered on the New Zealand Companion Animal Register, and is free-living, unowned and unsocialised, and has limited or no relationship with or dependence on humans	
Hawkes Bay	Pest: feral cats	Any cat living in a wild state and not being kept as a domestic pet.	<ul style="list-style-type: none"> All occupiers within a Predator Control Area shall maintain cats in accordance with the Hawke's Bay Regional Predator Control Technical Protocol (PN 4970).
Northland	Pest: cats (feral, stray)	Feral: Cats that have none of their needs provided by humans. Stray: Stray cats are companion/domestic cats that have been lost or abandoned. They may have many of their needs indirectly supplied by humans and live around centres of human habitation.	None listed besides the Biosecurity act pest rules.
Waikato	Pest: feral cats	Feral cats resemble domestic cats in size and colouration. They live in most terrestrial habitats, including sand dunes, pasture, forest, tussock and scrub, from sea level to elevations of about 3000m. If conditions are favourable they can have three litters per year. Feral cats are present throughout the region. Feral cats differ from stray cats. Stray cats are defined as cats that rely on food or shelter that is provided intentionally or otherwise by humans. This category includes animals kept on farms for rodent control and abandoned cats living in urban fringe situations such as rubbish dumps. Reproduction in these populations is not usually manipulated by humans. Feral cats are defined as	<ul style="list-style-type: none"> No person shall knowingly abandon or release, or cause to abandon or release to the wild any cat. No person shall actively assist in the maintenance of any feral cat.

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		free-living cats that have minimal or no reliance on humans, and which survive and reproduce in self-perpetuating populations (National Possum Control Agencies 2009. Feral and Stray Cats, Monitoring and Control, a Preliminary Guideline Towards Good Practice).	
Canterbury Chatham	Species/organism of interest: feral cats	None listed.	None listed.
Otago	Pest: feral cats	Not much of a definition. Only comparison with other cats: 'They tend to be solitary and territorial compared to domestic stray or unwanted cats that tend to form colonies.' Feral defined as: wild or otherwise unmanaged.	<ul style="list-style-type: none"> No person shall keep, hold, enclose or otherwise harbour in any place, either in transit to or present on Quarantine and Goat Islands any feral cats.
Southland	Pest: feral cats, Bengal cats. Pest agent: domestic cat	<p>Only comparison with other cats: 'Feral cats tend to be solitary and territorial compared to domestic stray or unwanted cats that tend to form colonies.' Feral defined as: wild or otherwise unmanaged.</p> <p>Domestic cats are only considered pest agents:</p> <ol style="list-style-type: none"> within the Stewart Island Rakiura Site-led Programme Zone; and where they are not de-sexed and microchipped 	<ul style="list-style-type: none"> Rule 6: No person other than an authorised person shall possess, keep, hold, enclose or otherwise harbour any Bengal cat within the Southland region. <ul style="list-style-type: none"> Exemptions to this will be considered by Environment Southland where it can be demonstrated that any animal has been de-sexed and micro-chipped for identification and the person is not living on, or travelling to, Stewart Island/Rakiura or any other offshore island. Rule 7: Any person who detects or suspects the presence of any Bengal cat within the Southland region, must immediately report the pest's presence and location to Environment Southland. Rule 25: No person shall keep, hold, enclose, either in transit to or present on Stewart Island/ Rakiura site any feral cat.

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			<ul style="list-style-type: none"> • Rule 27: Note: This is a pest agent rule. No person shall: (i) keep, hold, enclose or otherwise harbour in any place, either in transit to or present on the Stewart Island/Rakiura site any domestic cat; or (ii) release into the wild on the Stewart Island/Rakiura site any domestic cat. <ul style="list-style-type: none"> ○ Any person who is responsible for a domestic cat that is de-sexed and its identity microchipped is exempted from the provisions of Rule 27(i).
Tasman and Nelson	Pest: feral cats. Species/organism of interest	Not defined.	No rules listed.

Appendix 3: International examples of existing cat control specific legislation

Please note that cat populations are defined and referred to differently in different countries. In many countries free roaming cats are referred to as feral but these may be the same as stray or feral cats (or even free-roaming companion cats) as defined under New Zealand law.

Australia

*Table 11: Australian state-based legislation for domestic cat management**

Element	ACT	NSW	QLD	SA	TAS	VIC	WA
Cat registration	No	Yes by 6 months	No	No	No	Yes from 3 months	Yes from 6 months
Identification (collar & tag)	No	No	No	No	No	No	Yes
Microchip	Yes prior to sale/ transfer and by 12 weeks	Yes prior to sale/ transfer and by 12 weeks	Yes prior to 12 weeks	Yes prior to sale/ transfer and by 12 weeks	Yes by 6 months	Yes at 3 months	Yes by 6 months of age
Desexing	Yes by 3 months	No	No	Yes by 6 months	Yes by 6 months	No	Yes by 6 months

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Breeder registration	Yes from 3 months for entire cat	No	No	Yes by 6 months	No	Yes if have >3 fertile cats	Yes by 6 months
Breeder required to comply with Standards	Yes	Yes	No	Yes	No	Yes	No
Must not abandon a cat	No	No	No	No	Yes	Yes	No
Must not feed feral/stray cat	No	No	No	No	No	Yes	No
Nuisance	Yes	Yes	No	No	No	Yes	Yes
Stray cats to be surrendered	No	No	No	No	No	Yes	No
Prohibited areas	Yes	Yes	No	Yes	No	No	No
Animal Management Plans	No	No	No	Yes	No	Yes	No
Modified from the 'Comparison of key elements of state-based cat management legislation' table in Identifying Best Practice Cat Management in Australia (RSPCA Australia 2018)							

* There is no territory-based legislation relating to cat management in the NT.

Canada

Most municipalities in Canada have had dog control bylaws for many years, but very few municipalities have cat bylaws. Historically, it has been widely accepted that cats are allowed to roam free. This is beginning to change and now eight municipalities in British Columbia mandate that cats may not 'roam at large' and ten municipalities in British Columbia prohibit owner/guardians from allowing non-desexed cats to 'roam at large' (Human Canada: www.humanecanada.ca/animal_control).

Other municipalities are bringing in bylaws requiring cats to be registered and identified and placing limits on the number of cats allowed to be kept. For example, in the City of Ottawa ([The Animal Care and Control By-law \(By-law No. 2003-77\)](#))

Lithuania

A new law in Lithuania that came into effect on 1st January 2016 requires that all cats are microchipped. The ownership information is stored in a database run by the state.

In addition, municipalities are required to "organise activities to reduce the number of stray pets in a municipality, temporary care for homeless and stray animals and return of homeless animals to their owners".

Article 5 of the law states that "[it is not cruel treatment to] set free stray cats captured and neutered in accordance with cat neutering programmes coordinated with the municipal administration".

Breeding is also discussed within the law, for example, "Pet owners, except for the persons breeding pets for commercial purposes, must ensure that their pets would not reproduce unless they ensure the transfer of pet offspring to new owners (except for their transfer to an animal carer) or take care of them themselves."

Section IV of the law deals with stray and homeless animals and states:

- "Article 13. Stray and Homeless Animals
 1. In the territory of a municipality, temporary care of captured stray and homeless animals and stray and homeless animals reported by persons who capture, but cannot keep them shall be organised by the municipal administration in accordance with the procedure specified by the head of the municipal administration.

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2. In accordance with the procedure set out by the head of the municipal administration, the municipal administration shall, within its remit, participate in implementing stray cat neutering programmes drafted by animal care organisations.
3. When catching stray and homeless animals, animals caught must be subjected to as little physical and mental suffering as possible.
4. Neutered and externally marked stray cats caught must be immediately released, except where they are suspected to be ill or are maimed.

Article 14. Temporary Care of Stray and Homeless Animals Organised by Municipal Administrations

1. All stray and homeless pets whose capture is organised by the municipal administration or which are reported by persons who catch stray or homeless pets, but cannot keep them shall be transferred to an animal carer, and stray or homeless domestic animals – to a keeper of domestic animals able to temporarily take care of a domestic animal.
2. Upon the expiry of the period referred to in Article 4.61(3) of the Civil Code and where the animal owner remains unidentified, an animal shall be transferred free of charge to the person having taken care of it.

Article 15. Requirements for Animal Carers

1. Animal carers must meet the requirements set forth by legal acts.
2. In order to keep animals, animal carers may establish pet shelters.
3. Animal carers must: 1) check the condition of health of every animal reaching them, evaluate the possibility to further keep it and ensure the necessary veterinary assistance and vaccination of animals; 2) check the animal's identification to identify the owner of the animal and, where the owner is identified, immediately inform him about the animal found; 3) ensure publication of information about stray and homeless animals kept; 4) search for new owners for animals and provide new owners with all the necessary information about an animal, its health condition and how to keep it and ensure its welfare; 5) create conditions for keeping animals without jeopardising their health and welfare.
4. Animal carers may not breed animals."

USA

There are limited state laws relating to cats in the USA. There are anti-cruelty laws but other than these the majority of state laws address public health issues, such as requiring cats to be vaccinated against rabies.

Please note that laws in the USA refer to any free roaming cats as feral but these may be the same as stray or feral cats (or even free-roaming companion cats) as defined under New Zealand law.

Free-roaming and feral cats are generally considered by states to be a local issue but most states try to reduce the number of free-roaming and feral cats by requiring cats that are adopted from pounds and shelters to be desexed.

The only states that have comprehensive 'cat codes' are California, Maine, and Rhode Island:

- California mandates the minimum time for weaning kittens, yearly veterinary requirements, and holding periods for impounded cats and also has a comprehensive policy statement on the issue of feral cats.
- Maine mandates the seizure of stray cats and vaccination requirements.
- Rhode Island has a 'Cat Identification' act. RI ST 4-22-1 et. seq. which requires that cats display some form of identification (tag, tattoo, etc.) in an effort to reduce the feral/stray cat problem. The law also reduces the retention period for cats impounded without some form of identification. This state also has the 'Rhode Island Permit Program for Cats', which requires a permit for breeding and other cats to be desexed by 6 months of age.

Local legislation

Some communities in the U.S. have passed their own cat and TNR ordinances. For example:

- The Mountainbrook, Alabama: Code of Ordinances. Sec. 6-3. - Impoundment of stray, feral, or abandoned cats and felines states:

"(a) The City of Mountain Brook or its representatives, including the dog warden, animal control officer, or person serving in like capacity, or such persons or firms as may be designated or employed by the city or with whom the city may contract for such purposes, shall have the authority to trap or collect by humane means and impound any cat or member of the feline family that appears to be stray, abandoned, feral, undomesticated, or uncared for based on the

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behaviour or physical condition of the cat, and the absence of any collar, tag, microchip, or other means of identifying the name, address, or telephone number of the owner of the cat.

(b) If the impounded cat is not redeemed by its owner or placed with a new owner, the city or its representatives shall be authorized to euthanize and/or dispose of the cat in a merciful manner after following the process prescribed by section 6-110 of this Code.

(c) The collection, care, and disposition of any impounded cat shall be subject to state law governing such practices, including but not limited to desexing requirements set forth in the Code of Ala. 1975, § 3-9-2.

(d) If the impounded cat is determined by reasonable means to be infected with rabies, the cat shall be deemed a public nuisance and a danger to the health and safety of the community and shall be euthanized in a merciful manner.

(e) A cat that is trapped and impounded pursuant to subsection (a) herein may be released into the general area from which it was trapped subject to the following requirements:

(1) The cat is determined by reasonable means to be feral or undomesticated and not suitable for adoption;

(2) The cat is determined by reasonable means to be healthy and without disease or infection of any kind, including not falling within the purview of subsection (d) herein;

(3) The cat is sterilized³ pursuant to the sterilization⁴ requirements set forth in the Code of Ala. 1975, § 3-9-2 and other state law governing such practices;

(4) The cat is vaccinated for rabies; and

(5) The cat is marked with ear tags, a clipped ear, or other means to identify that said cat has been sterilized¹.

(f) The purpose of this section is to authorize the humane trapping, collection, and sterilization² and/or disposal of cats that are reasonably believed not to be owned or under the care of any person and which, by virtue of such status and other indicia, are deemed to represent an actual or potential threat to the health, safety, and welfare of the public. Nothing herein shall be deemed to prevent the city and its employees or agents from using reasonable discretion in discharging

³ Desexed

⁴ Desexing

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the functions and activities hereby authorized. Nothing herein shall be interpreted or deemed to create or to impose on the city, its agents, employees, persons, or entities acting on behalf thereof any duty, standard of care, or liability to the public generally or to any member thereof with respect to the collection, care, or disposition of cats impounded under the authority hereof.”

- Elk Grove, California:
 - Owned cats and dogs in Elk Grove must be licensed while feral and community cats are exempt from licensing requirements.
 - Elk Grove has a limit to the number of dogs and cats a person can keep. The relevant Ordinance states:
 - “Limitation on number of dogs and cats. It is unlawful for any person to keep or harbour more than four (4) dogs or four (4) cats or a combination of both not to exceed a total of four (4), which are over the age of four (4) months on or in any lot, premises, dwelling, building, structure, boat, or living accommodation.”

Elk Grove also mandates that no dog or cat shall be released for adoption without being desexed or without a written agreement from the adopter guaranteeing that such animal will be desexed and a desexing deposit made.

Appendix 4: Response to consultation feedback

Dear Stakeholder,

Thank you for taking the time to give feedback during the first and/or second round of consultation on the National Cat Management Strategy draft documents. We appreciate your input and engagement with this important issue and recognise the importance of working with the many stakeholders in cat management.

There was great diversity in the involved stakeholders' positions and approaches to the issue of cat management. It has been the National Cat Management Strategy Group's (NCMSG) intention to devise a strategy that is evidence-based, measured, moderate and practically applicable. While the NCMSG carefully considered all the feedback given it is acknowledged that it has not been possible to incorporate all of the suggestions or accommodate all points of view.

A number of common themes came up in the draft strategy consultation. These summarised below with responses to each of the main concerns or queries.

Concerns about microchips

A number of stakeholders expressed concerns about the potential for microchips to fail and the resultant inability to identify microchipped cats. Although this is a valid concern, the failure rate of microchips is very low. Of all the microchips registered on the New Zealand Companion Animal Register (NZCAR), the recorded failure rate is 0.1%. In addition, this is most likely an overestimate as when microchips are reported/recorded as failed NZCAR is unable to distinguish between implanter error, true microchip failure and microchip reader error (for further information please see the relevant section of the final strategy background document). There is no brand of microchip currently on the market that is immune to failure but microchipping is still far more reliable than other identification measures. In addition, the NCMSG recommends that cats also have external identification (a collar and tag). Other measures can also be used to increase the chance of a lost cat being reunited with his/her owner/caretaker (please see further information later in this document and in the final strategy background document).

There seems to be some misunderstanding surrounding the issue of mandatory microchipping and the perception that this will lead to the killing of more cats. In fact, it should be quite the opposite (and this is certainly the intention). Currently it is common for unidentified cats, particularly

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unsocialised cats, to be humanely killed if they are taken into custody by animal control officers, or if they end up at a pound or shelter. Mandatory microchipping will mean more cats are microchipped and this gives them a greater chance of being identified and returned to their owner. In addition, as mentioned above, the NCMSG is advising a number of other measures also be implemented to increase the number of cats reunited with their owners, rehomed or managed by non-lethal methods (for more detail see later).

There also seems to be some confusion about what generally happens to unwanted cats. This makes it difficult for people to recognise the need for and benefits of the strategies that are proposed in the cat management plan. In the interests of transparency and improved understanding, the NCMSG wants to make the current situation clear. When a cat is brought by a person other than the owner into an organisation that accepts cats, such as a pound or shelter, the following should occur (this does occur in some pounds/shelters/organisations but not all):

- 1) The cat's behaviour is assessed, to try and determine if the cat is socialised or unsocialised.
- 2) The cat is assessed for illness and/or injury, if the cat's behaviour allows this. Sometimes unsocialised cats displaying very fearful behaviour need to be sedated or anaesthetised before assessment can occur. Therefore, if a veterinarian is not available, this may not be possible.
- 3) The cat is checked for a microchip or other identification. This can be extremely difficult with unsocialised cats displaying very aggressive behaviour (see note above).

If the cat is identified, the following steps generally occur:

- Attempts will be made to contact the owner using the identification details.
- If the owner cannot be located, the cat will be kept for a hold period (usually for 7-8 days) to allow a possible owner to come forward. The cat will be listed on the lost and found databases during this time, lost and found flyers may also be put up in the area where the cat was found and local veterinarians contacted.
- If the owner cannot be located and the cat is seriously ill or injured and it is not considered possible to keep the cat comfortable for the hold period, the cat will be humanely killed (with the authorisation of a warranted inspector, if within the 7-day hold period).

If the cat is **not identified**, the possible outcomes for that cat are:

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- The cat will be kept for a hold period (usually for 7-8 days) to allow a possible owner to come forward. The cat will be listed on the lost and found databases during this time. Lost and found flyers may also be put up in the area where the cat was found, and local veterinarians contacted.
 - If the cat is seriously ill or injured, and it is not considered possible to keep the cat comfortable for the hold period, the cat will be humanely killed.
 - If, after a “settling down” period has passed, the cat appears to be unsocialised, and the cat displays fearful (and aggressive and dangerous) behaviour, and the assessor considers that the cat is most likely to be unowned and the cat unsuitable for rehoming due to his/her behaviour, the cat will be humanely killed (with the authorisation of a warranted inspector). This occurs where the cat's behaviour indicates that holding the cat would be distressing and cruel for the animal and would put staff at significant risk of injury during the hold period. The time given to see if the cat calms down, if any, will depend on the organisation and assessor, and varies considerably (see later for further information that addresses the inconsistent nature of cat behaviour assessments).

If no person comes forward to reclaim the cat (it is unusual for cats to be reclaimed), after the hold period, the cat's health and behaviour will be assessed again to determine if the cat is suitable for rehoming.

- If the cat is deemed suitable for rehoming, efforts are generally (dependent on organisation) made to rehome him/her.
- If the cat cannot be rehomed or develops health or behavioural issues whilst in care that preclude rehoming, the cat may be humanely killed.
- If the cat is not deemed suitable for rehoming due to health or behavioural reasons, the cat will be humanely killed.

Comments were made by some stakeholders about trying to provide adequate protection for roaming or lost microchipped cats and non-microchipped companion or stray cats. Procedures should be followed to give the cat and owner/caretaker (if there is one) every possible chance to be reunited. In fact, the NCMSG advocates that all organisations should follow a consistent and comprehensive protocol to ensure that cats have the best outcome possible. This includes recommending steps to follow for a member of the general public who finds a cat. This protocol should include the following procedures:

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- 3.1) If the cat has no external identification and is a healthy stray then, if it is possible and safe to do so, the cat should have a paper collar put on and returned to where he/she was found. For example, the New Zealand Companion Animal Council (NZCAC) has a free paper collar download available from: www.animalregister.co.nz/images/downloads/170720_pet_collar_template.pdf.
- Finder details should be put onto the collar with a request for the owner/carer to get in touch with the finder to let them know the cat has a home/carer. Ideally, this should be done BEFORE the cat is taken to a sheltering organisation. Once the collar has been put on the cat a few days should be allowed to pass to give a possible owner/carer time to get in contact. If, after 2-3 days, no one comes forward and other ways of checking for a carer (for example, asking neighbours and putting up flyers, NZCAC also has a free lost pet flier available for download and individualisation: www.animalregister.co.nz/lostpetflyer.aspx) have been tried and have also failed, then the cat can be taken to a sheltering organisation. If the cat is sick/injured, or in an unsafe location or situation, the cat should be taken to a sheltering organisation without delay.
- 3.2) Once the cat is taken to a sheltering organisation the cat should be checked for a microchip and for external identification before any decisions are made about the cat's future. The NCMSG is recommending that it be mandatory for cats to have physical identification and a microchip and this should increase the numbers of cats that benefit from the protection of being identified.
- 3.3) If no identification can be found, or the owner/carer cannot be contacted through the available identification details, the cat should be listed on lost and found databases and websites where people may search for a lost cat. This may include:
- New Zealand Companion Animal Register (NZCAR)
 - Pets on the Net
 - Neighbourly
 - Trade me™.

These measures are all recommended to increase the likelihood of owners/carers finding their lost cats. It should be noted that NZCAR currently has a free scanner offer that is open to veterinarians, SPCAs, rescue organisations, pet shops, or any other organisation that helps to repatriate lost animals. Furthermore, the New Zealand Companion Animal Council is bringing pet facial recognition technology to New Zealand; this will be another method to help reunite lost animals, including cats, with their owners. The NCMSG is also encouraging all

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veterinarians and animal health care providers to scan all animals at every consultation, to check that microchips are still working and to prompt owners to update their details.

- 4) Behaviour assessment of the cat should be carried out before any decisions are made about the cat's future. Additionally, the NCMSG is advising that a standardised and robust behaviour assessment is used to consistently evaluate cats throughout NZ. The SPCA will be developing guidelines to help those assessing cats to be as objective, fair and consistent as possible in the decision making process.

It is important to highlight that it is NOT suggested anywhere in the plan that all unmicrochipped cats be killed. In fact, it is explicitly stated in the plan that every effort should be made to find a non-lethal outcome for each cat. Humane killing should be the last resort, though this will likely be the outcome for unsocialised stray or true feral cats. At present, unsocialised stray or feral cats are already killed; consequently, no recommendations are anticipated to lead to an increase in the number of cats killed.

Additionally, if individual cat owners/caretakers are particularly worried about their cats, they have the opportunity to use a GPS tracking unit for their cat (in addition to microchipping and external ID) and new facial recognition technology when it becomes available in New Zealand. Furthermore, confining cats to the owner/caretaker's property will also help to safeguard the cats.

Another concern expressed was that microchipping may be prohibitively expensive for some people. In order to address this potential limiting factor, the strategy also calls for free or low cost microchipping as part of cat management campaigns.

Stray cat hold times

Some stakeholders believed that the hold time should be increased for cats of unknown ownership status or cats whose owners cannot be found. However, holding cats for long periods of time is a significant welfare issue. If the cats are truly unsocialised stray or feral cats, there is little to no chance that they will be claimed, this means that these cats will be subjected to significant suffering for no reason as they are extremely distressed by being held. It is believed that the mandatory 7-day hold period already subjects unsocialised stray or feral cats to unreasonable distress. Therefore, if a behavioural assessment indicates that the cat is an unsocialised stray or feral cat, the best outcome in terms of animal welfare, is for that cat to either be returned (after desexing) to where he/she was living if he/she is healthy and this is possible, or, if a non-lethal option is not available, then the cat should be humanely killed without the cat serving the full 7-day hold period. There are significant

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welfare issues associated with the hold period for even a socialised cat; confinement is stressful, cats may become ill, particularly with diseases that have a stress-induced component. For socialised cats a 7-day period is considered to be a reasonable balance between allowing the owner time to find the cat and protecting the cat's welfare by not subjecting him/her to a long holding confinement. It is important to highlight that the vast majority of even owned cats are never reclaimed by their owners (usually less than 2%). If the recommended procedures are followed, cats that have owners/carers looking for them should have ample opportunity to be claimed. In addition, stray cats will still be given every opportunity to find a new home after their 7-day hold period is completed as long as they are of suitable behaviour and health.

Some stakeholders made the valid point that some (potentially many) adult cats displaying unsocialised behaviour could be socialised, given enough time and resources. However, due to the numbers of these cats being brought to pounds and shelters this is not feasible, simply due to the fact that there are not enough resources (human, time or financial) available to try and socialise all of these cats. In order to understand the magnitude of this issue, consider that approximately 1000 cats/year are humanely killed because they are unsocialised stray or feral cats, in just one shelter in New Zealand.

Indeed, currently there are not enough homes available for all socialised cats, so even if the unsocialised cats were socialised, it would currently be extremely difficult to find them homes. For some of the cats, it may also cause unreasonable and unnecessary distress and a negative quality of life.

Mandating components of the cat management plan

A number of stakeholders expressed the belief that various components of the plan should be mandated. The NCMSG acknowledges that it will likely be necessary to mandate components of the plan in order to make them effective. However, the group is not in a position to do so; this mandate will need to come from central and local government. The NCMSG also believes that change will need to be incremental and that part of this will be incremental change in the public's attitudes and behaviours towards cats, achieved through education and awareness campaigns.

Legislation

Although there was general agreement from stakeholders that legislation should be based at central government level and standardised across the country, there were mixed opinions about where the

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responsibility should lie for the implementation of legislation. Most stakeholders were in favour of a collaborative approach between central and local government and welfare organisations. Some stakeholders questioned what the role of a national cat management task force would be in this mix. These are valid questions and will need to be addressed. However, the national cat management plan is a *strategic* plan, not an *operational* plan. If the plan is to be adopted, then further work will need to be done to devise an appropriate operational plan that includes detail on how the different components and involved stakeholders will work together to achieve the desired outcomes. Funding and support from government and other stakeholder groups will be necessary in order to achieve this.

Monitoring and reporting on management strategies

Stakeholders expressed their belief that the effectiveness of the management strategies would need to be monitored and reported in a way that is available to the public. The NCMSG is in full agreement and has made recommendations in the document regarding this.

The need for more research

Many stakeholders believe that more research is needed and the NCMSG recognises and agrees the importance of research specific to the NZ situation. In the draft plan the group has listed a large number of areas in which we believe more information relating to cat management is needed. This list has been revised and added to after the consultation (please see further information in the final strategy background document). This includes a need for more research about New Zealand opinions on cat management and also about which management strategies are the most effective whilst retaining welfare standards and minimising the need for lethal control of cats.

In addition, concerns were raised about the lack of evidence of the impact that companion and stray cats are having on New Zealand native species and ecosystems. Some stakeholders thought that the negative impact of cats was over-estimated in the draft background document and commented that many native animals are killed by other causes, which may have a greater impact than cats (for example, poisons, window collisions, road traffic accidents and ecological degradation). Other stakeholders expressed the opposite point of view, that the negative impact of cats was underestimated. The NCMSG agrees that more information is needed about the impact that cats have on native species and ecosystems. Research is ongoing in this area and is wholeheartedly supported by the NCMSG. Based on the evidence that is available, cats can and do have a negative impact on native species and ecosystems and are not currently being adequately managed to mitigate this. Therefore, the NCMSG feels that improvements in cat management are needed while the research is ongoing;

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this is why the national cat management plan has been developed. However, it will need to be modified and refined as more evidence and evaluations are available.

It was highlighted that some groups have collected data in areas where they believe the strategy is lacking. Some stakeholders also feel that individuals, communities, and groups around the country have information that has not been utilised. The NCMSG agrees that this is likely and the group needs access to the data that people are suggesting they have. Therefore, we call for this information, and a resource to manage this information, to be made available. In addition, the NCMSG calls for people and resources to help assess this data and make an appropriate research plan, as our group does not have the resources to do this in isolation.

Cat categories

There were concerns expressed by some stakeholders that the division of cats into categories and the use of this categorisation in the management algorithm is too complicated. The NCMSG recognises that this categorisation system may appear to be overly complicated. However, the cat sub-populations involved in the unwanted cat problem are complex and so, as a reflection of this, the categorisation system is also relatively complex. In particular, the cats previously referred to just as 'stray cats' cannot realistically all be combined into one category (as many suggested); the diverse characteristics of this group must be acknowledged and management must differ for the different subcategories. In addition, the added divisions within each category will allow the different groups of cats to be legally managed while also providing added protections for cats previously unprotected.

Trap neuter and return (TNR)

As expected, the suggestion that TNR be one of the management strategies available to communities received much comment and very mixed responses; some stakeholders were supportive and others vehemently opposed to the use of TNR, saying that all stray cats should be humanely killed or rehomed. There was concern expressed that no unowned cats (including managed stray, colony, or community cats) should be allowed, as if the cats are not having all their needs met by people, they may suffer from poor welfare and also will have more than a minimal impact on wildlife.

Under the proposed plan, all cats that can be rehomed would be rehomed. Managed and targeted TNR (mtTNR) simply offers a non-lethal option, in appropriate circumstances, rather than just humane killing, for cats that cannot be rehomed. It is important to highlight that the use of mtTNR as proposed in the strategy is a means to reduce unowned cat numbers (to none, ideally, or at least minimal

numbers) in areas where trap and humane killing programmes (TE) are not appropriate or desired by the community; ongoing management of cats through mtTNR is not the goal. In addition, stakeholders should note that TNR is not considered a wildlife conservation tool and is not intended for use with feral cats. TNR is a short-term strategy (albeit short-term meaning over some years) to reduce the numbers of stray cats with the ultimate goal of having very few or no stray cats in New Zealand. Despite TNR not being a conservation tool, the reduction in cat numbers achieved through TNR programmes in areas where otherwise cats would not be managed will help conservation efforts over the long term. Furthermore, the plan clearly recommends that mtTNR be conducted with adherence to best practice guidelines and used in conjunction with best practice cat colony management; this will help to protect cat welfare and also have benefits for the community (less likelihood of nuisance from cats) and wildlife (cats that are having all of their needs provided are likely to have less of a negative impact on wildlife). The NCMSG believes that there is the need for mtTNR and best practice cat colony management guidelines to explain what is believed to constitute a well-managed cat colony. As new evidence comes to light these guidelines can be adapted and improved. Funding is needed to provide the resources needed to produce, distribute and help to implement these guidelines.

It is acknowledged that mtTNR is not appropriate in all situations. In instances where mtTNR is inappropriate (for example, near a sensitive wildlife area) the NCMSG supports trap and rehome. Where no other humane and non-lethal opinions are available the NCMSG reluctantly acknowledges that trap and humane killing methods for stray cats may be necessary, if this is the only option available and cat numbers must be reduced to safeguard the survival of vulnerable native species.

Feral cat eradication

Stakeholders generally accepted the need for humane eradication of feral cats. It was commented that methods of humane killing for all cats should be specified and, preferably, should not include poisons. Methods of humane killing are intentionally not listed in the plan, as this document will not be updated regularly. Over time further research and scientific evidence should lead to improved and more humane feral cat control methods; it is vital that the most up to date and humane methods are used. It is of utmost importance that those reading the cat management plan and involved in feral cat control refer to those sources that provide regularly updated best practice, evidence-based guidelines. This is what is recommended in the plan.

Concerns about the cost of cat confinement

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A number of stakeholders expressed concern that the cost of cat confinement would be prohibitive. Although there would certainly be costs associated with this, it is important to highlight that these are no different from the costs involved with dog confinement. The public has accepted the need for dog confinement and the associated costs. Education of the public so that cat confinement is accepted in the same way as the public have generally accepted the need for dog confinement, will be needed to facilitate a gradual shift in attitudes, behaviour and social norms. Cat confinement and the associated cost will then become an accepted part of responsible cat ownership, just as it is for dog ownership.

Some concern was expressed that, if confinement of cats becomes more widespread, wandering cats may be targeted. However, no evidence to support this concern has been found. It is also important to highlight that the management plan does not recommend that cat confinement be mandated across the whole country but that it should be encouraged and facilitated. Some local governments may decide that cat confinement should be mandated at a local level, particularly in sensitive wildlife areas.

Containment or restriction of outdoor access for cats is generally supported in sensitive wildlife areas. However, there were differing opinions on what areas need protecting. Some stakeholders believe that cat confinement in urban or farm settings may provide less benefit because native species are less common and pest birds and rodents are abundant. Other stakeholders expressed the contrasting view, that urban green areas are an important source of wildlife interaction for the majority of the population and should be protected from predators. The NCMSG acknowledges that there will be diverse opinions on the merit of protecting specific areas and, also, that a rural-urban divide is likely in these opinions. It will be important for councils and organisations involved in cat management programmes to decide what a sensitive wildlife area is and plan which areas in their jurisdiction are not suitable for mtTNR and implement other cat management methods in those areas. On a national level certain areas can be designated as no mtTNR zones, then decisions can be made locally about other areas on a case-to-case basis with local government/councils. In those areas that local government and organisations decide are sensitive wildlife areas, a decision will need to be taken about how to manage cats in those areas. If a trap and rehome or a humane kill programme is decided on to manage cats, then it is important that the council takes responsibility for this. Welfare organisations cannot be expected to eradicate cats. Not only would this go against the mandate of the majority of these organisations, it would also be contrary to what their supporter base would expect and desire. Therefore, such actions could result in the loss of financial support, on which these organisations rely. If the council will not or cannot undertake a humane kill programme, serious discussion is required about the risk of doing nothing to manage cats in that area as opposed to a

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welfare organisations instigating and maintaining a mtTNR programme. Ongoing assessment and adjustment will be needed.

Nuisance behaviours

No stakeholders want the management strategy to, in any way, allow or encourage cruelty towards cats. A number of stakeholders expressed the opinion that a definitive and unambiguous list of nuisance behaviours should accompany the management strategy to try and prevent repercussions for 'normal' behaviours considered nuisance behaviours by some people. This is a valid concern but in reality, all cat 'nuisance behaviours' are normal behaviours. Education is a key component of making people aware and accepting of normal cat behaviour, but also a key component of ensuring that cat owners limit the nuisance their cat causes to others (even if the nuisance comes from normal cat behaviour). Confinement of cats will assist with mitigating nuisance issues. Stakeholders should also be aware that nuisance behaviours are set out under local government law, the cat management plan cannot define these. Each local area would have to examine and assess whether to update their local government laws about what constitutes nuisance behaviour for cats.

Summary

To address the feedback from the consultation process, changes, detail and clarifications have been added to the sections discussed above and others, including cat confinement, cat identification and collars, anti-predation devices, mtTNR/TNR, TE, stray cat management and research needs.

The National Cat Management Strategy recommendations and background document are now finalised and is attached to this email.

Thank you once again for your engagement and input. The NCMSG looks forward to New Zealanders working together to improve cat welfare, responsible cat and mitigate cats' negative impact on wildlife through well designed and managed cat management that are both humane and effective.

Yours sincerely,

The National Cat Management Strategy Group



Whakataka te hau

Karakia to open and close meetings

Whakataka te hau ki te uru	Cease the winds from the west
Whakataka te hau ki tonga	Cease the winds from the south
Kia mākinakina ki uta	Let the breeze blow over the land
Kia mātaratara ki tai	Let the breeze blow over the ocean
Kia hī ake ana te atakura	Let the red-tipped dawn come with a sharpened air
He tio, he huka, he hauhu	A touch of frost, a promise of glorious day
Tūturu o whiti whakamaua kia tina.	Let there be certainty
Tina!	Secure it!
Hui ē! Tāiki ē!	Draw together! Affirm!

Nau mai e ngā hua

Karakia for kai

Nau mai e ngā hua	Welcome the gifts of food
o te wao	from the sacred forests
o te ngakina	from the cultivated gardens
o te wai tai	from the sea
o te wai Māori	from the fresh waters
Nā Tāne	The food of Tāne
Nā Rongo	of Rongo
Nā Tangaroa	of Tangaroa
Nā Maru	of Maru
Ko Ranginui e tū iho nei	I acknowledge Ranginui above and
Ko Papatūānuku e takoto ake nei	Papatūānuku below
Tūturu o whiti whakamaua kia	Let there be certainty
tina	Secure it!
Tina! Hui e! Taiki e!	Draw together! Affirm!

AGENDA AUTHORISATION

Agenda for the Policy and Planning Committee meeting held on Tuesday 26 July 2022.

Confirmed:

Not Cast

A D McLay

Director Resource Management

Approved:



S J Ruru 20 Jul, 2022 3:37:32 PM GMT+12

Chief Executive