IN HOT WATER: THE FAILURE OF NEW ZEALAND'S RESOURCE MANAGEMENT SYSTEM TO RESPOND TO EVENTS INDUCED BY CLIMATE CHANGE

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The sustainable management of Aotearoa's natural resources requires a system which is responsive to environmental changes. This will become more important in the future with the more frequent extreme environmental events predicted with climate change. The current system relies on statutory powers to review consents and adaptive management regimes to re-examine resource consents following environmental changes. This article focuses on two group consents to draw over 7,000,000 m^3 of water per year from an aquifer in Northland. After these group consents were granted, a significant fire began which threatened the vulnerable wetland ecosystem. This article argues that the current system fails to respond to environmental events of this nature. With significant resource management reforms ongoing, it is crucial to consider how to create a responsive resource management system for a future dominated by the effects of climate change.

I INTRODUCTION

Anthropogenic climate change is the biggest challenge for the sustainable management of natural resources. Climate change impacts on the availability and quality of natural resources, and causes major environmental events.[1] The uncertainty and environmental risk introduced by climate change must be accounted for in the management of natural resources in order to sustain supplies for future generations. The management of natural resources in Aotearoa is governed by the Resource

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1 Sheila M Olmstead "Climate change adaptation and water resource management: A review of the literature" (2014) 46 Energy Economics 500.

Management Act 1991 (RMA). Despite explicit references to the effects of climate change in the RMA, the resource management system in Aotearoa is ill-equipped to deal with changes in environmental conditions caused by climate change. The poor management of natural resources will continue the degradation of the natural environment.[2]

The potential risk of poor management of natural resources is exemplified by the granting of resource consents in Northland. In 2018 and 2021 group consents were granted to extract over 7,000,000 m^3 of water per year from the Aupōuri Aquifer. The Northland Regional Council (NRC) concluded that any adverse effects on surface-water bodies could be managed through an adaptive management regime. In 2021 an extensive fire burnt through the Kaimaumau-Motutangi wetland, which is supplied by the Aupōuri Aquifer. This wetland is a nationally significant wetland with areas of significant indigenous vegetation. This fire is likely to add considerable stress to the hydrology of the area from which the water is being abstracted.

This article assesses the adequacy of the mechanisms in place to review or cancel resource consents where there has been a change in environmental conditions. This includes both statutory powers under the RMA and mechanisms agreed to in the adaptive management plan. The article concludes that the current resource management system does not adequately account for changes in environmental conditions. It then considers whether the changes proposed in the resource management reforms will create a more responsive system.

II BACKGROUND

A Environmental Setting of the Kaimaumau-Motutangi Wetland

The Aupōuri Aquifer (the Aquifer) covers approximately 788 km^2 of the Aupōuri Peninsula.[3] Currently there are 112 resource consents to take water from the Aquifer, totalling an annual abstraction of over 14,000,000 m^3 per year. The purpose of these resource consents includes municipal, domestic, horticultural and agricultural uses. The Aquifer is primarily recharged by rainfall which permeates through the soil.[4]

The Kaimaumau-Motutangi wetland is a 2.6 km^2 nationally significant wetland on the eastern side of the Aupōuri Peninsula.[5] The wetland provides habitats for unique indigenous biodiversity. The most recent report on the ecology of the Kaimaumau-Motutangi wetland was completed by the

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2 Ministry for the Environment and Stats NZ *New Zealand's Environmental Reporting Series: Environment Aotearoa 2022* (ME 1634, April 2022).

3 Scott Wilson and Ali Shokri *Aupouri Aquifer Review* (Lincoln Agritech, Report 1056-1-R1, April 2015).

4 At 11.

5 Boffa Miskell Ltd *Kaimaumau-Motutangi Wetland Mapping: Methods, Wetland and Vegetation Descriptions and Constraints – Prepared for the Department of Conservation* (21 June 2018).

Department of Conservation (DoC) in 2001.[6] This report identified threatened flora and fauna, for example black mudfish, Northland green geckos and fernbirds.[7] A 1988 fire at the Kaimaumau-Motutangi wetland impacted on the survival of these threatened species. The fire furthered the spread of exotic weeds which outcompete the native species.[8]

B Significance to Iwi

The Kaimaumau-Motutangi wetland falls under the NgāiTakoto rohe. In their Environmental Plan, NgāiTakoto note the concealing nature of wetlands, with koiwi[9] of NgāiTakoto tūpuna concealed in the wetland.[10] The wetland is also a significant site for harvesting, collection, hunting and gathering. A lake in the Kaimaumau-Motutangi wetland, Lake Waikaramu, was named after the tupuna Waikaramu. The lake was given this name because, like Waikaramu, "when you needed it the lake was never around".[11] NgāiTakoto highlight in their Environmental Plan that abstraction and water takes are impacting on the life-supporting properties of wetlands. Saltwater and nitrate intrusion and insufficient flow are threats to their ability to gather mahinga kai[12] species safely.[13]

In the NgāiTakoto Deed of Settlement, the Crown agreed to the Korowai for Enhanced Conservation, a framework to recognise the historical, cultural and spiritual association NgāiTakoto has with conservation land in the area. This framework includes membership to the Te Hiku o Te Ika Conservation Board and participation in the DoC planning cycle.[14] Currently NgāiTakoto is participating in a four-year $3.3 million scientific investigation into the Aquifer, the Te Hiku Water Study. This study seeks to improve understanding of how the Aquifer is recharged and the degree of connectivity with surface-water bodies, such as the Kaimaumau-Motutangi wetland.[15]

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6 DL Hicks, DJ Campbell and IAE Atkinson *Options for managing the Kaimaumau wetland, Northland, New Zealand* (Department of Conservation, Science for Conservation 155, March 2001).

7 At 62.

8 At 6.

9 "Koiwi" means human skeletal remains in te reo Māori.

10 Te Rūnanga O NgāiTakoto *Te Iwi O NgāiTakoto Environmental Plan* (June 2018).

11 At 57.

12 "Mahinga kai" means traditional food gathering in te reo Māori.

13 Te Rūnanga O NgāiTakoto *Te Iwi O NgāiTakoto Environmental Plan* (June 2018) at 147.

14 Te Rarawa "Te Korowai/Enhanced Conservation" <www.terarawa.iwi.nz>.

15 "Ground-breaking Research Used In Te Hiku Water Study" *Te Hiku Media* (online ed, Northland, 14 October 2022).

C Wetland Conservation

Wetland conservation is crucial to the preservation of the important ecosystem services that wetlands provide. Despite only covering 1.5 per cent of the Earth's surface, wetlands provide 40 per cent of ecosystem services.[16] Some of these ecosystem services are outlined below.

First, wetlands provide the environmental conditions for a diverse range of flora and fauna. Wetlands are found mostly in low-lying positions which allow nutrients and sediments to accumulate and settle.[17] These nutrients promote vegetation growth, which in turn provides habitats for birds, fish, insects and reptiles. The abundance of flora and fauna in wetland areas is an important source of food and materials for people. In Aotearoa wetlands are essential mahinga kai sites as well as sites for harvesting harakeke and the collection of plants for rongoā.[18]

Secondly, wetlands can minimise the effects of natural disasters. Wetlands reduce the force of floodwaters by storing large quantities of water and regulating water flow. Research has shown that directing funding towards restoring wetlands, rather than river engineering, can provide a more effective and sustainable option for flood mitigation.[19] A 2007 DoC study found that a natural flood control scheme managed by the Waikato Regional Council in the Whangamarino Wetland saved over $7 million during a 100-year flood in 1998.[20] With the increase in extreme weather events predicted with climate change, this nature-based solution presents a major opportunity.

Finally, wetlands provide significant carbon storage. Research shows that mitigating carbon emissions will not be sufficient in slowing climate change; rather, removing carbon from the atmosphere will be key.[21] For this reason environmental groups such as Forest and Bird and the Environmental Law Initiative argue that wetlands are a "climate change secret weapon"[22] and should be leveraged in climate policy as a nature-based solution.[23]

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16 Joy B Zedler and Suzanne Kercher "Wetland Resources: Status, Trends, Ecosystem Services, and Restorability" (2005) 30 Annual Review of Environment and Resources 39.

17 Beverley Clarkson, Anne-Gaelle Ausseil and Philippe Gerbeaux "Wetland ecosystem services" in John R Dymond (ed) *Ecosystem Services in New Zealand* (Manaaki Whenua Press, Lincoln, 2013) 192 at 194.

18 At 194. "Rongoā" means traditional Māori medicine in te reo Māori.

19 Marjan van den Belt and others "Flood Protection: Highlighting an Investment Trap Between Built and Natural Capital" (2013) 49 JAWRA 681.

20 Department of Conservation *The economic values of Whangamarino Wetland* (DOCDM-141075, May 2007).

21 William R Moomaw and others "Wetlands in a Changing Climate: Science, Policy and Management" (2018) 38 Wetlands 183.

22 Forest and Bird "Restoring peat wetlands – our climate change secret weapon" (2 February 2021) <www.forestandbird.org.nz>.

23 Environmental Law Initiative "Leveraging wetlands in NZ's climate change response" <www.eli.org.nz>.

Wetlands have been drained globally to support agriculture and urban development. Globally, 50 per cent of original wetland area has been lost. Aotearoa has lost 90 per cent, which represents one of the highest extents and rates of loss in the developed world.[24] Between 1996 and 2018, 5,760 hectares of freshwater wetlands and 180 hectares of saline wetlands were lost in Aotearoa.[25]

D Impact of Climate Change on Wetlands

The Intergovernmental Panel on Climate Change identifies wetlands as an ecosystem which will suffer irreversible impacts as a result of an increase in global mean temperature over 1.5°C.[26] The biggest threat climate change poses to wetlands is an alteration to hydrological regimes.[27] This can occur through changes in precipitation, increased evapotranspiration, more frequent fires and increased extreme weather events.[28] The Ministry for the Environment projects that days with very high or extreme fire danger will increase by 70 per cent by 2040.[29] With climate change the Kaimaumau-Motutangi wetland will likely experience higher precipitation in summer and autumn and significant decreases in precipitation in winter and spring.[30] The wetland, being on the coastline, is also vulnerable to sea-level rise. The NZ SeaRise map predicts 20–40 cm of sea-level rise by 2050 for a coastal location adjacent to the Kaimaumau-Motutangi wetland.[31] Such a rise is likely to exacerbate saltwater intrusion,[32] which is already a threat to groundwater abstraction from the Aquifer.[33]

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24 Karen Denyer *The Root Causes of Wetland Loss in New Zealand: Statistics and Backstories* (National Wetland Trust, October 2020).

25 Stats NZ "Wetland area" (14 December 2021) <www.stats.govt.nz>.

26 Hans-Otto Pörtner and others (eds) *Climate Change 2022: Impacts, Adaptation and Vulnerability – Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge University Press, Cambridge, 2022).

27 Kevin L Erwin "Wetlands and global climate change: the role of wetland restoration in a changing world" (2009) 17 Wetlands Ecology and Management 71.

28 At 72.

29 Ministry for the Environment and Stats NZ *New Zealand's Environmental Reporting Series: Our atmosphere and climate* (ME 1523, October 2020).

30 Ministry for the Environment *Climate Change Projections for New Zealand: Atmosphere Projections Based on Simulations from the IPCC Fifth Assessment* (2nd ed, ME 1385, September 2018).

31 NZ SeaRise "Takiwā NZ SeaRise map" <https://searise.takiwa.co>.

32 Zbigniew W Kundzewicz and others "Freshwater resources and their management" in Martin Parry and others (eds) *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge University Press, Cambridge, 2007).

33 Jacob Scherberg and Jon Williamson *Aupouri Aquifer Groundwater Model Factual Technical Report – Modelling* (Williamson Water and Land Advisory, WWLA0184, 5 February 2020).

E Waihārara Fire

On 18 December 2021 Fire and Emergency was alerted to a vegetation fire at Waihārara, on the western side of the Kaimaumau-Motutangi wetland area. Over 100 firefighters worked for 52 days to put out a 2,400-hectare fire which burnt through vegetation and peat.[34] Despite Fire and Emergency departing on 7 February 2021, the fire was still smouldering underground, feeding off peat, as of 2 March 2022.[35] It was expected that the fires would not be fully extinguished until significant rainfall in winter. The extent of damage to the wetland ecosystem is yet to be fully determined. The DoC national fire manager Aroha Hughes expressed concern about the local species already threatened.[36] Forest and Bird Northland conservation manager Dean Baigent-Mercer labelled the fire an ecological "catastrophic disaster".[37]

The first potential impact of the Waihārara fire is on the wetland itself. According to a 2005 DoC study, wetlands in Aotearoa take approximately 10 years to return to pre-fire composition and vegetation structure.[38] The second potential impact relates to the drainage and recharge of the wider Aupōuri Aquifer. Fires can cause a number of hydrological effects; for example, ash from wildfires can increase runoff, which has been linked to a reduction in groundwater flow.[39] The greatest hydrological effect is observed 14 months after a fire. Therefore, the Waihārara fire could impact on the fulfilment of water takes from the Aquifer as well as on the long-term ecology of the area.

F Framework for Wetland Conservation in Aotearoa

The preservation of the natural character of wetlands and their protection from inappropriate subdivision, use or development is listed as a matter of national importance in the RMA.[40] Additionally, s 6(c) of the RMA requires consenting authorities to provide for the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna. Wetlands are often sites of indigenous vegetation or habitats for indigenous fauna. The RMA delegates responsibility for

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34 Fire and Emergency New Zealand "Whanaungatanga on Display at Waihārara" *Ignite* (New Zealand, 22 March 2022).

35 Fire and Emergency New Zealand "Outdoor fires discouraged as Northland braces for strong winds and dry weather this week" (press release, 2 March 2022).

36 Denise Piper "Far North fire one of NZ's most complex, recovery could take up to 15 years" *Stuff* (online ed, New Zealand, 8 January 2022).

37 "Kaimaumau fire labelled an ecological 'catastophic disaster' for near-extinct species" *RNZ* (online ed, New Zealand, 23 December 2021).

38 Peter N Johnson *Fire in wetlands and scrub vegetation: studies in Southland, Otago and Westland* (Department of Conservation, DOC Research and Development Series 215, July 2005).

39 Benjamin T Johnk and David C Mays "Wildfire Impacts on Groundwater Aquifers: A Case Study of the 1996 Honey Boy Fire in Beaver County, Utah, USA" (2021) 13 Water 2279.

40 Resource Management Act 1991, s 6.

wetland management to regional and territorial authorities.[41] The responsibility of regional councils to protect wetlands can be found in the requirement to control the use of land,[42] to maintain and enhance water quality and quantity, and to maintain and enhance ecosystems in water bodies.[43]

The National Policy Statement for Freshwater Management 2020 (NPS-FM) lists preventing further loss of natural inland wetlands, protection of their values and promoting their restoration as one of 15 key policies. The NPS-FM requires regional councils to include a policy in their regional plans which promotes restoration of wetlands and prevents further loss.[44] A subclause is included which sets out a council's obligations when considering a resource consent which would result in the loss of the extent or values of a natural inland wetland.[45] The National Environmental Standards, which sit alongside the NPS-FM, prohibit activities which are likely to drain wetlands, and such activities are classified as non-complying if they occur within 100 metres of a natural wetland.[46]

III THE RESOURCE CONSENTS

There are currently 112 consents to take over 14,000,000 m^3 of water from the Aquifer per year.[47] Thirty-nine of these resource consents are split between two group consents. Before these recent group consents, the abstraction volume was 1,800,000 m^3 per year from the Aupōuri Aquifer.[48]

A 2018 Motutangi-Waiharara Water Users Group Consent

The first group consent was granted to the Motutangi-Waiharara Water Users Group (MWWUG) in 2018 by the NRC. The consent allocated 2,446,350 m^3 per year across 17 separate applications to service avocado orchards in the area. The NRC issued one composite decision for the 17 applications, but each application stands alone in terms of consent conditions and appeal rights.[49] The applications for resource consent were limited-notified to 1,047 identified owners or occupiers of adjacent

41 Sections 30 and 31.

42 Section 31.

43 Section 30(1)(c).

44 National Policy Statement for Freshwater Management 2020, cl 3.22.

45 Clause 3.22(3).

46 Resource Management (National Environmental Standards for Freshwater) Regulations 2020, reg 38.

47 Scherberg and Williamson, above n 33.

48 Hangjian Zhao and Jon Williamson *Motutangi-Waiharara Groundwater Model Factual Technical Report* (Williamson Water and Land Advisory, WWLA0026, 31 August 2017).

49 Northland Regional Council *Decision following the hearing of an application by 17 persons, collectively referred to as the Motutangi-Waiharara Water Users Group, to Northland Regional Council for discretionary activity water resource consents under the Resource Management Act 1991, heard in Kaitaia 26–28 March 2018* (REQ.581172, 7 June 2018).

properties and to nine iwi groups.[50] The resource consent was approved by independent commissioners for the NRC, David Hill and Peter Callander.

1 *Kaimaumau-Motutangi wetland*

A point of contention was the issue of the potential impacts on the Kaimaumau-Motutangi wetland and the weight these impacts should be given according to the relevant statutory documents. Mr Williamson, hydrogeologist for the applicants, gave expert evidence of the low permeability between the Kaimaumau-Motutangi wetland and the wider aquifer. This evidence was disputed by DoC's hydrologist and hydrogeologist.[51] DoC's key concern was the lack of information on the groundwater connectivity of the wetlands. Further investigations were recommended.[52]

Environmental Defence Society Inc v The New Zealand King Salmon Co Ltd allows a decision-maker to consider higher order documents where the relevant planning instrument is incomplete.[53] Here, the Commissioners considered the New Zealand Coastal Policy Statement 2010 (NZCPS) due to the incomplete coverage of the Northland Regional Policy Statement. It was concluded that Kaimaumau-Motutangi wetland would fall within the meaning of coastal environment in the NZCPS. The guidance under the NZCPS is to avoid adverse effects, a higher requirement than in the National Policy Statement.[54] The Commissioners concluded that the adaptive management plan detailed below was sufficient to detect adverse effects on the wetland.

2 *Adaptive management*

DoC opposed the resource consent application on the basis that there was an insufficient evidential foundation for an adaptive management regime, as required by *Sustain Our Sounds Inc v The New Zealand King Salmon Co Ltd*.[55] The Commissioners concluded that the adaptive management regime developed by the applicant's hydrogeologist was "capable of delivering an appropriately cautious and responsive regulatory regime".[56]

The Commissioners approved a Groundwater Monitoring and Contingency Plan (GMCP), which set out a four-stage approach to the water abstraction. This included a one-year, low-level abstraction

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50 At [8].

51 At [90].

52 At [92].

53 *Environmental Defence Society Inc v The New Zealand King Salmon Co Ltd* [2014] NZSC 38, [2014] 1 NZLR 593 at [90].

54 Northland Regional Council, above n 49, at [103].

55 *Sustain Our Sounds Inc v The New Zealand King Salmon Co Ltd* [2014] NZSC 40, [2014] 1 NZLR 673 at [125].

56 Northland Regional Council, above n 49, at [123].

to establish a monitoring baseline. After the first 12 months, a trigger for groundwater levels would be set. If this level were exceeded, all MWWUG consent-holders would have to reduce their daily allocation volume by 50 per cent.[57] The Council would then commission a Groundwater Trigger Exceedance Report to assess the cause of the trigger level exceedance. If the trigger level were still exceeded after 21 days, the consent-holder would have to reduce abstraction to 25 per cent of the daily volume.[58] The Commissioners rejected DoC's recommendation to monitor the Kaimaumau-Motutangi wetland itself on the basis that:[59]

> … there are many influences on the wetland that are far greater than the MWWUG abstractions and any effect from these abstractions will best be identified from the groundwater level monitoring that is proposed in the GMCP.

B Appeal to the Environment Court

The MWWUG resource consent was appealed to the Environment Court by DoC and Mr Burgoyne, with the first decision delivered in February 2019.[60] Mr Burgoyne represented his personal interests and spoke for Te Taumata Kaumatua o Ngati Kuri Research Unit. Mr Burgoyne sought amendments to the conditions on the basis of Te Tiriti o Waitangi. DoC sought amendments to the resource consent conditions to provide for more monitoring and identification of trigger levels.[61] The Court identified the key issue as whether the method laid out in the resource consent was an adequate method of adaptive management, as required by *Sustain Our Sounds*.[62] The judgment was delivered in two decisions. Following the first decision, the parties were directed to consult on unresolved issues and file their preferred consent conditions in the Environment Court.[63] The second decision made minor amendments to the consent conditions.[64]

1 New Zealand Coastal Policy Statement

Whether the NZCPS is engaged affects the requirements on the Council to avoid adverse effects. The applicant and the NRC argued that the Regional Coastal Policy Statement did not include the Kaimaumau-Motutangi wetland in its delineation of the coastal environment.[65] The Court took the

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57 At [161].

58 Motutangi-Waiharara Water Users Group Groundwater Monitoring and Contingency Plan, condition 27.

59 Northland Regional Council, above n 49, at [153].

60 *Burgoyne v Northland Regional Council* [2019] NZEnvC 28.

61 At [5].

62 At [14].

63 At [84].

64 *Burgoyne v Northland Regional Council* [2019] NZEnvC 137.

65 *Burgoyne v Northland Regional Council*, above n 60, at [18].

view that the wetland was clearly within the coastal environment, meaning the NZCPS applied.[66] NZCPS Policy 11 was engaged due to the indigenous biological diversity of the Kaimaumau-Motutangi wetland.[67] This imported an obligation to avoid adverse effects on the indigenous ecosystem.

2 Adaptive management

A number of significant changes were made to the adaptive management regime which the Court viewed as fulfilling the requirements under *Sustain Our Sounds*.[68] First, the conditions were amended to reflect the obligation in the NZCPS to avoid adverse effects. Secondly, the conditions were amended to require consent-holders to suspend abstraction in the event that the trigger levels were exceeded. Thirdly, one of the conditions was amended to require the NRC to review the resource consent under s 128 of the RMA if the trigger levels were exceeded.

The Court was concerned that a lack of monitoring of the effects on the Kaimaumau-Motutangi wetland in the first 12 months would be inconsistent with the obligations in the NZCPS and the requirements for adaptive management in the *Sustain Our Sounds* decision.[69] The Court concluded that the water level of the wetland must be set for monitoring in the first 12 months as a proxy for the effects on the Kaimaumau-Motutangi wetland. If this trigger level were exceeded, further investigations by wetland ecologists and hydrologists would determine whether this change was due to natural fluctuations.[70]

The conditions of the resource consent explicitly note the power under s 132 of the RMA to cancel a resource consent if there were material inaccuracies when the application was granted.[71] The Court stated that an adverse effect on the Kaimaumau-Motutangi wetland would be a material inaccuracy allowing the cancellation of the consent.[72] This was due to the clear intention of the parties to avoid adverse effects on indigenous biodiversity in the resource consent conditions.

The Court concluded that the adaptive management regime was sufficient to avoid adverse cultural effects.[73] According to the Court, the adaptive management regime would maintain the

66 At [19].

67 "Policy 11: Indigenous biological diversity (biodiversity)" in New Zealand Coastal Policy Statement 2010.

68 *Burgoyne v Northland Regional Council*, above n 60, at [32].

69 At [42].

70 At [44].

71 Motutangi-Waiharara Water Users Group Groundwater Monitoring and Contingency Plan, condition 31.

72 *Burgoyne v Northland Regional Council*, above n 60, at [53].

73 At [62].

mauri[74] of the area and might improve the mauri due to the resource information required by the regime.

C 2021 Aupōuri Aquifer Water User Group Consent

In 2021 the NRC granted a second group consent to the Aupōuri Aquifer Water User Group (AAWUG). This time the consent was to take 4,606,260 m^3 per year across 24 resource consents. Again, the consent application was limited-notified to neighbouring landowners and iwi groups. During the proceedings the revised National Policy Statement for Freshwater Management and accompanying National Environmental Standards were released.[75] The Council took a lengthy adjournment to assess the bearing these standards had on the consent application. The consent was granted by the same commissioners as in the MWWUG consent, David Hill and Peter Callander.

1 Effects on surface waterways

The hydrogeologist for the applicants, Mr Williamson, argued that the degree of hydroconnectivity in the wetland was not sufficient to require allocations to be limited by Policy H.4 of the proposed Regional Plan for Northland (pRPN).[76] However, DoC argued that Mr Williamson's groundwater model failed to account for local effects. The Commissioners concluded that any potential adverse effects on the Kaimaumau-Motutangi wetlands would be minor. The Commissioners were confident that the adaptive management regime was sufficient to provide a cautious approach to the implementation of the resource consent.[77]

2 Effect on existing consents

DoC submitted that the granting of these consents raised a potential derogation of right issue for MWWUG consent-holders.[78] The applicants noted that the proposed consents could be granted without exceeding the allocation limits in the pRPN.[79] The Commissioners concluded that interference could be avoided by a gradual implementation regime. This interference refers to the overlap between the staged implementation in the MWWUG and AAWUG consents. The MWWUG consent allowed 25 per cent of the abstraction volume in the first year, 50 per cent in years two and

74 "Mauri" means life force or vital essence in te reo Māori.

75 National Policy Statement for Freshwater Management 2020; and Resource Management (National Environmental Standards for Freshwater) Regulations 2020.

76 Northland Regional Council *Proposed Regional Plan for Northland* (Updated Appeals Version, May 2021).

77 Northland Regional Council *Decision following the hearing of an application by 22 persons, collectively referred to as the Aupōuri Aquifer Water User Group (AAWUG), to Northland Regional Council for discretionary activity water resource consents under the Resource Management Act 1991, heard in Kaitaia at Te Ahu Centre, 1–3 September 2020* (REQ-596300.01.01, 1 September 2021).

78 At [93].

79 At [93].

three, 80 per cent from years four to six, with full abstraction from year seven onwards.[80] A similar regime was applied for the AAWUG consent, with 25 per cent abstraction in the first year, 50 per cent in years two and three, 75 per cent from years four to eight, and full abstraction from year nine onwards.[81]

3 Effect on future use of water supply

The AAWUG consents bring the total allocated volume to between 52–99 per cent of the allocation limits per zone as stated in Policy 4.4 of the pRPN.[82] The Commissioners noted submitter concerns regarding the future use of the Aquifer. It was recognised that Te Mana o te Wai is a fundamental concept in the NPS-FM.[83] This imports an obligation to balance the health and well-being of freshwater with the health and well-being of the wider environment and community.[84] The Commissioners stated that these concerns were fundamental to their decision.[85] However, the proposed abstraction fit within the allocation limits laid out in the pRPN. The Commissioners also noted that the allocation limits were conservative and that the correct approach would result in a "smoothing of the allocations across the zones and [make] allocation numbers generally fit more comfortably within the limits".[86]

4 Adaptive management

DoC's arguments were similar to those in the MWWUG consent application and appeal to the Environment Court. They argued that a precautionary approach should be taken given the uncertainty of adverse effects. The need for precaution was magnified by the cumulative effect of both group consents. According to DoC, this precautionary approach was supported by the requirement to avoid adverse effects in the NPS-FM and the requirement that dune lake levels remain unchanged in Policy 4.2 of the pRPN.[87] Again, the Commissioners concluded that potential adverse effects were minor, and the adaptive management regime would be sufficient to provide warning of adverse effects.

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80 Northland Regional Council, above n 49, Appendix 2 at [1A].

81 Northland Regional Council, above n 77, at [129].

82 At [121].

83 Te Mana o te Wai is a concept in the National Policy Statement for Freshwater Management 2020 which refers to the vital importance of water and imposes a hierarchy of obligations for decision-makers.

84 National Policy Statement for Freshwater Management 2020, cl 1.3.

85 Northland Regional Council, above n 77, at [103].

86 At [123].

87 At [145].

D Appeal to the Environment Court

DoC appealed the AAWUG consent to the Environment Court; an interim decision was issued on 7 September 2022.[88] DoC sought amendments to the consent conditions to ensure the environmental risk was appropriately managed. The Court concluded that the water takes could be consented with significant revisions to the consent conditions. The Court commented that "[n]ever in the Court's collective resource management experience has it seen a more complex set of draft conditions".[89] The Court expressed concerns about how the conditions were to be understood and implemented given their complexity. The Court suggested that the parties reconsider the consent conditions and notify the Court if they required a full decision.

1 Finding on consents

The Court acknowledged that Williamson Water and Land Advisory's groundwater model could not adequately account for local effects and, importantly for this article, also noted that the model could not assist with the impact of extreme weather events on the Aquifer. Nonetheless, the Court concluded that it was "very confident that [it] could grant consents for takes significantly less than 100 percent of the Aquifer allocation volume available under the pNRP".[90] However, the uncertainties arising from incomplete evidence of the hydrogeology of the Aquifer necessitated an adaptive management approach. The Court noted that a cautious approach must be taken, with particular care exercised around staging of water takes, trigger levels and the framing of consent conditions.

2 Types of conditions necessary

The Court emphasised the need to assume that the groundwater takes were causing adverse effects since the contrary could not be proved conclusively.[91] The wording of the draft AAWUG consent conditions required proof that an adverse effect was caused by the abstraction. The Court asserted that this approach was unacceptable. The consent conditions needed to be designed so that new information could be incorporated, such as information resulting from the Te Hiku Water Study. This new evidence might shed light on whether the abstraction was causing adverse effects on the Aupōuri Peninsula, allowing the approach to adapt.

Diverging from the approaches taken by the NRC in granting the MWWUG and AAWUG consents and by the Environment Court in the MWWUG appeal, the Court then stated that trigger levels should be set using both Western science and mātauranga values. This would recognise the partnership obligations under Te Tiriti o Waitangi and acknowledge that this large aquifer should be

88 *Director-General of Conservation v Northland Regional Council* [2022] NZEnvC 170.

89 At [9].

90 At [85].

91 At [89].

used for general public benefit.[92] The Court also asserted that trigger levels need to be robust so that they can alert consent-holders in the event of extreme weather events.[93] The need for trigger levels to alert consent-holders is key to avoiding adverse effects and exercising kaitiakitanga over natural resources, as required under the RMA.[94]

3 Treaty position for Māori claimants and existing takes

The Court considered the implications of the resource consents on obligations under Te Tiriti o Waitangi in greater depth than in the appeal of the MWWUG consent. The Court noted that tangata whenua with existing consents have a legitimate expectation under their Treaty settlement and partnership with the Crown to access water from the Aquifer.[95] The Court noted that these parties abstract water from the Southwestern Sub-Aquifer, which is subject to fewer water abstractions. Therefore, the Court was not concerned that these water takes could not be fulfilled in the future.[96]

The groundwater model suggests that the sub-aquifers can be treated separately for the purposes of conditions. The Middle Sub-Aquifer is particularly vulnerable as this is where the MWWUG consents primarily abstract water from. This sub-aquifer also supplies the Kaimaumau-Motutangi wetland, necessitating a more complex approach.[97] Abstractions from the other sub-aquifers are primarily tangata whenua takes. The Court saw an opportunity in these sub-aquifers to develop an approach based in mātauranga Māori.

4 Commentary

This Environment Court judgment is noticeably different from the three previous decisions relating to the MWWUG and AAWUG consents. Significantly, the Court changed the requirement of proof that an adverse effect is caused by abstraction. Here, the Court suggested a cautionary approach by assuming that the adverse effect was caused by abstraction, unless the contrary could be proved. Other significant statements include the consideration of extreme conditions within the adaptive management regime and the inclusion of mātauranga Māori when setting trigger levels. However, this judgment is only an interim decision and it is yet to be seen how these suggestions will be implemented. It was aptly noted by the Court that it will be a challenge for the parties to integrate the Māori worldview, Western worldview and science whilst also securing environmental imperatives.[98]

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92 At [95].

93 At [96].

94 Resource Management Act, ss 5 and 7.

95 *Director-General of Conservation v Northland Regional Council*, above n 88, at [111].

96 At [114].

97 At [117].

98 At [31].

IV MECHANISMS TO REVIEW OR CANCEL A RESOURCE CONSENT

This article has discussed the national importance of the Kaimaumau-Motutangi wetland, the recent fire, the need to protect wetlands in Aotearoa in the face of climate change and the freshwater management context in Northland. The next Part will investigate the mechanisms available to review or cancel the MWWUG and draft AAWUG consents following the Waihārara fire.

A Support from High Order Documents

The review or cancellation of a resource consent where there has been a change in environmental conditions is supported at a high level by the RMA. The purpose of the RMA is to promote sustainable management of natural and physical resources.[99] This includes sustaining the potential of natural resources to provide for the reasonably foreseeable needs of future generations and safeguarding the life-supporting capacity of air, water, soil and ecosystems. Significant environmental events, such as fires, create vulnerable natural states. Fires change vegetation composition, create water stress and impact on nutrient availability.[100] In this altered environmental state, continuing water abstraction will only add more stress to the natural system. Further water abstraction does not safeguard the life-supporting capacity of affected wetland ecosystems.

Since 2004 decision-makers have been able to consider the effects of climate change under the RMA.[101] Harry Duynhoven in the third reading of the Resource Management (Energy and Climate Change) Amendment Bill 2003 (48) stated that having regard to the effects of climate change is "simply good risk management".[102] Litigation over the application of s 7(i) of the RMA has focused primarily on the effects of sea-level rise.[103] For example, the Environment Court in *Buckley v South Wairarapa District Council* upheld the decision of the South Wairarapa District Council to refuse a resource consent for the construction of a property near the coastline.[104] In these cases the potential effects of climate change were on infrastructure and the concern of the courts was with safety.

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99 Resource Management Act, s 5.

100 Florent Mouillot, Serge Rambal and Richard Joffre "Simulating climate change impacts on fire frequency and vegetation dynamics in a Mediterranean-type ecosystem" (2002) 8 Global Change Biology 423.

101 Resource Management Act, s 7(i) as inserted by the Resource Management (Energy and Climate Change) Amendment Act 2004.

102 (26 February 2004) 615 NZPD 11401.

103 *Buckley v South Wairarapa District Council* EnvC Wellington W004/08, 4 February 2008; *Gillies v Otago Regional Council* EnvC Christchurch C060/08, 11 April 2008; *Save The Point Inc v Wellington City Council* EnvC Wellington W082/07, 20 September 2007; and *Otago Regional Council v Dunedin City Council* [2010] NZEnvC 120, [2010] NZRMA 263.

104 *Buckley v South Wairarapa District Council*, above n 103.

The decision regarding s 7(i) of the RMA with the most relevance to the MWWUG and draft AAWUG consents related to an appeal of an application to take water from the Waimakariri catchment.[105] The Environment Court concluded that the increase in water temperature predicted with climate change was an additional stressor on native fish inhabiting the Cass River and a consideration under s 7(i).[106] The Court stated that "the effects of climate change are … part of the reasonably foreseeable environment".[107] Similarly, in a separate case, the Environment Court considered the effect of warming water temperatures and potential droughts on native fish within the context of an amendment to a water conservation order.[108] These cases are more analogous to the present context because the Court was considering climate change as an additional stressor on the natural environment, rather than on infrastructure. Therefore, there is scope to consider environmental events caused by climate change in decision-making under the RMA, although the case law is not developed in this area.

The specific obligations on regional councils in the NPS-FM to consider the effects of climate change are only in relation to the setting of limits on resource use and environmental flows and levels.[109] However, it is a key policy that freshwater is managed as part of New Zealand's integrated response to climate change.[110] The NZCPS references climate change more frequently than the NPS-FM. For example, it is a key policy of the NZCPS to adopt a precautionary approach to the use and management of coastal resources vulnerable to the effects of climate change.[111]

Therefore, the purpose and principles of the RMA, NPS-FM and NZCPS support a mechanism for reviewing or cancelling a resource consent when there has been a change in environmental conditions due to climate change.

B The Power in the RMA to Review or Cancel a Resource Consent

Section 128 of the RMA allows a consent authority to review the conditions of a resource consent.[112] *Feltex Carpets Ltd v Canterbury Regional Council* held that the power in s 128 is wide and flexible and there is no limit on how far the consenting authority can subtract or qualify a resource

105 *P & E Ltd v Canterbury Regional Council* [2016] NZEnvC 252.

106 At [189].

107 At [190].

108 *Whitewater New Zealand Inc v New Zealand and Otago Fish and Game Councils* [2013] NZEnvC 131.

109 National Policy Statement for Freshwater Management 2020, cls 3.14(2)(a)(ii) and 3.16(4)(a).

110 Clause 2.2.

111 "Policy 3: Precautionary approach" in New Zealand Coastal Policy Statement 2010.

112 Resource Management Act, s 28.

consent with new conditions.[113] However, the power in s 128 does not extend to terminating a resource consent.[114] A consenting authority can also review a resource consent if provided for in the consent conditions, for example within an adaptive management regime.[115] This allows consenting authorities to reassess the consent conditions as more evidence of the effects of the activity becomes available.

The MWWUG and draft AAWUG consents directly incorporate s 128 into the GMCP through a review condition. The MWWUG consent allows a review through s 128 in limited circumstances: either to deal with adverse effects arising from the exercise of the resource consent or to review the water allocation.[116] The Environment Court appeal amended the review condition to include the insertion of trigger levels.[117] These circumstances were expanded further in the draft AAWUG consent to include the amendment of trigger levels and the reduction of abstraction volume if water use is inefficient or surplus to needs.[118] These review powers appear to be significant but rely on meaningful action from the NRC. There are a number of reasons why the NRC may be reluctant to exercise these powers, as will be further discussed.

Under s 132 of the RMA, a consenting authority can cancel a resource consent if the application included inaccuracies which materially influenced the decision to grant the consent and there were significant adverse effects on the environment as a result of the consent. The application of s 132 to the MWWUG consent was noted in the Environment Court appeal. The Court stated that, given the clear intention of the parties to avoid adverse effects on the Kaimaumau-Motutangi wetland, the occurrence of adverse effects would be a material inaccuracy justifying the cancellation of the resource consent.[119] This reasoning reflects an earlier Environment Court decision which asserted that an inaccurate prediction of environmental effects is a material inaccuracy warranting cancellation of the resource consent.[120]

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113 *Feltex Carpets Ltd v Canterbury Regional Council* (2000) 6 ELRNZ 275 (EnvC).

114 *Minister of Conservation v Tasman District Council* HC Nelson CIV-2003-485-1072, 9 December 2003.

115 Hilke Giles and Barry Barton "Adaptive Management Under the RMA: The Tension Between Finality and Flexibility" (2020) 24 NZJEL 1.

116 Motutangi-Waiharara Water Users Group Groundwater Monitoring and Contingency Plan, condition 31.

117 *Burgoyne v Northland Regional Council*, above n 60, at [43] and [44].

118 Aupōuri Aquifer Water User Group Groundwater Monitoring and Contingency Plan, condition 32.

119 *Burgoyne v Northland Regional Council*, above n 60, at [53].

120 *Pickering v Christchurch City Council* [2017] NZEnvC 68.

Application to environmental changes

Environment Court Judges Hassan and Kirkpatrick argue that a well-drafted review condition provides an effective mechanism to ensure ongoing sustainable management of the resource.[121] Therefore, review powers under s 128 provide a potential tool for adapting resource consents to environmental change. However, the theoretical benefits of the review powers under s 128 do not seem to have been translated into practice. A review of council decisions and cases applying ss 128 and 132 of the RMA demonstrates a limited application of the powers of review and cancellation. No example could be found of a case where the consenting authority reduced a water allocation in response to adverse environmental effects under s 128. There are a number of barriers to consenting authorities exercising review powers under s 128. These barriers result in the powers of review being rarely exercised.[122]

The first barrier is administrative. In legal submissions on the Otago Regional Water Permits Plan Change, the Otago Regional Council recommended shorter consent durations for water permits rather than longer consents with regular reviews under s 128.[123] The key reason for this recommendation was concern about the effectiveness of the review powers under s 128. The Otago Regional Council highlighted that consent review processes are resource-intensive.[124] Consent reviews can also be appealed, which further draws out the process.[125] Therefore, the Council argued, once a long resource consent is granted it is unlikely the consenting authority will review the consent under s 128.

The second barrier to conducting a consent review under s 128 is the risk of future litigation if the consenting authority restricts rights granted under the resource consent. The High Court in *Aoraki Water Trust v Meridian Energy Ltd* concluded that reducing an existing resource consent in order to grant a subsequent consent would derogate from the original grant.[126] In reaching this conclusion, the Court analogised a water permit to a profit à prendre, a property right.[127] This aspect of the decision

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121 J Hassan and DA Kirkpatrick "Conditions of Consent for Complex Developments" (paper presented to the Resource Management Law Association Roadshow, November 2014).

122 Philip Milne *When is Enough, Enough? Dealing with the Cumulative Effects under the Resource Management Act* (February 2008).

123 Otago Regional Council "Closing Legal Submissions of Counsel for the Otago Regional Council" (ENV-2020-CHC-127, 7 July 2021).

124 At [194(d)].

125 Guy Charlton and Barry Brunette "Sustainable development and water use in New Zealand: water priority and allocation under s 5 of the Resource Management Act 1991 and the National Policy Statement on Freshwater Management 2011" (paper presented to Water and Society Conference, Las Vegas, December 2011).

126 *Aoraki Water Trust v Meridian Energy Ltd* (2004) 11 ELRNZ 207 (HC).

127 At [29].

was criticised later in *Hampton v Canterbury Regional Council (Environment Canterbury)* where the Court of Appeal asserted that a water permit granted under the RMA does not equate to a property right.[128] However, despite the correction in the Court of Appeal this view of the rights granted by resource consents may explain the reluctance of consenting authorities to exercise powers of review under s 128.[129]

Another barrier to exercising review powers under s 128 is proving a causal link between the resource consent and the adverse environmental effects.[130] This relies on effective monitoring and an understanding of the interconnected nature of environmental effects. Proving an adverse effect is linked to a particular resource consent is particularly difficult with groundwater takes due to the scale of potential effects.[131] One downstream effect could be related to a number of water takes, natural fluctuations upstream or other activities in the catchment area. The statement by the Environment Court in the appeal of the MWWUG consent that the consent could be cancelled under s 132 if unexpected adverse effects were to occur appears powerful. However, crucially, it would have to be proved that these unexpected effects were a result of the resource consent. In the Aquifer context, the group consents make it more difficult to fairly attribute an adverse effect to the offending consent-holder. The statement by the Environment Court in the AAWUG appeal that it should be assumed that the abstraction is causing the adverse effect overcomes this issue of proving a causal link between the effect and the resource consent. This approach is appropriate where there is incomplete evidence of the adverse effects caused by the resource consent.

These barriers aside, ss 128 and 132 are not effective tools to address a change in environmental conditions. The primary justification for a consenting authority exercising review powers under s 128 is to deal with adverse effects arising due to the exercise of consents.[132] Unless the consent includes a review condition which allows the consenting authority to review the consent in the event of a significant environmental change there is no power to do so. Therefore, in the context of the Waihārara fire there is no power for the NRC to review the groundwater takes under s 128 unless the adverse effects can be linked to the resource consent. The Environment Court in the appeal of the AAWUG consent did not require the NRC to review the consent in the event of an environmental change.

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128 *Hampton v Canterbury Regional Council (Environment Canterbury)* [2015] NZCA 509, [2016] NZRMA 369.

129 Milne, above n 122.

130 At 28.

131 At 12.

132 Resource Management Act, s 128(1)(a)(i).

However, they did suggest a council review of the consent at each staged increase in abstraction.[133] This would allow the NRC to consider environmental changes as the consent is implemented.

C The Role of Adaptive Management

Resource management traditionalists would argue that an effective adaptive management regime is capable of dealing with environmental changes such as the fire at the Kaimaumau-Motutangi wetland. Adaptive management is the approach used in Aotearoa to support a resource consent where the environmental effects are uncertain, complex or could be significant over time. Adaptive management is a mechanism for consenting authorities to retain some flexibility in decision-making whilst ensuring a decision is made to allow these activities.[134] Adaptive management facilitates an iterative learning process where the monitoring of effects advances understanding of the resource and adjusts management of the resource in response.

Adaptive management emerged in the late 1970s and remained largely undefined until the leading case, *Sustain Our Sounds*.[135] In *Sustain Our Sounds*, the Supreme Court gave guidance on when adaptive management regimes were appropriate and provided some requirements for implementation. The Supreme Court established that the threshold question for the use of an adaptive management regime was whether there is an "adequate evidential foundation to have reasonable assurance that the adaptive management approach will achieve its goals of sufficiently reducing uncertainty and adequately managing any remaining risk."[136] Additional considerations include:[137]

(a) the extent of the environmental risk (including the gravity of the consequences if the risk is realised);
(b) the importance of the activity (which could in some circumstances be an activity it is hoped will protect the environment);
(c) the degree of uncertainty; and
(d) the extent to which an adaptive management approach will sufficiently diminish the risk and the uncertainty.

The Commissioners in the MWWUG and draft AAWUG consents, as well as the Environment Court, had confidence in the ability of the adaptive management regime to provide warning of adverse environmental effects.[138] The Environment Court found that the water level of the Kaimaumau-

133 *Director-General of Conservation v Northland Regional Council*, above n 88, at [87].

134 Giles and Barton, above n 115.

135 *Sustain Our Sounds Inc v The New Zealand King Salmon Co Ltd*, above n 55.

136 At [125].

137 At [129].

138 *Burgoyne v Northland Regional Council*, above n 60, at [52].

Motutangi wetland was a sufficient proxy for adverse effects.[139] If the water level dropped by 25 mm below the base level, this would trigger further investigations by wetland ecologists and hydrologists.

The true test will be whether adaptive management regimes are robust in the context of extreme environmental events caused by climate change. One issue is that an adaptive management regime relies on the prediction of environmental changes. There is an underlying assumption of "stationarity", the idea that natural systems change within an "envelope of variability".[140] Adaptive management regimes aim to preserve this "steady" state. Whether this assumption is valid in the absence of the effects of climate change is doubted.[141] However, the variability and uncertainty introduced to natural systems by anthropogenic climate change has definitely forced environmental changes outside this envelope of variability.

The establishment of an adaptive management regime relies on an adequate evidential foundation.[142] The issue is whether one can rely on this evidential foundation after a significant environmental event where it is likely the baseline conditions have changed. The uncertainty and degree of environmental risk introduced by a significant environmental event may mean that an adaptive management regime is no longer appropriate under *Sustain Our Sounds*. This can be demonstrated by the fire affecting the Kaimaumau-Motutangi wetland. Groundwater models created by Williamson Water and Land Advisory were relied on heavily as the evidential foundation for both the MWWUG and draft AAWUG consents. These models estimate the drainage and recharge of the Aquifer based on factors such as soil infiltration, plant available water capacity and evaporation losses.[143] There is strong evidence that these factors are all impacted by fire.[144] Therefore, considering the likely impacts of the Waihārara fire on the Aquifer, the evidential foundation used to justify the MWWUG and draft AAWUG consents might no longer be valid.

Application to environmental changes

The adaptive management regime in the MWWUG and draft AAWUG consents is unlikely to respond to the change in environmental conditions caused by the fire at Waihārara. One issue is that wetland water level is the only indicator monitored to detect adverse effects to the Kaimaumau-

139 At [43].

140 PCD Milly and others "Stationarity is Dead: Whither Water Management?" (2008) 139 Science 573.

141 Robin Kundis Craig "'Stationarity is Dead' – Long Live Transformation: Five Principles for Climate Change Adaptation Law" (2010) 34 Harv Envtl L Rev 9 at 36.

142 *Sustain Our Sounds Inc v The New Zealand King Salmon Co Ltd*, above n 55.

143 Scherberg and Williamson, above n 33, Appendix B at [B1].

144 Johnk and Mays, above n 39; and K Nelson and others "Peatland-fire interactions: A review of wildland fire feedbacks and interactions in Canadian boreal peatlands" (2021) 769 Science of the Total Environment 145212.

Motutangi wetland. Adverse effects to the wetland other than a drop in water level are not expected and are not monitored. The Court stated:[145]

> If unexpected adverse effects do occur, in our view this fundamentally contradicts the terms of this consent and would breach the primary purpose of the adaptive management plan and consent conditions.

Without wider environmental monitoring it is not clear how these unexpected adverse effects are to be detected. The fire is likely to create a change in environmental conditions other than water level. For example, fires can cause a change in ecosystem values, nutrient availability and soil health.[146]

Another issue is the lack of certainty surrounding when exceeding a trigger level justifies a reduction in water abstraction. If a drop in water levels below the trigger level is detected, this results in a Groundwater Trigger Exceedance Report. This report identifies the cause of the trigger level exceedance to determine whether the change is due to "natural fluctuations".[147] The process adopted in preparing the Groundwater Trigger Exceedance Report in order to consider the cause of the exceedance could not be identified by this author. According to the draft AAWUG consent, avoiding a change in water level means that the median water level, mean annual fluctuation and patterns of water level seasonality are unchanged.[148] However, it is unclear, if a change in water level were detected as a result of the fire, whether the fire would be considered a "natural fluctuation". If it is a natural fluctuation, the abstraction would not be reduced. This demonstrates that even if water level is an appropriate environmental indicator the effectiveness of the trigger level depends on the phrasing of the condition and the response from the consenting authority.

The MWWUG and draft AAWUG consents also highlight the importance of setting appropriate trigger levels. The Supreme Court in *Sustain Our Sounds* confirmed that appropriate indicators are a central component of an effective adaptive management regime.[149] The selected trigger level must be able to indicate an adverse effect caused by the resource consent. Therefore, there must be evidence that the indicators monitored will provide sufficient warning of the adverse effects.

The MWWUG and draft AAWUG consents used water level as a proxy for wetland health. However, adverse effects on the wetland caused by groundwater takes are broader than only water level. According to the *Handbook for Monitoring Wetland Condition* prepared by Landcare Research and the National Institute of Water and Atmospheric Research (NIWA), there are five different

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145 *Burgoyne v Northland Regional Council*, above n 60, at [82].

146 Daniel G Neary, Kevin C Ryan and Leonard F DeBano (eds) *Wildland Fire in Ecosystems: Effects of Fire on Soil and Water* (United States Department of Agriculture, Gen Tech Rep RMRS-GTR-42-vol 4, September 2005).

147 Motutangi-Waiharara Water Users Group Groundwater Monitoring and Contingency Plan, condition 4.

148 Northland Regional Council, above n 77, Appendix A at [1MC(b)], n 1.

149 *Sustain Our Sounds Inc v The New Zealand King Salmon Co Ltd*, above n 55, at [133].

indicators of wetland health.[150] These include changes in hydrological integrity, ecosystem intactness and the dominance of native plants. Hydrological integrity can be measured with different methods, including a change in water level, as monitored at the Kaimaumau-Motutangi wetland. However, other measurements, such as the proportion of dryland species, can be a good indicator of a change in groundwater recharge and discharge rates, which are affected by groundwater abstraction.[151] Choosing only one indicator for wetland health expects a certain adverse effect, leaving other adverse effects undetected. As indicated in the Environment Court in the appeal of the AAWUG consent, trigger levels should also be set using mātauranga Māori.[152] This is essential in order to recognise partnership under Te Tiriti o Waitangi and to develop a resource management system which is equitable for all of Aotearoa. It is likely that water level at the wetland was selected as the environmental indicator as it supposedly has a direct connection to the groundwater abstraction consented. However, it may be that other environmental indicators had not been regularly monitored. The latest report on the ecology of the Kaimaumau-Motutangi wetland was completed in 2001.[153] If there was an inadequate evidential foundation of all potential adverse effects, the resource consent should never have been granted.[154]

The MWWUG and draft AAWUG consents demonstrate that adaptive management regimes need to be able to account for the uncertainty that climate change introduces to natural systems. This would mean a shift away from the assumption of stationarity. Jan McDonald and Megan Styles propose two ways in which adaptive management regimes can account for this uncertainty.[155] First, a statutory requirement could require decision-makers to consider climate change when developing adaptive management regimes. This would incorporate climate change into adaptive management plans. The second proposal would be to shift away from strictly adhering to allocation limits and instead to focus on more holistic goals. These could be qualitative goals, such as maintaining key ecosystem functions of water resources. These goals may require the resource consent to adapt to changing environmental conditions. McDonald and Styles identified some disadvantages with this approach, including inconsistent application and poor political acceptability.[156] This highlights a key issue in designing a responsive adaptive management regime: striking the right balance between flexibility and certainty.

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150 Beverley R Clarkson and others *Handbook for Monitoring Wetland Condition* (Landcare Research, Ministry for the Environment Sustainable Management Fund Project 5105, June 2003).

151 At 19.

152 *Director-General of Conservation v Northland Regional Council*, above n 88, at [95].

153 Hicks, Campbell and Atkinson, above n 6.

154 *Sustain Our Sounds Inc v The New Zealand King Salmon Co Ltd*, above n 55, at [125].

155 Jan McDonald and Megan C Styles "Legal Strategies for Adaptive Management under Climate Change" (2014) 26 JEL 25 at 41.

156 At 42.

V LOOKING FORWARD: RESOURCE MANAGEMENT LAW REFORM

The resource management system is undergoing significant reform in Aotearoa. The RMA will be replaced with three different pieces of legislation: the Natural and Built Environment Act (NBEA), the Spatial Planning Act and the Climate Adaptation Act.[157] The Natural and Built Environment Act 2023 and the Spatial Plannning Act 2023 both received royal assent on 23 August 2023. One of the five objectives set by the Government for the new resource management system is to "better prepare for adapting to climate change and risks from natural hazards, and better mitigate emissions contributing to climate change".[158] This Part will assess whether the changes in the NBEA will create a resource management system that is responsive to events induced by climate change.

A Purpose and Principles

The purpose of the NBEA is to uphold "te Oranga o te Taiao", a new concept which incorporates five components including, for example, the health of the natural environment and the interconnectedness of all parts of the environment.[159] Principles in the RMA are divided into "Matters of national importance" and "Other matters",[160] with decision-makers required to have regard to the effects of climate change.[161] In the NBEA, all principles are included as "system outcomes" that the National Planning Framework and plans must provide for. One of these system outcomes is:[162]

> The risks arising from natural hazards and the effects of climate change are reduced and other measures are taken to achieve an environment that is more resilient to those risks.

Application to environmental changes

The new purpose – to uphold te Oranga o te Taiao – is likely to be too general to make a meaningful change to how the new resource management system responds to environmental events. The only potential difference is a consideration of how environmental events can impact on other components of the natural system, given the interconnectedness of the environment.

The system outcome in the NBEA related to climate change is more prescriptive than in the RMA. Rather than requiring decision-makers to "have particular regard to … the effects of climate

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157 Ministry for the Environment "Key components of our future resource management system" <https://environment.govt.nz>.

158 Ministry for the Environment *Resource management reform: The need for change* (November 2022) at 4.

159 Natural and Built Environment Act 2023, s 3.

160 Resource Management Act, ss 6 and 7.

161 Section 7(i).

162 Natural and Built Environment Act, s 6(4).

change",[163] the NBEA requires that the National Planning Framework and plans provide for the reduction of risks arising from the effects of climate change and for measures to be taken to achieve an environment that is resilient to those risks. As previously mentioned, the application of s 7(i) of the RMA by decision-makers resulted in a consideration of how climate change would impact on infrastructure allowed under a resource consent.[164] The system outcome in the NBEA is directly relevant to environmental events caused by climate change. Consequently, this outcome may require a more careful consideration of the effects of climate change, with a focus on environmental risk. It may be argued that this outcome would have no impact on the granting of the MWWUG and AAWUG consents because the presence of environmental risk and uncertainty necessitates an adaptive management approach, which was applied. However, the outcome may impact on the types of conditions required for an adaptive management approach. This was illustrated in the appeal of the AAWUG consent where the Environment Court stated that the consent conditions needed to accommodate extreme environmental events.[165]

In the NBEA, all system outcomes are listed equally, a change from the hierarchy in the RMA. How conflicts between system outcomes will be resolved is a concern raised in submissions on the NBEA.[166] The Minister for the Environment has indicated that the National Planning Framework and plans will resolve conflicts between system outcomes, rather than individual decision-makers. Therefore, it is difficult to assess fully how this outcome will be implemented without the draft National Planning Framework.

B Powers to Review or Cancel Resource Consents

Section 337 of the NBEA is the primary replacement for s 128 of the RMA. Section 337 preserves the power to review a resource consent to deal with an adverse effect on the environment which arises from the exercise of the consent.[167] However, the circumstances in which a resource consent can be reviewed are widened substantially. Implementing recommendations from the Resource Management Review Panel's 2020 report,[168] the NBEA now includes the power to review a resource consent if there are exceptional circumstances where "it is necessary to adapt to the effects of climate change or

163 Resource Management Act, s 7(i).

164 *Buckley v South Wairarapa District Council*, above n 103.

165 *Director-General of Conservation v Northland Regional Council*, above n 88, at [96].

166 Environment Canterbury Regional Council "Submission to the Environment Committee on the Natural and Built Environment Bill and Spatial Planning Bill 2022".

167 Natural and Built Environment Act, s 337(2)(a)(i).

168 Tony Randerson *New Directions for Resource Management in New Zealand: Report of the Resource Management Review Panel* (June 2020) ch 5 at [34].

to avoid, mitigate, or reduce risks from natural hazards".[169] There are also new review powers which will help to integrate existing resource consents into the new resource management system. For example, resource consents can be reviewed where required by the National Planning Framework or plan[170] or where it is necessary to ensure compliance with targets and limits.[171]

Application to environmental changes

The wording of the review clause in the NBEA is a promising improvement on the RMA. Crucially, the NBEA provides for a review of a resource consent where it is necessary to adapt to the effects of climate change. However, the review powers are limited by the requirement that there must be "exceptional circumstances".[172] It is not clear what type of situations will meet the threshold of an "exceptional circumstance". This restriction prevents a wholesale review of resource consents, which may be required to adapt to the widespread environmental changes predicted with climate change. As detailed previously, territorial authorities can be reluctant to conduct resource consent reviews because they are resource-intensive and can lead to litigation. This may be resolved in the new resource management system by strengthened monitoring and enforcement powers, and an increase in funding for territorial authorities.[173] Additionally, the National Planning Framework or plans may require resource consent reviews.[174]

C Adaptive Management

Another key change from the RMA is the formalising of the adaptive management approach into legislation. As previously mentioned, the adaptive management approach has been a creature of case law until now. Section 296 of the NBEA sets out requirements which must be included in an adaptive management approach. The requirements of particular relevance are that an adaptive management approach:[175]

> (b) must require baseline information for—
>
> (i) monitoring and reporting; and

169 Natural and Built Environment Act, s 337(3).

170 Section 337(1)(b).

171 Section 337(4)(a).

172 Section 337(3).

173 David Parker, Minister for the Environment "How the future resource management system will better enable development outcomes" (speech to the Resource Management Infrastructure stakeholders' event, Wellington, 6 September 2022).

174 Natural and Built Environment Act, s 337(1).

175 Section 296(2)(c)–(f).

(ii) setting triggers and limits (other than an environmental limit) for the purpose of monitoring and reporting; and

(c) must require ongoing monitoring and reporting; and

…

(e) may include provisions to allow for an activity to step back to a previous stage or cease temporarily where triggers are met, to allow for management practices or monitoring requirements to be adapted accordingly; and

(f) may include provisions to allow for an activity to be discontinued permanently (in circumstances where the effects are found to be unanticipated at the time consent was granted).

In determining whether an adaptive management approach is appropriate, the consent authority must consider whether there is adequate evidence that the adaptive management approach will reduce the uncertainty of the effects of the activity and manage any remaining environmental risk.[176] The consenting authority may be satisfied that the adaptive management approach reduces uncertainty and environmental risk where there is sufficient monitoring of the environment, indicators are set to prompt remedial action before adverse effects occur or reach unacceptable levels, and adverse effects can be remedied before they become irreversible.[177]

Application to environmental changes

Section 296 of the NBEA does not introduce anything which was not outlined in *Sustain Our Sounds.* However, the formalisation of the adaptive management approach in legislation will likely produce greater consistency between adaptive management regimes. For example, now an adaptive management approach must include provisions to slow practices allowed by the resource consent or to stop them permanently. Importantly for this article, s 296 of the NBEA sets requirements for trigger levels. Monitoring of the environment must be sufficient to set environmental indicators which can alert the consent-holder of adverse effects, and these indicators trigger remedial action. The presence of this legislative requirement might have led to more careful consideration of the trigger levels in the MWWUG and draft AAWUG consents.

However, s 296 falls short of implementing the recommendations of McDonald and Styles.[178] Section 296 could have included reference to climate change, rather than to environmental risk more generally, and specified that trigger levels may be established using holistic goals. In Aotearoa's context, holistic goals could mean the incorporation of mātauranga Māori. This would implement the suggestions of the Environment Court in the appeal of the AAWUG consent decision.

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176 Section 296(3)(a).

177 Section 296(4).

178 McDonald and Styles, above n 155, at 41.

VI CONCLUSION

The current resource management system does not have the necessary mechanisms to ensure that resource consents can respond to environmental changes caused by climate change. Such mechanisms are in line with science and with the principles and policies of the RMA and other planning documents. The statutory powers in ss 128 and 132 have limited application to extreme environmental events. Adaptive management regimes are more promising. However, the effectiveness of adaptive management regimes relies on the setting of appropriate trigger levels and a meaningful reaction from consenting authorities when a trigger level is exceeded.

The ineffectiveness of these mechanisms presents a strong argument for change. The ongoing resource management law reform has some promising aspects. The key challenge is to design a system which accounts for uncertainty whilst also providing certainty for consent-holders. Significant environmental events such as the Waihārara fire in Northland will become more common. It is therefore imperative that a workable solution be found to ensure the sustainable management of New Zealand's natural resources in a future dominated by the effects of climate change.