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**Restraints of change:
Limits to ‘managed retreats’ in Aotearoa New Zealand**

A thesis
submitted in fulfilment
of the requirements for the degree
of
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at
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Abstract

Managed retreat is an important strategy for natural hazard risk reduction and climate change adaptation, but its operationalisation brings many challenges, even when it is compelling. With significant built, cultural and infrastructural assets sited on low lying coastal land, and settlements traversing fault lines, flood plains, volcanic fields, and debris flow fans, remedying unsustainable land use patterns is essential to building societal resilience. To progress managed retreat from rhetoric to reality, however, New Zealand's governance framework must be fit for purpose.

The decision-making challenge for managed retreat in New Zealand rests predominantly with environmental planning and the mandated promotion of sustainable management of natural and physical resources. The focus of this research is to examine the role of environmental planning in enabling managed retreat in New Zealand, identify and analyse the potential mechanisms available, and consider opportunities to improve practice. Quantitative and qualitative methods are applied to investigate the function and effect of the various instruments able to influence the practice of managed retreat, identify significant barriers and enablers, ascertain public perceptions towards policy, and consider governance constraints and the prospects to build institutional capacity.

The research finds that the term 'managed retreat' incorporates a broad array of regulatory and financial mechanisms, with the potential to reduce exposure to a range of natural hazards and disruptive environmental changes across space and time. Although the current institutional framework has elements that can address future managed retreat of new development, instruments and support for managing legacy land uses are weak. Policy learning is occurring nationwide, but fragmentation and a lack of strong and consistent direction hinders effective management of risk. Important contributions of the research include a detailed interrogation of managed retreat in policy, analysis of the significant constraints hindering its application and acceptance in New Zealand, and the development of new opportunities to pursue managed retreat in a more effective, equitable, responsive, and robust manner. A governance framework provides a foundation to better examine and consider the various types of 'managed retreats' which align to the nature of the problem. It also helps shed light on the areas where research, law, and policy is currently lacking, in order to continue to answer the difficult questions of managed retreat by whom, how, when, and who pays?

Overall, this research exposes the complexities inherent in a diverse array of managed retreats, which at present are constrained by a range of socio-political-cultural, economic, and institutional barriers, requiring new arrangements of the law, planning, and funding mechanisms, and potentially, alternative governance modes. Retreat is inevitable in certain local and global environs—how it is delivered will determine the success of its outcomes and ultimately, the resilience of current and future generations. Bridging the gap between managed retreat theory and practice to increase resilience is essential.

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Abbreviations

BOPRC	Bay of Plenty Regional Council
CAB	Citizens Advice Bureau
CCATWG	Climate Change Adaptation Technical Working Group
CDEMA	Civil Defence and Emergency Management Act 2002
CDG	Consensus Development Group
CER	Canterbury Earthquake Recovery Act 2011
CERA	Canterbury Earthquake Recovery Authority
CERZ	Current Erosion Risk Zone
CG	Central government
CHEPA	Coastal Hazard Erosion Policy Area
CPA	Coastal Protection Area
CRU	Coast Ratepayers United
CSL	Coastal Systems Ltd
DC	District Council
DEFRA	Department for Environment, Food and Rural Affairs (UK)
DENR	Department of Environment and Natural Resources (AUS)
DOC	Department of Conservation
EQC	Earthquake Commission
ERZ	Erosion Risk Zone
FEMA	Federal Emergency Management Agency (USA)
GNS	Institute of Geological and Nuclear Sciences
IPCC	Intergovernmental Panel on Climate Change
JMA	Joint Management Agreement
KCDC	Kāpiti Coast District Council
LG	Local government
LGA	Local Government Act 2002
LGNZ	Local Government New Zealand
LGOIMA	Local Government Official Information Act 1987
LIM	Land Information Memorandum
LTP	Long-term plan
MCA	Multi-criteria analysis
MCDEM	Ministry of Civil Defence & Emergency Management
MfE	Ministry for the Environment
MOU	Memorandum of Understanding
NGO	Non-governmental organisation
NZCPS	New Zealand Coastal Policy Statement 2010
NZHRC	New Zealand Human Rights Commission
NZTA	New Zealand Transport Agency
PAR	Protect, accommodate, retreat
PDP	Proposed District Plan
PWA	Public Works Act 1981
RCP	Regional Coastal Plan
RMA	Resource Management Act 1991
RPS	Regional Policy Statement
T&T	Tonkin and Taylor Ltd
UDA	Urban Development Authority
UNISDR	United Nations Office for Disaster Risk Reduction
USA	United States of America
WCC	Waitakere City Council
WCRC	West Coast Regional Council
WDC	Whakatāne District Council
WRC	Waikato Regional Council

Chapter I Introduction

1.1 Rationale

Aotearoa New Zealand (NZ) is celebrated for its breathtaking landscapes and features. These spectacular attributes, formed by the positioning of the country upon two of Earth's major tectonic plates, situated within the Pacific Ring of Fire and intersecting the Roaring Forties, are landmarks of a nation highly susceptible to natural hazards (Campbell, 2012). In 1990, Rt. Hon. Sir Geoffrey Palmer made a fitting comment about the hazardscape of New Zealand, stating, "If you want drama—you've come to the right place" (as cited in McSaveney, 2012, p. 11). Today, in a constantly changing, uncertain and complex environment, with the effects of climate change exacerbating risk, the need to build resilience to nature's challenges is more pressing than ever.

According to Campbell and Hicks (2012), New Zealanders will face at least one natural hazard in their lifetime simply by living in this country. New Zealand is shaken on a daily basis by earthquakes, home to a large number of volcanoes, and subject to climate hazards due to its long, mountainous form and vast maritime surrounds (Crozier, 2007). Although natural hazard risks are actively managed in New Zealand, the reality of the hazardscape, combined with an increasing population, land use intensification, and the influences of climate change, suggests that societal risk is likely to be increasing at a rate faster than it is being managed (Lawrence, 2016; Local Government New Zealand, 2019; Willis, 2014). For example, exposure to natural hazards is increasing due to demographic and land use changes, coupled with the projected impacts of climate change (Reisinger, 2014). 'Significant work' is required across New Zealand public and private sectors to effectively adapt to the impacts of climate change (CCATWG, 2017). Of increasing concern is compounding risk in "areas adjacent to coasts, estuaries and harbours, because of the rising frequency of coastal hazard impacts and the increased exposure of people and assets as areas are developed and property values increase, together with legacy issues from past decisions" (Ministry for the Environment, 2017a, p. 11).

New Zealand's Ministry for the Environment (2016) (MfE) affirms the anticipated impacts of climate change as including: more frequent and intense winter rainfalls, which will increase the potential for river and flash floods; greater storm intensity and sea level rise increasing the risk of erosion, salt water

intrusion and coastal flooding; more frequent droughts, small-scale wind extremes and thunderstorms; and stronger ex-tropical cyclones.

Loss of life can be a devastating consequence of natural hazard events. Due to the unpredictable nature of geological and meteorological processes, people can be exposed at any time, often with little warning. Losses may occur in both the short-run (from a few months-years) and the long-run (three to five years) but can sometimes span decades (Noy & duPont IV, 2016). Psychosocial recovery following any disaster can take a long time, due to the secondary impacts of the event that continue into the longer term. These impacts can be wide ranging, including stress, anxiety and depression, isolation, loss of community facilities, and community separation, reduced air quality affecting health, material loss, and hardship (Dorahy & Kannis-Dymand, 2012; Potter, Becker, Johnston, & Rossiter, 2015).

The Insurance Council of New Zealand has recorded the insurance costs of natural hazard events in New Zealand since 1968 (including floods, earthquakes, tornadoes, frost, severe weather, and coastal erosion). With inflation adjustments, it has been recorded that over a 50-year period (from April 1968 to August 2018), approximately \$27 billion has been claimed for damage caused by natural hazard events (Insurance Council New Zealand, 2018). While these costs are substantial, they do not paint a full picture of the financial burden. For example, a report commissioned by Local Government New Zealand (LGNZ) stated that the 2004 Manawatu floods insurance pay-out was \$112 million. However, the estimated cost to the agricultural sector for uninsured losses amounted to \$185 million, and emergency service and infrastructure repair costs were calculated at approximately \$90 million (Willis, 2014). Overall, these costs totalled \$387 million, approximately 0.3% of the annual GDP at this time (Easton, 2016). This single cost represents just one form of natural hazard damage in just one of 67 districts in New Zealand.

In contemplation of the severe social, economic, and environmental impacts that natural hazards can cause, and recognising the limits of human control over natural processes, the concept of resilience has emerged as compelling in both literature and planning practice. Resilience planning evolved as a tool to reduce risk and increase the capacity of societies to stabilise, adapt, and transform when disturbance is experienced (White & O'Hare, 2014). "Managing for resilience enhances the likelihood of sustaining development in a changing world where surprise is likely" (Folke et al., 2002, p. 440). Our uncertain and complex world

calls for increased resilience of social-ecological systems, whether to cope, adapt, or transform. Using uncertainty to postpone action, particularly where irreversibility is present, is not an acceptable alternative (Lawrence, Bell, Blackett, Stephens, & Allan, 2018; United Nations, 1992).

Resilience planning can produce a more sustainable direction for society by working to build the capacity of people and communities to adapt to change, learn from experiences, and avoid or mitigate risk. In terms of natural hazard planning, a resilience perspective provides a more proactive, adaptive, and flexible approach for managing risk. Such an approach has become favoured by scientists and policy makers, as it prepares people and communities to cope with and adapt to the impacts of environmental change, rather than attempting to resist or control adverse effects, as has framed past efforts to address natural hazard risk. (Adger, Arnell, & Tompkins, 2005; Folke, Hahn, Olsson, & Norberg, 2005; Mees, Driessen, & Runhaar, 2014). Subsequently, new approaches have arisen in both literature and practice, reflecting the principles of resilience and adaptive management. In particular, managed retreat has evolved as a proactive adaptation strategy, to reduce exposure to the impacts of natural hazards and climate change. Managed retreat is expected to be increasingly required due to the levels of current and future risk that many communities and ecosystems face (Bardsley and Niven, 2013).

Managed retreat is defined as the strategic relocation of people, assets, and activities to reduce natural hazard risks and adapt to the impacts of climate change. This approach has emerged following a dominant history of hard engineering practice, where humans have altered the physical environment to mitigate the impacts of natural processes. Managed retreat is an adaptive form of resource management, aiming to work with nature to reduce physical exposure and resulting adverse effects, rather than working against it, and 'holding the line'. Experience reveals the limits of reliance on protection measures, which entrench existing use rights and expectations about ongoing development and protection, often generating adverse effects on natural character and amenity values, and limiting opportunities for adaptive and transformational change (Burby, 2006; Cooper & McKenna, 2007; Cooper & McKenna, 2008; Gesing, 2016; Jackson & Mcilvenny, 2011; Jha, Stanton-Geddes, & Stanton-Geddes, 2013; O'Donnell, Smith, & Connor, 2019; Reisinger et al., 2014; White, 2013). White (2013) explains that while using public money in this way can be politically attractive, it can enhance longer-term risk via the 'escalator effect' (Parker, 1995)

or the ‘safe development paradox’ (Burby, 2006), where defences cause the area behind them to seem safe and therefore attract new capital and new exposures.

Managed retreat is an advantageous approach as it has the potential to avoid natural hazard exposure to life and infrastructure, increase resilience of vulnerable communities, protect environmental and amenity values, and provide a cost effective, long-term option for hazard risk management, with one-off costs and avoidance of future maintenance and emergency management expenses (Abel et al., 2011; Alexander, Ryan, & Measham, 2012; Bardsley & Niven, 2013; DEFRA, 2002; Turbott & Stewart, 2006). Managed retreat broadly captures planned relocation in the disaster risk reduction (DRR) and climate change adaptation (CCA) fields, and managed retreat or realignment, in coastal management and environmental planning practice. Distinct from migration and displacement, it is strategically planned and will need to (and is beginning to) occur in anticipation of, and response to, the slow-onset effects of climate change, as well as sudden-onset disasters. Managed retreat is becoming a more viable and tested strategy—albeit a controversial one (O’Donnell et al., 2019).

The relocation of people, assets and sometimes, entire settlements, is challenging to accept, especially for those directly impacted, and in some circumstances for the receiving community. People are intrinsically connected to their personal spaces, and attachment to the home, community and land is tied to human identity, history, culture, psychology, livelihoods, and property rights. As a consequence, managed retreat has often been seen as a last resort option as it can result in significant public opposition, despite its potential to avoid and reduce significant risks (Dahm, 2003, p. 29; Stewart, Leonard, Johnston, & Hume, 2005, p. 43).

Recent publications have recognised the need to further investigate this strategy. A 2015 Parliamentary Commissioner for the Environment report presented the following questions to be addressed for New Zealand’s future, highlighting the merit of further research on managed retreat, for example: “Where should beaches be left to retreat inland? And when does the retreat of a whole community become inevitable?” (Wright, 2015, p. 72). Similar questions were presented in a LGNZ report on natural hazards: “When does retreat become the most viable option and how can this be given effect to?” (Willis, 2014, p. 57). An article by Rouse et al. (2016, p. 30) also considers that practical and aspirational research for the next decade could include engaging with communities to map out options for flexible, adaptive pathways, and integrating

CCA with DRR. Finally, as stated by Turbott and Stewart (2006, p. 57), “there is little or no New Zealand research on the acceptability of retreat as an option.” While research has advanced recently, these statements highlight the need to develop ways to plan for managed retreat, providing justification for further research in this field, and recognition of key gaps. With a focus on aiding resilience through the concept and practice of managed retreat, this thesis aims to interrogate its principal barriers and enablers, and investigate opportunities for building resilience by critically analysing how to plan for and enable managed retreat. Increasing resilience to adapt to the challenges of natural hazards and climate change is vital to governing the current and future hazardscape of New Zealand. Further, exploring the role and function of environmental planning, and broader governance actors and modes, is fundamental in achieving this principal aim.

1.2 Aim and objectives

This research is part of a wider project, driven by the demands of The National Science Challenge: Resilience to Nature’s Challenges. The overall **aim** is to:

Critically analyse the functions and practices of environmental planning in enabling managed retreat in New Zealand.

Underpinning this aim are the following research objectives:

1. To interrogate the links between resilience, governance, planning, and managed retreat.
2. To analyse how managed retreat is facilitated in New Zealand resource management policy and plans.
3. To identify principal barriers and enablers for realising the benefits of managed retreat in planning policy and practice.
4. To ascertain public perceptions towards managed retreat policy and principles.
5. To consider new opportunities to build capacity for managed retreat governance.

1.3 Research structure

This thesis consists of nine chapters (see overview in Figure 1). Chapter 1 introduces the motivation for the research and its associated aim and objectives. Chapter 2 provides a literature review and international analysis of managed retreat interventions. The chapter examines the concept of resilience, recognising the importance of adaptive and transformative action. Governance literature is also introduced, to provide a foundation for assessing opportunities and principles for enabling managed retreat in practice. Chapter 3 describes the research design, setting out the rationale for the research process, methods, limitations and the analytical strategy. Chapter 4 examines the formal New Zealand institutional framework that provides the decision-making context for Chapters 5-8. Chapter 5 comprises an extensive analysis and critique of New Zealand planning instruments, to determine the application of, and direction for managed retreat. Subsequently, the focus narrows to New Zealand's most recent attempt to apply managed retreat under the planning system, within the case study of Matatā. A significant focus here is identifying and analysing the barriers and enablers of the planning procedures, and the social implications of managed retreat. Chapter 6 delves into current planning practice, based on thematic analysis of the empirical data collected from interviews, site visits, and from document analysis of the case study. Developing upon the policy and practice findings, Chapter 7 returns to the national scale, consolidating public perceptions towards managed retreat policy, key barriers, and potential cost allocation principles. Common threads of governance capacity concerns emerge throughout the core chapters, leading to analysis of governance frameworks in Chapter 8, where opportunities are considered to better govern managed retreat, taking into account the research findings and international practice. A governance continuum, emerging from the literature review in Chapter 2, frames the scope for change. Chapter 9 summarises the contribution to scholarship, research findings and recommendations. The thesis concludes by discussing further research necessary.

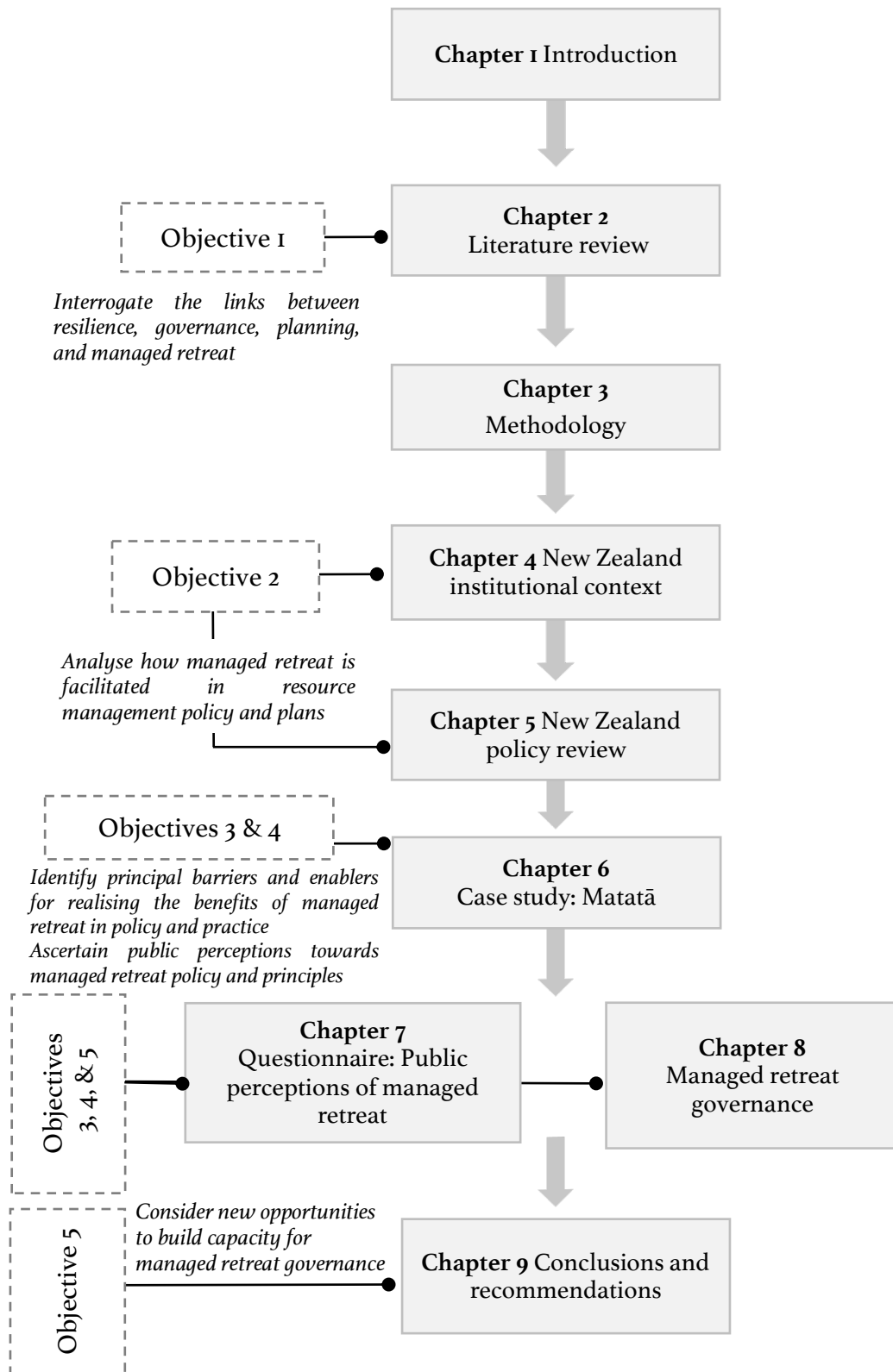


Figure 1: Research structure

Chapter 2 Resilience, governance, and managed retreat: Analysis of theory and practice

2.1 Introduction

Chapter 2 begins with a critical analysis of the key concepts, resilience and governance. A governance framework is introduced to examine governance modes, elements, and orders across a spectrum of state intervention and autonomy. DRR and CCA fields are subsequently explored, followed by an enquiry into the role of environmental planning in managing risk. At the core of this research is the concept of managed retreat, which is analysed in relation to its development, nature, and scale, with international examples informing significant barriers and enablers for implementation, and revealing the current state of practice and theory. This review works to provide the foundation for the thesis, recognising gaps in literature and practice, and developing a framework to guide the empirical chapters.

2.2 Resilience

The future is uncertain, and in some cases the complexity and severity of the challenge appears too great, or the tools, resources, and capacities of authorities too limited for meaningful action (Boston, 2014). Nevertheless, it is not ethical, nor sensible to be frozen in fear or overwhelmed by difficulties. Humans have moral obligations to consider how actions today will affect the wellbeing of current and future generations (Ibid). Walker, Lempert, and Kwakkel (2012) recognise that not all uncertainties can be eliminated, but ignoring them could limit the ability to take corrective action in future, resulting in lock-in, missed opportunities and path-dependency. Natural hazards, disasters, and exogenous shocks will undoubtedly occur, increasing resilience to their impacts is critical (Boston, 2014).

Human and 'natural' systems are intrinsically connected. Pisano (2012) argues that humans exist within social systems that are intimately linked with the ecological systems in which they are embedded; social-ecological systems are complex, adaptive systems that change in an unpredictable and non-linear manner. Resilience thinking offers a framework for understanding how a social-

ecological system operates over connected scales in time and space, in relation to coping with and adapting to disturbance (Ibid). Using a perspective of resilience shifts the focus from controlling change in systems, to managing a system's capacity to cope with, adapt to, and transform with change (Berkes, Colding, & Folke, 2003; Pisano, 2012; Smit & Wandel, 2006). Possessing these principles, resilience is considered to be a useful concept for managing unpredictability and disturbance, one of the reasons it has come to the forefront of natural hazard and climate change adaptation (Walker, Holling, Carpenter, & Kinzig, 2004).

Resilience stems from the Latin root *resiliri*, meaning to spring back (Davoudi, 2012). The term was first used in relation to a metal spring, but it was introduced to the field of ecology, established by Crawford Holling, who made a distinction between engineering and ecological resilience (Ibid). Holling deemed engineering resilience to be the ability of a system to return to a steady state after disturbance (Holling, 1973). In contrast, he defined ecological resilience as the magnitude of disturbance that can be absorbed by a system before its structure is changed (Holling, 1996). The concept of ecological resilience recognises that there are many possible states of equilibrium, therefore, a system may not necessarily 'bounce-back' to its previous state, but bounce forward, into a new state of stability (Davoudi, 2012). This perception can be represented by the 'adaptive cycle' which illustrates that there are four stages of change within a system: growth and exploitation, conservation, release or creative destruction, and reorganisation (Gunderson & Holling, 2002). The adaptive cycle illustrates how systems mature, but with vulnerabilities, eventually resulting in decline or creative destruction, which at the same time, can open new doors for transformation of the social-ecological system. Davoudi (2012) critiques this model for being too deterministic, maintaining that each stage in the adaptive cycle should be understood as a tendency of a system, not an absolute outcome.

A third model of resilience, named as evolutionary or transformative resilience, challenges the notion of an equilibrium and contests that all systems can change over time, whether there is disturbance or not (Scheffer, 2009). Evolutionary resilience is based upon the idea that rather than returning to a previous state of stability after an event, a system can change, alter itself and adapt to stresses in a way that is "complex, nonlinear, and self-organising, permeated by uncertainty and discontinuities" (Berkes & Folke, 1998, p. 12). This form of resilience is based upon a different way of viewing the world, where

instead of imagining space and society as being structured and ever-constant, it is understood as being multifaceted and uncertain (Davoudi, 2012).

While resilience is becoming high profile, its definition is somewhat ambiguous. For clarity, in this thesis resilience is conceptualised as comprising three characteristics, informed by literature (Brand & Jax, 2007; Carpenter, Walker, Anderies, & Abel, 2001; Folke, 2006; Lawrence, White, Glavovic, & Schneider, 2017; Walker et al., 2002; Walker et al., 2004):

***Absorptive capacity:** Resistance to change whilst retaining the same structure and processes*

***Adaptive capacity:** Learning from experience in a self-organising manner, to adjust to impacts and incrementally transition to less vulnerable states*

***Transformative capacity:** The capacity to create a fundamentally new system when cultural, moral, economic, political, technological and environmental conditions make the existing system untenable*

Resilience with a focus on absorptive capacity, where systems persist and 'bounce-back' dominates practice due to multiple meanings of resilience allowing for 'business-as-usual', a lack of attention towards politics, power and agency, the propensity to engineer solutions to support persistence over change, and decision-making processes best suited to address problems simply, but not necessarily sustainably (Davoudi, 2012; White & O'Hare, 2014). Resilience as absorptive capacity is appropriate in some circumstances, for example, the use of insurance to spread the cost of hazard events, however, a focus on persistence can make adaptive and transformative resilience less achievable, as people attain a false sense of security, and further investment in risky spaces makes systemic change expensive and politically problematic (Lawrence et al., 2017, p. 2).

"Adaptive capacity is sometimes seen as the 'ability to be resilient'; at other times it refers to 'learning' in response to disturbance in systems" (Bahadur, Ibrahim, & Tanner, 2010, p. 2). One strand of literature frames adaptive capacity as the ability of systems to cope with change, determined by social-ecological characteristics (Plummer et al., 2018; Smit, Pilifosova, & Burton, 2001; Vincent, 2007). In this way, adaptive capacity is often referred to as stocks of capitals (such as social, human, financial, built, and natural) that are critical to sustain livelihoods (Plummer et al., 2018). However, as recognised by Thomsen et al., (2012) this notion of adaptive capacity aligns more strongly with 'manipulation' or absorptive capacity (described above), focused on undertaking external adjustments which address the symptoms of stress rather than the causes of it.

Therefore, adaptive capacity in this manner is more likely to permit external change “to better suit the existing predisposition of certain individuals or social groupings with the intention of avoiding change within these entities” (Ibid, p. 3). In contrast, adaptive capacity in this thesis is considered a process of social learning, using the collective capacity of human actors and knowledge to manage resilience by adjusting to impacts and incrementally transitioning to less vulnerable states (Hudson, 2010; Walker et al., 2004). Rather than attempting to control external factors, it is focused on internal adjustment within human systems, reassessing ‘how we should behave’, as opposed to ‘how life should be’ (Thomsen et al., 2012, p. 3). Protective strategies to manage risk reflect absorptive dimensions of resilience, whereas managed retreat has a greater propensity to trigger adaptation of systems’ social elements (Ibid).

The third dimension of resilience is transformation. A transformative system must be able to move and restructure with change, whilst maintaining its vital functions. The ability of a system to transform is dependent on the ability of people to imagine and implement alternative futures to create a less vulnerable society. To steer towards a more resilient, sustainable future, changes in human values and associated governance regimes will be required (Pelling, 2010). Transformation, with its focus on addressing the systems that drive vulnerability and risk, helps to identify routes towards significant, sustainable change (Bahadur & Tanner, 2014, p. 211). Transformative change may require a paradigm shift, altering fundamental attributes of socio-ecological systems (IPCC, 2014b).

These conceptualisations of resilience are intertwined with the key concepts of absorptive capacity, adaptive capacity, and transformative capacity. As recognised by Miller (2010), building and enhancing resilience is a multidimensional problem requiring a range of expertise and resources of multiple groups. Resilience thinking alters perspectives aiming to control change in systems that are presumed to be stable, to managing the capacity of social-ecological systems to cope with, adapt to, and shape change (Berkes et al., 2003; Pisano, 2012; Smit & Wandel, 2006).

Dimensions of resilience can be applied in multiple ways, however absorptive resilience to maintain system functions and rebound from external shocks dominates practice. White and O’Hare (2014) highlight that resilience actions are predominantly hard engineering techniques, to ‘build back stronger’ following inevitable crises, rather than transforming underlying social-political systems and institutional frameworks. Coaffee and Clarke (2015) challenge the

usefulness of resilience planning to date, due to its emergence as a 'buzz word' and implementation gaps, where theory is seldom (or slowly) grounded within everyday planning practice. Closure of the 'implementation gap' is challenged by ever-increasing socio-economic problems, risks, limited resources and decision-making practices, and tools predominantly suited to non-dynamic risks and straightforward issues (Coaffee & Clarke, 2015). Davoudi et al., (2012) also argue that the broad, encompassing nature of resilience hinders its ability to effect change, allowing continuation of the status quo, with its definition arbitrarily moulded according to corporate and political agendas. In this regard, distinguishing the dimensions of resilience (absorptive, adaptive, and transformative) reduces ambiguity and strengthens its potential application.

Resilience, with its view that "humans are inextricably entwined within, produced by and productive of 'natural' processes means that it is no longer possible to act as if humanity was separate to, above or controlling, separate forces" (Grove & Chandler, 2017. p. 85). Evans and Reid (2014) consider that resilience notions of human immersion into nature removes potential for freedom and political action, by focusing on adaptation to a pathological earth. However, as elucidated by Grove and Chandler (2017), Grosz (2011) argues that 'renaturalising' politics offers opportunities. Beyond binaries of 'Man' and 'Nature', notions of resilience can change thinking to focus on contingency as an opportunity rather than a constraint (Grove & Chandler, 2017). Resilience is not based on human obedience to nature and loss of human agency, but a systems approach to enable sustainability. By refraining from controlling nature and working towards understanding and respecting its functions, managed retreat is an important opportunity to work towards resilience. In light of implementation concerns, the greatest challenge for resilience planning is to use the concept to help communities navigate change; altering decision-making norms, practices, and systems to achieve this. This thesis addresses the implementation challenge for managed retreat, with a view to enhance the capacity for adaptation.

As such, resilience demands new ways of governing to provide for learning and the development of capacity to cope, adapt, and transform with change (Folke, Hahn, Rockström, & Osterblom, 2009). To progress beyond absorptive resilience and towards more naturalised, adaptive outcomes associated with managed retreat, an examination of the governance of decision-making in this context is required.

2.3 Governance

Governance concerns the organisation and guidance of society via collective action to achieve common goals (Healey, 2006; Torfing & Ansell, 2016). Governance perspectives emerged in response to an ‘overload of government’, tensions between civic expectations, limited public resources, and low public sector productivity growth, contributing to a legitimacy crisis for the modern state (Torfing & Ansell, 2016). The shift from ‘government’ to ‘governance’ that has since taken place in many western societies (Arts, Leroy, & van Tatenhove, 2006; Ostrom, 1990; Rijke et al., 2012) exhibits a movement away from strictly hierarchical and institutionalised control implemented by governments, to less formal approaches where power is distributed amongst many actors (Rijke et al., 2012). As a process, Kooiman (1993, p. 2) determines governance to be “those activities of social, political and administrative actors that can be seen as purposeful efforts to guide, steer, control or manage (sectors or facets of) societies.” Governance relates to the way in which social order is created and sustained, and can be considered as the patterns that arise from the governing actions (Rijke et al., 2012).

In environmental sectors, early conversations were focused on the need to address externalities stemming from the ‘public good’ nature of environmental resources and processes (Lemos & Agrawal, 2006). In addressing these concerns, state action was seen as an imperative. However, in the late 1970s debates about shifts from government to governance emerged. For example, Ostrom (1990) advanced arguments about governing the commons, identifying opportunities for self-governance by people and communities (Lemos & Agrawal, 2006), later revealing the false dichotomy between states and markets (hierarchy and self-governance) (Ostrom, 2010). Recently, attention has been drawn to more nuanced arguments regarding hybrid forms of interactions, joining markets, states, and communities (Driessen, Dieperink, van Laerhoven, Runhaar, & Vermeulen, 2012; Lemos & Agrawal, 2006).

Environmental governance faces increasing challenges due to western production and consumption trends, which has produced claims of a new geological epoch, where human activity has become a geological force (Grove & Chandler, 2017). Burdens of the Anthropocene are composite, dynamic, and full of uncertainty. Given escalating environmental degradation, it is argued that contemporary governments are not well suited to, or capable of, meeting these challenges (Armitage, de Loe, & Plummer, 2012; Duit & Galaz, 2008;

Meadowcroft, 2009). To provide insights into the varying challenges presented by absorption, adaptation, and transformation, insights from governance theory are revealing.

A review of literature reveals that governance can be conceptualised as encompassing a range of: *modes* situated on a spectrum delineated (not necessarily in opposition) by ‘hierarchy’ and ‘self-governance’ (Hysing, 2009; Treib, Bähr, & Falkner, 2005); *elements*, the instruments which enable governing action, and; *orders* of governance, including interactions between actors, rules and procedures, and principles required for effective governability—the capacity for governance (Kooiman, 2003; Kooiman & Jentoft, 2009). Here, *first-order* governance deals with day-to-day affairs aimed at solving societal problems. *Second-order* governance focuses on the institutional arrangements which first order governing takes place within, and the *third-order* involves debate on underlying values and principles, feeding into the entire governance exercise (Kooiman, Bavinck, Cheuenpagdee, Mahon, & Pullin, 2008; Kooiman & Jentoft, 2009).

The review also uncovered archetypical governance modes, elements, orders, and the constructive and limiting aspects of each mode. Structurally informed by Driessen and others’ (2012) conceptual framework, Kooiman, Bavinck, Cheuenpagdee, Mahon and Pullin’s (2008) interactive governance model, and Hysing’s (2009) governance continuum, Figure 2 provides an indicative horizontal continuum, summarising the principal governance *modes* found within the literature, across a spectrum of state intervention and societal autonomy. Its fluid nature reflects the hybridity of modes present in reality (Driessen et al., 2012; Lemos & Agrawal 2006). *Elements* and *orders* of the modes are illustrated, in particular, the instruments, interactions, institutional arrangements and guiding principles across the notional governance spectrum. Institutions denote the agreements, rules, rights, laws, norms, beliefs, roles and procedures applied to make decisions (Kooiman et al., 2008, p. 7). Institutions also create the framework for governance to take place, comprising the structure to support formal and informal interactions, procedures and programmes for actors (including organisations) to solve societal problems and create opportunities.

Figure 2 provides a useful, simplified, and concise illustration of how different modes of governance may have tendencies towards certain elements and orders. Each mode can be appropriate depending upon the type of problem being addressed, and the required dimension of resilience. The framework represents what Bovens & 't Hart (1996) argue to be 'optimist' and 'realist' governance philosophies, delivering a frame to analyse both functional and procedural governance barriers, and help reveal broader tensions and power struggles that may restrain action.

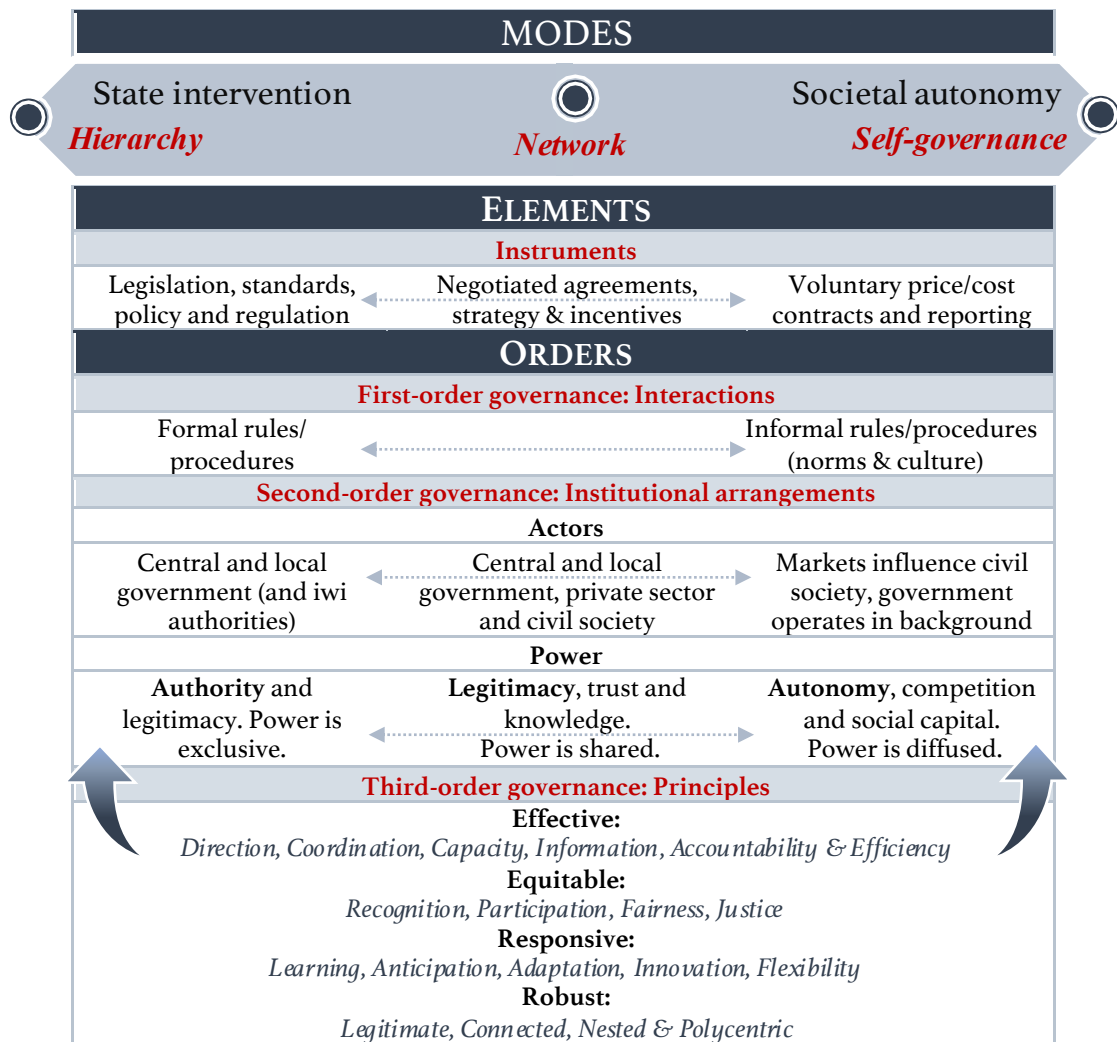


Figure 2: Governance modes, elements and orders

2.3.1 Modes, elements, and first and second governance orders

Hierarchy

Hierarchy delivers a top-down structure based on a chain of command, with a clearly identified leadership authority, steering society in a routinised and repetitive manner (Stephenson, 2016). Examples of hierarchy can be present in indigenous cultures, where power resides exclusively with a chief, and under state control. Under hierarchical government, power is held by a central governing authority and its empowered organisations. Formal instruments and interactions 'direct' society via regulation, norms, and procedures. Due to high sunk costs invested in institutional structures, the rearrangement of rules and practices to enable adaptation and deal with information deficits can be difficult. Therefore, hierarchal tendencies can be rigid, reactive, and prone to path dependencies (Duit & Galaz, 2008; Ostrom, 1999). Hierarchy can also function in a de-centralised manner. De-centralised government is structured via vertical intergovernmental relations where central and local government actors take the lead, and civil society is the recipient of governing elements and orders characterised by formal rules, regulations, policies and procedures developed for the public good (Driessen et al., 2012). While there is still strong top-down direction, this mode brings decision-making closer to those affected by governing actions, promoting public participation, considering time-and-place specific knowledge, allowing jurisdictional competition, and facilitating innovation and experimentation (Driessen et al., 2012; Lemos & Agrawal, 2006; Marks & Hooghe, 2004). De-centralised governance can be greatly constrained if it does not have the capacity to make decisions, and it can result in a complex operating environment with reduced democratic accountability (Bache, Bartle, & Flinders, 2016, p. 488).

Network

Moving along the indicative spectrum, power becomes more dispersed and governance less authoritative. Network, or interactive governance is structured as a polycentric system of several centres of decision-making that are formally independent of each other (Ostrom, Tiebout, & Warren, 1961). These systems have been defined as complex, integrated and variably sized units with different purposes which, together form a largely self-organised regime (Pahl-Wostl, 2009). Numerous forms of networks exist, for example 'global or virtual networks' (Holton, 2008) and 'policy networks' (Rhodes, 1990). First-order

interactions often include a combination of formal and informal rules, norms and procedures, with action to achieve aims commonly delivered via instruments of strategy, negotiated agreements and incentives. Networks are transdisciplinary, often including both government and non-government actors (second-order governance). Power is shared and social, political, and ecological change is harnessed by the flexible multi-actor, multi-level, and multi-sectoral coordination possible within this mode, and the diverse sources of knowledge and adaptability to cope with uncertainty (Folke et al., 2004; Kickert, Klijn, & Koppenjan, 1997). Lower transaction costs from an absence of central government coordination, and a high learning capacity make this mode more viable under conditions of uncertainty, complexity, and crisis (Ibid). Another benefit is a network's tendency to have more accessible and flexible forms of governing (Dedeurwaerdere, 2005). Despite these benefits, network governance is not suitable for all conditions. It can face challenges in achieving representative membership which may lead to legitimacy disputes (Pahl-Wostl, 2009), with potential for the creation of norms becoming a 'law unto themselves' triggering transparency issues and accountability concerns (Keast, 2016; Rhodes, 2000). Network governance also requires considerable investment of time and effort to build and sustain interactions and trust (Driessen et al., 2012; Keast, 2016), as well as "judicious network leadership and management, to navigate the complex sets of relationships and agendas and bypass or overcome blockages to ensure public value is delivered" (Keast, 2016, p. 449). It is important to recognise that network governance is not independent of hierarchical arrangements, acting in concert with these as a component of a broad hybrid assembly (Ibid, p. 446).

While it is not 'archetypal', a secondary governance mode of note uncovered in the literature is public-private governance or 'closed co-governance' (Arnouts, van der Zouwen, & Arts, 2012), which refers to the joint actions of partners in public and private sectors. Positioned near network governance on the spectrum, but moving closer to self-governance, it is incentive based with government acting as a facilitator, however private actors decide autonomously about collaborations within top-down, pre-determined boundaries (Driessen et al., 2012). Under this mode, power is diffused and relationships are voluntary and cooperative. Public-private governance is useful where there is less trust in governing authorities, however parties must rely upon each other to cooperate and achieve shared goals. The key difficulties of this mode include inability to

attract cooperation to achieve outcomes, (Glasbergen, 1998), which could be relationship or resource based, triggering negotiation failure, and ensuring the interests of civil society are not side-lined by relationships between governments and the private sector.

Self-governance

Finally, at the far end of the continuum, representing high societal autonomy is self-governance, where non-governmental actors manage their own affairs. In practice, pure self-governance does not exist, as actors are influenced by a world of formal and informal constraints. Governmental actors are likely to be involved 'in the background' but keep their distance (Kooiman, 2003; Kooiman & van Vliet, 2000). Elements to achieve action can include voluntary price-based contracts and reporting, undertaken via informal interactions (first-order governance). Development of industry norms and practices, such as code of conducts to regulate behaviour, is also a form of self-governance (Isailovic & Pattberg, 2016). This governance mode affords far-reaching autonomy based on contracts, competition, and transactions, in a self-organising, bottom-up direction. A constraint of this mode can be its inability to deal with complexity due to the tendency to ignore intended and unintended consequences of behaviour on others (Kooiman, 2003). Isailovic and Pattberg (2016) also recognise that self-governance or 'private governance' often privileges business-as-usual practices, can weaken representation of the less privileged, and effectiveness may be compromised by profit seeking behaviour. A significant limitation of self-governance is that it is typically self-interested and focused on the short-term, meaning it is susceptible to failing to address underlying causes of social and environmental problems (Ibid).

While indicative modes have been drawn out to illustrate difference, it is important to note that the governance modes exist along a fluid continuum, representing hybrid forms of authority, and approaches which will be applicable under diverse conditions.

2.3.2 Third-order governance

Archetypal modes and associated elements and first and second governance orders have been discussed, but governance also involves both the structure and capacity for governability, which may be referred to as third-order governance. This includes the underlying principles required for governability, which feed into any governance exercise (Kooiman, 2003; Kooiman & Jentoft,

2009). Governance arrangements are an important factor in the enablement or hindrance of effective environmental management (Armitage & Plummer, 2012; Lockwood et al, 2010; Ostrom, 1999). As such, useful *principles* for environmental governance theory have developed in a range of areas, including under ‘adaptive governance’, ‘anticipatory governance’, and ‘good governance’ to name a few relevant subfields (Bennett & Satterfield, 2018). The following discussion examines the principles of adaptive, anticipatory, and ‘good’ governance, to provide insights into the kinds of questions that governance approaches are seen to address, and to begin to develop a framework by which to interrogate managed retreat policy and practice.

As argued by Djalante, Holley, and Thomalla (2011), there is not one model of adaptive governance as such, but a range of literature emphasising key principles, relating to polycentric and multi-layered institutions, participation and collaboration, self-organisation and networks, learning and innovation. Adaptive governance is derived from a range of theories, in particular adaptive management, cooperative management, and collaborative governance (Djalante et al., 2011; Hurlbert, 2017). It is a useful concept as it aims to manage uncertainty and integrate decision-making across multiple groups involved in fostering resilience, applying reflexive and experimental techniques to prepare for and adapt to change.

Whilst adaptive governance focuses on collaborating with communities and continually learning from and evolving policy and decision-making, anticipatory governance attempts to address bias towards the present, in the face of challenges and vulnerability, now and in future. Boston (2016b, p. 49) considers that attention bias towards the present has resulted in a focus on policy problems of the present over the future, a failure to anticipate future problems and a policy agenda dominated by immediate or urgent issues, displacing the resources and time available to address major long-term concerns. Boston further argues that to build resilience and ensure a better, less vulnerable, and more sustainable tomorrow, we must anticipate and prepare for foreseeable challenges, regardless of their conceptual, analytical, and political difficulties (Boston, 2016b, p. 3).

Anticipatory governance uses a range of possible futures to anticipate and monitor adaptation strategies (Quay, 2010), seeking robust and flexible democratic institutions and processes in the face of presentism, path dependence, and vested interests (Boston, 2016a, p. 12). To mitigate these challenges, Boston (2016a) suggests tools, policy frameworks, and ‘commitment

devices' (mechanisms designed to bind individual, organisations or governments to a particular course of action) to ensure long-term costs, benefits, risks and opportunities are brought into the short-term focus. Anticipatory governance is proactive and precautionary, seeking prevention of harm rather than response to it, aligning with the aims of managed retreat. It welcomes the holistic notion of resilience and does not expect the future to be clearly mapped, instead recognising the requirement for dynamism and flexibility, advanced by anticipatory planning and adaptive management (Boston, 2016a). While this offers potential, it leads to further questions about implementation, particularly in the midst of the existing structures, biases, power asymmetries, and vested interests of the present. Boston and others provide some high level considerations for this, including requiring policy makers to have the best available science, ensuring transparency in decision-making, using analytical frameworks that capture the full range of likely costs and benefits (e.g. direct, indirect, long-term, short-term, tangible, intangible) and applying commitment devices that require the policy regime and those subject to it to conduct foresight exercises and long-term forecasts, applying precautionary decision-making and risk consideration over long timeframes (Boston, 2016a, p. 17; Lawrence, 2016, p. 36). However, overcoming the constraints of political myopia on long-term decision-making remains a challenge.

Another subset of third-order governance is 'good governance', with established principles applied in codes of the World Bank, the United Nations Development Programme and Ostrom's (1990) common resource property design principles (Lockwood, Davidson, Curtis, Stratford, & Griffith, 2010). Lockwood et al., (2010) examined international and Australian codes to present a suite of natural resource governance principles relevant to the multilevel context. Eight common principles were identified: legitimacy, transparency, accountability, inclusiveness, fairness, functional and structural integration, capability, and adaptability.

In recognition of the broad sentiments of 'good governance' across these subfields, the biases of existing good governance frameworks, (for example inclusion of equity but not effectiveness (Graham, Amos, & Plumtree, 2003; Lockwood et al., 2010)), and an absence of adequate capture of the entirety of potential aims and attributes of governance, Bennett and Satterfield (2018) undertook a comprehensive literature review to formulate governance principles relevant to environmental problems. They garnered principles from

diverse areas of theory to characterise key features of good environmental governance relevant to environmental policy makers and practitioners. Their framework suggests that environmental governance has four principal objectives: to be *effective*, *equitable*, *responsive*, and *robust*.

Whilst having many attributes in common with the other governance literature (e.g. flexibility, anticipation, adaptability, legitimacy, transparency, accountability, inclusiveness, fairness, functional and structural integration, capability, polycentricity, participation, networks, learning, and innovation) their framework is applicable to broad environmental problems and modes of governance at a range of scales. *Effective* governance is defined as supporting the maintenance of system integrity and functioning, requiring direction, coordination, capacity, information, accountability and efficiency. *Equitable* governance ensures inclusive processes and fair outcomes, requiring recognition, participation, fair distribution of benefits and burdens, and access to justice. *Responsive* governance enables adaptation and anticipatory action with learning, innovation and flexibility. Finally, *robust* governance ensures that functioning institutions persist, maintain performance, and cope with perturbations and crises, being legitimate, connected, nested and polycentric (Ibid, p. 7). Table 1 links the principles to the attributes to help provide more detailed insights into how New Zealand may better enable effective, equitable, responsive and robust managed retreat governance.

Table 1: Good governance principles adapted from Bennett & Satterfield (2018, p. 3)

Principles	Attributes
<p>Effective managed retreat governance: Supports maintenance of system integrity and functioning</p>	<ul style="list-style-type: none"> • Direction: Scope, goals and aims of managed retreat are comprehensive, clearly articulated and communicated to stakeholders. Clear boundaries on action and scope exist.
	<ul style="list-style-type: none"> • Coordination: The roles, functions, and mandates of intervening governments, agencies and organisations are coordinated
	<ul style="list-style-type: none"> • Capacity (including capability): Skills and resources are sufficient to plan and deliver managed retreat. Capable and visionary leadership is present. Mechanisms are present to resolve conflicts between authorities and communities, and within communities.
	<ul style="list-style-type: none"> • Information: Planning and management decisions and actions for managed retreat are informed by best available information and integration of a diversity of knowledge types and systems.
	<ul style="list-style-type: none"> • Accountability: Procedures are present to hold governors accountable for performance of the strategy and process. Mechanisms are in place to ensure that means and rationales for managed retreat decisions are transparent.
	<ul style="list-style-type: none"> • Efficient: Efficacy guides decisions regarding management actions and deployment of resources. Timeframes are reasonable. Economic costs and actions taken are commensurate with outcomes.
<p>Equitable managed retreat governance: Employs inclusive processes and produces fair outcomes</p>	<ul style="list-style-type: none"> • Recognition: Managed retreat strategy, policies and processes acknowledge and respect incorporation of diverse perspectives, values, cultures and rights. Views of marginalised and vulnerable groups are included.
	<ul style="list-style-type: none"> • Participation: Spaces and processes to enable community participation and choice are present, with representation and engagement of all stakeholder groups.
	<ul style="list-style-type: none"> • Fair: Mechanisms are in place to ensure socio-economic costs and benefits of managed retreat are just and fairly distributed. Rights and responsibilities are shared and assigned fairly. Unequal circumstances are considered.
	<ul style="list-style-type: none"> • Just: Laws and policies are present to protect local rights, and mechanisms ensure that groups have access to justice
<p>Responsive managed retreat governance: Enables adaptation to diverse contexts and changing conditions</p>	<ul style="list-style-type: none"> • Learning: Monitoring, evaluation, reflections and communication of managed retreat process and implementation performance is institutionalised. Processes and platforms are in place to co-produce knowledge and enhance social and institutional memory.
	<ul style="list-style-type: none"> • Anticipatory: Long-term planning and foresight thinking are institutionalised. Known and unknown risks and opportunities are considered, analysed and strategically planned for.
	<ul style="list-style-type: none"> • Adaptive: Spaces for reflection and deliberation are institutionalised. Processes exist to revisit and evolve policies and adapt long-term actions.
	<ul style="list-style-type: none"> • Innovative: Innovation and experimentation are encouraged, and success and failures are monitored. A higher risk tolerance is embodied.
	<ul style="list-style-type: none"> • Flexible: Managed retreat policies are adjusted to fit local realities. Efforts are taken to understand and document the diverse contexts where policies are applied and to deliberate on necessary adjustments.

Principles	Attributes
Robust managed retreat governance: Ensures functioning institutions persist, maintain performance and cope with perturbations and crises	<ul style="list-style-type: none"> • Legitimate: A collective vision shapes managed retreat policies and guides actions at all scales. Institutional legitimacy is conferred (e.g., in policy) and perceived (e.g., by constituents). Governors act with integrity and consistency. Institutions are transparent.
	<ul style="list-style-type: none"> • Connected: Networks of relevant organisations and actors are linked vertically and horizontally. Processes are in place to support network development, mutual learning, and develop social relations.
	<ul style="list-style-type: none"> • Nested: Tasks are assigned to appropriate levels. Managed retreat decision-making authority and responsibility are conferred to the lowest level possible. Authority and responsibility are supported by adequate state or other outside support and oversight
	<ul style="list-style-type: none"> • Polycentric: Decision-making and action taking centers in multiple places, across jurisdictions and at multiple scales interact and cohere towards a common goal. Institutions are present that are diverse and redundant - that serve similar purposes and have overlapping jurisdictions and functions.

It is recognised that in practice, engaging with all four objectives and corresponding attributes will be difficult, but these principles provide a set of guidelines to inform theory and practice, with synergies and trade-offs inevitable. Integrating principles from a range of relevant subfields in this way is designed to provide a framework that is applicable to differing strategies and contexts, including those relating to this study. This flexibility is important as managed retreat interventions will inevitably vary across space, time, and risk contexts. Together the governance framework (Figure 2) and Bennett and Satterfield’s (2018) holistic principles provide a clear foundation to better understand and interrogate managed retreat governance and contribute to understanding the key barriers, enablers, and opportunities to improve practice (Objectives 3, 4 and 5). As such, the thesis will draw upon the framework to help identify and analyse managed retreat governance modes, elements (instruments), and orders (interactions, actors, power, and guiding principles). Further, to work towards resilience, consideration of such governance devices is required to deliver ‘good’ outcomes in the face of the increasing exposure, complexity, and uncertainty germane to the fields of disaster risk reduction and climate change adaptation. The following sections now turn to examining the development and goals of DRR and CCA and the role of environmental planning in enabling managed retreat to deliver upon these.

2.4 Disaster risk reduction and climate change adaptation

Disaster risk reduction emerged following a growing international awareness of the significant impacts that natural hazards exude on societies and the need to reduce human exposure and vulnerability (Ireland, 2010). The 1990s were declared the international decade for DRR (Ibid) but its development began much earlier, with White's notions of 'human adjustment' in response to flooding (White, 1945). White's concepts of undertaking adjustments such as land use change, rather than relying on protection works could be seen as prophetic, only recently being incorporated into public policy (Macdonald, Chester, Sangster, Todd, & Hooke, 2012). At present, commitment to the *Sendai Framework for Disaster Risk Reduction 2015-2030* requires an increased focus on proactive management of disaster risk through active intervention, including a priority to strengthen disaster risk governance by formulating public policies aimed at addressing the issues of managed retreat (UNISDR, 2015, p. 171). The Sendai Framework recognises growing vulnerabilities to natural hazards and climate change impacts worldwide, and asserts that prevention and reduction of disaster risk is a primary role of signatory governments, New Zealand included.

UNISDR (2015) states that there are two key elements that create risk; hazards and vulnerability. Risk represents the possibility of future adverse effects, emerging from interactions between social and environmental processes. It is a contested and subjective concept, as perception of risk varies across space and time, and between individuals. Risk is never fixed, but continually evolving, much like vulnerability.

Conceptualisations of risk have advanced over time, with more complex definitions emerging, for example, depicting risk as the combination of natural hazards and vulnerability—including the exposure of people and assets to the hazard, and the resilience of the people and assets that are exposed. In the past, the New Zealand planning approach for addressing risk has focused on responding to the hazard, resulting in concentration on the likelihood of an event occurring, with little consideration of the consequences of such events (Saunders, Beban, & Kilvington, 2013). This approach has meant that many developments have been approved which increase the risks (or potential risks) to people and property (Ibid).

International trends in risk management and communication are placing increasing emphasis on providing good opportunities for public engagement in

risk assessment (Saunders et al., 2013). This departs from the technocratic approach traditionally applied, recognising the importance of local and indigenous knowledge, and that risk management and land use planning fundamentally require value judgements about the costs and benefits of different margins of safety (Ibid). Collaborative, risk-based approaches are emerging in New Zealand planning documents, however ‘consequence’ predominantly remains to be framed by quantifiable impacts such as building damage and fatalities. At present, little attention is focused on the drivers of social vulnerability which often correlate to significant adverse consequences of hazard events.

Vulnerability is a similarly widely used and often contested concept. The term is used in numerous contexts and disciplines, from economics, to psychology, engineering and risk (Adger, 2006). It is a widely generalised term, often used to describe the elderly, children, or women as ‘vulnerable,’ without any indication as to what these groups are actually vulnerable to (Cardona et al., 2012). Vulnerability has been referred to as the opposite of resilience, however this over-generalises both concepts and results in the interpretation that a system is vulnerable because it is not resilient and it is not resilient because it is vulnerable (Klein, Nicholls, & Thomalla, 2003; Manyena, 2006). The key concepts of exposure and capacity to cope are also found in the definition of vulnerability within the CCA field. Vulnerability to climate change is defined as the “degree to which geophysical, biological and socio-economic systems are susceptible to, and unable to cope with, adverse impacts of climate change” (Adger et al., 2007, p. 27). Three key components of vulnerability include exposure, sensitivity, and adaptive capacity. This is slightly distinct from DRR definitions because the rate and magnitude of climate change is considered (Cardona et al., 2012). Exposure is associated with proximity to hazards or environmental change. This aspect of vulnerability is physical, connected to space and place. Sensitivity is the physical predisposition of humans, infrastructure, and the environment to be adversely affected by a natural or anthropogenic phenomenon due to a lack of resistance or as a consequence of their intrinsic condition (Ibid). Adaptive capacity is the ability to anticipate, respond, and adapt with change, learning from experience and incrementally transitioning to new, less vulnerable states (Ibid).

The DRR field provides a subtly different framing of vulnerability, linked to social construction of risk. The term is deconstructed by Pelling (2012) into key

aspects: exposure (location relative to hazard and surroundings) and resilience (absorptive, adaptive, and transformative capacity). Figure 3 synthesises Pelling’s depiction of risk with the dimensions of resilience applied in this research, illustrating how a range of factors comes together to form risk. Vulnerability can be considered as the degree to which an individual or group is susceptible to harm, which is dependent on physical exposure and the three dimensions of resilience. Changes in climate (from anthropogenic actions and natural variability) will impact upon the likelihood and consequences of hazards, much like contextual dimensions will impact upon the exposure and resilience of systems (IPCC, 2014a).

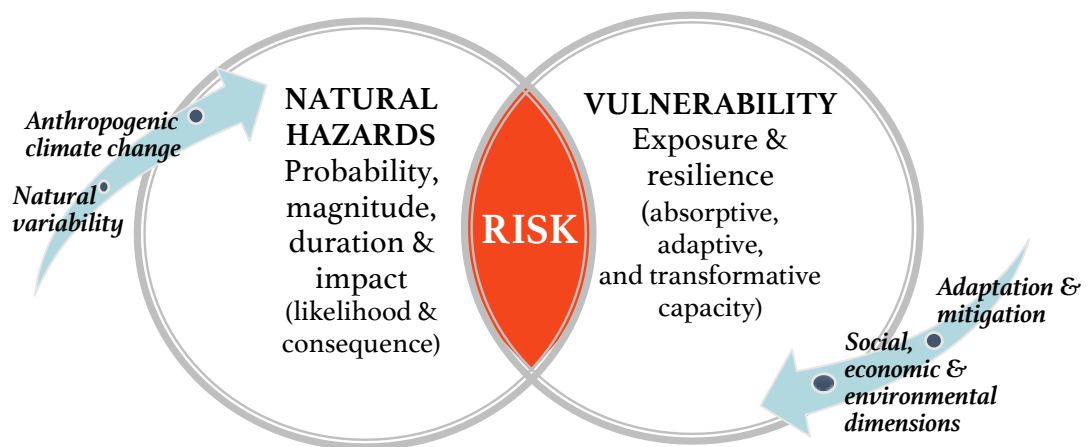


Figure 3: Hazards, vulnerability and risk

Vulnerability is multi-dimensional, varying across space and time, among and within social groups, in an ever-changing state (Vogel & O’Brien, 2004). In summarising the DRR and climate change scholarship, Cardona et al., (2012) emphasise that vulnerability is significantly bound to the social, economic, and environmental dimensions of a locality. Environmental dimensions include physical, geographical, and developmental elements, and economic dimensions include work and livelihoods (Cardona et al., 2012). Social dimensions are diverse, consisting of demography, migration and displacement, social groups, education, health and well-being, culture, institutions and governance (Ibid, p. 80). While context specific, broad factors such as poverty, risk communication deficits, weak social networks and support mechanisms, and maladaptation can affect vulnerability levels (Ibid, p. 70). Maladaptation is “an adaptation that does not succeed in reducing vulnerability but increases it instead” (McCarthy, Canziani, Leary, Dokken, & White, 2001, p. 990). Institutional factors are critical here (Adger, 2000), influencing the social distribution of vulnerability and shaping of adaptive capacity. Institutional systems, behaviours, and norms that

govern society help determine vulnerability, influencing power relations, risk perceptions, and in deciding how vulnerability, risk reduction, and adaptation are managed (Ibid).

Whilst exposure is increasingly integrated in risk-based decision-making, social aspects of vulnerability are often overlooked. For example, O'Hare and White (2017, p. 393) assert that despite recent academic developments in social vulnerability for flood risk management, these dimensions are yet to influence practice, as they open debates beyond technical considerations, entering into wider policy fields and political economy debates. Vulnerability offers a critique of existing power relations and the status quo, making it a powerful concept, but like adaptation and resilience, it can be subverted by the neoliberal agenda (Bankoff, 2018). For example, relocation strategies for development purposes can be renamed and justified by governments as adaptation (Mortreux et al., 2018). Bankoff (2018) argues that only through continuous emphasis on the root causes of vulnerability, how power relations place some people more at risk than others, and on how there is opportunity for radical, systemic change, can human societies undertake transformation.

DRR and CCA have largely emerged as parallel but distinct discourses, however, convergence between the two has begun to emerge (IPCC, 2012; Lawrence & Saunders, 2017). Their differences largely relate to rates of change and the global scale of projected climate impacts, but both must function under conditions of uncertainty and change (Ibid). These conditions add scale and frequency challenges for both DRR and CCA and put pressure on institutions of planning and their practice (Ibid). Although humans have been adapting to risks and change for millennia, current society exists in an increasingly complex and highly developed social-ecological system. As such, planning for resilience to work towards DRR and CCA goals is no simple task, being logistically, physically, and scientifically complex, in the face of vast social, political, cultural, environmental, economic, and governance challenges, amplified by conditions of uncertainty.

2.5 Planning for resilience

Environmental planning is the activity of “purposeful anticipation of and provision for the future” (Selman, 2000, p. 1). The term ‘planning’ is used to describe land use planning, asset, infrastructure and services management, housing and economic development, and transport, health and safety, resource

and spatial planning. The purpose of planning is to form the scope and nature of resource use and development, identifying present and emerging needs, and developing plans to ensure these needs will be met, to foster resilient societies that thrive, reproduce, and revitalise themselves (Ericksen, Crawford, Berke, & Dixon, 2001, p. 8). Ideally, it is expected that with the development and implementation of policy and plans, built environments become more efficient, liveable and vibrant, ecosystems flourish and the benefits of these improved conditions are more equitably distributed within and between current and future generations (Ericksen et al., 2001). However, planning operates within an increasingly complex system where conflict arises between competing priorities (e.g. 'The Planner's Triangle' (Campbell, 2016)) and contested interpretations, not to mention the issue of uncertainty that is inherent (O'Hare, White, & Connelly, 2015).

Environmental planning has long been established as an important tool for avoiding and reducing natural hazard (and now climate change) risk in communities. As reasoned by Glavovic, Saunders, and Becker (2010), the potential of natural hazard planning is its role in assisting decision-making that fosters identification, avoidance and reduction of risk, facilitation of community understanding, and governance to develop resilient, sustainable communities. In this regard, CCA and DRR can be practically achieved in three primary ways:

- **Protect:** allowing the continued use of at risk areas via defence measures
- **Accommodate:** continue living in vulnerable locations by adjusting lifestyle and management habits
- **Retreat:** strategically withdraw from risky localities and prohibit new development in the previously occupied area

The 'protect, accommodate, retreat' (PAR) logic emerged in the context of sea level rise management with the first Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) (Dronkers et al., 1990; Thomsen, Smith, & Keys, 2012). This logic has developed in parallel to natural hazard thinking around avoidance and reduction of risk. Figure 4 presents the adaptation categorisation, depicting examples of the various techniques that may be implemented within each category. Although it presents standalone examples of each approach, these can be applied in combination, and as part of long-term adaptation pathways.

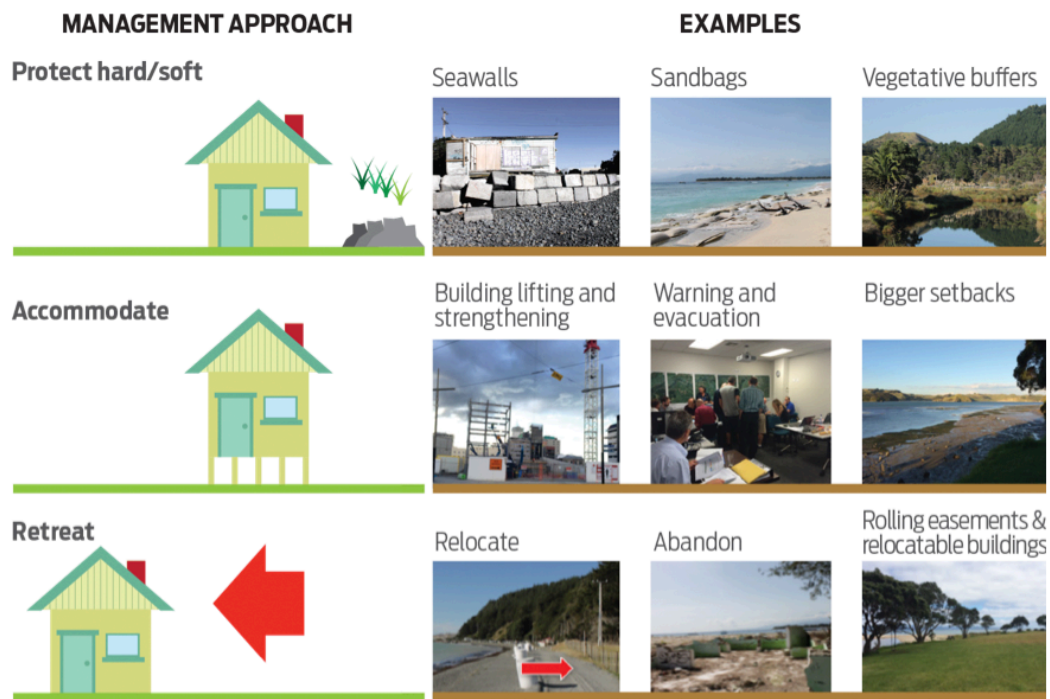


Figure 4: The suite of hazard management approaches

Given the uncertainty of decision-making under environmental and socio-economic change, strategies for adaptive risk management need to be applied in practice. Adaptation pathways are dynamic decision strategies which provide a long-term vision and sequence of steps for the entity at risk, triggered by “adaptation tipping points”—the points in time when adaptation actions cease to be effective and new actions are required” (Barnett et al., 2014, p. 1103). ‘Dynamic Adaptive Policy Pathways’ (DAPP), a new planning approach for making adaptive decisions under conditions of deep uncertainty (Haasnoot, Kwakkel, Walker, & ter Maat, 2013), often integrates PAR approaches into long-term strategies. Particularly for slow-onset risks, DAPP enables the creation of proactive, dynamic strategies that can respond to change by following a series of pathways, developed with pre-determined trigger points and monitored to adapt with environmental change, unlike traditional static policies which have a ‘design life’ (Lawrence & Haasnoot, 2017). At the local level, Lawrence and Haasnoot (2017) detail the socialisation, testing, application, and policy integration of DAPP in the New Zealand local government context, to inform the exercise of statutory planning functions and powers. Barnett et al., (2014) also provides empirical evidence of the proposed development of a local coastal adaptation pathway in south-eastern Australia.

Although a range of management approaches exists, environmental planning faces many challenges in achieving its DRR and CCA functions. People

tend to resist change, hence there exists a global proliferation of protectionism to maintain development in hazardous locations. In the United States of America (USA) Schechtman (2014) surveyed climate-adaptive practices in coastal communities from Maine to Virginia. This study found that just three per cent of adaptation actions included managed retreat, whereas accommodation and protection accounted for 46% of actions (the remaining actions being provision of information). In Australia, Young (2015) notes that the few managed retreat schemes have been limited to government buyouts, and consideration of potential schemes in response to coastal hazard risk is limited. Managed retreat is not an easy solution, hence it is often considered a last resort, however this only continues the trend of bias towards the present, at the cost of future species, and human populations who must maintain alternatives such as protection works, or respond reactively to significant system failures (White & Haughton, 2017). There are likely to be property value and scalar thresholds where managed retreat is not viable, but in places where it is uneconomical to maintain defences compared to the value of assets at risk, managed retreat may be economically advantageous in the long-term (Cooper, 2003; Hinkel et al., 2018). In these circumstances, to be effective, managed retreat must progress from its position of political 'last resort', to a viable strategy that is considered and facilitated alongside the traditional DRR and CCA regime, without causing extreme social conflict and inequity.

2.6 Managed retreat

At the global scale, humans have settled in dangerous locations. Human induced environmental transformation has allowed societies to improve living standards, expand, and progress, but intensive land use activities and modification of the natural environment have resulted in increased exposure to potentially devastating perils. Humans have drained, deforested, re-claimed, and sealed land, diverted and constrained natural water courses, carved out roads and railways and built for the masses, altering ecological functions, processes, and landforms (Goudie, 2013; Goudie & Viles, 1997). In the process, historic and some contemporary decisions about the location and nature of human settlements has resulted in people exposed to extreme events and environmental change.

Natural hazard risk is escalating in New Zealand and abroad due to climate change, land use change and intensification, and newly exposed legacy development, resulting in communities that are susceptible to harm with potentially limited coping capacity (Lawrence, 2016; Local Government New

Zealand, 2019; MfE, 2017a; Willis, 2014). Given the imminent risks to human lives, infrastructure, assets, and social investments, managed retreat is inevitable in certain locations, to avoid and reduce social, economic, and environmental costs of natural hazard events. The challenges of environmental change have significant implications for property owners, communities, ecosystems, and the economy. Property owners and dwellers may not only be exposed to potential loss of life, but declining property values, which will also impact the rating base for districts, reducing funding availability for key services and infrastructure. Property owners with large mortgages may find the value of at-risk homes to be lower than what they owe the bank, or they may own homes that are uninsurable or uninhabitable (Union of Concerned Scientists, 2018). This will not only affect the economic welfare of individuals, but of banks holding mortgages on devalued properties. Particularly at the coast, where property values are generally inflated in New Zealand, once market risk perceptions ultimately reflect reality, the reduction of property values could have wide ranging impacts, affecting banks, insurers, investors, developers, and taxpayers, with the potential to trigger regional, and even national housing market crises, depending on the scale of change (Ibid). Humans cannot control natural processes, but we can shape vulnerability by reducing exposure to harm and building resilience of people and communities. Managed retreat may be a radical approach for reducing human and asset exposure to harm, however, it is a reality of the land use legacies and extreme environments that some New Zealander's inhabit.

New Zealand is a hazardous country, and human exposure has increased due to settlement decisions to locate close to river mouths and fertile soils, and desires to live with a view of the sea. Land management practices such as wetland drainage and vegetation clearance have contributed to increased exposure. Traditionally, to manage the adverse interactions between development and environment, the predominant approach has been to control nature, building structures to hold the line against the perils of seas, rivers and debris. However, experience reveals the limits of reliance on protection measures, and the need to focus on more sustainable, long-term risk reduction measures (Burby, 2006; Cooper & McKenna, 2007; Cooper & McKenna, 2008; Gesing, 2016; Jackson & Mcilvenny, 2011; Jha et al., 2013; White, 2013).

Managed retreat offers an alternative to traditional approaches, and in theory, it is a sustainable form of risk management. It avoids exposure to potentially irreversible harm to human life and assets, builds long-term

resilience of communities, protects environmental and amenity values, and can be a cost effective option for hazard risk management, with one-off costs and avoidance of future emergency management expenses (Abel et al., 2011; Alexander et al., 2012; Bardsley & Niven, 2013; DEFRA, 2002; Turbott & Stewart, 2006). Managed retreat aims to avoid and reduce natural hazard risk for the long-term, rather than mitigating it via physical controls. Bardsley and Niven (2013) posit that managed retreat strategies reflect a change in attitude towards the environment, where humans refrain from altering nature and work towards understanding and respecting it. There are, however, varying terminology, principles and policy drivers between and within nations.

Unlike displacement and migration, managed retreat is a deliberate strategy to reduce exposure to harm and make space for natural processes. The term 'managed retreat' emerged in coastal engineering, signifying a shift from the traditional hard protection legacy (Neal, Bush, & Pilkey, 2005). It has evolved to be applied in natural hazard planning more generally, from natural hazard setbacks and relocatable buildings to strategic removal of people and assets at risk. In the United Kingdom (UK) managed retreat is synonymous with 'managed realignment', with the aim of increasing natural flood and storm buffering capacity, reducing defence costs, and increasing natural habitat, or providing replacement habitat to compensate for coastal squeeze (DEFRA, 2002). While sustainable flood risk management was the original motivation, pressure to enhance nature conservation and dynamically adapt to climate change contributed to this shift in focus (Esteves, 2014). Managed/planned/strategic retreat are the dominant terms used in the USA, Spain, Australia, and New Zealand, but terms de-embankment and de-polderisation may be found in northern Europe, particularly for the creation of intertidal areas (Esteves, 2014). Figure 5 draws from the literature to summarise key terms, highlighting the differences between managed and unmanaged retreat and their corresponding scales and approaches.



Managed retreat

Strategic relocation of people, assets, and activities to reduce natural hazard risk and/or adapt to the impacts of climate change

Managed realignment:

A planned process of establishing new defence lines for river corridors or coastlines, often set back from the existing position, with the aim of improving the long-term sustainability of the defence, or contributing to other aims such as habitat creation (DEFRA, 2005).

Planned relocation:

Coordinated process in which people and communities are assisted to relocate from places of residence and settle in new locations with the necessary conditions to rebuild their lives (Ferris, 2017, p. 6).

Resettlement:

Component of planned relocation, which enables people and individuals to re-establish in a new location, supported with adequate housing, resources, utilities, opportunities to recover assets, livelihoods, land, and living standards, in a safe and non-discriminatory environment (Weerasinghe et al., 2014, p. 10).



Unmanaged retreat

Autonomous and involuntary relocation or abandonment under the influence of risk, economic, insurance and regulatory factors

Displacement:

Reactive, forced (by physical or social drivers) movement which may be temporary or permanent (Weerasinghe et al., 2014).

Migration:

Voluntary or forced movement in response to environmental change and/or socio-economic conditions (Weerasinghe et al., 2014).

Scale



Figure 5: Retreat terminology and scales

The focus of the thesis is managed retreat at property, community and regional scales. However, it is recognised that there is much literature and practice on larger scale resettlement of people and communities for development purposes (The World Bank, 2004) and in the face of environmental change; human displacement as a result of extreme events, and migration in response to extreme events or slow-onset changes (Barnett & Webber, 2010).

Akin to the deliberate, strategic nature of managed retreat, the term 'planned relocation' is also found in the literature. Whilst part of the managed

retreat discourse, planned relocation is a fully integrated, coordinated process in which people and communities are assisted to relocate from their homes or places of residence and settle in new locations with the necessary conditions to rebuild their lives (Ferris, 2017, p. 6). In a broad sense, managed retreat may include resettlement, but it does not necessarily do so by default. Planned relocation generally takes place within national borders, at individual and community scales, but it can be implemented at the international level. Policymakers are beginning to consider cross-border planned relocation for CCA, however this is limited by lack of political will and national government responsibilities to manage risks internally (McAdam & Ferris, 2015). In exceptional circumstances, international planned relocation (for example, of small island states) may be required if a significant portion, or an entire country of origin is rendered unfit for habitation (Ibid). Even so, McAdam and Ferris (2015) argue that migration is likely to be more common at this level. Resettlement, as a component of planned relocation, can be defined as the “process of enabling persons to establish themselves permanently in a new location, with access to habitable housing, resources and services, measures to restore/recover assets, livelihoods, land, and living standards, and to enjoy rights in a non-discriminatory manner” (Weerasinghe et al., 2014, p. 10). Concepts of planned relocation are not new, resonating with deliberations of previous centuries about surplus population and resource scarcity (McAdam, 2015). For example, during the 19th to the mid-20th century, relocation was theorised as a proactive solution to anticipated overpopulation and resource scarcity. Yet, in a similar vein to what we are currently witnessing with managed retreat, history shows that the translation from rhetoric to reality proved difficult in practice (Ibid., p.97).

The nuances of terminology are important. For example, managed retreat is a broader term than managed realignment, encompassing risk reduction and adaptive management of a range of natural (and socio-natural) hazard and climate change risks, not exclusive to water sourced threats or strategic removal of protection works. However, while there are differences, there are commonalities. Managed realignment, planned relocation, resettlement, and managed retreat all encompass principles of allowing natural processes to persist, by removing people and assets away from threatening areas, providing a potentially environmentally sustainable and precautionary approach to risk management and planning for the long-term (Bardsley & Niven, 2013; Esteves &

Thomas, 2014; Fletcher et al., 2013; Neal et al., 2005; Rupp-Armstrong, 2007). There is also unmanaged retreat, which can be self-governed in response to risk, regulation, and insurance retreat (where insurance becomes less attainable or unavailable) and drives behaviour and market adjustments, but it also captures human migration at broader scales and alternative land tenure arrangements, distinct from private property rights. Migration occurs on a continuum of voluntary to forced movement in response to environmental change. 'Displacement' is reactive, forced movement which may be temporary or permanent (Weerasinghe et al., 2014).

Reflecting upon the literature, much discussion relates to managed retreat from coastal inundation and erosion (Abel et al., 2011; Alexander et al., 2012; Bardsley & Niven, 2013; Cooper, 2003; Dyckman, St. John, & London, 2014; Gibbs, 2016; Harker, 2016; Harman, Heyenga, Taylor, & Fletcher, 2015; Klarin & Hershman, 1990; Kousky, 2014; Linham & Nicholls, 2010; Neal et al., 2005; Reisinger, Lawrence, Hart, & Chapman, 2015; Rupp-Armstrong, 2007; Ryan et al., 2012; Titus, 1986; Young, 2018). However, it can be applied to a range of hazards and risk contexts, incorporating an array of techniques, which may differ according to distinct locales and risksapes. Managed retreat (and unmanaged retreat) may be anticipatory or reactive. Anticipatory retreat is the relocation of communities and assets prior to the impacts of a major hazard event, or just before significant environmental change as a result of incremental impacts. For example, Gibbs (2016) highlights rolling easements as a flexible, anticipatory way of managing anticipatory retreat, by requiring that in coastal areas, public access is maintained along the dry beach, even if it migrates inland, that property owners avoid hazard protection or elevation of the grade of their land, and that once a certain trigger is reached the land use is required to change, or buildings are to be relocated. Reactive retreat occurs following a disaster or extreme event and can be implemented via regulation to prevent rebuilding within the impacted area, land acquisition of affected properties, and resettlement. Despite the benefits of managed retreat, its social and economic costs are often significant barriers to implementation, particularly when dealing with existing development. Managed retreat of private property can be plagued with challenges, which may vary according to resourcing, levels of risk and citizen engagement, cultural ties, political will, local leadership, agency, and institutional frameworks (Sipe & Vella, 2014). The following section pulls

together insights from the international literature to summarise broad enablers and barriers of managed retreat, and lessons from practice.

2.7 Managed retreat in practice: Governance elements, orders, and lessons

The literature review uncovered over 30 international managed retreat interventions (see Appendix 2), including elements of incentivised retreat, formal policy and regulation attempts, and strategic planning processes, exhibiting managed retreat instruments across the governance spectrum. The examples examined next (Section 2.7.1) were selected based on availability of in-depth information, relevance to the scalar focus of this thesis, prominent challenges and opportunities, contemporary nature, and local examples for their relevance to the New Zealand institutional context, helping to provide a foundation for Chapter 4. These examples, and the associated scholarship, are designed to reveal broad challenges and opportunities for the implementation of managed retreat, and, by applying the governance framework, to help reveal the instruments, institutional arrangements, and guiding principles applied in practice. The enablers and barriers within these examples correlate with many of the third-order governance principles outlined in Figure 2 (and Table 1), reinforcing their relevance to the effective governance of managed retreat. As will be demonstrated, while it is gaining some traction internationally, managed retreat remains shackled by a range of socio-political-cultural, environmental, economic, and institutional barriers.

2.7.1 International interventions

The following examples represent interventions taken in the USA, England, and Australia, where incentives are applied to encourage managed retreat, or property is compulsorily acquired and land use is regulated by government. Property purchase can be voluntary or compulsory, in anticipation of, or in reaction to hazard events, but it is typically reactive (for example in the USA and Australia). Buyout programmes are well established in the USA, and in England for managed realignment, however, incentivised retreat is generally applied in an ad hoc manner in Australia (and New Zealand).

United States of America: Buyouts

Managed retreat governance instruments in the USA are predominantly rebuilding regulations and negotiated buyouts, often enacted immediately following a major natural hazard event, where authorities introduce laws that prevent high-risk areas being resettled, or apply buyout programs. Buyout programmes in the USA are generally funded by the federal or state government, but are managed at state or county levels, enabling residents who no longer wish to live in high-risk zones to sell their properties and move to safer locations (Freudenburg, Calvin, Tolkoﬀ, & Brawley, 2016). The federal government guidelines for the buyouts recommend governance actors (state agencies, tribal agencies, federally recognised tribes and local governments who are the eligible sub-applicants) designate priority acquisition areas to target residents for the programmes. The Federal Emergency Management Agency (FEMA) manages a voluntary buyout programme where home-owners can opt to sell their homes to government if they have been damaged by inundation events and are expected to be repeatedly exposed such events (Gibbs, 2016). This demonstrates the sharing of power between the governing authorities and individuals under the incentivised, voluntary approach. While the buyouts can be an effective instrument, they are often hindered by funding constraints, and may limit responsive governance due to their reactive nature (Freudenburg et al., 2016).

Managed retreat, in the form of planned relocation and resettlement has also commenced for some small communities in the USA, due to coastal erosion, river flooding, sea level rise threats and melting permafrost. Relocation of communities has been planned in Shishmaref, Kivalina, Isle de Jean Charles and Newtok due to imminent risks in the environment (Davenport & Robertson, 2016; Lowlander Center, 2016; Mele & Victor, 2016). In the case of Isle de Jean Charles, a grant of \$48m (USD) from the government has been provided to assist with relocation, however, it has not yet been decided where exactly the community will be moving to.

The relocation of Shishmaref, a traditional Inupiaq Eskimo village, with 400 years of settlement (Agyeman, Devine-Wright, & Prange, 2009) has been through a 40-year process to approve a resettlement plan. In Shishmaref, although relocation would result in significant disruption to the community, the majority of residents were not opposed to the plan, voting 89 to 78 to leave (Mele & Victor, 2016). It has been noted by Agyeman et al. (2009) that due to strong political and

expert involvement with the Shishmaref community over a long period of time, and the impending threat of the rising tide, a democratic decision was able to be made. Agyeman et al., (2009) and Burley et al., (2007) argue that local knowledge of place is an essential component for successful managed retreat strategies. Where public acceptance is concerned, managed retreat interventions have a higher likelihood of being accepted when they are interpreted by those involved in and affected by it as a process that is fair, transparent, and inclusive, and that the strategy results in positive and fair outcomes for those involved (Agyeman et al., 2009). This case highlights the relevance of equitable governance outcomes for public acceptance of managed retreat.

Furthermore, Burley, Jenkins, Laska, and Davis (2007) consider that places and spaces are socially constructed manifestations of 'the self' and that change in these arenas (whether organic or enforced) will catalyse forms of psychological reactions. Place attachment is the emotional bond between individuals or groups and their environment, including both dependence and identity elements (Dandy, Horwitz, Campbell, Drake, & Leviston, 2019; Masterson et al., 2017). Place attachment influences the meanings of place and the imagery it conveys, producing a 'sense of place' (Dandy et al., 2019). Burley et al., (2007) note that many managed retreat interventions have failed to recognise how communities relate to their spaces and places, and how this understanding can result in less conflict between local officials, experts and communities, allowing for more successful outcomes. Attachment to place may be both a hindrance and an enabler, as communities are more likely to be involved in a managed retreat process if there is attachment to place and an understanding that this place is under threat (Ibid). However, what is necessary for managed retreat to occur is 'place-detachment' where the community individually and collectively understand and negotiate the future consequences of remaining in the affected place, and slowly loosen ties to the present attachment and form new attachments in safer locations (Agyeman et al., 2009). This process of place detachment is considered significant for managed retreat, where people work towards stability through change in both loosening and creating ties to place and space. Place attachment is a social barrier to implementing managed retreat, and as highlighted by Agyeman et al. (2009), more research is needed to further understand the process of detachment to place and space and the ways in which policy interventions can effectively nurture detachment without provoking resistance to change.

Revealing governance constraints based on research in Alaska, Bronen (2015) highlights the importance of institutional instruments to facilitate managed retreat in response to climate change, and to determine where, when, and how relocation must occur. While ties to place have been loosened in Shishmaref, relocation steps are unclear, and the lack of an overarching institutional relocation framework and funding for climate change adaptation present significant barriers to operationalising managed retreat (Bronen & Chapin, 2013). These barriers are a result of limits to third-order attributes and ultimately, effective governance. In particular regarding direction, capacity, and coordination.

England: Managed realignment property acquisition

In England, the Department for Environment, Food, and Rural Affairs (DEFRA) manages the development of flood and coastal erosion risk policy, and the Environment Agency develops planning instruments, such as Shoreline Management Plans (SMPs) to implement DEFRA's policies (Esteves, 2014). The policy "Making Space for Water" was introduced by DEFRA in 2005 to reduce erosion and flooding risks, identifying managed realignment as the preferred strategy for rural areas (Ibid). The majority of managed realignment schemes in England has been undertaken for coastal flooding and erosion management, with a strong focus on creating a positive environmental outcome (Rupp-Armstrong, 2007). In England, managed realignment schemes have been undertaken at a range of sites, involving the alteration of existing defence lines or the widening of flood plains with additional aims of recreating natural habitats to act as a natural form of defence. The key objective of these strategies is to create more sustainable estuarine, riverine or coastal forms that are better equipped to cope with natural riverine processes, surge tides, and heavy rainfall events (Tinch & Ledoux, 2006). In turn, this approach makes space for nature, resulting in significant conservation benefits. Examples of managed realignment in England can be found at Medmerry, Wallasea, the Blackwater Estuary, Orphlands and Thorngumbald (later renamed Paull Holme Strays) (McAlinden, 2015; DEFRA, 2002; Esteves, 2013; Rupp-Armstrong, 2007; ABP, 2004). Each of these cases was susceptible to flooding and coastal storms and has subsequently become a managed realignment project initiated and funded by the Environment Agency. In the majority of these cases, agricultural land was

purchased or leased to allow for the realignment of defences and the creation of a natural barrier to flooding and erosion.

Medmerry has been classed as Europe's largest realignment scheme, costing £28 million for the realignment of seven kilometres of land with new defences, producing 183ha of new intertidal habitat area and a nature reserve (McAlinden, 2015). While the upfront cost of this scheme appears to be high, the maintenance costs of continuing the previous protection measures as well as the damage caused by storm events are much greater. Furthermore, the Environment Agency argues that the scheme provides 1000 times improved flood protection as well as wider ecological benefits. At first, residents doubted the scheme would work and were worried it would damage the local economy, but a stakeholder group was developed to improve public acceptance and foster local decision-making, including people in the setting of project objectives, and design of key access routes and facilities of the nature reserve (Ibid). To ensure fair and extensive community involvement, representation included local authorities, parishes, businesses, landowners, recreational interests, and community and environmental groups, contributing to the success of the project (Blunkell, 2017; McAlinden, 2015). The enablers of this strategy can be attributed to the presence of third-order governance principles including: the strong institutional (land acquisition instruments) and resourcing capacity of the Environment Agency, effective leadership, coordination, inclusive community engagement with local stakeholders, and local involvement in the planning and decision-making process. Furthermore, significant local economic benefit (approximately £90m of direct economic benefit) and green tourism has boosted the project's success, generating income and jobs (McAlinden, 2015).

Grantham, Australia: Land swap

Incentivised managed retreat in Australia is less common, but there is a locally driven intervention commonly referenced in the adaptation literature. Following disastrous floods in January 2011, the town of Grantham in Queensland suffered 12 deaths and significant public and private asset damage costs. Up to 87% of the total housing stock was damaged, ten homes were completely destroyed and 19 beyond repair (Sipe & Vella, 2014). Due to repeated floods and loss of life, the Lockyer Valley Regional Council decided to relocate the flood affected areas of the town. To implement this the Council purchased a 377ha site to enable private landowners to take part in a land swap. Standard

planning regulations were temporarily discounted to enable a fast process. Grantham was declared a Reconstruction Area under the Queensland Reconstruction Authority Act 2011, enabling a master plan for the rebuild to be transferred into a Proposed Development Scheme to allow a fast-tracking of the process (Reddish, 2015). The community was heavily engaged throughout the process and was included in decisions on the master plan. Participation in the land swap was voluntary, demonstrating power sharing between actors to incentivise retreat, with eligible residents being given the opportunity to indicate their top preferences for the land swap (similar to their existing land) and final land allocations being carried out by ballot. The first relocation took place 11 months following the flood event in January. General planning costs were waived and residents could apply for grants (\$35,000 AUD) from the state government to supplement the costs associated with resettlement (Okada, Haynes, Bird, van den Honert, & King, 2014).

As discussed by Okada et al. (2014) and Sipe and Vella (2014), the success of this community relocation was largely due to the community focus, strong local leadership, flexible and adaptive governance, and the readily available land nearby. It is considered that the very recent flood event contributed to the success of the project as social memory of the devastation would have undoubtedly been strong. In this case, the networked governance framework removed the constraints of long-held formal rules, streamlining managed retreat via incentives and negotiation, supported by interactions reflective of third-order principles, demonstrating attributes of effective, equitable, responsive and robust governance.

Byron Bay and Fleurieu Peninsula, Australia: Policy and regulation attempts

Australia's national assessment of coastal climate change risks promotes managed retreat (Australian Government, 2009), however limited implementation guidance is provided, and little action has been successfully undertaken to date. The first council in Australia to implement a policy of planned retreat was the Byron Shire Council in 1988 (Bardsley & Niven, 2013). This policy was in response to a report revealing the high erosion rate of the coast following a series of storms in the mid 1970s. Following community consultation, a relocation policy was accepted, and the local environment and development plans were updated to reflect new rules. These rules required that any buildings of a relocatable nature must be relocated when the erosion escarpment encroached within 20m of the structure, and non-relocatable buildings must be

removed once the erosion escarpment encroached 50m of the structure (Bardsley & Niven, 2013). Property owners who purchased prior to 1988 were to be compensated with public funds, but landowners who purchased after 1988 were to bear their own losses (Frohlich et al., 2019). However, the policy was not consistently applied and resulted in litigation issues and negative publicity due to equity concerns. The ‘legal storm’ that subsequently emerged in Byron Bay highlights the limited capacity to manage existing use rights which in this case, produced legal legacies, entrenching hard protection path dependencies (Ibid). Among monitoring and enforcement inconsistencies, ignoring the ‘elephant in the room’ represented by legacy land uses to avoid costly compensation for regulatory takings or land acquisition, meant that some property owners were subject to a ‘just-in-time’ retreat policy and others to reactive retreat (Ibid). Significantly, the presence of power, in the form of access to substantial legal support, (combined with the lack of local government capacity to manage existing use rights), enabled wealthy individuals to successfully challenge managed retreat decisions, eventually resulting in the council abandoning its retreat policy.

Another example in the South Coast of the Fleurieu Peninsula, South Australia reflects a similar result to the Byron Bay example. Coastal risks are increasing in this area, presenting an increase in conflicts between stakeholders regarding the management options to implement. Seawalls, groynes and breakwaters have continuously been erected along the beaches to address erosion and rising sea levels, signifying a preference by governments and communities for hard or soft protection structures rather than adaptive approaches (Bardsley & Niven, 2013). In a study carried out by Bardsley and Niven (2013), the hard protection approach was supported in all interviews with the Alexandrina District Council, City of Victor Harbour Council, the Fleurieu Natural Resource Management Group and with a senior planner from the Coastal Protection Branch of Department of Environment and Natural Resources (DENR). It was further stated by a DENR representative that “people won’t give up their patch without a hell of a fight or demand compensation” (as cited in Bardsley & Niven, 2013, p. 204).

Alexander et al. (2012) and Bardsley and Niven (2013) identified that although managed retreat may be the only feasible or the most appropriate option for risk management, it is highly likely to result in significant costs for the community, such as increased market uncertainty and loss of property values with the

majority of these costs falling on individual property owners. These costs are likely to result in political contention and a degree of unwillingness, creating difficulties relating to private investment, equity, and political acceptance (Bardsley & Niven, 2013). As further noted by Bardsley and Niven (2013), the wider implications of managed retreat must be considered prior to developing a scheme. These can range from impacts on community networks, psychological wellbeing, and livelihoods. Successful managed retreat strategies protect people and assets from harm, but they must be socially, politically, and economically acceptable to be effective. Due to the complexity of implementing managed retreat in Byron Bay and the South Coast of the Fleurieu Peninsula, protective structures remain a favoured risk management option. This is affirmed by the recently commissioned *Coastal Hazard Management Study—Byron Bay Embayment* which determines the coastal management options for Byron Bay, and the case study analysis by Frohlich et al., (2019). Although retreat was one of the six options explored, it was not recommended due to “high economic cost, low economic viability, social disruption and unresolved funding, equity and logistical issues” (Carley, Coghlan, Drummond, Dean-Jones, & Anning, 2016, p. vii). Instead, improvement of the status quo was recommended for Main Beach, an ‘adaptive option’ of seawalls, groynes and sand nourishment for Belongil, and minor retreat of the Captain Cook carpark (by 2050) was recommended for Byron Shire. These examples highlight the importance of consistency and equitable governance for managed retreat instruments of policy and regulation, but also that managed retreat will not be applicable in every circumstance, particularly at the coast, where levels of investment reach certain thresholds (Abel et al., 2011). At these higher investment thresholds, access to legal resources may present a significant challenge.

2.7.2 New Zealand interventions

Kāpiti: Hazard notification and retreat policy failure

Managed retreat may be viewed as a re-structure of development and land use patterns to remedy unsustainable settlement decisions. Hence planning policy and regulation is one of the strongest mechanisms available to achieve this change. A notorious New Zealand policy attempt at coastal managed retreat occurred in Kāpiti Coast District. Between 2006 and 2014 Kāpiti Coast District Council (KCDC) engaged Coastal Systems Ltd (CSL) to undertake coastal erosion risk assessments to inform the revision of its District Plan. CSL’s erosion

assessment report was released in August 2012 and KCDC (as legally required) sent letters to owners of the 1800 affected properties, (those within 50 and 100 year erosion prediction zones) informing them that the new zones would be notified on Land Information Memorandum (LIM) reports forthwith (Coastal Systems Ltd, 2018). KCDC publicly notified its Proposed District Plan (PDP) which included development restrictions for properties within erosion zones. Under Policy 4.8, the risk management approach included managed retreat of buildings and activities from areas where hard protection structures fail or are no longer able to be sustainably managed. Three Coastal Hazard Management Areas (CHMA) set restrictions for the coast: *No-build urban CHMA*, *Relocatable build urban CHMA*, and *No-build rural CHMA*, to prohibit further subdivision of land, but permit new development, provided it be relocatable. The PDP discouraged hard protection structures and required development strategies to reduce reliance on such structures over time, ensuring costs and benefits of maintaining such works were affordable when considering climate change and sea-level rise (Policy 4.9). For existing development within the no build urban area, KCDC intended to work with the community to enable a form of managed retreat for existing uses, or ‘adaptation strategy’ as they termed it.

There was immediate public outcry following the public letters and PDP release, resulting in the formation of the high-profile group, Coast Ratepayers United (CRU) which set out to block implementation by relentless challenge of the CSL assessments (Ibid). Due to significant criticism, KCDC commissioned an Independent Review which resulted in a decision to withdraw all new plan provisions for Coastal Management Hazard Areas (among others). The Independent Review highlighted a range of issues and two key problems became apparent in the context of the managed retreat provisions. Firstly, there appeared to have been ‘reduced opportunities’ for community input in the plan drafting process, particularly since a draft plan was not circulated prior to notification (Allan & Fowler, 2014). Although there is no statutory requirement to circulate a draft plan (Schedule 1, RMA), it is considered best practice, and may have led to an improved PDP. Secondly, there were concerns regarding the communication of the policy evidence base. The reviewers found that the discussion document on natural hazards and managed retreat (released prior to the PDP) did not promote a range of mitigation options, focusing mainly on managed retreat (Allan & Fowler, 2014). This meant that the full suite of mitigation options was not presented to the community from the beginning,

resulting in what many considered a lack of fair, transparent and participatory community engagement (limiting equitable governance). Although, according to Allan and Fowler (2014, p. 49) little comment was actually received on the initial discussion document and the responses were mainly supportive—it was not until the PDP provisions became a reality that members of the community raised alarm.

Baer (1997), Ericksen et al. (2001), Berke et al. (2006), and Godschalk and Berke (2009) argue that a strong factual basis is a key element in plan quality. The Independent Review found that the recommended hazard lines were not “sufficiently robust for incorporation into the PDP” (Allan & Fowler, 2014, p. 50). The coastal hazard assessment reviewers considered that “differences in the immediacy of the hazards could be reflected in the management approaches adopted to minimise human impacts; for example, in the degrees of restrictions placed on residents” (Carley, Komar, Kench, & Davies, 2014, p. 54). This is an important distinction for coastal hazard risk management where long-term impacts progress slowly and may not require the same immediate policy approach as short-term impacts. Carley and others (2014) recommended that a range of management options be developed and considered with the community prior to introducing hazard lines and regulation into the District Plan. While the adaptive approach of the plan was endorsed by Allan and Fowler, they raised the need to fully evaluate the quantitative and qualitative costs and benefits of the provisions before including them in the PDP (Section 32 RMA). It was noted that when using an adaptive approach to coastal hazard risks, consideration of the potential effects of a more comprehensive range of impacts including coastal inundation, changes in floodable areas and ground water changes due to sea level rise should also be considered. The unsatisfactory evidence base, narrow hazard focus and lack of early, effective community engagement let the Kāpiti Coast provisions down, and ultimately limited opportunities for ‘good’ retreat governance and outcomes.

To fulfil its responsibilities, KCDC will have to amend the PDP once it becomes operative (and is currently working on this) to incorporate new coastal hazard provisions through a plan variation process the literature suggests should be effective, responsive, robust, and equitable. However, this will likely be a social and political challenge given the reduced legitimacy and organisational trust caused by the limits to good governance in this first attempt at managed retreat. Inequitable processes and outcomes are a significant barrier to

implementation of managed retreat, which can also undermine its legitimacy and impact its effectiveness. These cause-effect relationships of limited 'good' governance orders help reveal further barriers to operationalising managed retreat.

Urenui: Managed retreat failure

In an entirely different circumstance, coastal erosion threatened a popular section of a golf course in Urenui, Taranaki. The District Council employed a consultant to work with the community to determine the best outcome to manage the area (Blackett, Dahm, & Hume, 2007). Managed retreat was deemed the best option, however, a lobby group opposed it, using political power to apply for resource consent to build a seawall, illustrating representation concerns for equitable governance and power. Eventually the lobby group succeeded, and the \$800,000 seawall was constructed (Blackett et al., 2007). Similar situations have occurred in other locations in New Zealand, such as at Waihi Beach, Wainui Beach (Gisborne District Council) and Mōkau Spit (Waitomo District Council) where protective works have been chosen over long-term solutions (Turbott & Stewart, 2006). These cases demonstrate the strong appeal for protection works in New Zealand (Blackett et al., 2007) and the influence of power and vested interests to maintain the status quo. However, recent council projects (Greater Wellington Regional Council, 2019a) are demonstrating greater consideration of alternatives (see, Section 2.7.2 and Chapters 5-6).

Clifton to Tangoio Coastal Hazards Strategy 2120, Hawke's Bay: DAPP

Managed retreat necessitates a strategic planning process which is likely to encompass a range of enabling mechanisms. The four ensuing examples detail comprehensive, strategic interventions, including use of DAPP, adaptive management, and integrated growth and natural hazard planning.

For the most developed area of the Hawke's Bay coastline, a collaborative strategy has been established by Hastings District Council, Hawke's Bay Regional Council, Napier City Council, mana whenua and tangata whenua representatives, with independent researchers from the Resilience to Nature's Challenges National Science Challenge, 'Living at the Edge' research programme acting as critical friends of the process. The *Clifton to Tangoio Coastal Hazards Strategy 2120* is a first in New Zealand, comprehensively assessing the risks associated with coastal hazards over a 100-year period, to understand and identify them, determine key management methods for the long-term and

implement selected short-term options in a coordinated and planned manner. Applying the DAPP approach with guidance from ‘The Edge’ researchers, this strategy seeks to encompass the tremendous complexity of natural hazard and climate change adaptation, infrastructure provision, growth and resource management, and community desires, aligned with the recently released national guidance on coastal hazards and climate change (Ministry for the Environment, 2017a). The Strategy is supported by key decision-making tools, Multi-Criteria Analysis (MCA) to assess multiple objectives and alternatives within a DAPP framework, applying Real Options Analysis (ROA) to address future coastal hazard risk uncertainties (Lawrence, Bell, & Stroombergen, 2019).

Significant resourcing has been required for the project, which is split into four stages: stage one the establishment of a risk framework via hazard evaluation, risk assessments and consultation with key stakeholders; stage two, the formation of the decision-making framework including two assessment panels to represent the interests of tangata whenua, communities, and agencies exposed to coastal hazard risks and; stage three entailing 11 workshop programmes to present risks, confirm priority units, present social impact and cultural values assessments, identify potential responses, receive community and cultural values feedback, determine MCA criteria, refine pathways, and evaluate, confirm and test these with communities (Bendall, 2017). The community based assessment panels produced a series of recommendations for the Joint Committee and decisions have been endorsed by each council to commence stage 4, to develop and test the planned actions for the priority units (Corbett & Bendall, 2019). The key actions were categorised as pathways for the short, medium, and long-term with three out of nine unit areas working towards managed retreat in the long-term, but not in any of the earlier time periods:

Unit	Short-term	Medium-term	Long-term
- Clifton	Sea wall	—————▶	Managed retreat
- Haumoana	Renourishment + control structures	—————▶	Managed retreat
- Clive	Status quo	Renourishment + control structures	Managed retreat/ retreat the line

Following agreement of the actions, stage 4 has been initiated, including implementation planning and policy framework review (Bendall, 2017). While this process has greatly progressed long-term, strategic risk management by providing a framework for collaboratively assessing coastal hazard risks and

management options over the long-term, it is not yet clear how managed retreat will be realised (e.g. the decision trigger values, intervening/incentivising mechanisms, and funding support). This potentially limits the applicability of the strategy, as the implementation challenge remains nationwide. Issues connected to this will be examined further in the thesis.

Summarising key lessons of this case, Lawrence et al., (2019) outline the complexities of planning over the long-term and aligning a hybrid of decision-making tools. Important lessons include the impact of simplification in the DAPP process, which reduces policy flexibility and responsiveness by applying a single sequence of actions, rather than many possible options and pathways to dynamically adapt to environmental fluctuation (Ibid). The early inclusion of consentability assessments (and affordability) of DAPP actions and pathways is necessary to deliver legitimate options that will secure the necessary resource consents, statutory plan changes, and coastal permits to warrant implementation of the strategy (Ibid). Finally, as recognised in Section 2.3.1, the modes of network governance similar to these requires monitoring systems and ongoing political leadership to deliver a robust approach that spans the life of the strategy.

Key enablers of the process included the clear decision framework, transparent process, an overarching governance group (the Joint Committee), the support of the 'Living at the Edge' research programme increasing the knowledge diversity, capability, and credibility of the strategy, regular evaluation of the governance process, and a collaborative approach with strong community engagement (Lawrence, 2019). Some of the lessons learnt highlight procedural gaps and limitations for robust, networked, anticipatory managed retreat governance, but testing and evaluating new ways of making decisions requires innovation, learning, and adaptation—vital principles to deliver responsive third-order governance. Under the mode of network governance, this example demonstrates the long-term enablement of managed retreat, applied using instruments of DAPP and associated decision-making tools, supported by third-order governance attributes of strong resourcing, technical, and organisational capacity, undertaken in a collaborative, strategic manner. All of which, produce valuable lessons for future application.

Riverlink, Upper Hutt: DAPP and urban revitalisation

A significant urban renewal and flood risk management project in Hutt City is underway to deliver a more resilient, accessible and liveable city. Due to high flood risks of the Hutt River, Greater Wellington Regional Council (GWRC), Hutt City Council and NZ Transport Agency (NZTA) collaborated to integrate urban renewal and transport enhancement with flood risk management. The New Zealand Climate Change Research Institute, Victoria University of Wellington (NZCCRI), assisted with incorporating new knowledge of climate change effects and tools, including DAPP (Lawrence, Haasnoot, et al., 2019).

A knowledge broker from NZCCRI undertook workshops with council staff and politicians to frame the problem and help them understand the changing risk (Lawrence & Haasnoot, 2017). Further awareness was raised by introducing the 'Sustainable Delta game' to provide staff with a simulated experience of making decisions under conditions of uncertainty (Lawrence & Haasnoot, 2017; Lawrence, Haasnoot, et al., 2019). This work catalysed demand for an associated 'pathways generator' to develop alternative pathways and stress test these against divergent future scenarios, applying IPCC projections (Lawrence, Haasnoot, et al., 2019). The pathway generator created six feasible flood risk management pathways for the project team to analyse using ROA and MCA, to help analyse pathway(s) selection (Ibid). Alongside this work, concept design was undertaken to integrate the city centre flood protection options with opportunities for urban revitalisation, roading, transport, environmental, visual and recreational improvements (Greater Wellington Regional Council, 2015b).

Following analysis of adaptation pathway alternatives, the councils consulted the community on two options (and other aspects of the project) before making a decision on a preferred flood management pathway:

Option A - One step:

Provide 1:440 year return period flood protection that includes allowance for climate change, by enlarging and realigning stopbanks, requiring purchase of properties on Pharazyn and Marsden streets

or

Option B – Two Steps, Staged approach:

- i) Initially building flood protection within existing corridor to a slightly lower standard, requiring no property purchases but,*
- ii) In ~20 years, move to the higher Option A flood protection standards for completion in around 30 years to allow for increased river flows caused by climate change*

(Greater Wellington Regional Council, 2015a)

Following consultation, a public survey deemed Option B as the preference. The councils agreed to this option in their final decision, which was subsequently

communicated to the affected properties directly, via the local media and the Council's formal decision record (Lawrence, Haasnoot, et al., 2019). Lawrence et al., (2019) note that the Councils' decision to commit to land purchase under Option A provided certainty for affected property owners. Property owners preferred the near-term certainty of Option A rather than waiting ten years for the land purchase to take place. Certainty was a stronger motivator than cost for both directly affected property owners and the wider community (Ibid).

Riverlink is not only adaptive and innovative, but strategic, integrating a range of opportunities and organisational functions to form a significant project with wide ranging benefits. Project team members discussed the success of the property negotiations process to date, which were all based on a 'willing-seller, willing-buyer' approach, with early engagement of those directly affected (Baily, Campbell, & Lawrence, 2019). In this case, the intervention taken is more appropriately deemed managed realignment, and the presence of a stopbank (as a public work) allowed for compulsory property acquisition under the Public Works Act 1981 (PWA). In the community consultation information sheet, Greater Wellington Regional Council (2015d) made it clear to property owners that:

What happens if I don't want to sell?

It is Council's strong preference to acquire property by agreement through good faith negotiations with property owners. If Council is unable to acquire by agreement and the property is essential to the effective delivery of the project, ultimately Council would need to revert to its powers to acquire your property compulsorily under the PWA 1981.

While this is an effective approach where council funding and legal powers are available, there are social implications, discussed in the following examples. Much like the previous case, important lessons from this project include the presence of a trusted 'knowledge broker' and facilitator for transfer of new knowledge and tools, and building Council staff capability under conditions of uncertainty (Lawrence & Haasnoot, 2017). Leadership of Council staff and politicians enabled uptake of the adaptive approach, with political certainty being an important factor (Lawrence, Haasnoot, et al., 2019). The DAPP approach provided sufficient progress required to satisfy local short-term political cycles, for a project extending over longer timeframes. Certainty of decision-making was a preference for the community (even at a higher cost) with immediate action selected over staged action (Ibid). This highlights the need to consider how to

deliver adaptive planning in a way that communities can trust that the planning approach and decisions made will persist amongst changing political settings, wildcards, governance arrangements, and economic conditions (Ibid).

Funding availability for managed realignment and associated property purchase was vital for the success of the project, enabled by the collaborative nature of the project and integrated approach to deliver multiple outcomes and flood damage savings (estimated at \$1billion for a single flood bank breach, not including social and cultural impacts (GWRC, 2015)). Riverlink was physically constrained by the Hutt River, but broader spatial strategies with a wider variety of risks, communities, and jurisdictions will express different opportunities and constraints. Overall, Riverlink demonstrates key attributes of third-order governance principles, including the benefits of boundary organisations to overcome barriers to governance effectiveness, learning and innovation to build institutional capacity, integrated connections between actors and project aims, and adaptive, flexible policy that can deal with uncertainty, providing choices, but also assurance of the immediate future to directly affected people and the wider community.

Muriwai: Adaptive management

An earlier example of an adaptive strategy is at Muriwai Beach in Auckland, involving a large proportion of publicly owned land. Since the 1960s, Muriwai Beach has experienced coastal erosion threatening public car parks, the local surf club and road infrastructure (Turbott & Stewart, 2006). In 2006, coastline erosion was occurring at a rate of 1-1.5 metres per year, which was initially managed with a seawall, however this was not effective (Tinker, 2013; Turbott & Stewart, 2006). Following robust engagement with the community, adaptive management was recommended by coastal scientist Jim Dahm, and an anticipatory managed retreat strategy was adopted. This was termed an adaptive management process, where the assets at risk were progressively relocated to accommodate the coastal processes.

Mandated by the Reserves Act 1977, the Auckland Regional Parks Management Plan 2010 sets out the implementation of the adaptive management strategy. Map 8.1 of the Management Plan identifies the new surf club location, parking, and surf club beach access, and the assets to be relocated. It also includes clear policies that emphasise avoidance of risk rather than protection. Relevant policies include avoiding permanent facilities in hazard zones, removing existing

structures when practicable, treating coastal erosion as a natural process thus avoiding structural interference, retreating infrastructure at risk where coastal erosion occurs, revegetating and restricting access, progressively removing engineered stormwater systems, and reinstating natural waterways wherever practicable (Auckland Council, 2010). Further policies include ensuring the likely impacts of climate change are considered in long-term planning and decision-making, including managed retreat of infrastructure (Policy 8.I.2 c). These policies strongly reflect good managed retreat principles. The adaptive management strategy is considered to have resulted in a positive outcome, increasing trust between the community and the local authority, and avoiding damage from erosion (Blackett et al., 2007). In this case, the absence of residential property (and resultant absence of public-private tensions), robust community engagement efforts, effective planning mechanisms, and the socio-ecological benefits of preserving the natural character and amenity values of the coast were contributors to the success of the project. With positive social and environmental benefits and an absence of significant public-private tensions, this example demonstrates the strong capacity of de-centralised government in New Zealand to deliver managed retreat of public assets where people are effectively engaged.

Tasman: Avoidance and staged retreat

Another strategic planning approach that has been documented is the Tasman District Council coastal planning process. In the late 1990s, detailed planning for Mapua and Ruby Bay began due to coastal development pressures. A key objective involved directing future growth away from low-lying land, particularly the coastal inundation and erosion prone areas between Mapua and Ruby Bay. The Coastal Risk Area was revised to include coastal erosion, coastal and freshwater inundation, climate change, sea-level rise, and activities that could increase risk. Plan provisions were developed limiting subdivision, development and hard protection structures, and a Residential Closed Zone was established at Ruby Bay which prohibited further subdivision, infill, new habitable buildings, and extensions or replacement of existing buildings close to the shore. Following statutory plan processes, Tasman District Council was successful in seeking a declaration from the Environment Court to enable the subdivision and land use regulations to have immediate effect (s 86D RMA). The Court granted the immediate legal effect on the basis that the changes promote sustainable management of natural and physical resources, and avoid a 'rush of applications' to subdivide or develop land that may occur under the typical plan

change process (*Tasman District Council* [2011] NZEnvC 47) further cementing the status quo (Lawrence, 2015). Tasman District Council successfully implemented the planning controls with minimal contention, partially due to its effective governance arrangement (being a unitary authority) with strong coordination and connections, strategic direction for addressing climate risk, and experience of repeat climate events (Ibid).

Canterbury: Red zone property acquisition

In 2010 and 2011, the Canterbury region experienced devastating earthquakes. Damage was severe, and Parliament passed the Canterbury Earthquake Recovery Act 2011 (CER Act) to respond to the disaster. This Act required the establishment of the Canterbury Earthquake Recovery Authority (CERA) to plan and coordinate a Recovery Strategy (prevailing over existing use rights and planning mechanisms). The CER Act gave the Minister powers to compulsorily acquire land and to suspend, amend, cancel or revoke any council plans and policies (s 27(1)) and to suspend or cancel, in whole or in part, any resource consent or existing use rights protected or allowed under the RMA (s 27(2) CER Act). This legislation was radical, with significant powers, which in some cases were applied.

As part of home insurance cover in New Zealand, policy holders have cover for damage to land through the Earthquake Commission (EQC), but without Government intervention, it was expected that Canterbury property owners would face significant delays in resolving insurance claims. The Government was considering a range of policies to aid those living in areas where risk to human life was unacceptable, but was concerned that compulsory acquisition (enabled by the CER Act) could prejudice insurance between the loss from the earthquake or the government action, and if land were purchased at a value above present market value it could be seen as an 'intervention' by the Crown (Canterbury Earthquake Recovery Authority, 2016). Therefore in June 2011, Cabinet determined a zoning approach in combination with voluntary purchase offers to insured residential red zoned properties (Ibid, p. 4), ultimately affecting 8,060 properties and over 16,000 people in Christchurch (MacDonald & Carlton, 2016). Key objectives of the policy response were as follows:

Table 2: Red zone policy objectives (Canterbury Earthquake Recovery Authority, 2016)

Agreed policy objectives
Certainty of outcome for property owners as soon as practicable
Create confidence for people to be able to move forward with their lives
Creating confidence in decision-making processes (for home-owners, business owners, insurers and investors)
Using the best available information to inform decision
Having a simple process in order to provide clarity and support for landowners, residents, and businesses in [residential red zone] areas

Following the zoning announcements, community meetings and workshops commenced, to explain the rationale and the process (Nielsen, 2016). Between June 2011 and July 2015, The Government delivered a series of offers to property owners based on the 2007/08 rateable value of their properties (higher than the post-earthquake market value, but approximately equivalent to pre-earthquake values) (Ibid, p.7). Some owners did not feel that the valuation was a true reflection of their property’s value, however Ministers’ views were that individual negotiations would not have met the Government’s objectives of a simple process with certainty to property owners, and that the process avoided lengthy insurance negotiations for property owners (Ibid).

The Government spent \$1.9 billion purchasing property from insured property owners, recovering some costs from the insurance payments on the purchased land and buildings. Lower offers were made for un/underinsured properties due to their lower value to the Government, on the principle of fairness to insured owners who had paid for insurance premiums, and to avoid moral hazard risk (Ibid, p.8). This was appealed by a group of property owners, and in March 2015 it reached the Supreme Court, where both the decision made to carry out the ‘voluntary’ property acquisition of the red zones, and the lower value offers to un/underinsured properties were deliberated.

Initially, in *Minister for Canterbury Earthquake Recovery v Fowler Developments Ltd* [2013] NZCA 588 at [127] the Court of Appeal had determined that the June 2011 decisions to make offers to affected landowners by the Minister were an action authorised by ‘residual freedom’ as it did not consider that people’s legal rights were affected, and therefore did not require specific statutory authorisation. Residual freedom (often referred to as the third source of authority, non-statutory powers, or de facto powers) is the concept that the Executive is free to do anything that is not prohibited by law (statute or common law). It is named the third source to distinguish it from Executive powers granted

by statute (the ‘first source’) and prerogative powers—powers unique to the Crown (the ‘second source’) [76]. Residual freedom does not allow government officials to act in conflict with the legal rights and liberties of citizens (for example, common law rights or the RMA) and it cannot be used for Executive action where the field of that action is covered by statute [79]. On that point, the Supreme Court in *Quake Outcasts v Minister for Canterbury Earthquake Recovery* [2015] NZSC 27 at [138] was in disagreement with the previous judgement, and held that (at the least) the outline of the purchase decisions should have been a part of the Recovery Plan (CER Act) as an integral part of the red zoning being the encouragement of those living there to retreat. The Court further stated at [140] that while the Crown did not use its powers of compulsory acquisition under the CER Act, it is “unrealistic to describe the transactions that occurred as voluntary” as the red zone inhabitants had “no realistic alternative but to leave, given the damage to infrastructure and the clear message from the government that new infrastructure would not be installed and that existing infrastructure may not be maintained and that compulsory powers of acquisition could be used.”

The Court made it clear that just because the mechanisms of the CER Act were not perfectly aligned with the desires of the Executive, that statutory procedures should not be bypassed, especially when Parliament can amend legislation that is not fit for purpose [131]. The Court went on to state that the role of the CER Act involves safeguards which hold importance due to many powers of the Act being ‘highly coercive’ and that:

[137] This intention to facilitate and encourage voluntary withdrawal reinforces the link between the red zone decisions, the purchase offers and recovery from the earthquake and also reinforces the significant character of the decisions. It also highlights the need for such measures to have been the subject of a Recovery Plan. This would have required at least the minimum consultation provided for by s 20 of the Act. Indeed, given the significance of the decisions made for all of Christchurch and in particular for those in the red zones, it may be that further consultation, albeit expedited, would have been required.

The Court did not consider that the CER Act and its safeguards (especially participation of affected communities [118]) should be circumvented by acting outside of the legislation. It held that decisions of that magnitude should have been made under the Act and through the Recovery Plan processes. Acting around the guiding legislation “undermined the safeguards, community participation and reviews mandated by the Act” [146]. The Human Rights

Commission (granted leave to intervene) argued that measures put in place by Parliament should not be “side-stepped by executive action under the guise of ‘residual freedom’ or the ‘third-source’” [98].

The findings of the Supreme Court raise a range of considerations for managed retreat by incentivisation, or in this case, coercion. The conclusion of the Supreme Court that the voluntary offers were not in fact, realistically voluntary, is important to consider when presenting such policies. It is indeed arguable whether this form of retreat can be labelled ‘voluntary’ when affected persons are presented with what Judge Panckhurst in *Fowler Developments Ltd v Chief Executive of the Canterbury Earthquake Recovery Authority* [2013] NZHC 2173 described at [93] as ‘Hobson’s choice.’ Questions around the use of ‘residual freedom’ recognise the requirement to implement significant recovery tasks such as managed retreat within the ambit of the relevant recovery legislation. Had managed retreat occurred under CER Act (or the RMA) public consultation would have been required. Clear concerns were voiced in the 2010/11 financial review of the CERA and the Earthquake Commission, citing insufficient consultation founded on unclear criteria which proved divisive of communities. The report further highlighted concerns due to the long-term effects of the decisions, and in contrast with “normal council processes, which would involve advertising and public submissions, information flows had been confusing and poorly managed” (Finance and Expenditure Committee (2012) as cited in *Fowler Developments Ltd v Chief Executive of the CERA* [2013] NZHC 2173 at [62-3]). The red zone decisions made outside of the relevant legislation can be described as undemocratic.

Although the Supreme Court held that red zone measures should have been introduced under a Recovery Plan, it was not considered practical to make a declaration as to the unlawfulness of the decision with it already being implemented. The Supreme Court did declare, however, that the Crown offer of 50 per cent of the rateable value to vacant, commercial and uninsured red zone properties was not lawful, as the well-being purposes of the CER Act had not been considered, along with consultation failures, and the very difficult living conditions of the red zones [197-9] highlighting key equitable governance concerns. Following this decision, the Crown offered revised purchases of red zone properties.

Nielsen (2016) conducted a study on behalf of CERA to determine the extent to which the Crown’s policy objectives had been met, and to understand the

wellbeing outcomes of red zone property owners who accepted the voluntary buyout. This study surveyed a sample of 2,038 (42%) former red zone owners who accepted the offer. Of these participants, 79% believed the outcome provided certainty and 82% considered that having the offer was better than not having one (Ibid, p.10).

However, confidence in the agencies involved was not high, with 38% having confidence and 33% not. With regard to the final objective, 68% found the offer process clear and 73% considered they were given sufficient time to make a decision (Ibid, p.11). Perceptions of the fairness of the value of the offer were measured, 43% believed the offer was fair or more than fair, yet 54% felt it was less than fair. Respondents were also asked what the overall financial impact of accepting the Crown offer had been, with polarised results indicating the overall impact as 41% negative and 38% positive (Ibid, p.83). The majority of those who indicated a negative response lost money due to discrepancy between actual property value and the pay-out, with new or bigger mortgages, and difficulty in purchasing in an overheated and shrinking property market. Additional costs incurred included legal fees, relocation costs, independent reports, accommodation, and additional building and purchase costs for new properties. Groups most affected, and more likely to describe negative experiences, were those living with a health condition or disability, lower household incomes, those who felt the overall financial impact had been detrimental, and those who were unhappy with their new property type and/or location (Ibid, p.17). While many expressed a positive view of the process, some respondents experienced high stress and difficulty.

In 2016, the New Zealand Human Rights Commission (NZHRC) published a report assessing the red zone policy with a focus on the ~ 300 remaining residents who did not retreat. Key messages of the report were that human rights must be front and centre in disaster recovery, prevention and preparedness, that property rights in New Zealand are fragile, that community engagement is paramount, and the need to act swiftly must be carefully weighed against the need for community engagement in the design and implementation of solutions (Ibid, p.9).

Key reasons for respondents remaining in the residential red zones were financial (affordability/costs of moving/uneconomical to take offer), attachment to property, attachment to location/community/lifestyle, perception of safety, perception of property remaining liveable, unresolved insurance claims, and

others such as lack of consultation. While in theory, insured owners were entitled to a new build on land purchased with the Government offer, this was not financially viable for all claimants due to the offer at the 2007/08 rateable value, in comparison to sections at the present market rates, and land not being available on a like-for-like basis. Comments from the surveys indicate that age and/or employment status factored into people's decision to remain living in the residential red zones:

Financially we could not accept the Govt. offer as our only income was the Superannuation and we would never be able to afford to move to a location similar to this area (MacDonald & Carlton, 2016, p. 70).

Findings from the Human Rights Commission showed that place attachment was the most powerful reason for respondents staying, followed by financial reasons and a perception of safety (MacDonald & Carlton, 2016, p. 68). In terms of place attachment, the length of time they had been living in the home or neighbourhood was a factor in their decision to stay (Ibid, p. 70). As made clear in the report, dislocating people from their homes after a disaster appears to have had strong impacts on people's wellbeing and ability to recover (Ibid, p. 73). This provides additional reasoning to act before disaster strikes (if knowledge of the risk is available), when stress, trauma, and recovery pressures are absent. The aftermath of the earthquakes had far greater implications for people's stress levels than the events themselves, highlighting the need for post-disaster mechanisms that alleviate rather than exacerbate the stress of the disaster (Ibid, p. 136). There was widespread "disillusionment and dissatisfaction among those who participated in the survey with regard to participation, engagement, collaboration and decision-making" (Ibid, p.100). The discrepancy between 100% and 50% offers and the length of time between revisions caused considerable stress. MacDonald and Carlton (2016, p. 157) stated that the "most significant barrier to recovery faced by people affected by the red zoning has been the lack of certainty in their situations."

Key lessons include the need for flexibility to consider individual cases rather than a blanket policy (Ibid p.158), the importance of meaningful, equitable engagement and legitimate decision-making "...[r]ather than a dictatorial approach" (Ibid, p. 153), the social implications of reactive retreat, and greater acknowledgement that life risk is something individually assessed rather than imposed. Many of these social concerns relating to human rights, livelihoods,

place attachment, and a need for policy flexibility are expressed throughout the thesis, particularly in Chapters 6-7. The Canterbury Red Zones illustrate the limits of hierarchical managed retreat governance, where decisions are not conferred to the lowest level possible, and governance interactions result in inequitable outcomes as a result of coercion and ineffective engagement.

Franz Josef: Property acquisition

Smaller scale managed retreat via land acquisition occurred in Franz Josef, following a risk assessment for a motel, lodge, and campground adjoining the Waiho River, identifying a high likelihood of river flooding, and sudden floods produced by geological hazards, estimated to have a 2-4% annual likelihood, with limited warning and a high fatality likelihood for anyone present (Taig, Webb, & Massey, 2012, p. 20). The risks to life were considered intolerable by the Ministry of Civil Defence Emergency Management (MCDEM) and in 2003, following consultation with the affected property owners, central government agreed to provide financial assistance to relocate the businesses, in combination with local authority support. The CDEM Minister stated that the government “contribution followed the 2002 ‘Milligan’ report, which found significant risk to life...Although flooding at Franz Josef remained the responsibility of the Westland District and West Coast Regional Councils, given the extent of the risk the Government would assist” (Hawkins, 2003, p. 1). A 2003 Cabinet paper set out the government rationale for its “financial intervention” including maintaining the image that New Zealand is a safe place to visit, the intolerable level of risk, the lack of resources and powers of the district and regional councils to adequately deal with the risk, previous government funded river control works that may have aggravated riverbed aggradation, and government interest in maintaining a viable community at Franz Josef (Office of the Minister of Civil Defence & Office of the Minister for the Environment, 2003). Central government contributed \$862,000 towards relocating businesses, Westland District Council \$234,000 for land purchase as well as a further \$300,000-\$500,000 each from Westland DC and West Coast Regional Council (WCRC) in loan finance to assist with relocation costs, (the majority to be borne by landowners) (Ibid). The Glacier Gateway Motel was to receive \$350,000 plus all available loan finance (up to \$1m). The owners and leaseholder of the motor camp and lodge formed a consortium and were to receive \$650,000 to assist relocation (Ibid). WDC agreed to assist relocation by meeting all building and

resource consent fees up to (but not including) Environment Court proceedings. MfE was to ensure restrictions were placed on the titles of the land to prohibit future residential or commercial accommodation. Property owners were required to reach agreement with existing leaseholders to enable transfer to the relocated businesses.

Due to the significant residual cost for owners in re-establishing their businesses, the settlement process provided a year to leave the sites with WDC applying temporary risk mitigation measures. A 2015 report by WDC confirmed that negotiated settlements had been reached with all businesses except the motel, and the majority of buildings had been relocated or demolished (Westland District Council, 2015). Efforts to reach settlement with the motel had failed until ownership changed in 2012. The remaining funding (\$300,000) from central government was used in combination with \$100,000 from West Coast Regional Council's Franz Josef Rating District and \$300,000 from NZTA for river and road management purposes (West Coast Regional Council, 2015a). A Memorandum of Understanding was agreed to specify that the land on the south side be for road and river management purposes only (Ibid). Demolition costs were shared by WDC and WCRC. In this case, presence of third-order governance attributes: direction, information, cross-government coordination, organisational support, flexibility, and funding capacity enabled an effective, responsive and robust process which delivered equitable outcomes for affected parties.

Project Twin Streams, Waitakere: Property acquisition

At a similar point in time, Waitakere City Council (WCC) undertook a voluntary retreat strategy named *Project Twin Streams* (PTS) to address flood risk and stormwater management challenges caused by urbanisation in the Lower Oratia catchment and climate change impacts. The stormwater concerns had ascended in the 1990s, with Auckland Regional Council warning of a moratorium on development if they were not addressed (Atlas Communications & Media Ltd, 2011). In 2002, following comprehensive flood modelling, PTS commenced in line with WCC's 'Eco City' mandate and Agenda 21 principles, favouring participatory processes and restoration of natural ecosystem processes over hard engineering works (Smith, Leitch, & Thomsen, 2016, p. 24). PTS was a comprehensive 10-year strategy involving the purchase and removal of houses in the flood plains and the restoration of 56 kilometres of riparian margins. (Atlas

Communications & Media Ltd, 2011, p. 3). Key drivers included WCC's Eco City Status and desire to 'work with nature' creating natural flow paths for stormwater and improving sedimentation and water quality issues (Atlas Communications & Media Ltd, 2011, p. 4). Protection and accommodation interventions had previously been considered, however, these were discarded in favour of managed retreat. The project was successful in receiving a significant grant of \$39 million from Infrastructure Auckland (now Auckland Council). Ninety-eight full property purchases and 83 part-purchases were identified as necessary for the project.

WCC undertook a voluntary retreat approach, although it could have invoked compulsory acquisition under the PWA (Smith et al., 2016). While compulsory acquisition under the PWA was not applied, its key principles were used as a baseline guide in combination with a conciliatory and educative approach to buy properties in a way which "respects property owners' rights, avoids coercion and is fair" (Atlas Communications & Media Ltd, 2011, p. 6). PTS was designed to produce equitable outcomes, ensuring both the affected and wider communities understood the issues, allowing property owners to reach their own understanding of how managed retreat was the most practical option, considering health and safety, environmental and technical aspects of the flood risk (Atlas Communications & Media Ltd, 2011, p. 6).

In recognition of the challenges that come with managed retreat, WCC developed an engagement process and key consultation materials prior to commencing any communication with affected property owners. An external consultant, council and project staff developed the engagement plan, with weekly staff meetings during implementation to ensure a coordinated, consistent approach (Smith et al., 2016). Following this, affected owners were individually informed by technical experts and mediators to address any concerns. Flexibility (responsive governance) was a key principle applied:

...there was no 'one solution fits all' approach. In some instances, owners had ideas as to how the flooding could be addressed...Each idea was treated with respect; in some instances they had potential and were investigated further. Each owner was given feedback on their suggested options, and reasons for accommodating or not pursuing them. (Atlas Communications & Media Ltd, 2011, p. 9)

Sale and purchase negotiations were undertaken on a case-by-case basis using a wide range of engagement approaches, including briefing all professional stakeholders, initial letters to affected people (to ensure notice across the board

at one point in time), media briefing and regular press updates to avoid inappropriate information leaks, appointments and phone calls with property owners, face-to-face visits with all owners and local drop in days. All owners were informed that after contact had been made Council, their LIMs would be updated, showing the flood zone, and that council was discussing purchase with the owners for stormwater management purposes. This is a particularly important measure to ensure that any parties to private sales would be aware of the retreat process underway to avoid having to deal with new owners. For community support, local Citizens Advice Bureau (CAB) managers were trained to give accurate, independent advice and support to residents, sometimes accompanying elderly residents to visit real estate agents and lawyers. Vacant houses were made available to affected families as temporary accommodation, to make the transition easier.

According to Atlas Communications & Media Ltd (2011) a large flood in the Henderson Valley occurred just before the property purchase launched. Due to this, the project received considerable support and initial uptake from residents in Henderson Valley, which helped set the scene for other areas (Ibid, p. 10). 'Family A' (interviewed by Atlas) stated that they now enjoy the recreational benefits of the project, frequently using the walk and cycle way. "They readily admit they might not have been so ready to sell if it hadn't been for that big flood. But having experienced a major flood first-hand, they had no reservations about selling." (Ibid, p.16). Interview respondent 'B' on the other hand (a 70-year-old retired widow) had only experienced one minor flood in her family home of 30 years and was very reluctant to sell her house, calling the original price offer "disgusting"—"where can you buy a house for \$159,000?" (Atlas Communications & Media Ltd, 2011, p. 17). She changed lawyers and managed to negotiate a better deal but "it still wasn't enough to buy a house. Houses were selling for \$300,000 and there's no way at my age I was going to take out another mortgage" (Ibid). When asked why she finally decided to leave, she stated: "I didn't decide; I felt I had no other option" (Ibid). Similar to the Christchurch red zone residents, age appears to be a factor for some experiencing a strong attachment to home and reluctance to leave, for sentimental and financial reasons. Whilst being able to temporarily rent a vacant PTS house from WCC, she was unhappy with her living situation and the lack of security in the retreated neighbourhood. In some cases, WCC attempted to work with landowners to

foster detachment from their homes such as relocating buried placentas and special trees or placing a plaque to mark an ancestral family farm.

Overall, 78 properties were removed or relocated, 78 part-properties were purchased, and 67 covenants were created to ensure access for riparian planting (Atlas Communications & Media Ltd, 2011). PTS achieved many of its objectives including engagement with the community and the purchase of affected properties without recourse to compulsory acquisition under the PWA, avoiding lengthy legal negotiations. It is important to note, however, that the fundamental principles of the PWA were relied on, and it was made very clear to property owners that the Council could apply the PWA if voluntary purchase could not be negotiated (Atlas Communications & Media Ltd, 2011). While PTS demonstrates that voluntary retreat can occur if it is a well-designed and thorough process, it falls into the same territory of Canterbury as being notionally voluntary, as the recognition of compulsory acquisition powers can be seen as coercive (something the Council aspired to avoid in initial goal setting), particularly as experienced by persons such as Respondent 'B' who felt she had no choice but to sell. However, in this case, the flexibility of terms, strong engagement, significant support streams and case-by-case negotiations allowed for a more mutual, cooperative approach. Key enablers in this case include guiding principles to provide policy direction, the careful selection of capable project team members, sufficient time, training and financial resources to build capacity and capability, the importance of being aware of the diverse impacts upon affected persons, the efficacy of an approach grounded in building the knowledge of those people, quality engagement, and flexible decision-making to negotiate equitable and individualised outcomes (Smith et al., 2016, p. 25) In addition, engaging with those who influence or advise the target audience is important to implementation effectiveness. These enablers are illustrative of many of the third-order governance principles, demonstrating their value to managed retreat governance frameworks and application.

2.7.3 Overview of managed retreat interventions

The international and New Zealand examples reveal key enabling and disabling factors of managed retreat governance modes, elements, and orders illustrated in Figure 2. Third-order governance issues were particularly important to acknowledge, as they comprised the underlying values and principles which feed into the entire governance exercise (Table 3). It is clear that where managed retreat has been implemented, various attributes of effective,

equitable, responsive and robust governance principles are present. Moreover, where these principles are limited or absent, particularly attributes of equitable governance, implementation has faltered. For example, perceptions of unfair processes and outcomes in Kāpiti and Byron Bay. In these cases, overall robustness was limited by legitimacy concerns, triggered by inadequate capacity, participation, recognition, fairness or information. Consolidating their relevance to the evaluation of managed retreat governance, the principles are also pertinent to the broader barriers and enablers uncovered in the international and grey literature, discussed next. It is also recognised that substantial access to resources and in particular, legal support, can hinder managed retreat implementation, particularly where there is a presence of existing use rights for land use activities and associated protection works.

Table 3: Third-order governance: Principles and attributes (Bennett & Satterfield, 2018)

Effective	Equitable	Responsive	Robust
<i>Direction</i>	<i>Recognition</i>	<i>Learning</i>	<i>Legitimate</i>
<i>Coordination</i>	<i>Participation</i>	<i>Anticipatory</i>	<i>Connected</i>
<i>Capacity</i>	<i>Fair</i>	<i>Adaptive</i>	<i>Nested</i>
<i>Information</i>	<i>Just</i>	<i>Innovative</i>	<i>Polycentric</i>
<i>Accountability</i>		<i>Flexible</i>	
<i>Efficient</i>			

2.8 Governance insights

Looking across the literature reviewed allows a better appreciation of the range of barriers and enablers to implementing managed retreat. Governance elements and orders across the spectrum have been examined, including formal and informal interactions, and corresponding instruments of policy and regulation, strategy and incentives. Diverse institutional arrangements have been reviewed, with varying degrees of power sharing between governing authorities and individuals. With regard to third-order governance, which permeates throughout the governance framework, the literature review has revealed that managed retreat barriers and enablers are often representative of limits to, or realisation of, good governance principles.

The research thus far demonstrates how managed retreat has a higher likelihood of being accepted when it is interpreted by those involved in and affected by it as an equitable process; being fair, transparent, and inclusive (Agyeman et al., 2009; Vandebeld, 2013). In a similar vein, applying parties' motivations for managed retreat within a conceptual model, Hino, Field, and Mach (2017) mapped international case studies on horizontal and vertical continuums according to residents' willingness to move and the implementing

party's motivation to support it. Their framework created four quadrants representing different managed retreat drivers: 'mutual agreement' with residents initiating retreat and governing authorities supporting it; 'greater good' where managed retreat is imposed on residents and broader society benefits; 'hunkered down' where residents do not support retreat and broader societal benefits are minimal, and; 'self-reliance' where residents support managed retreat but have no implementation assistance. Much like the examples examined in this chapter, the quadrant highlights the importance of community empowerment and agency, political will, and organisational support, with institutional power sharing arrangements of 'mutual agreement' being more likely to succeed (for example Grantham, Australia).

The examples and literature all highlight the importance of good governance principles. Documented failures reveal the pitfalls of flawed science and science communication, 'late' or ineffective community engagement, and inconsistent strategies, resulting in public contention and litigation. Key lessons include the need for community involvement in the design of solutions, respect and knowledge of local place and space, flexibility in implementation, and effective, robust institutions to support interventions. Local leadership, transparency and credibility are essential, and bridging organisations can foster learning, innovation and adaptation, particularly under conditions of uncertainty and limited organisational capability. Where 'good' governance principles of effective, equitable, responsive and robust managed retreat are limited, implementation may reflect the same fate.

It is clear that existing use rights present a significant barrier to managed retreat, often addressed with governance instruments of incentives where there is high risk to human life. However, as numbers of people living in exposed areas increase and property values grow (particularly at the coast), governments are more likely to succumb to political and legal pressure to build and maintain hard defences, with managed retreat becoming less economically and politically viable (Abel et al., 2011). Additionally, lack of nearby available land can deter or constrain the ability to relocate without significantly disrupting attachment to place, livelihoods and identity.

Managed retreat literature is generally centred upon the exposure and vulnerability of people, but in practice, it also requires attention towards the infrastructure and utilities required to service receiving settlements, public lands and ecosystems at risk, and growth and development patterns to plan for changes

in land use and allocate new space for relocation. Integrated, strategic planning is crucial at city, regional and national scales—factors not exclusive to managed retreat. In short, managed retreat may protect people, ecosystems, and assets from harm, but it must be effective, equitable, responsive, and robust to be realised in a manner that is socially, politically and culturally acceptable, and practically achievable.

Table 4 summarises the primary enablers and barriers raised in both literature and practice. To aid interpretation, these are grouped into four primary categories that drive and deter the implementation of managed retreat: socio-political-cultural, environmental, economic, and institutional. The issues should be seen as integrated, for example, institutional issues can have cause-effect relationships with barriers of trust and legitimacy concerns within communities. The enablers and barriers listed may not be present in all cases, and local contexts will bring unique hurdles and co-benefits to consider, but as managed retreat imposes trade-offs between costs now and those in the future, there will inevitably be opposition. The art of effective governance is in balancing these tensions in a responsive and robust manner, where communities are thoroughly engaged, empowered and supported to detach from their places of habitation, in a way that delivers equitable outcomes. The governance framework (Figure 2) has provided a useful means to reveal the often hidden governance issues, and a practical way to examine the structure and operationalisation of managed retreat interventions, including how to deliver ‘good governance’ and evaluate its principal barriers and enablers.

Table 4: Socio-political-cultural, environmental, economic and institutional enablers and barriers of managed retreat

Enablers	Barriers	Sources
Socio-political-cultural		
Prevention of risk to life and assets	May be viewed unfavourably by affected property owners and politicians	<p>(Abel et al., 2011; Agyeman et al., 2009; Bardsley & Niven, 2013; DEFRA, 2002; Esteves, 2013; Fazeya et al., 2016; Fletcher et al., 2013; Fried, 1963; Harman et al., 2015; Hayward, 2008; Hino et al., 2017; Hogg, Kingham, Wilson, & Ardagh, 2016; Lei, Finlayson, Thwaites, & Shi, 2015; Linham & Nicholls, 2010, 2012; Mortreux & Barnett, 2009; Ryan et al., 2012; Townend & Pethick, 2002; Turbott & Stewart, 2006; Usamah & Haynes, 2012; Wenger, 2015)</p> <p>Examples:</p> <ul style="list-style-type: none"> • Urenui, NZ • Byron Bay, AUS • Kāpiti, NZ • Hawke's Bay, NZ • Muriwai, NZ • Waitakere, NZ • Tasman, NZ • Canterbury, NZ • Medmerry, UK • Grantham, AUS • Riverlink, NZ
Can increase adaptive capacity and resilience of communities	Disruption to attachment of place, culture, and sense of identity	
Opportunity for collaboration between community and decision-makers	May result in community division (for receiving and retreating communities) and political contestation	
Protection of wider community values (access, amenity, urban renewal, reduced maintenance/emergency management costs)	May result in loss of social networks, distress, feelings of lost control and may increase vulnerability	
Can be a flexible option for managing uncertainty, action may not be required until a certain threshold is met (e.g. DAPP)	Existing use rights and the expectation of permanent use of land when land may not be permanent. This is worsened by increasing property values, particularly in coastal areas.	
Reduction of social discomfort from emergency	People directly affected may have a sense of loss	
Community empowerment and agency	<p>Visible and hidden power within the community can influence decisions (e.g. wealthy property owners exerting political and legal pressure to protect properties)</p> <p>Cultural heritage</p> <p>Incremental protection measures can decrease the feasibility of retreat – path dependency, escalator effect, safe development paradox, levee effect</p> <p>Livelihood incompatibilities or inadequacies</p>	
Recent social memory of disasters		
Efficient strategy for reducing risk with potential for anticipatory risk reduction		
Enablers	Barriers	Sources
Environmental		
Protection of environmental and amenity values including carbon sequestration benefits of wetlands (managed realignment).	Abandonment/relocation resulting in low-quality environment if restoration is not staged and adequately funded, or the institutional enablers are not in place	<p>(Abel et al., 2011; Bardsley & Niven, 2013; DEFRA, 2002; Linham & Nicholls, 2010; McNamara & Jacot des Combes, 2015; Sipe & Vella, 2014)</p> <p>Examples:</p> <ul style="list-style-type: none"> • Muriwai, NZ • Medmerry, UK • Waitakere, NZ • Grantham, AUS • Riverlink, NZ
Prevention of coastal squeeze and habitat loss		
Nearby, available land for resettlement	Lack of accessible/useable land for resettlement	
Economic		
One-off cost with limited maintenance expenditure	Potentially significant costs; risk assessment, strategic planning, stakeholder and community	(Abel et al., 2011; Bardsley & Niven, 2013; Cooper, 2003; Cooper & McKenna,

	engagement, collaboration, relocation, funding and restoration	2008; DEFRA, 2002; Gibbs, 2016; Hino et al., 2017; Linham & Nicholls, 2010; Roca & Villares, 2012; Townend & Pethick, 2002; Turbott & Stewart, 2006)
Reduction of future emergency management and hard protection expenses	Potentially higher risk management costs for individual property owners directly affected than other methods (but long-term, public benefits).	Examples: <ul style="list-style-type: none"> • Waitakere, NZ • Kāpiti, NZ • Hawke’s Bay, NZ • Muriwai, NZ • Franz Josef, NZ • Medmerry, UK • Riverlink, NZ
	Potential for reduced property values, equity and market uncertainty	
	Authorities who re-zone land to afford space for ecosystems may become liable for consequent decrease in property values, even if risks to properties are expected to increase on that land in future.	
	Numbers of coastal residents and value of properties at risk may have thresholds where retreat becomes less likely.	
	Moral hazard and precedent risks of incentivisation	
Institutional		(Bronen, 2015; Bronen & Chapin, 2013; Linham & Nicholls, 2010; McNamara & Jacot des Combes, 2015; Sipe & Vella, 2014)
Local leadership	Insufficient institutional and funding support	Examples: <ul style="list-style-type: none"> • Riverlink, NZ • Hawke’s Bay, NZ • Shishmaref, USA • Grantham, AUS • Franz Josef, NZ • Kāpiti, NZ • Canterbury, NZ
Respect and knowledge of local place and space	Ineffective/absent/late community engagement	
Flexible, adaptive governance	Flawed science and science communication	
Organisational support and capacity building (i.e. NZCCRI for Riverlink, National Science Challenge Edge Team support in Hawke’s Bay, Department of Fisheries support in Vunidogoloa village, Fiji & MCDEM support Franz Josef).	Inconsistent application of policy	
Effective governance, transparency and legitimacy		
Political certainty – demonstrating short-term progress of long-term strategies		

2.9 Summary

There are many challenges for operationalising managed retreat. Although some of the cases denote success in relocating people and assets away from danger, they are rare in the literature, due partially to the fact that managed retreat is only recently gaining recognition, but also because it fails to emerge beyond initial scoping processes. Both the real and the perceived costs of managed retreat present difficulties for decision-makers, and more often than not, protection structures are preferred as they hold a legacy, are less publicly and politically contested, and they allow people to remain, preserving certainty

and the status quo. However, as recognised by Bardsley and Niven (2013), managed retreat is going to be increasingly required due to the levels of future risk that many communities and ecosystems face. It will need to (and is beginning to) occur in anticipation of, and response to the slow-onset effects of climate change and sudden-onset disasters.

Resilience theory resists the notion that humanity is separate to, or dominant over nature. However, socio-political resistance to managed retreat is somewhat derived from ideological concerns which correlate retreat with defeat in a military sense, as 'giving up' to nature (Koslov, 2016). Desires for economic growth, often at the expense of environmental values, contribute to negative perceptions towards managed retreat, as it reduces potential for traditional development opportunities, which are often at the centre of social aspirations and political influence. Transforming away from the Man v Nature binary is a fundamental challenge to gaining traction on more naturalised planning such as managed retreat (Grove & Chandler, 2017). The literature and examples explored demonstrate that contexts and challenges are diverse, and that, as demonstrated in Figure 2, the modes, elements and orders available are varied and context specific. Interventions vary in approach, and by way of the governance modes applicable to local conditions. That said, it is also clear that in realising managed retreat, 'good' governance principles are often held in common.

Chapter 2 has set the basis for resilience planning, justifying the need for risk reduction; the role of governance modes, elements and orders in managing and delivering 'good' outcomes and in overcoming the socio-political-cultural, economic, environmental, and institutional barriers of managed retreat; and the relevant literature and lessons from practice which foreshadow the analysis and conclusions made later in the thesis. This conceptual foundation integrates insights from resilience and governance scholarship, shaping the themes that will be used to structure and guide the thesis, being the investigation into New Zealand institutions, practice, and perceptions, significant barriers and enablers and ultimately, the governance of managed retreat. With an understanding of the theory, approaches, and broad international barriers and enablers, a review of the New Zealand institutional context is required to assess local managed retreat elements and orders, and answer Objectives two and three of this research. Chapter 3 provides the research design and methods used and Chapter 4 begins with the New Zealand context.

Chapter 3 Methodology

3.1 Introduction

Chapter 3 provides the research approach and justifies the methods and data analysis employed to respond to the research aim and objectives. It also addresses limitations of the research and ways in which these are overcome. The interdisciplinary nature of managed retreat requires research of breadth and depth. The aim and objectives of this thesis necessitate understanding of theory and practice, institutional frameworks, barriers and enablers, social values, guiding principles, and perceptions towards managed retreat. Therefore, the research strategy employs a range of qualitative and quantitative methods to deliver both culturally rich and technically detailed insights required to develop this broad field.

In accordance with the ethical principles set out by the University of Waikato, a mixed methods approach was undertaken. Ethical approval was obtained from the Faculty of Arts and Social Sciences Human Research Ethics Committee on 17 July 2017 and minor amendments to the application accepted on 18 September 2017 (Appendix 1). The research was carried out with careful consideration, sensitivity and commitment to ensuring consistency with the spirit and intent of Te Tiriti O Waitangi, the Treaty of Waitangi. Due to the sensitive and ongoing nature of the case study, confidentiality of participants was maintained, it was made clear to all participants that their involvement in the research was entirely voluntary, and participants were able to request interview transcripts to check and confirm their statements.

3.2 Research strategy

What is defined as knowledge, and how it can be discovered is subjective. A paradigm is a shared world view that is informed by ontological assumptions about the nature of social reality, and forms of 'knowing' (epistemology). Qualitative approaches are generally associated with the interpretivist paradigm, with an emphasis upon the way in which the world is socially constructed and understood (Blaikie, 2000; McEvoy & Richards, 2006). Quantitative methods are broadly associated with a positivist paradigm where theories are tested to determine objective facts that can be generalised to a wider population (McEvoy & Richards, 2006).

Qualitative and quantitative research address different research questions,

employing distinct methods. For empirical research, qualitative methods such as case study analysis and interviews provide a depth and richness of experience that cannot be easily matched by quantitative methods (Jay, 2004). On the other hand, quantitative methods provide detached data that can be used to identify patterns and trends within groups, allowing researchers to draw conclusions and create future scenarios by calculating their probability (Davies, 2007; England, 2006).

Since the “communicative turn” (Healey, 1996) planning has seen a greater emphasis on process rather than measurable outcomes, with issues discussed and compared qualitatively as opposed to being exclusively quantified (Næss, 2015). However, planning is highly interdisciplinary, and in certain facets (notably transportation planning and risk management) positivist approaches still dominate (Ibid). Planning often incorporates both ontological perspectives of intangible and tangible realities associated with interpretive and positivist paradigms. The research problem of this thesis is centred within the planning system, aiming to increase understanding of more tangible realities such as managed retreat policy and legislation, and intangible realities impacting its social and political acceptance. Given the research problem, a mix of qualitative and quantitative methods have been selected, to examine managed retreat within theoretical, practical, and institutional settings, to interpret the meanings surrounding it, the meanings people attribute to it, and to identify patterns with regard to policy application and acceptability.

By combining methods, researchers can attempt to counteract biases associated with ontological and epistemological assumptions about the nature of social reality and ways of knowing. The logic of a mixed methods approach is based on the recognition that neither quantitative or qualitative methods are sufficient to develop our knowledge, but when used in combination they can complement each other (Creswell, M.D, & Ivankova, 2004). The research strategy for this thesis predominantly represents the interpretivist paradigm, where meaning is inductively developed through patterns and themes throughout the research process (Creswell, 2003). Quantitative data is utilised to support and expand upon the qualitative data, to deepen, triangulate and consolidate the broad concepts developed to help validate, broaden, and make sense of the research findings.

A review of managed retreat literature and associated methodological approaches assists in informing the methodological selection, due to the

complex and multi-disciplinary nature of managed retreat. Following a search for 'managed retreat' on the Waikato University Library database, the top 20 articles, book sections, theses and technical reports (focused specifically on managed retreat), applied the following methods, in order of most common to least common: literature review, interviews, case studies, policy reviews, surveys, workshops, questionnaires and site visits. The top four methods are applied in the majority of the literature and have presented a useful basis for determining key method selection for this study. The following sections justify and detail the methods selected to address the research aim and objectives: literature reviews, textual analysis, a questionnaire, site visits, and semi-structured interviews.

3.3 Literature reviews

A literature review is necessary to provide a comprehensive and critical review of existing works relevant to the research topic, supporting the development of the research position and the means to justify further exploration within the field (Berg, 2007). The review outlines the theoretical framework for the thesis and contextualises the topic. This is a conventional method used in several research fields, including environmental studies (Frohlich, Jacobson, Fidelman, & Smith, 2018; Plummer, de Loë, & Armitage, 2012).

The purpose of the literature review is to understand the theoretical links between resilience, governance, planning, and managed retreat. Searches for peer-reviewed literature (in English language) were undertaken on the Waikato University Library website (including e-copy and hard copy resources), Scopus, and Google Scholar, using the key words, 'resilience' (singularly and in combination with 'natural hazards'), 'adaptive management', 'managed retreat', 'managed realignment' and 'community relocation.' The top 200 results of each search (sorted by relevance) were reviewed. Where the key words were present in the title or abstract of resources, the works were imported to Endnote to be critically reviewed and incorporated into Chapter 2. References listed in selected papers were investigated to broaden the literature review and identify additional case studies of managed retreat.

To supplement the academic literature, Google internet searches were undertaken of the underlined search terms (above) to broaden the evidence base. Due to the large volume of results (>29,000,000 for managed retreat alone) the top 200 results of each entry was reviewed. The grey literature found, such as

technical planning and hazard management reports supplement the literature review, providing practical knowledge on the application of managed retreat, nationally and internationally. For the key terms underlined above, results were filtered based on fulfilment of the following criteria: resources theorising managed retreat (and related terms), and resources analysing managed retreat case studies. Resources that did not provide theoretical or practical evidence of managed retreat such as GIS analysis of potential managed retreat sites were not included in the review.

To identify cases where managed retreat has been implemented, international case studies were documented throughout the course of the literature review. This process provided insight to the global application of managed retreat, the differences in approach and terminology and significant barriers and enablers to its implementation. Appendix 2 provides a summary of the cases found between July-December 2016 and this informs the selection of key terms for the textual analysis.

In addition to the review of resilience and managed retreat literature, a review of governance theory and frameworks was undertaken to extend understanding of governance theory, and develop a framework to examine managed retreat governance. Key terms, “governance theory” and “governance conceptual frameworks” were searched on the Web of Science Core Collection and the Waikato University Library database, peer-reviewed and published in English, between 2000-2018. The results were ordered by relevance and the top 200 results of each search were reviewed (due to the significant number of results; >300,000). This involved scanning the titles and abstracts for governance theory (modes, elements and orders) and conceptual governance frameworks which synthesised the range of modes found in practice and theory. The content of works selected were reviewed and tabulated according to the governance modes and elements discoursed. Driessen and others’ (2012) conceptual framework, Kooiman and others’ (2008) interactive governance model and Hysing’s (2009) governance continuum provided the foundation for tabulation of the modes.

For the literature reviews, to overcome the limitation of searching the top 200 results of each code, snowball searches (pursuing citations in the tabulated literature) were undertaken and included to supplement the data found. However, it is acknowledged that the search terms and selection criteria may have excluded relevant publications, including peer-reviewed and non-peer-

reviewed literature from alternative sources, as well as non-English research articles.

3.4 Textual analysis

The focus of the textual analyses is managed retreat discourse present in New Zealand planning instruments. Healey (1997, p. 277) summarises policy discourse as systems of meaning embodied in a strategy for action. In the context of this study, the instruments for action are resource management policy and plans, long-term plans, management plans and strategies discursively produced and decreed governable by law, expert evidence, decision-making and public consultation processes (Feindt & Oels, 2005). These instruments, produced in social settings, are regarded as collective social products which form a field for research in their own right, not to be considered as mere props for action (Prior, 2003, p. 26).

To fulfil Objective 2 of this research, an analysis of managed retreat discourse in New Zealand planning documents was required. Due to the significant scale and detail of the document sample groups, focused textual analyses (rather than a broad discourse analysis) were carried out to uncover meaning, develop understanding, and discover insights most relevant to the research objective (Merriam, 1988). While it is understood that it is important to look beyond the text (to encompass the wider meaning of discourse), the textual analyses are targeted at the national, regional and district scales, resulting in a significant number of documents to review. Analysis of wider discourse, including media, non-resource management instruments and interview data is undertaken in subsequent chapters (6-8).

Textual analysis of RMA planning instruments was carried out in December 2016-March 2017 to fulfil Objective 2 of this research. A summary of the methodological approach is provided in Figure 6 and discussed in detail next.

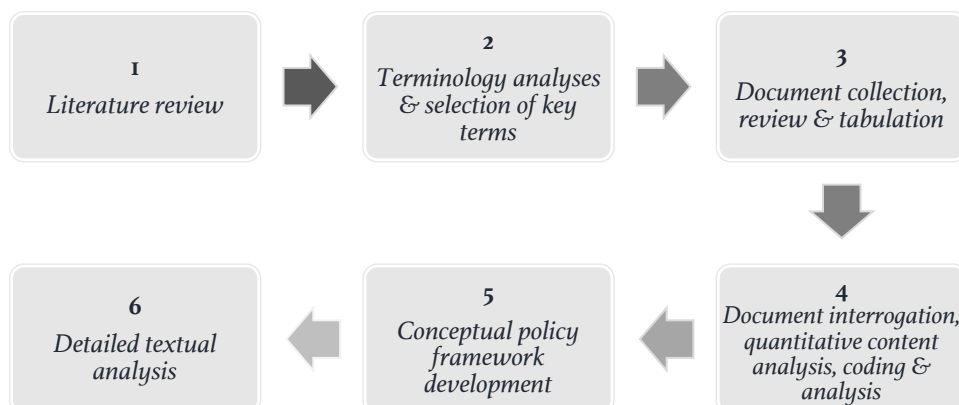


Figure 6: Textual analysis methodology summary

Six key steps structured the textual analysis of New Zealand planning instruments. The purpose of the analysis was to determine how managed retreat is treated within New Zealand RMA planning documents, to discover the approaches used and the extent to which planning documents are enabling managed retreat in New Zealand. Before collecting the documents, key search terms were established. The international literature review revealed significant variation in managed retreat terms and approaches. Appendix 2 provides the range of terms used to describe practices for moving at risk populations and assets away from high risk locations. For each of the international examples, the key terms used to describe the process were documented to inform the textual analysis. Terms ‘migration’ and ‘rollback scheme’ were not included as they were outliers, with ‘migration’ being focused at national-international scales and ‘rollback scheme’ used to describe a single programme. As the sample group comprises policy instruments, a test analysis was carried out on 40 resource management plans to gain a base understanding for the regulatory terms and plan formats. The terms found in the international examples were searched in the policy review test, with relevant regulatory provisions recorded to determine the key regulatory terms. These two methods resulted in the compilation of key terms (Table 5) as indicators for managed retreat policies in New Zealand planning documents. Two relevant terms (*italicised*) not present in the international examples were added to the list as they had emerged out of the broad literature review (Barnett et al., 2014; Rouse et al., 2016) in Chapter 2.

Table 5: Key search terms

Managed retreat terms (literature)	Regulation terms (policy test)
1. Managed retreat/retreat/planned retreat	1. Relocatable
2. Managed realignment/realign	2. Rebuild
3. Relocate/relocation	3. Reconstruct/ion/Re-construct/ion
4. Setback/set back/set-back	4. Replace
5. Adaptation/Adaptive management	5. Damage/d
6. Abandon	6. Alter/Alteration
7. Purchase offer/purchase	7. Addition/s
8. Acquisition/acquire	8. Protection
9. Buy/buy-out	9. Extension/s
10. Resettlement	10. Setback/set back/set-back
11. <i>Pathway</i>	11. Remove
12. <i>Strategy</i>	
*Unique terms found during the analysis	
13. Exit strategy	12. Transported
14. Soft-engineering	13. Shift
15. Withdraw/al	

Once the key terms were developed, analysis was carried out using O’Leary’s (2010) process of collecting, reviewing, interrogating and analysing the relevant documents, with the use of a general inductive approach to develop principal findings (Thomas, 2006). The sampling frame for the data collection included operative and proposed regional policy statements (RPS), regional plans, regional coastal plans (RCP) and district plans. Table 6 provides a breakdown of the number of plans reviewed by document type. In total, 150 documents from 17 regional councils and 67 territorial authorities were reviewed, interrogated and analysed within a conceptual framework. During the data collection process (December 2016-January 2017), the legal status of each plan was recorded, and proposed/draft plans were included.

Table 6: Sampling frame breakdown

Document type	Number reviewed
Regional Policy Statements	17 Operative and 4 Proposed
Regional Plans	18 Operative & 5 Proposed/Draft – These plans included land & water plans, freshwater plans and regional resource management plans. There are 18 Operative Regional Plans due to the Operative Wairau/Awatere & Marlborough Sounds Resource Management Plans being separated into two documents.
Regional Coastal Plans	18 Operative & 5 Proposed/Draft – There are 18 Operative Regional Coastal Plans due to the Operative Wairau/Awatere & Marlborough Sounds Resource Management Plans being separated into two documents.
District Plans	68 Operative & 15 Proposed/Draft – Out of 67 Territorial Authorities, there are 68 Operative District Plans due to the additional Franklin, Wairau/Awatere and Banks Peninsula District Plans and the Wairarapa Combined District Plan (combining the Masterton, Carterton & South Wairarapa Districts’ regulation under one plan).

Once documents were collected, reviewed and tabulated, they were interrogated with four key questions, illustrated in Figure 7.

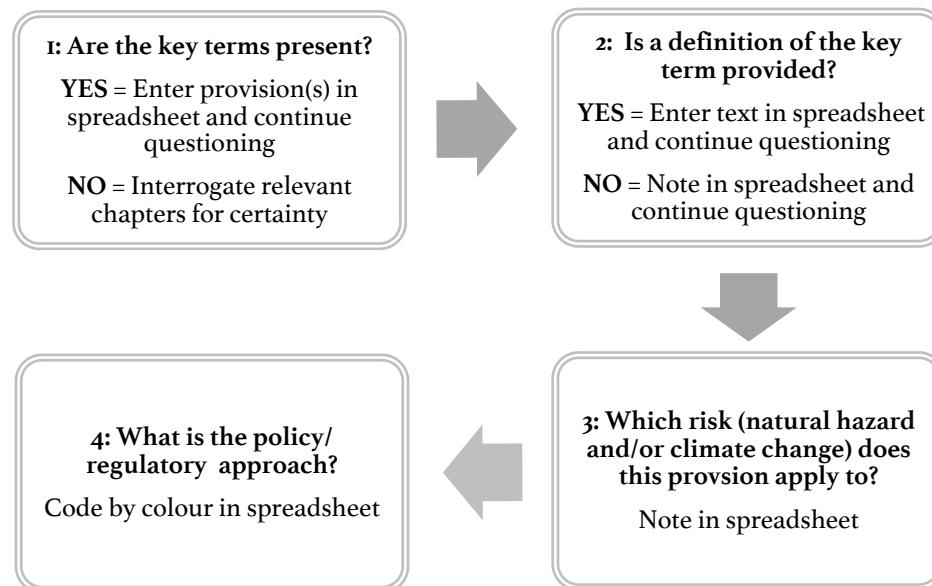


Figure 7: Content interrogation

As depicted in Figure 7, the review was commenced using both discrete term searches and qualitative analysis of relevant document chapters. For all 150 instruments, each of the key terms were searched and where relevant policies were found, these were recorded in full. Documents were checked twice for accuracy and where no results could be found, a full investigation of the text was carried out to mitigate the limitation of using key terms. In a couple of cases, unique terms* were found during the broad analysis and these were identified and added to the search list (exit strategy, withdrawal, soft-engineering, transported and shift). All documents reviewed prior to the finding of the new terms were re-reviewed. To document the findings, a spreadsheet format was used to enable analysis and data reduction. To carry out the data analysis, the original dataset was reduced into explicit spreadsheets, using analytical codes based on interpretative themes (Hay, 2010) including terminology, policy and regulation categories, and natural hazard and climate change risk influences. Due to the absence of empirical literature on managed retreat policy, a ‘general inductive approach’ was employed to identify the relevant and frequently occurring themes and categories (Pila, Mond, Griffiths, Mitchison, & Murray, 2017; Thomas, 2006). This approach allows research findings to emerge from the “frequent, dominant, or significant themes inherent in raw data, without the restraints imposed by structured methodologies” (Thomas, 2006, p. 238). The reduced datasets enabled specific analysis of provisions, and the ability to compare between instruments. The inductive data evaluation process allows theory to emerge by way of themes or categories, to develop a framework of the

underlying structure or processes evident in the raw data (Thomas, 2006). With the policy categories (I-6) coded (Table 7), a framework was developed as the basis for deeper analysis and further coding was applied to determine the level of direction for managed retreat within each category. Quantitative content analysis was carried out to determine the terminology, definition, hazard type and climate change influences, and document date counts.

Table 7: Policy codes

<p>Category 1 Natural hazard policy for existing development</p> <p><u>Category 1 includes policies that identify managed retreat as a natural hazard risk 'mitigation' option.</u></p> <p><u>Category codes:</u></p> <p><i>Consider</i> managed retreat as an option or simply note it as a potential approach. <i>Assess/have particular regard</i> to managed retreat as an option <i>Encourage</i> managed retreat as an option <i>Prioritise</i> managed retreat above other options</p>
<p>Category 2 Regulation of new and re-development</p> <p><u>Category 2 includes provisions requiring relocatable design of new buildings and the regulation of new and re-development in vulnerable locations.</u></p> <p><i>Category 2a</i> is tiered from the use of guiding policy, to assessment criteria in plans, to policy areas that specifically require relocatable building design and finally, to relocation strategies that facilitate relocation with trigger points, consent conditions and monitoring.</p> <p><i>Category 2b</i> is tiered from the use of policies requiring to the use of permissive or restrictive activity statuses to regulate re-development and in some cases, prohibit it.</p>
<p>Category 3 Regulation of hard protection structures</p> <p><u>Category 3 comprises the regulation of hard protection works</u></p> <p><u>Category codes:</u></p> <p><i>Consider</i> managed retreat as an alternative <i>Assess</i> alternatives such as managed retreat <i>Refuse</i> resource consent applications or <i>prohibit</i> hard protection structures</p>
<p>Category 4 Infrastructure management</p> <p><u>Category 4 entails the management of infrastructure assets</u></p> <p><u>Category codes:</u></p> <p><i>Consider</i> 'appropriate mechanisms' to manage infrastructure risk (including managed retreat) <i>Promote</i> strategic withdrawal of infrastructure in hazard prone areas, <i>Avoid</i> or <i>prohibit</i> further infrastructure investment.</p>
<p>Category 5 Regulation of the rebuilding of materially damaged or destroyed buildings as a result of a natural hazard event</p> <p><u>Category 5 includes regional plan provisions that do not allow rebuilding of damaged or destroyed buildings as of right, to encourage managed retreat over-time.</u></p> <p><u>Category codes:</u></p> <p>The activity status of regulatory provisions determines the direction of provisions in Category 5, with <i>permissive</i> to <i>restrictive</i> controls.</p>
<p>Category 6 Distinct approaches</p> <p><u>Category 6 encompasses unique approaches found within the analysis.</u></p> <p><u>Category codes:</u></p> <p><i>Consider</i> mitigation options such as managed retreat (when working with landowners to identify and implement adaptation measures) <i>Promote</i> plan changes to encourage voluntary relocation <i>Facilitate identification</i> of when it is appropriate to <i>require</i> managed retreat <i>Require</i> managed retreat through a structure plan process</p>

The results of the RMA analysis highlighted the need to broaden the scope to general planning instruments, to capture the full range of policies, such as instruments specifically addressing infrastructure retreat. Therefore, a second textual analysis was carried out (April-June 2017) of non-RMA instruments with the potential to enable managed retreat, including management strategies, asset management plans, long-term plans, spatial plans, structure plans and resilience plans. The same process of collecting, reviewing, interrogating and analysing (O'Leary, 2010) the relevant documents was carried out using the key search terms. The collection process resulted in much fewer documents (25) containing managed retreat provisions, with the majority taking the 'consider' approach. Therefore, the following framework (Figure 8) was developed to encapsulate the ways in which managed retreat is treated in non-RMA plans. This framework is condensed as the approaches have greater commonalities and less detail than those found in RMA plans. Documents were coded according to the four categories inductively developed; consider, promote, facilitate and require. The analytical codes were developed to capture the documents along a spectrum of limited to active direction according to the level of stringency applied to enable managed retreat. At one end of the scale, there is an expectation to consider managed retreat, whereas at the other end, it is a legally binding requirement.

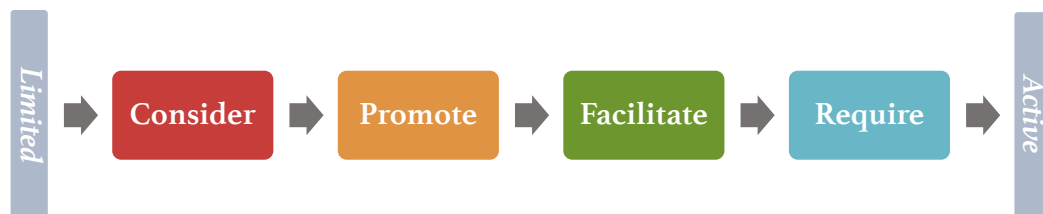


Figure 8: Non-RMA instrument direction setting framework

Table 8 provides examples of how the coding was applied. For the code *consider*, documents that recognised the need to consider managed retreat, or simply recognised managed retreat as a possible risk reduction approach were captured. *Promote* characterises documents that go further than consideration, endorsing managed retreat as a risk mitigation approach and prioritising it over other approaches—particularly hard protection structures. Documents which *facilitate* retreat are actively setting the direction and process for the retreat of assets or the withdrawal of protection interventions. Finally, at the most active level of direction setting framework is *require*. This includes documents which command and deliver action on managed retreat.

Table 8: Coding analysis

Code	Instrument	Text
Consider	New Plymouth Coastal Strategy 2006	<i>“Where possible, consider promoting the retreat of development from areas currently at risk from natural coastal hazards is a priority.”</i> (New Plymouth District Council, 2006b, p. 31)
	Resilient Greater Christchurch Plan 2015	<i>“Eastern Christchurch, perhaps more than any other part of urbanised Greater Christchurch, is exposed to multiple hazards. The level of risk from those hazards will vary from sudden and extreme inundation from relatively rare tsunami events, to very real projections of sea level rise expected in the next 50-100 years. The level of risk able to be managed through different building standards and mitigation, the level of insurance that people have access to, or areas we may need to retreat from are all issues that will shape the future for the area.”</i> (Christchurch City Council, 2015b, p. 93)
Promote	Wairoa Coastal Strategy 2004	<i>“7. Adopt a ‘hierarchy of options’⁴ to manage risk from coastal hazards. This will require a Variation to the Proposed Wairoa District Plan, and should include the following assessment options (1=most preferred, 4=least preferred): 1. Activities (e.g. beach accessways) and land use practices to protect natural barriers such as sand dunes, gravel ridges, cliffs, salt marshes and other vegetation. 2. Management of land use to avoid areas of coastal hazard (e.g. location of development away from coastal hazards, retreat or relocate infrastructure)....(Wairoa District Council, 2004, p. 14)</i>
	Waitaki Reserves Management Plan 2014	<i>“Policy 109 Council will aim to limit the potential for erosion on reserves by giving preference to ‘soft’ engineering solutions, such as the strategic planting of appropriate plant species and managed retreat (where costs of protection outweigh the benefits to the community), and these options will be identified in Council-approved concept plans for reserves development.”</i> (Waitaki District Council, 2014, p. 54)
Facilitate	Coastal Reserves Management Plan November 2006 (as amended 18 June 2015)	<i>“e) The reserve will be managed according to a policy of managed retreat from river erosion. As such, no management intervention will be undertaken to address erosion except to protect significant public assets such as the road. Future vegetation and structures will be placed away from the river banks. Changes in the riverbank will be monitored and assessments made of implications for local infrastructure.”</i> (New Plymouth District Council, 2006a, p. 151)
Require	No plans required managed retreat	-

The textual analysis was undertaken systematically, with checks in place to avoid oversights. A limitation of this approach is its focus on key terms, however, broad plan reviews were undertaken to mitigate this. Furthermore,

supplementary documents were found and documented during the collection stage that did not fit within the document sample group—they represented local projects implementing managed retreat in unique forms. Although these documents were not in the initial scope of the analysis, and have not been captured by the quantitative assessments, they are useful as they help to uncover the broader status of managed retreat implementation in New Zealand.

3.5 Case study research

The use of a case study was chosen to explore the application of managed retreat in New Zealand. Case studies provide an in-depth analysis of the subject through the collection of detailed information. It is this depth of learning that is relevant to the research aim and linked strongly to Objectives 2, 3 and 4. Case studies are defined by Yin (2003, p. 13) as a form of inquiry which “investigates a contemporary phenomenon within its real-life context.” To examine the practical enablement of managed retreat, and the ways in which communities react to it, it is necessary to develop a thorough understanding of social experiences, perceptions, and values where it has been tried and tested, to use this as a basis for improving future practice. Flyvbjerg (2006) recognises that case studies are particularly useful in the social sciences, as they make learning possible when hard evidence is difficult to come by. Although a case study can provide a great depth of knowledge and learning, it is understood that there is a risk of generalisation through its use. This limitation is mitigated through the use of more than one research method to compare the barriers, enablers and lessons uncovered, as well as consolidation and triangulation of the data collected in the literature review, questionnaire, and in the textual analysis.

The case study of Matatā was selected based on the unique planning process local authorities were undertaking to facilitate managed retreat, informed by the policy review (Chapter 5). The only place in New Zealand progressing managed retreat in sufficiently advanced state was Matatā, hence the selection of this as the primary case. Other local authorities, in Mōkau and the Hawke’s Bay were progressing managed retreat as part of adaptation pathways, and in Tauranga and Northland in separate risk management projects. However, councils were not yet facilitating the managed retreat process yet. Because members of the public could not be interviewed as key stakeholders in a similar way in these additional locations, they are not comparable case studies as such, but their experiences supplement the case study data via semi-structured interviews of local authority staff (Chapter 8), consolidating and validating the institutional

findings uncovered in Matatā.

When undertaking case study research, Yin (2003) notes that it is necessary to design the research approach so that it meets the four tests of empirical social research. To ensure the quality of the research when using case study methodology, Yin states that construct validity, internal and external validity and reliability are vital. Construct validity is based upon ensuring that the correct measures for researching the case are used to ensure accuracy and that subjective judgment during information collection and analysis is avoided. Yin (2003) provides that this can be overcome by using a range of evidence sources and establishing a chain of evidence. In this research, the case study was researched via a range of methods, including analysis of local documents, semi-structured interviews and a site visit to maintain a clear evidence chain. The second test, internal validity is based upon relationships within findings (Yin, 2003). Internal validity was upheld by the consistent use of methods for analysis. External validity relates to the ability of the findings to be applied externally to the research, in other words, whether they can be generalised. For this research, it is understood that a singular case study presents unique findings, however, the questionnaire and supplementary interviews (Chapters 7 & 8) act to consolidate these findings at the national scale. While each location has distinct locales and circumstances, the issues faced are similar and the institutional context is common, meaning the approaches to resolving these issues provide learnings that can be used nationally. Finally, research reliability is important to ensure that the study can be replicated with the same results drawn if it was to be undertaken again. To provide reliability, research procedures have been carried out consistently, with the support of triangulation to validate data through multiple sources (O'Leary, 2010).

A benefit of examining a range of locations across New Zealand (case study and supplementary locations) is that lessons could be shared immediately. For example, research findings from Matatā were reported on and provided to planning staff in Mōkau to help clarify the issues other localities were experiencing. The lessons learnt in Matatā were taken into consideration in Mōkau to help inform the retreat process and avoid the difficulties encountered.

3.5.1 Site visits



Figure 9: Site visit context (Hawke's Bay, Matatā and Mōkau)

As the basis of case study research is to build an in-depth understanding and analysis of a particular location, site visits are an important aspect of understanding local spaces and places. Site visits were conducted to get a sense of the case study locations and to capture this on camera, recognising the character and identity of each place, the visual representation of risk and attachment to place and space, as a photo can often provide a better sense of this than words. The walking component helped to ‘make sense of place’ in a way that cannot be narrated or told, allowing for a better understanding of the immediate geographies of the case study and supplementary locations (Davies & Dwyer, 2007).

3.5.2 Semi-structured interviews

Semi-structured interviews are advantageous as they provide the setting for flexible conversation in a manner where the participant is given the chance to explore issues they consider to be important (Longhurst, 2003). Interviews are discussions with a purpose of collecting information and Yin (2003) declares them one of the most valuable sources of information for case study data collection. For the case study, 17 semi-structured interviews of approximately 60 minutes in length were conducted. Five additional semi-structured interviews were undertaken with planning professionals who had emerging planning projects involving managed retreat, analysed in Chapter 8.

Key themes guided the structure and content of the interviews, with specific questions posed depending on the roles and experiences of participants

(Appendix 3). The semi-structured approach allowed participants to talk freely about their experiences of the managed retreat strategy to explore views on the development of the approach, key barriers and enablers and lessons learned. Participants included environmental planners, project managers, politicians, community members and kaumātua. Case study participants were chosen based on the following matters: location (i.e. property owners in Matatā within the high-risk zone); snowball selection (Creswell, 2009) via the council project manager and policy team following their community consultation efforts; governance roles, for example, consensus development groups, regional and district council staff and politicians, technical expert involvement (found within public documentation), and members of the community mentioned in media releases. Prior to conducting the interviews, the aims of the research, its scope, and ethical considerations were discussed with participants. The interviews were carried out in convenient places for respondents and run via a set plan, however there were open-ended questions to allow for flexibility and expression of thought by the interviewee, which is noted as being necessary to the success of case study data collection (Yin, 2003).

The purpose of the study was described on the information sheet which was emailed to participants ahead of the interview and discussed at the beginning of each interview. Where consent was given, interviews were digitally recorded, and notes taken. Throughout the process, I worked to clarify, pursue expansion or bring discussion back to the key themes, as appropriate. Digital interview recordings were transcribed either the day of interviewing or the following day. A coding approach was employed to analyse the interview data, where each document and interview transcript was organised and coded relating to key words, phrases, concepts and topics relating to managed retreat. An example of these themes is the social and procedural barriers and enablers organised into topics following consistent references by interviewees. The interview questions themselves provided a clear structure for analysing the data and comparing participants' answers. Quotations used in this thesis reflect consistently raised issues and help to capture real life experience of managed retreat, including the raw emotions connected to it.

3.6 Questionnaire

To collect general perceptions from a large population, a questionnaire is an appropriate method (Denscombe, 2001). Questionnaires aim to produce comparable answers to questions from participants (Flick, 2015) and this method

was applied to produce an understanding of public perceptions towards managed retreat in New Zealand, and fulfil Objective four of this research, using both closed and open-ended questions. A limitation of questionnaires is that they cannot provide the full amount of detail and depth required (Denscombe, 2001). This limitation was overcome by using a mix of quantitative and qualitative questions. Whilst discovering public perceptions towards managed retreat policy, the questionnaire solidified the social barriers found in the case study.

Waters and Barnett (2018, p. 4) argue that to discuss 'a' public perspective is a "somewhat crude simplification of the heterogeneous nature of individual and group perspectives on collective issues within society." Publics can be socially constructed, resulting in marginalisation or bias towards certain groups. Potential bias from the questionnaire is overcome by diversifying the data collection sources and approaches, however, its exclusively online access creates limits. The questionnaire targeted a varied selection of 'publics' with different interests in managed retreat outcomes.

Participants were recruited online to take part in the questionnaire which was advertised via email, social media, a magazine article and organisational newsletters. Respondents were recruited across New Zealand over a nine-month period in September 2017-May 2018. Community board members of New Zealand (110 community boards and 21 local Auckland boards) were emailed, requesting them to distribute the questionnaire to their members. A link (with an explanation) was posted on local community board and community organisation Facebook pages and groups. Facebook is New Zealand's second favourite leisure activity, with 2.9 million New Zealanders holding an active account (and 2.3 million New Zealanders accessing Facebook everyday) representing approximately 61% of the population (as of 2017) (Fyers & Cooke, 2017). This high use and ability to share posts heightened the exposure of the questionnaire. Emails were sent to companies and government organisations in New Zealand, requesting that they distribute the questionnaire to staff or members. Further to the email and social media exposure, the Property Council advertised the questionnaire in its November 2017 newsletter and the link was provided in an article published in Build Magazine (December 2017). Appendix 4 provides the primary sample group for the questionnaire, however, its reach is much wider, with the snowballing approach used, where community members and professionals shared the emails and social media links to other individuals and parties in New Zealand.

The questionnaire was exploratory in nature, aimed at gaining a general understanding of public perceptions towards managed retreat, supporting case study findings, and uncovering competing interests and tensions of retreat interventions. The method has some limitations due to the self-selection of participants, meaning that the responses are not representative of the New Zealand population. While the data is not representative, the questionnaire enabled the collection of a wide range of views on the topic from computer-literate members of the community who were interested in voicing their opinion about managed retreat policy in New Zealand. As approached by Abel et al. (2011) in a similar study on sea-level rise and managed retreat in Australia, the limitation of self-selection is addressed by classifying responses into key groups to compare results against. Chapter 7 provides comparative data analysis to uncover the relationships between the findings and participants' attachment to their property/place of residence, their age, and ownership of property. Due to the non-representative sample of the questionnaire, care should be taken when determining the implications of the results, however, this approach has enabled the collection of a wide range of perceptions towards managed retreat from individuals with access to technology and an interest in expressing their opinions about natural hazard risk reduction in New Zealand. A final limitation of the questionnaire is the focus on natural hazards, with less reference to the impacts of climate change (with the exception of Question 7). While many responses referenced the influences of climate change regardless, it would have been more useful to have made reference to climate change as influencing natural hazard risk, especially for Question 11. As reference to climate risk profiles was noted by respondents in this question (and throughout the questionnaire), it is not considered to have had a significant impact on the reliability of the analysis.

3.7 Summary

This chapter has set out the research design and analysis, providing detail of the ethically approved and delivered research, based on reliable methods. Utilising the methods outlined in Chapter 3, the following chapters realise the research aim and objectives in a robust and reliable manner. Chapter 4 sets the foundation for the New Zealand context, providing a review of the institutional framework for managing natural hazard and climate change risks and facilitating managed retreat in New Zealand.

Chapter 4 Managed retreat instruments: New Zealand's institutional framework

4.1 Introduction

Chapter 4 analyses the formal institutional context, including the legislative architecture supporting natural hazard and climate change risk management in New Zealand, and the governance instruments available to implement managed retreat, responding to Objective two of this research. Integral to the research aim is understanding decision-making problems and opportunities for managed retreat, the institutional framework being a key source of these. This chapter provides an analysis of New Zealand legislation and case law, introducing the regulatory and non-regulatory context for the management of risk and the enablement of managed retreat. It finds that managed retreat appears well supported, however, difficulties lie in the ability to operationalise powers and intentions within the institutional context.

4.2 Institutional framework

Institutions are the agreements, rules, rights, laws and decision-making procedures and programmes. Institutions include both formal rules and procedures and informal rules such as norms and culture. Historic tendencies of relying on protecting communities from risk stems from informal social norms where “economic growth, corporate interests and ‘new development’ are viewed as pre-eminent societal imperatives, and private property rights are held virtually sacrosanct” (Glavovic et al., 2010, p. 683). While these norms endure, local experience, international scholarship, and sustainability imperatives have highlighted the need to move beyond protection, to reduce exposure or avoid the impacts of natural hazard events (Ibid). In New Zealand, the introduction of the RMA created a formal framework in which sustainable management of resources takes priority over property rights, providing opportunities to re-shape risk culture, with greater attention upon avoiding and reducing natural hazard risks. Māori cultural norms influence the management of risk, with customs, environmental and historical insights, and philosophies existing ‘in the

background', gaining broader prominence of late, although formal recognition and support remains incomplete (Lambert, 2015).

The formal institutional framework for natural hazard management in New Zealand is not strictly linear, as multi-level roles and responsibilities build upon a hierarchy of de-centralised government applying formal and informal rules. Central government, via the creation of legislation, national policy statements, national environmental standards, and non-statutory guidance sets the decision-making framework, devolving powers to local government. Among other functions, the management of natural hazard and climate change impacts, land use planning, and civil defence emergency management are the responsibility of local government. In addition to the development of regional policy, plans and rules, regional (and unitary) authorities set the policy framework and direction for the development of local rules, administered by territorial authorities via district plans. Regional councils may also extinguish existing use rights, a power unavailable to territorial authorities despite their responsibilities under s 31 RMA. The institutional framework includes the procedures, regulations and responsibilities codified in key statutes, namely The Resource Management Act 1991 (RMA), Local Government Act 2002 (LGA), Civil Defence and Emergency Management Act 2002 (CDEM), Building Act 2004 (BA), Local Government Official Information Act (LGOIMA) 1987, Public Works Act 1981 (PWA), Soil Conservation and Rivers Control Act 1941 (SC&RCA) and The Land Drainage Act 1908 (LDA). Each of these pieces of legislation devolve power and responsibilities to authorities to contribute to the management of natural hazards and climate change adaptation through the development of procedures and regulation.

Organisations are the “formal arrangements that embody the social norms of the actors who use the institutional frameworks through the disciplinary practices relevant to their functions set out in statutes” (Lawrence, 2015, p. 2). Organisations with statutory functions and instruments for the management of natural hazards include regional councils, territorial authorities (and unitary councils), the Ministry of Civil Defence & Emergency Management (MCDEM) and civil defence emergency management and engineering lifeline groups. Cooperation between each of these agencies is fundamental to providing an effective and integrated national approach for natural hazard planning (Saunders et al., 2013). As recognised by Glavovic et al. (2010), the legal regime for natural hazards planning in New Zealand is grounded in a robust institutional framework, significantly driven by the demands of the RMA.

4.2.1 Resource Management Act 1991

The Resource Management Act is New Zealand's primary planning legislation, containing mechanisms for managing natural hazards and adapting to the impacts of climate change. The purpose of the RMA is to promote the sustainable management of natural and physical resources. This purpose sets the framework by which natural hazards are to be considered when making decisions. It identifies expected outcomes, (social, economic, and cultural well-being, health and safety of communities, and the preservation of the life supporting capacity of air, water, soil, and ecosystems) and extends this beyond current generations, to the reasonably foreseeable needs of future generations. The RMA encourages public participation via nested decision-making to ensure equitable, robust and effective governance outcomes. Effects under this Act are to be managed by avoidance, remedy or mitigation. The RMA defines effects as any positive or adverse, temporary or permanent, past, present, or future effect, any cumulative effect, any potential effect of high probability, and any potential effect of low probability which has a high potential impact (RMA s 3). As indicated in Table 10, the definition of natural hazards refers to the many sources of effects and their recipients. The reference to the risk management language of probability and level of impact within the definition of effect under the RMA demonstrates that the effects-based approach of the RMA is a risk-based approach (Tonkin & Taylor Ltd, 2016).

Section 6(h) of that Act requires that all persons exercising functions and powers under the RMA shall recognise and provide for the management of significant risks from natural hazards (a result of the Resource Legislation Amendment Act 2015) and further under s 7(i) they must have particular regard to the effects of climate change. The management of significant risks is an important amendment as it explicitly introduces the concept of risk into the RMA, requiring planners to consider both the consequences and likelihood of a natural hazard event when making decisions (Saunders et al., 2013). This amendment enables a greater emphasis on the consideration of the risks from natural hazards in all resource management decisions. The Courts have confined s 7(i) to consideration of climate change adaptation as opposed to mitigation (Harker, 2016, p. 74).

Under the RMA, power and responsibilities are devolved to local authorities to contribute to sustainable management of natural and physical resources, implemented through policies, plans and consent process. Resource

management is focused on the regulation of activities which use and develop natural and physical resources, mandated by the RMA, via a three-tier governance hierarchy of policy and regulation instruments (Palmer, 2012, p. 773). As shown in the first level of the RMA hierarchy (Figure 10), central government may create national policy statements (NPS) and national environmental standards (NES) among other policy and regulations. The Minister for the Environment is to have regard to a range of guidelines to determine whether it is appropriate to prepare a NPS for local and international environmental factors (Palmer, 2012).

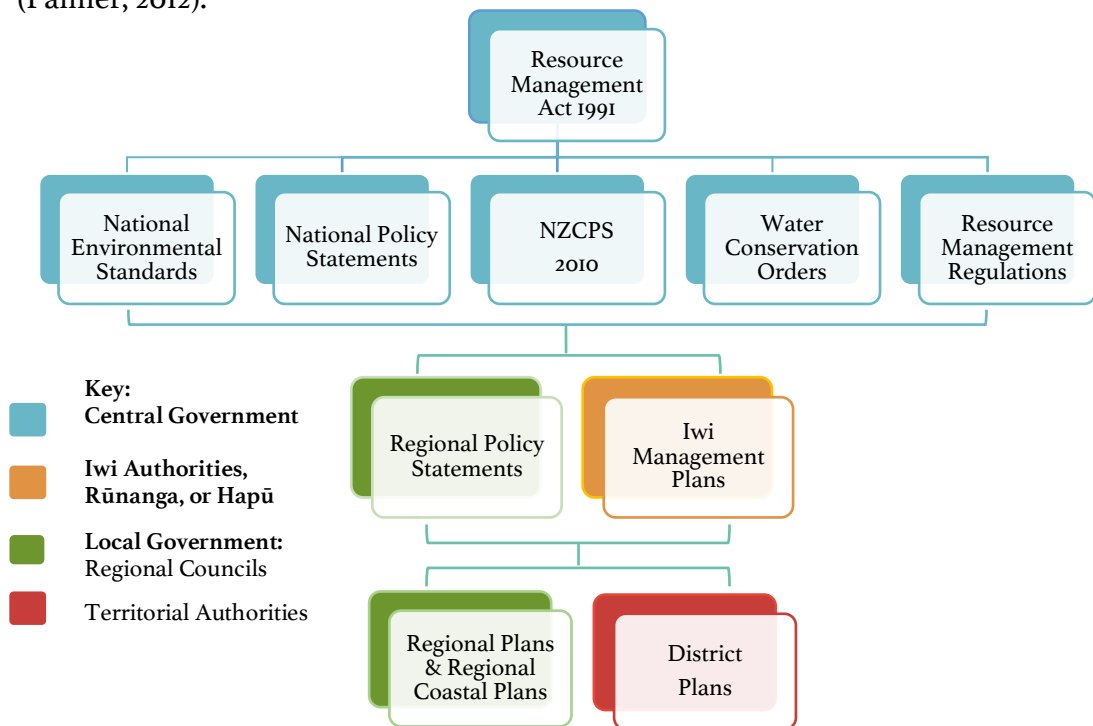


Figure 10: Resource Management Act 1991 hierarchy

Section 45A of the RMA requires NPS to “state objectives and policies for matters of national significance that are relevant to achieving the purpose of this Act”. National policy statements may state matters that local authorities must consider, achieve or provide for, objectives and policies that must be included in local plans and other directions for monitoring, plan methods and implementation of the NPS (ss 45A(2)). To date, no statement or standard has been created specifically for natural hazards, but there has been much expectation that central government release an NPS for natural hazards. However, the New Zealand Coastal Policy Statement 2010 (NZCPS), administered by the Minister of Conservation, applying a precautionary approach, provides guidance on coastal hazards. Objective 5 of the NZCPS aims to “ensure” that coastal hazard risks (taking account of climate change), are

managed by avoiding areas prone to such risks, and responses to be considered include managed retreat for existing development, and protection or restoration of natural defences to coastal hazards. In areas potentially affected by coastal hazards in the next 100 years, Policy 25 of the NZCPS requires that for subdivision, use, and development, change in land use (including managed retreat), and design for relocatability is encouraged to reduce adverse effects from coastal hazards. Policy 25(d) encourages the location of infrastructure away from areas of hazard risk, where practicable. Policy 27 requires that in areas of significant existing development which are likely to be affected by coastal hazards, a range of options for reducing risk are assessed, including the promotion and identification of long-term sustainable risk reduction approaches (such as managed retreat). Local authorities must give effect to the NZCPS through their policies, plans and resource consent decisions.

While no NPS for natural hazards has been produced to date, there have been recent legal clarifications regarding the strength of the NZCPS. The Supreme Court's decision in *Environmental Defence Society Incorporated v New Zealand King Salmon Company* [2014] NZSC 38 (*King Salmon*) gives strong weighting to the directive policies of the NZCPS. In this decision, a Board of Inquiry used the overall broad judgement in its decision to grant consent to a proposed aquaculture development, asserting that applying the primacy of s 5 of the RMA over the NZCPS is correct. The Supreme Court on the other hand, held that by taking this approach, there is no provision for an environmental bottom line, meaning the NZCPS becomes a mere list of requirements to consider when making decisions. The Court held that this approach is not correct, as the purpose of the NZCPS is to assist in achieving the purpose of the RMA, giving substance to Part 2. The NZCPS is an arm of the RMA, and to cherry pick which policies are adhered to not only undermines the NZCPS but the function and integrity of the RMA. Giving effect to the NZCPS in general is not adequate. 'Give effect to' is a strong directive which cannot be evaded by a general approach [80]. There are a range of implications borne from *King Salmon* affecting RMA decision makers, policy drafters, and applicants. As strongly expressed by Nolan and Gardner-Hopkins (2014, p. 3) "the doctrine of precedent requires the King Salmon decision to be followed." Ensuing the precedent set by *King Salmon*, in *Gallagher v Tasman District Council* [2014] NZEnvC 245 the Environment Court declined a plan change appeal that was advocating for residential development on land subject to coastal erosion and inundation. In this decision, the Court

applied *King Salmon*, determining that the development should not be permitted as it would “increase the risk of social, economic and cultural harm from coastal hazards in conflict with NZCPS Objective 5 and Policy 25” (Harker, 2016, p. 78). *King Salmon* has implications for managed retreat, ensuring that policies of the NZCPS must be given effect to, and therefore, greater avoidance of risky development and stronger direction for relocation or withdrawal of assets and infrastructure at risk, with regard to plan making.

To enable formal recognition of Māori interests, the Minister for the Environment must seek and consider comments from iwi authorities when preparing NPS and NES (s 46 RMA). Local authorities must consult local tangata whenua when preparing policy statements and plans, and take into account any relevant iwi planning document that has been lodged with the council, to the extent that its content has a bearing on the resource management issues of the district or region (ss 61(2A)(a), 66(2A)(a), and 74(2A) RMA). According to Saunders (2017) a ‘relevant iwi planning document’ refers to an iwi management plan, a statutory document applicable at regional and district planning levels, and to non-statutory planning mechanisms. The plan may detail how iwi and hapū expect to be involved in resource management and their expectations for engagement and participation in planning processes (Ibid). In particular, IMPs may include preferred hazard management options, risk reduction techniques and engagement processes to assist with the transfer of natural hazard knowledge (Ibid). Recognition of Māori interests is important to achieving equitable governance.

The RMA mandates the functions of local authorities, requiring regional councils to control land use for the avoidance or mitigation of natural hazards (s 30 RMA) and territorial authorities to control actual or potential effects of the use, development or protection of land, including for the purpose of avoiding or mitigating natural hazards (s 31 RMA). Sections 30 and 31 of the RMA do not require local authorities to remedy natural hazards, but to manage the use of land and the effects of the use of land, to avoid or mitigate natural hazards. Local authorities can avoid or mitigate natural hazards via policies, plans and consent processing. In terms of dealing with uncertainty, the precautionary principle, which the promotion of sustainable management under the RMA is immersed in, but not explicitly referenced, highlights that uncertainty is not a valid justification for inaction, especially where potential consequences are high or irreversible, and the timing and magnitude of effects are unknown (United

Nations, 1992). RMA s 32 (2)(c) reflects the precautionary principle, stating that the evaluation of plans and statements must “assess the risk of acting or not acting if there is uncertain or insufficient information about the subject matter of the provisions.”

Regional policy statements and regional plans set the basis for which district plans are developed to control land use activities. Pursuant to s 61 RMA, regional councils must prepare and update their RPS in accordance with their functions under s 30 and the provisions of Part 2 of the RMA, among other obligations. Regional policy statements integrate and guide the management of natural and physical resources within each region, specifying objectives, policies and methods (but not rules). They are influential documents as regional and district plans must 'give effect to' them (ss 67(3)(c) and 75(3)(c) RMA). Regional plans contain provisions addressing issues relevant to council functions including coastal hazards, floodplain management, land stability, and geothermal hazards. Under s 10(4) of the RMA, regional councils (unlike district and city councils) can include rules in their regional plans for controlling land (for the purposes of avoiding or mitigating natural hazards) that may impinge on existing use rights. If resource consent is required due to new rules in a proposed plan, activities regulated under the operative regional plan may continue until the proposed plan becomes operative, but resource consent must be applied for within six months of the provisions becoming operative (Palmer, 2012, p. 808). This provision makes regional plans an instrument for managing hazard risk in areas where there is existing development, potentially providing an opportunity to overcome the significant barrier of existing use rights (Chapter 2). However, there remains a lack of clarity as to the legality of this approach and the application of s 85 RMA, to be further discussed in Chapter 6.

Pursuant to s 31 of the RMA, territorial authorities (district and city councils) control the effects of the use of land for the avoidance or mitigation of natural hazards. Territorial authorities are required to prepare a district plan and ensure it gives effect to the relevant RPS. Territorial authorities have the authority to control subdivision under s 31(2) of the RMA and under s 106 have the power to refuse subdivision consent or impose conditions (s 220) if there is a significant risk from natural hazards. Amendments to the RMA in 2017 resulted in changes to ss 106 and 220 to broaden the range of natural hazards to be considered, ensuring that all natural hazards are considered in decisions and conditions on subdivision consent applications. Previously, these sections did not require a risk

management approach, which resulted in decisions where low-likelihood and high-consequence hazards were excluded from consideration, for example, *Kotuku Parks Ltd v Kāpiti Coast District Council* EnvC Ao73/00 (Ministry for the Environment, 2017c). Further amendments introduce a risk-based approach for subdivision applications, guided by s 106(1A), which includes a combined assessment of:

- (a) the likelihood of natural hazards occurring (whether individually or in combination); and*
- (b) the material damage to land in respect of which the consent is sought, other land, or structures that would result from natural hazards; and*
- (c) any likely subsequent use of the land in respect of which the consent is sought that would accelerate, worsen, or result in material damage of the kind referred to in paragraph (b).*

The amendments require decision-makers to consider the magnitude of hazards, including those with a high impact but low probability of occurrence, aligning assessments with the definition of ‘effect’ under the RMA, and providing for the management of significant risks from natural hazards (Ministry for the Environment, 2017c). The current framing of risk in the RMA is predominantly technocratic, focused on likelihood and effects. The LGA on the other hand has historically had a focus on the ‘four well-beings’ which were removed in 2012 but have recently (in 2018) become a focus again.

4.2.2 Local Government Act 2002

The RMA and LGA recognise and make provisions for the connections between sustainable management and the reduction of natural hazard risk. The LGA outlines the key functions, obligations, restrictions and powers of local authorities and enables the engagement of the community in decision-making. The Local Government (Community Well-being) Amendment Bill 2018 is seeking the reinstatement of the promotion of social, economic, environmental and cultural well-being to the statutory purpose of local government. The Bill acknowledges the role of local government in promoting the well-being of citizens and communities rather than simply providing core services, thus providing opportunities to consider dimensions of vulnerability and take action to address these. Relevant sections of the LGA are shown in Table 9.

Table 9: Relevant Local Government Act 2002 provisions

Section 10	“(i) The purpose of local government is— (a) to enable democratic local decision-making and action by, and on behalf of, communities; and (b) to meet the current and future needs of communities for good-quality local infrastructure, local public services, and performance of regulatory functions in a way that is most cost-effective for households and businesses.”
Amendment Bill (2018)	Section 10 amended (Purpose of local government) (i) Replace section 10(i)(b) with: “(b) to promote the social, economic, environmental, and cultural well-being of communities in the present and for the future.”
Section 11A	“In performing its role, a local authority must have particular regard to the contribution that the following core services make to its communities: ... (d) the avoidance or mitigation of natural hazards...”
Sections 145 & 163	Gives local authorities the power to make bylaws, including for the purpose of protecting, promoting, and maintaining public health and safety and specifies powers in relation to the removal of works in breach of bylaws.
Sections 93-97	Provide for Long Term Plans that describe the activities of local authorities. This can include descriptions of local authority activities as well as the management of natural hazards.
Section 101B	“(1) A local authority must, as part of its long-term plan, prepare and adopt an infrastructure strategy for a period of at least 30 consecutive financial years... (3) The infrastructure strategy must outline how the local authority intends to manage its infrastructure assets, taking into account the need to—... (e) provide for the resilience of infrastructure assets by identifying and managing risks relating to natural hazards and by making appropriate financial provision for those risks...”

Palmer (2012) concludes that the ‘participatory democracy’ model highlighted in s 10 of the LGA suggests that elected decision makers, committees and officers have a function to implement the wishes of the community via adequate enquiry and consultation. Present and future community needs are to be met by local government in a cost-effective manner and in performing their roles, local authorities must have particular regard to the avoidance or mitigation of natural hazards. Section 93 of the LGA necessitates the development of a long-term plan (LTP), to provide the vision and activities for communities within a 10-year timeframe. An LTP sets the strategic direction for a local authority over a 10-year period, including an infrastructure strategy to dictate the management of infrastructure assets over a 30-year period. Asset management plans guide the maintenance, improvement and growth of Council owned assets. These assets are generally community facilities, roads and parking, rubbish and recycling, stormwater, wastewater and water supply facilities and recreation/open spaces. LGA Schedule 10, cl 1 provides “A long-term plan must, to the extent determined appropriate by the local authority, describe the community outcomes for the local authority’s district or region.” LTP are intended to provide integrated

decision-making and co-ordination of local resources, a long-term decision-making focus and a basis for accountability (LGA s 93(6)). As part of this, an Annual Plan supplements the LTP, by defining the financial contributions required to achieve the vision.

As managed retreat interventions require financial support for planning and risk assessment processes (let alone implementation costs) LTP processes are vital for allocating project funds. However, as illustrated by Campbell's (2016) 'Planner's Triangle', due to competing social, economic and environmental values and priorities, funding allocation is never guaranteed. Lawrence et al., (2019, p. 196-197) recognise this as a barrier for long-term river flood adaptation planning: "This funding system, with its focus on structural investments for "protecting" communities from floods, as opposed to reducing future risk, will affect how reviews at trigger points can be implemented." Long-term, dynamic adaptation pathways to enable managed retreat may be limited by static funding processes, familiarity and preference for structural investments, and competing projects, values and vulnerabilities.

4.2.3 Civil Defence and Emergency Management Act 2002

The CDEMA is administered by the Ministry of Civil Defence and Emergency Management. This Act aims to achieve management of hazards, risk and disaster response and recovery through policy, planning and decision-making practices. The purpose of the CDEMA is explicitly focused on risk management (Table 10). Unlike the RMA and LGA, the CDEMA is more specifically focused on building resilience to all hazards, guided by the emergency management concept of the 4Rs: **reduction** (of risk); **readiness** (for an event); **response** (during an event); and **recovery** (following an event). Vallance and Carlton (2015) conclude that the 4R's, as represented in NZ disaster management, are part of a mutually reinforcing cycle. Reduction, is focused on ascertaining risk and where possible, avoiding or reducing it. This phase of the cycle is predominantly carried out under the RMA, through land use planning. Readiness, involves the use of community and organisational based capabilities and programmes prior to a disaster, such as training emergency services or obtaining food, water and essential supplies for three days (Vallance & Carlton, 2015). Immediately following a disaster is where the response phase clicks into gear, involving the necessary actions to save lives, protect properties and restore key services. Following a disaster is the recovery phase, which is often an extended period, involving political, social, economic and environmental

complexities for decision-making. Resilience thinking should be intertwined within each of the 4R's, where in 'peace-time', efforts are made to build resilience and adaptive capacity of social-ecological systems in an anticipatory manner. During and following disasters, the resources to cope with and adapt to change within the system must be available.

4.2.4 Other legislation

The Building Act and Local Government Official Information and Meetings Act support sustainable management of natural hazard risk by ensuring safe building standards and enabling public availability of official information held by local authorities. When building consent is applied for on land that is subject to one or more natural hazards, or the building work is likely to accelerate, worsen or result in a natural hazard on that land or any other property, a building consent authority must refuse consent, unless adequate provision has been made to protect the land from the natural hazard(s) (BA 2004 s 71(2)). Where building consent is issued pursuant to s 72 of the BA, it is given a s 74 notification particularising the consent and the natural hazard is registered on the Certificate of Title by the Registrar-General of Land. This notification alerts future purchasers or those with an interest in the property (i.e. lenders and insurers) that the land is subject to natural hazard(s).

Land information memorandums are prepared under the LGOIM Act. They provide a summary of information that a local authority holds in relation to property. Hazards registers are kept by local authorities so that hazard information from LIMs are able to inform the preparation of plans (The RMA Quality Planning Resource, 2016). LIMs are a key method for communicating hazards and risk, providing a responsive means for keeping information up to date, and delivering that information to property owners (Saunders & Mathieson, 2016). According to Saunders and Mathieson (2016) LIM reporting must include all information held about a natural hazard and therefore can be utilised by councils to convey hazard information without going through a formal district plan review. Under s 44A(2)(a) of the LGOIM Act, a LIM can include information identifying special features or characteristics of the subject land, including potential natural hazards or likely hazardous contaminants which includes, but is not limited to:

- (a) potential erosion, avulsion, falling debris, subsidence, slippage, alluvion, or inundation, or likely presence of hazardous contaminants, being a feature or characteristic that—*

- (i) *is known to the territorial authority; but*
- (ii) *is not apparent from the district scheme under the Town and Country Planning Act 1977 or a district plan under the Resource Management Act 1991:*

Terms ‘potential’ and ‘likely’ were discussed in *Weir v Kāpiti Coast District Council* [2013] NZHC 3522. The court concluded that ‘potential’ is to be distinguished from ‘likely’; “[l]ikely’ unquestionably refers to probability — specifically a state of facts that is more probable than not” [50]. Potential was discussed in relation to physical effects on the land (erosion, avulsion, etc.) that have not yet and may never occur, meaning it is unfeasible to attach probability to potential. The court found “Instead, there is an obligation to refer in the LIM to information held by the Council and relating to such future events only if there is a possibility that they may occur in the future. By possibility, I mean a reasonable possibility, objectively determined” [51]. Fundamentally, the purpose of a LIM is to provide notice of facts that may affect the physical state and potentially the value of land, information in the district plan does not need to be included in the LIM (Saunders & Mathieson, 2016).

Sections 131 and 132 of the BA require territorial authorities to adopt a policy on Dangerous and Insanitary Buildings. Councils respond to information regarding potentially dangerous or insanitary buildings, inspect and take action. If an on-site wastewater system is affected by rising groundwater or salt-water intrusion causing leakage/overflows there would be implications for regional discharge regulations and potential breaches of subdivision or land use consents where provision of sanitary services is specified as a condition. Councils may apply RMA or BA enforcement processes. Where there is no ability to address the issue and provide effective sanitary services, territorial authorities can use their powers under BA s 129 to undertake any actions to fix insanitary conditions such as prohibiting occupation of the building or demolishing it. Whilst reactive and possibly contentious, this is both a measure and trigger to enforce managed retreat.

Compulsory land acquisition is enabled in New Zealand under the Public Works Act 1981. Under ss 4A and 16 of the PWA, the Minister of Lands is empowered to acquire any land required for government work if it is for a public purpose. Section 2 defines government work as “a work or an intended work that is to be constructed, undertaken, established, managed, operated, or maintained by or under the control of the Crown or any Minister of the Crown for any public purpose.” As will be discussed in Section 4.3.3, the use of the PWA is currently

limited for managed retreat, however it can enable managed realignment where properties are purchased to realign public works such as engineered protection structures and infrastructure. The PWA may be used by requiring authorities (and potentially community-based organisations) as part of the RMA designation process for public works (Part 8 RMA) (MfE, 2017a, p. 229).

Flood and erosion control is administered under the Soil Conservation and Rivers Control Act 1941 by regional (and unitary) councils, to prevent damage by floods, prevent and mitigate soil erosion, and manage land to achieve this (Lawrence, 2015). The Land Drainage Act 1908 is administered by all local government authorities to maintain watercourses and drains. Both the SC&RCA and the LDA govern and facilitate the funding of flood risk management in New Zealand (Ibid).

In accordance with the Reserves Act 1977, Reserve Management Plans identify the management approach, use and development policies for local reserves. This could include approaches such as managed retreat where natural hazards are present.

4.2.5 Legislative summary

Resilience planning in New Zealand is supported by the mandated promotion of sustainable management under the RMA, and the functions and powers of local authorities to avoid and reduce the effects of natural hazards and climate change, make democratic decisions on behalf of communities, fund risk management activities, and register hazard information. Whilst ‘managed retreat’ is not explicitly referenced in the legislation, it is recognised as a legitimate planning approach under the NZCPS, and local authorities have mechanisms available to apply it. Whether or not it is enabled in planning practice is the subject of Chapter 5.

Table 10 provides a summary of the key purposes of the primary acts, the definition of natural hazards and climate change (demonstrating the scope of each piece of legislation), the responsibilities of governance actors, and specific mechanisms to manage natural hazard and climate change risks. This summation provides a broad depiction of the wide range of mechanisms available to the empowered groups who have responsibilities and functions under these acts. Visible concepts from the literature review are highlighted, demonstrating formal institutional associations with risk, resilience, and governance principles. For example, the devolved, participatory, and directive

nature of the RMA is illustrative of good governance attributes: nesting, where decision-making authority and responsibility are conferred to the lowest possible level; recognition and respect of diverse perspectives and values and; direction and coordination, where aims are clear, functions are coordinated and governors accountable.

Other than the mechanisms provided in Table 10, planners and environmental managers can draw on other instruments for risk management, including non-statutory plans and guidelines, hazard contingency plans, growth and management strategies, asset and infrastructure management plans, financial enticements/deterrents, hazard registers, easements, land swaps, structure plans, emergency management training, warning and evacuation planning, education, research and advice (Glavovic et al., 2010; The RMA Quality Planning Resource, 2016b). Structure plans and growth strategies act to comprehensively plan and manage a set area, with consideration to mitigating the effects of natural hazards. Guidance or requirements established in these plans are often implemented through district plan provisions. Management strategies aim to deliver policy direction for the management of resources of a set area and are commonly used in coastal and riverine environments. Non-statutory strategies are beneficial as they can integrate and provide direction for a wide range of council functions, including risk management (examined further in Chapter 5). Table 10 provides the general context for the formal planning instruments available for natural hazard and climate change risk management. In the following section, Table 11 expands upon this framework, exploring specific mechanisms for enabling managed retreat, including the provision of information, regulation, incentives and risk transfer.

Table 10: Legislative aims, definitions, responsibilities and instruments for managing natural hazard and climate change risks in New Zealand

Statute and purpose	Definitions	Responsibilities	Visible concepts	Instruments
Resource Management Act 1991: Promote the sustainable management of natural and physical resources, including natural hazards and the effects of climate change.	Section 2(1) <i>Natural hazard: any atmospheric or earth or water related occurrence (including earthquake, tsunami, erosion, volcanic and geothermal activity, landslip, subsidence, sedimentation, wind, drought, fire, or flooding) the action of which adversely affects or may adversely affect human life, property, or other aspects of the environment</i> <i>Climate change: a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods</i>	Ministry for the Environment/ Department of Conservation/ Governor General: NPS, NES, national guidance	<ul style="list-style-type: none"> • Risk (technocratic- s 6 and natural hazard provisions) • Resilience (intrinsic value of ecosystems) • Effective governance (direction, coordination and accountability) • Equitable governance (participation and recognition) • Robust governance (nesting and legitimacy) • Responsive governance (NZCPS explicit & RMA implicit precautionary principle) 	-NPS -NES -NZCPS 2010 -Regional policy statements -Regional coastal plans -Regional plans -Resource consent processing -District plans -Resource consents (and conditions e.g. easements & covenants) -ss 106 & 220 RMA -s 229(a)(v) RMA -Designations
		Regional councils: Control <u>use</u> of land for avoidance of hazards; monitor and keep records of information		
Local Government Act 2002: To enable democratic local decision-making and action by, and on behalf of, communities; to meet the	Section 5(1) <i>Natural hazard has the meaning given to it in s 2(1) of the Resource Management Act 1991</i>	Territorial authorities: Control <u>effects</u> of land use for avoidance of hazards; monitor and keep records of information	<ul style="list-style-type: none"> • Risk (infrastructure planning) • Four wellbeing's – drivers of vulnerability • Resilience 	-LTP -Annual plan -Bylaws (ss 145 and 163) -Infrastructure
		Territorial authorities: Set strategic direction and having regard to core services, including avoidance or mitigation of natural hazards (s		

Statute and purpose	Definitions	Responsibilities	Visible concepts	Instruments
current and future needs of communities for good-quality local infrastructure, local public services, and performance of regulatory functions in a way that is most cost-effective for households and businesses. <i>*Wellbeings amendment</i>		IIA(d)); determine hazard management actions, flood protection and control works; financial planning for risk reduction, taking into account the foreseeable needs of future generations.	(infrastructure) <ul style="list-style-type: none"> • Effective governance (coordination, accountability, and efficiency) • Equitable governance (participation and recognition) • Robust governance (nesting and legitimacy) • Responsive governance (anticipatory – long-term planning) 	strategy (s 10)
CDEMA 2002: To improve and promote the sustainable management of hazards to contribute to the four wellbeings, encourage and enable communities to achieve acceptable levels of risk (by identifying risks and applying risk reduction), provide planning and preparation for emergencies (readiness, response and recovery), integrate local and national CDEM planning and activity across the range of empowered agencies and organisations.	Section 4 <i>Hazard means: something that may cause, or contribute substantially to the cause of, an emergency.</i>	Ministry of Civil Defence Emergency Management/ Dept. of Internal Affairs Sustainable management of hazards, identification of hazards of national significance, planning and preparation for readiness, response and recovery. <i>Reduction of risk is predominantly carried out under the RMA and LGA.</i> Local Authorities Form a CDEM Group Identify and manage hazards and risks Consult and communicate about risks to the community	<ul style="list-style-type: none"> • Resilience • Adaptive capacity • Four wellbeing's – drivers of vulnerability • Risk (explicit) • Effective governance (coordination, accountability and efficiency) • Equitable governance (participation) • Robust governance (nested, polycentric and legitimate) 	-National Emergency Management Strategy -NEWM Group Plans -Directors Guidelines -CDEM Group Plans -Training exercises -Warning systems -Communication systems -Logistics for

Statute and purpose	Definitions	Responsibilities	Visible concepts	Instruments
		Carry out emergency responses and recovery activities Plan and prepare for emergencies and response and recovery.		equipment, accommodation -Participation in MCDEM Strategy/Plans
Building Act 2004: To provide regulation and standards for building work to ensure that people can safely use buildings and so buildings are designed, constructed, and are able to be used in ways that promote sustainable development	Section 71(3) Natural hazard: <i>Erosion (including coastal erosion, bank erosion, and sheet erosion); falling debris (including soil, rock, snow, and ice); subsidence; inundation (including flooding, overland flow, storm surge, tidal effects, and ponding); and slippage.</i> <i>*(Definition does not include active faults, liquefaction, lateral spreading/tsunami).</i>	Department of Building and Housing Establish licensing regime Building performance standards	<ul style="list-style-type: none"> • Risk (technocratic) • Effective governance (direction) • Robust governance (nested and legitimate) 	-Building regulations/code
		Territorial Authorities Identify and provide information about hazard prone land Restrict building construction of hazard prone land Control earthquake prone buildings		-Policies and regulations for earthquake prone buildings -PIMs (s 31-35) -Building consent processing and conditions (s 71-74)
Local Government Official Information and Meetings Act 1987: To increase public availability of official information held by local authorities and to promote open and public transaction of business at meetings of local authorities for more effective public participation in decision-making and accountability of local authority officials.	No definitions	Local authorities Make local authority information publicly available and provide natural hazard information to be included on LIMs where this information is not shown within the District Plan (s 44A(2)(a)(ii)).	<ul style="list-style-type: none"> • Equitable, effective and robust governance 	-LIMs -District Plans

4.3 Managed retreat instruments

Managed retreat is likely to require some form of regulatory control, but it can rely on a range of instruments for its enablement. As evident in Chapters 2 and 4, retreat (including managed and unmanaged) mechanisms can be categorised into four key groups: provision of information; regulation; incentives and; risk transfer. Information is necessary to educate current and potential property owners of risk, to catalyse a strategic retreat process, or to allow residents to retreat voluntarily. Regulation and incentives can be applied as a combination of ‘carrot and stick’ tools, and the insurance sector spreads risk, with insurance retreat likely to provide market signals resulting in reduced property value and eventual investment decline. Table II details the primary forms of interventions and corresponding instruments and actors, illustrating the diverse sources of power and influence of the governance of managed retreat.

Table II: Managed retreat instruments and actors

		Instruments
Actors		Inform
	STATE, PRIVATE SECTOR & CIVIL SOCIETY	<ul style="list-style-type: none"> • National guidance documents • International standards • Technical science reports and papers • Research outputs (e.g. National Science Challenges) • Public meetings/workshops to provide evidence of natural hazard and climate change risks • Science communication tools (e.g. Waikato Coastal Inundation tool) • Local and indigenous knowledge
		Regulate
	STATE	<ul style="list-style-type: none"> • Central government has some potential to regulate managed retreat under s 360(1)(i) of the RMA • Public Works Act 1981 • CER Act 2011 (see Chapter 2) • RMA ss 6(a)(d)(h) and 7(i) • National environmental standards • National policy statements <ul style="list-style-type: none"> ○ New Zealand Coastal Policy Statement 2010
	LOCAL GOVERNMENT & CIVIL SOCIETY	<ul style="list-style-type: none"> • Regional policy statements • Regional coastal plans • Regional plans • District plans • LIMs • Notices on Certificate of Titles under the BA • Structure plans • LTPs (funding and infrastructure strategies) • Iwi management plans • Special rating area, or pre-paid fund targeted at those receiving benefits from hazard protection to contribute to the cost of relocation.

Actors	Incentivise			
	<table border="1"> <tr> <td style="background-color: #d3d3d3; text-align: center;">STATE & LOCAL GOVERNMENT</td> <td> <ul style="list-style-type: none"> • Land acquisition under residual freedom/general competency powers of the LGA followed by either: <ul style="list-style-type: none"> ○ Leasing property back to the previous owner/unrelated tenant ○ Rehabilitation and conversion to reserve ○ Covenant property and re-sell • Relocation subsidy to incentivise uptake of retreat • Land swap • Deferred zoning to open up new land for relocation </td> </tr> <tr> <td style="background-color: #d3d3d3; text-align: center;">PRIVATE SECTOR</td> <td> <ul style="list-style-type: none"> • Insurance retreat resulting in reduced property values and eventual decline of habitation. • Insurance offsetting losses by sharing or spreading the losses post-event and providing compensation which could support relocation to other sites. </td> </tr> </table>	STATE & LOCAL GOVERNMENT	<ul style="list-style-type: none"> • Land acquisition under residual freedom/general competency powers of the LGA followed by either: <ul style="list-style-type: none"> ○ Leasing property back to the previous owner/unrelated tenant ○ Rehabilitation and conversion to reserve ○ Covenant property and re-sell • Relocation subsidy to incentivise uptake of retreat • Land swap • Deferred zoning to open up new land for relocation 	PRIVATE SECTOR
STATE & LOCAL GOVERNMENT	<ul style="list-style-type: none"> • Land acquisition under residual freedom/general competency powers of the LGA followed by either: <ul style="list-style-type: none"> ○ Leasing property back to the previous owner/unrelated tenant ○ Rehabilitation and conversion to reserve ○ Covenant property and re-sell • Relocation subsidy to incentivise uptake of retreat • Land swap • Deferred zoning to open up new land for relocation 			
PRIVATE SECTOR	<ul style="list-style-type: none"> • Insurance retreat resulting in reduced property values and eventual decline of habitation. • Insurance offsetting losses by sharing or spreading the losses post-event and providing compensation which could support relocation to other sites. 			

4.3.1 Inform

Information is critical to managed retreat as it is knowledge of risk that fundamentally drives the need to adapt. Risk information can come from a range of sources, but certain forms, especially technocratic risk assessments currently have greater legitimacy and impact in the formal institutional framework. Technical risk information can include national government guidance documents and standards, science reports and papers. These are often disseminated online, at community workshops, via interactive communication tools, and regulation (Section 4.3.2). Once derived, risk assessments ‘become’ accurate, rational reflections of the world, however, they are in fact, socially constructed (Tierney, 1999). Political and economic power determine the ability to impose risks on others, shape risk discourse and its acceptability, forming the basis for state interventions such as managed retreat (Ibid). Risk creation and allocation is connected to broader political and economic contexts and measures of control. As it will be examined further (Chapters 6-8), risk tolerability differs greatly according to local contexts, vulnerability, and individual perceptions, making the provision of risk information complex and contested. While provision of ‘rational’ information is beneficial to managed retreat decision makers to provide direction and create legitimacy, information from a diverse set of actors, including local and indigenous knowledge, is vital to ensure equitable, context specific decision-making and inclusive risk assessments. Provision of information is not sufficient to enable managed retreat alone, but it is an essential prerequisite to assessment of options and strategies for decision-makers, and it acts to inform individuals to avoid investment in risky localities, and to enable autonomous, unmanaged retreat.

4.3.2 Regulate

Local authorities have responsibilities to identify natural hazards and provide this information to the public. Hazard information can be provided via district or regional plans, LIMs and notices on titles under the Building Act giving it regulatory status. However, as noted by Harker (2016, p. 79) “[d]espite statutory and common law obligations to provide coastal hazard information, local authorities have faced legal and political challenges when attempting to include coastal hazard notifications on property notices.”

For example, concerned Kāpiti property owners sought judicial of a district council decision after it referenced 50 and 100-year coastal hazard lines on property LIMs. As a result of the review, the notifications were removed, partially due to concerns regarding the accuracy of the hazard lines (Chapter 2). Similarly, Dunedin City Council undertook mapping of coastal hazards and indicated a ‘red line zone’ where extreme risk is present in Brighton (Strack, 2016). The assessment caused distress to Brighton residents as they were concerned that the hazard zone would affect property values and make insurance more difficult. Strack (2016, p. 5) noted, “The council conceded that the ‘Red Lining’ was unfortunate given the same terminology used for Christchurch earthquake zoning, and they moderated their stance by suggesting that nothing would be finalised until widespread community consultation was completed.” The reactions of the public to the notification of hazard information and the concomitant concern over property values creates sharp political pressures for local authorities seeking to manage hazards, and ultimately, tensions between private and public interests. These difficulties highlight the utility of national standards which could accommodate local nuance, as well as recognition of the political struggles that local government will encounter when providing such information independently (Harker, 2016). Harker considers that climate-risk statements could be made mandatory by central government to remove political pressure from local governments. In 2018, Dunedin Mayor and Local Government New Zealand president Dave Cull called on central government to require councils to make public any risks faced by climate change:

At the moment, if a council identifies a risk and records that on the land information memorandum we get immediate pushback—understandably—from the property owner, who will claim that we’ve devalued their property. To some extent ... council is liable for that...So what we need is central government, I think, to require local

government, councils, to identify risks and make it public (Cull, D as cited in Harris (2018)).

Hazard notification is often considered a blunt tool which causes shock to property owners, and early and effective community engagement is required for managed retreat interventions, including the provision of information. Identification of hazard prone and at-risk areas is vital to ensure that owners and potential purchasers of private property understand the risks at hand and can make educated decisions about their investments.

The RMA provides opportunities for guidance and regulation on managed retreat, via national policy statements and national environmental standards. Although these mechanisms are not currently employed, the NZCPS, as discussed in Section 4.2.1 provides some regulatory direction on managed retreat in the coastal environment. NES and NPS (including the NZCPS) are binding at the regional and district levels, requiring local authorities to impose planning controls to give effect to them through their policies, plans and resource consent decisions. The Minister of Conservation has functions under the Reserves Act 1977 and the Foreshore and Seabed Act 2004 which have an indirect effect on risk management (Turbott & Stewart, 2006). Central government has some ability to make regulations under s 360(1)(i) of the RMA however the application of this approach, to enable managed retreat requires further investigation:

*(1) The Governor-General may from time to time, by Order in Council, make regulations for all or any of the following purposes:
(i) Providing for any other such matters as are contemplated by, or necessary for giving full effect to, this Act and for its due administration.*

Local regulation is one of the strongest instruments currently available for managed retreat interventions. Territorial authorities, using district plan control over land use activities have the greatest potential to limit new development in areas subject to natural hazards. District plans can regulate land in affected zones to limit, setback or avoid subdivision, use and development. Section 106 of the RMA empowers territorial authorities to refuse applications for subdivision consent if:

*(a) the land in respect of which a consent is sought, or any structure on the land, is or is likely to be subject to material damage by erosion, falling debris, subsidence, slippage, or inundation from any source; or
(b) any subsequent use that is likely to be made of the land is likely to accelerate, worsen, or result in material damage to the land, other land, or structure by erosion, falling debris, subsidence, slippage, or inundation from any source;*

Territorial authorities also have powers under s 71 of the BA to refuse building consent where the land is subject to or likely to be subject to one or more natural hazards, or the building work is likely to accelerate, worsen or result in a natural hazard on that land or any other property. However, these are unplanned responses which do not enable a strategic approach or consistent policy to be adopted and pursued (Berry & Vella, 2010).

Local authorities may decline resource consent applications for hard protection works. This is a particularly important planning mechanism in the coastal environment where there is legacy development and expectations of works to protect properties although they impact upon natural character and amenity values of the coast and can result in adverse effects on coastal processes (Berry & Vella, 2010). In the coastal marine area, regional coastal plans have the ability to control such works. Due to the restrictive nature of regional coastal plans, where no plan provision sanctions coastal protection works, resource consent is required. This was demonstrated in *Falkner v Gisborne District Council* [1995] NZRMA 462 where property owners wished to construct protection works to avoid further encroachment by the sea. The appellants argued that at common law, the Crown had a duty to protect property from inroads of the sea and as land owners they had a right to protect their land. The High Court held that these common law rights, if established, were subject to the RMA and therefore the right of land owners to protect their land from the sea was inconsistent with the resource consent procedure of the RMA (Harker, 2016, p. 76). This decision provided a useful method for authorities to control hard protection works in favour of longer-term adaptation methods (Harker, 2016).

Although there are opportunities to regulate new land uses, where development already exists in New Zealand, territorial authorities have limited control over this. Requiring relocation of existing structures is not possible where activities have existing use rights. Section 10(1)(a) of the RMA enables continuation of an activity if it was lawfully established under the planning regulations which applied at the time, on the basis that the effects of the land use are the same or similar in character, intensity and scale to those that were originally established.

However, existing use rights present less of a barrier to managed retreat under regional planning instruments as s 20A of the RMA allows the continuation of existing use rights until the new regional plan rules become

operative. Therefore, if it is within the scope of the regional council's functions, it may be possible to apply regional rules under s 20A to extinguish existing use rights. As noted by Berry and Vella (2010), *McKinlay v Timaru District Council* [2001] NZRMA 569 (EnvC) confirmed that for coastal hazards, regional councils have the authority to control the use of land including the extinguishment of existing use rights. A matter of legal interest at present is the application of s 85 RMA in extinguishing existing use rights to enable managed retreat. Previously, if the Environment Court agreed that a plan provision leaves land incapable of reasonable use, and places an unfair and unreasonable burden on the person who has interest in that land, the Court could direct the local authority to change, delete or remove the plan provision. This meant that even if there was a high level of public interest in applying the provisions, councils could not retain them (Ministry for the Environment, 2017d). The 2017 Resource Amendments introduced an alternative remedy if the threshold of s 85 RMA is met. The Environment Court can now direct councils to acquire the land, part of the land or an interest in land from the affected landowner under the Public Works Act 1981 (PWA) instead of changing the provision (Ibid). This amendment is aimed at providing flexibility for when a council would prefer to keep the plan provisions in place, however, as discussed in Section 4.3.3, managed retreat is not included as a public work under the PWA and therefore further clarity is required for this amendment. Berry and Vella's (2010) analysis of coastal hazard regulations in New Zealand regions highlighted that regional councils have been reserved in the use of their power to extinguish existing use rights, however, as will be discussed in Chapters 5 and 6, the use of this power for the enablement of managed retreat is gaining traction.

Control over the use of land makes for contentious decision-making, even when it is in the interest of the health and safety of communities and the quality of the environment. *Falkner v Gisborne District Council* verified that the RMA creates a system in which sustainable management takes priority over property rights. The Court dismissed the land owners' argument that managed retreat from coastal erosion is essentially a 'seizure of property' in terms of the Bill of Rights Act 1990 (BORA), because any land lost to action of the sea would be vested in the Crown (Berry & Vella, 2010, p. 15). The Court stated:

The whole thrust of the regime is the regulation and control of the use of land, sea, and air. There is nothing ambiguous or equivocal about this. It is a necessary implication of such a regime that common law

property rights pertaining to the use of land or sea are to be subject to it ...

The effect of all this is simply that, where pre-existing common law rights are inconsistent with the Act's scheme, those rights will no longer be applicable. Clearly, a unilateral right to protect one's property from the sea is inconsistent with the resource consent procedure envisaged by the Act; accordingly, any protection work proposed by the residents must be subject to that procedure ...

[T]here is nothing in the scheme of the Act to suggest that the common law right cannot be infringed – quite the reverse. The Act is simply not about the vindication of personal property rights, but about the sustainable management of resources.

As has been acknowledged both academically and judicially, the statutory implementation of integrated planning and environmental regimes represents a clear policy shift towards a more public model of regulation, based on concepts of social utility and public interest. Private law notions such as contract, property rights and personal rights of action have consequently decreased in importance.” (Falkner v Gisborne District Council as cited in Berry and Vella (2010, pp. 15-16).

In short, there is “no constitutional guarantee of property rights in New Zealand” (Berry & Vella, 2010, p. 16) and land may be moderated or affected by environmental regulation without compensation. As further confirmed by Barton (2003, p. 1):

“...it is legal, constitutional, principled and ethical to regulate the use of land. Land use regulation cannot be dismissed if we are to make progress on amenity, natural character, ecological integrity, biodiversity, and sustainability. Policymakers should remain undeterred by the possibility that RMA regulation will affect the rights of property owners.”

However, while policymakers may regulate without compensation to achieve sustainable management, “whether they should as a matter of policy or principle, is a different question” (Berry & Vella, 2010, p. 21). The tensions between private property rights, regulation, and compensation are rooted deeply in the managed retreat debate, to be unearthed further in the thesis. These issues are connected to the following category, which is often required in support of regulatory measures, to improve acceptability of managed retreat, particularly for affected property owners.

4.3.3 Incentivise

The RMA empowers environmental regulation over private property rights to deliver public and environmental protections. While restrictions on new development are not as difficult to apply without compensation, the extinguishment of existing use rights creates concerns for equitable governance. Under all circumstances, there is a need to consider how managed retreat will be funded and who bears the costs of this (Boston & Lawrence, 2018). The cost of managed retreat will be significant in many cases, but so too is the cost of leaving people in unsafe and uninsurable buildings, passing on legacy costs to future generations and diminishing intrinsic ecosystem values.

Land acquisition is a financial instrument for avoiding risk to life and assets. Properties faced with significant risks from natural hazards can be acquired and converted to reserve or restored to a functioning natural ecosystem that delivers mitigating benefits. Compulsory land acquisition is enabled in New Zealand under the PWA. As recognised by Harker (2016, p. 81), in most circumstances, land acquisition by agreement should be attempted before commencing the compulsory process, but there is disagreement about whether for the purpose of reserves, land can be compulsorily acquired under the PWA, or whether it is only able to be purchased by agreement. For example, planners at Whakatāne District Council received legal advice that the PWA could not be used for managed retreat and subsequent reserve conversion (Chapter 6). While there is no set process for acquiring land for managed retreat under the PWA, central government may potentially use its powers under this Act as such land is ‘undeniably public’ and local government could potentially acquire land for reserve purposes (Harker, 2016, p. 82).

Fee simple titles are a significant barrier to managed retreat, as market values do not reflect the potential transience of land (Turbott & Stewart, 2006, p. 43). To overcome this, where risk to life is not imminent, but expected to increase over-time, the change of use rights to a fixed term would enable precautionary, long-term, managed retreat. To implement this, property would first have to be acquired by local or central government, then rented or leased for a fixed term, allowing adaptive management of the risk. While this option is less likely to be feasible with short-term risks, it has some potential where ‘lease-for-life’ terms would be available (Ibid).

Covenants could be used in combination with land acquisition, where provisions are registered on property titles, requiring owners to carry out certain actions or restricting them from such. Covenants can be registered through the resource consent regime or in the circumstance that local or central government acquires, covenants and re-sells or leases a property. For managed retreat, covenants can include requirements that buildings are relocated/removed when a certain level of risk is reached, prohibition of protection works (including resource consent applications) and no complaints of adverse effects (Ibid).

Easements are another potentially useful instrument for protecting public access in coastal areas subject to erosion, to ensure that the wider community can still access the beach, even as it migrates inland. In the United States, rolling easements have been discussed to provide the public with rights to walk along the dry beach, even if it migrates inland (Titus, 2011). The disadvantages of covenants and easements is that it will often require the willingness of a property owner to implement them, the resource consent process, or acquisition of the land at risk. In many cases, properties in New Zealand will continue unchanged, holding existing use rights for long periods of time and therefore the opportunity for applying easements and covenants on properties is low.

Although there are advantages to acquiring land to enable managed retreat, it is expected to be a prohibitive approach in densely developed coastal settlements where property values continue to rise. Valuing land that is subject to planning restrictions such as natural hazard risk zones carries potential for complications, especially if there is no data available on the value of other similarly restricted land (Harker, 2016). Whakatāne District Council has formed a managed retreat strategy including incentivised retreat in combination with planning regulations. Property owners are being offered a buyout based on an independently assessed valuation, with further incentives of a relocation subsidy and legal fee contribution. This approach is further discussed in Chapter 6.

4.3.4 Transfer

Managed retreat instruments generally align with provision of information, regulation and financial incentives by empowered authorities, but insurance companies and banks have an important function in this space. Property owners insure their assets to safeguard themselves against adverse effects of investment loss or damage. In New Zealand, the Government plays a major role in the provision of natural hazard insurance through the Earthquake Commission (EQC). EQC is a risk transfer mechanism which spreads the costs of natural hazard damage to private residential property and contents caused by “earthquake, volcanic eruption, hydrothermal activity, landslip, tsunami, or fire caused by natural disaster” (Storey et al., 2017, p. 4). Damage caused by storm and flood hazards (excluding coastal erosion) is covered for land, but not for residential structures or contents (Ibid). To spread risk, a flat premium is applied across New Zealand. While this distributes the insurance cost, it removes the cost signal of the consequences of living in hazardous locations which arguably increases investment in such areas, and contributes to pressure for protection works (Storey et al., 2017; Turbott & Stewart 2006).

Property owners insure their assets to safeguard themselves against adverse effects of investment loss or damage. Strack (2016, p. 8) considers that “[g]iven the inevitability of sea-level rise and the hazard implications, higher premiums, higher excesses, and even withdrawal of cover are legitimate responses that should alert property owners of the impermanence of their investment in coastal land.” This approach can be applied to all hazards. Provisions in most home insurance contracts (and EQC cover) do not provide for ‘betterment’, insurers may repair a home which is at risk of future flooding but they will not subsidise relocation of the home or the construction of a new home on a safer site (Boston & Lawrence, 2018). The insurance sector is highly reactive, only redistributing risk, rather than lessening it.

Strack (2016) notes that banks and lenders are responsible for giving appropriate notice to property owners by limiting mortgage finance on property subject to natural hazards. Banks can provide information to borrowers, attempt to limit their exposure to inflated values, and they could even establish a policy to refuse finance for development on land that is regarded as high risk (Strack, 2016). According to Storey et al. (2017) insurers cover risk where uncertainty exists, therefore insurers themselves will retreat their cover from locations once

the risks are ‘sufficiently probable.’ Storey et al., (2017, p. 7) warns that “Insurance retreat by a single insurer can cause industry-wide retreat” which could decrease house prices due to mortgages becoming unavailable (or more costly). In New Zealand, insurance is a requirement for residential mortgages, failing to maintain insurance may trigger default (Ibid). Furthermore, as mortgage periods often span decades, but insurance contracts are renewed annually, insurers can exit an insurance market within 12 months, while a lender has years or decades of payments to fulfil, potentially leaving them in technical default. It is expected that banks will be less likely to lend to high risk property owners and coastal property owners in future, or require greater equity or apply higher interest rates (Ibid). Although insurance retreat is not a particularly appealing approach due its financial and social implications, it may be one of the most effective ways to curb investment in hazardous locations.

4.4 Summary

There is strong institutional founding for building resilience in New Zealand communities. Managed retreat is not only possible under the existing institutional framework, but is central to the promotion of sustainable management and risk reduction practice. With no constitutional guarantee of property rights, and an institutional framework that prioritises public interests, and enables regulation to moderate land use activities, managed retreat appears well supported. Additional to the enabling regulatory instruments are information, incentives, and risk transfer to reinforce this approach. While regulation and incentives hold the greatest potential to enact managed retreat, information and risk transfer can be integrated as part of a coordinated, strategic approach.

However, managed retreat will not be achievable in all circumstances, for social, cultural, economic, and political reasons, and particularly where population and investment reach certain thresholds (Abel et al., 2011). But where managed retreat is possible, this chapter presents the formal institutional framework and opportunities for its enablement. Difficulties lie in the ability to operationalise powers and intentions within the institutional context, to transform the guiding principles and mechanisms of the Acts and their empowered organisations into action. Producing clear objectives, policies and rules to give effect to the RMA requires robust information—something that is not always available to councils, particularly in relation to future risk. Council plan provisions and decisions are subject to intensive scrutiny, especially when

policies may have an effect on private property, or constrain economic development (Glavovic 2014). Furthermore, local politicians often feel at risk countering proposals that provide immediate economic benefit, but expose people to future risks (Ibid).

Many of these difficulties have led to development in New Zealand that is not appropriately located or considerate of long-term effects, giving rise to risky legacy land uses and structural protection costs. Chapter 4 has revealed the opportunities for managed retreat interventions, but it recognises that challenges lie ahead for managing existing use rights, regardless of the ability to moderate land use activities under the RMA. Chapter 5 continues this line of inquiry, delving further into the regulatory enablement of managed retreat, analysing local planning instruments to determine the level of direction afforded to managed retreat, and uncover the current state of play. Chapter 6 ensues, critically analysing the first example of a local managed retreat intervention attempting to extinguish existing use rights. Under the current framework, pathways towards managed retreat, albeit bumpy, are beginning to be paved.

Chapter 5 Managed retreat policy: Revealing the terminology, approaches, and direction of local planning instruments

5.1 Introduction

Local policies and plans are instruments of hierarchical, de-centralised government, used to manage the issues and contests of regional and local environments. These instruments set the basis for making decisions by “providing a common set of facts” (Ericksen et al., 2001, p. 11) about an area, as well as facilitating the development and dissemination of local environmental knowledge, and setting the regulatory framework and vision for the locality. Policy and plans are key guiding documents for local authorities. They provide direction to elected officials, council staff, property owners, developers, and the public on resource management matters, are guided by national resource management law and policy, and establish context specific provisions. As recognised in Chapter 2, direction is a fundamental attribute of effective governance—ensuring scope, goals, and aims are comprehensive and clearly articulated to stakeholders. Policy and plans shape reality in response to resource problems, and are particularly influential when they provide a clear and convincing direction for the future (Godschalk, David, Berke, & Kaiser, 1998). The language used within planning instruments is fundamental in forming policies, polities, and politics, (Feindt & Oels, 2005) and the level of direction provided for solutions to environmental problems is determined by the language used, developed by the values and social knowledge underpinning it. To further understanding of the application of managed retreat in New Zealand, an analysis of the primary planning documents for enabling it is necessary.

Chapter 4 informed the reader of the formal institutional framework, contextualising the RPS, regional plans, and district plans within the RMA hierarchy, to reveal their roles in influencing the management of natural hazard risk in New Zealand. Chapter 5 explores the regulation of managed retreat and is split into two sections:

5.2 Textual analysis of resource management policy and plans

5.3 Textual analysis of local government planning instruments

Section 5.2 introduces the conceptual policy framework of the first textual analysis, exploring key terminologies found, followed by detailed interpretation of the data to reveal the dominant discourses present, and the RMA policy and regulation used to enable managed retreat in New Zealand. This analysis is grounded in the conceptual policy framework inductively developed, determining the level of direction for managed retreat within resource management policy and plans. A summary of findings delivers an overview of the analysis and highlights the key themes, approaches and policy gaps that have been discovered. With the findings of the RMA policy established, further research was undertaken using the same methodology to broaden the scope. Section 5.3 analyses the data against a (condensed) policy direction framework, cultivating in-depth evaluations and comparisons of the text. Supplementary findings compliment this work, to uncover the status of managed retreat projects.

The principal findings of the textual analyses highlight that planning instruments are predominantly providing limited direction to enable managed retreat, demonstrating weak policy support for the approach. Where managed retreat is present, diverse terminologies are applied, and a lack of interpretation support exists. In RMA policy and plans, five approaches dominate the policy landscape, but there is an absence of strategic, coordinated provisions to enable managed retreat. Among the instruments reviewed, implementation support is lacking and a coastal hazard focus is present. The findings highlight that managed retreat is emerging via social learning and policy experimentation, resulting in an assortment of provisions across the country. Overall, Chapter 5 provides a detailed examination of the current role of environmental planning in enabling managed retreat. To further this understanding, Chapter 6 (and aspects of Chapter 8) examine the applied role of planning, and Chapter 7 uncovers public perceptions towards mechanisms to enable managed retreat.

5.2 Textual analysis of resource management policy and plans

RMA policy and plans provide the basis for avoidance and mitigation of the effects of natural hazards, and are where the first textual analysis is focused. Plan evaluation frameworks suggest that there are key internal and external indicators of plan quality, such as plan vision, fact base, internal consistency, policy framework, implementation, coordination and influence (Brody, 2003; Godschalk & Berke, 2009; Saunders, Grace, Beban, & Johnston, 2015). The textual

analysis is more focused than a general plan evaluation or discourse analysis, specifically evaluating the enablement of managed retreat within the policy framework of New Zealand RMA plans. As stated by Godschalk, Rodríguez, Berke, and Kaiser (2006, p. 69), a “high-quality plan provides a clear and convincing picture of the future, which strengthens the plan’s influence in the land planning arena.” Policy frameworks are critical direction setters and Godschalk and Berke (2009, p. 233) argue that a weak direction-setting framework results in a community that is less likely to exert control over its planning agenda to ensure that long-term public interests supersede short-term interests and private concerns. Managed retreat will result in significant short-term costs to bring sustained, long-term gains with resultant public-private tensions. The level of policy direction for managed retreat is therefore a key determinant in its application.

Employing a general inductive approach, the textual analysis evaluates the level of direction provided for managed retreat using a conceptual policy framework. Where managed retreat is identified in RMA instruments, it is then categorised into six primary policy and regulation themes (which emerged inductively) and assessed against a spectrum of direction, based on the policy language used or the regulation rigour adopted (as discussed in Chapter 3). The framework is segregated by policy or regulation type (Categories 1-6) to allow for comparison between key provisions targeted at:

- 1) Mitigating the effects of natural hazards on existing development;*
- 2) Regulating new and re-development;*
- 3) Regulating hard protection structures;*
- 4) Planning for the resilience of local infrastructure and services;*
- 5) Regulating the re-construction of materially damaged or destroyed buildings; following a natural hazard event; and*
- 6) Distinct approaches found within the policy context*

An analysis is carried out within each category using key examples to examine the differing approaches and to determine key themes. This provides insight into how managed retreat provisions are applied in resource management plans, to fulfil Objective 2 of this research, as well as providing an opportunity to learn where improvements could be made (Godschalk & Berke, 2009). In total, 150 instruments (regional policy statements, regional plans and district plans) from 17 Regional Councils and 67 Territorial Authorities were collated, reviewed and interrogated using key search terms from international managed retreat literature and analysis of New Zealand planning documents.

5.2.1 Terminology

Planning documents are a source of discourse, representing key issues and ideas of their time and in this case, key approaches to risk avoidance and mitigation. Operative and proposed RPS, regional plans, and district plans were interrogated in search of terms relevant of the concept managed retreat. In plan vocabularies, the most prevalent terms (in order of the most to least common) were: ‘relocate’/‘relocatable’/‘relocation’, ‘abandon’/‘abandonment’ and ‘managed retreat’/‘retreat’/‘planned retreat’ (Figure 11).

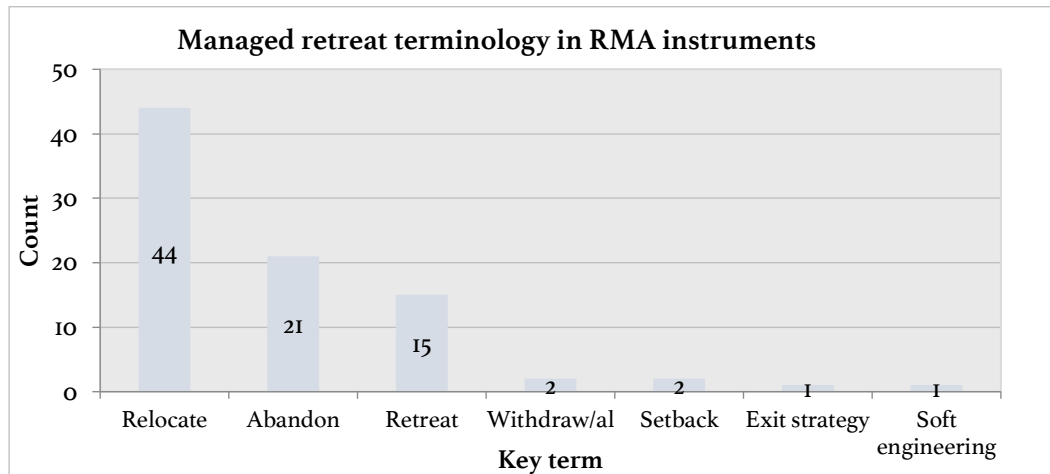


Figure 11: Terminology count for policy and plans

Of 150 instruments, 75 included one or more of the key terms. Where ‘managed retreat’ terms were present, a count was provided once for each term found. Some documents used a range of terms, and the count includes this variability. The following table provides a breakdown of the instruments that applied managed retreat terms, demonstrating that only ten per cent of RMA plans specifically referenced ‘managed retreat’, that there is a very low level of recognition for ‘managed retreat’, ‘relocation’ and other key terms in regional plans, and a dominance of ‘relocate’ terminology in regional coastal plans and district plans. It is anticipated that prevalence in district plans is due to the greater number of territorial authorities, and their lack of remit to extinguish existing use rights, rendering a stronger focus on managed retreat of new development via relocation and building design requirements.

Table 12: Managed retreat terms by instrument type

	<i>Instrument type</i>	<i>RPS</i>	<i>Regional Plans</i>	<i>Regional Coastal Plans</i>	<i>District Plans</i>	<i>Total</i>
<i>Managed retreat terms</i>	Retreat	7	0	3	5	15
	Relocate	12	2	11	19	44
	Abandon	5	1	9	6	21
	Withdraw/al	1	0	0	1	2
	Setback	1	0	1	0	2
	Exit strategy	1	0	0	0	1
	Soft engineering	1	0	0	0	1

Of the 16 operative and proposed RPS that featured the key terms (five did not), seven used the term ‘retreat’ and 12 used ‘relocate’ (with three of these instruments using both retreat and relocate). Where ‘retreat’ was used (managed retreat, planned retreat or just retreat), the majority (57%) became operative or proposed in 2016 and 86% were operative or proposed between 2012-2016. Where the term or affixes of the term, ‘relocate’, were used, only three instruments were produced in 2016, and 58% became operative or proposed between the years 2012-2016. Therefore, in terms of the RPS, the more recent documents are predominantly making use of the use the term 'managed retreat' (or 'retreat'/'planned retreat'), but 'relocation' remains slightly more popular overall.

Managed retreat has great potential to be a sustainable risk reduction approach, enhancing resilience by reducing exposure to people and assets rather than working against nature to ‘hold the line.’ Therefore, as the guiding document for regions of New Zealand, it is important that the more recent policy statements are referring to managed retreat as an option within the policy toolbox. It would be of benefit for the remaining RPS which did not provide guidance on any of the key terms, to reference ‘managed retreat’ and provide policy to enable it, or at a minimum, to highlight it as an option for council officials and staff, developers, and members of the public to consider. Nonetheless, it is noted throughout this analysis that even without RPS guidance, many plans incorporate forms of managed retreat within their policies, rules and assessment criteria.

Although there was a close split in terminology choice between the regional policy statements, at the subsequent levels in the RMA hierarchy, this was not the case, with only three regional coastal plans and five district plans specifically referring to managed retreat as a risk reduction approach—the majority (32 regional coastal plans and district plans) used the terms

'relocate'/'relocatable'/'relocation', with 22 referencing 'abandon'/'abandonment' in conjunction with this. Overall, within local authority discourse, the term 'relocate' represents 47.5% of the terminology, 'abandon' 27.5% and 'retreat' 17.5%. The common use of the words 'relocate' and 'abandon', represent the approach taken in most plans, where 'relocation' or 'abandonment' are simply recognised as risk reduction options on a case by case basis, not necessarily as part of adaptive, integrated strategies. Where 'managed retreat' is referenced, it is expected that a more comprehensive policy would be in place than those that are just signalling 'relocation' or 'abandonment'. Although 'managed retreat' has made its way into the policy arena, there are few circumstances where a comprehensive and coordinated strategy is enabled. In most cases, like 'relocation' and 'abandonment', 'managed retreat' is merely referenced as an option with no further explanation or implementation pathway. This is an important finding, as 'managed retreat' is founded on strategic principles, being a deliberate, coordinated process to strategically withdraw from unsustainable locations. Without integrated, strategic planning, or follow through, its enablement is limited.

Ad hoc terms found during the review included 'withdrawal', referenced by a regional and a district plan and 'setback', used by Waikato Regional Council in their RPS and RCP. Within RMA documents (and international practice) the term 'setback' is most commonly used to determine a line from where new development is prohibited on policy maps. Another distinctive finding is the reference to land purchase to reduce natural hazard risk within the Environment Southland Operative RPS 1997 (which no longer has legal effect). The 2012 Proposed RPS, however, does not refer to such an approach. The Hawke's Bay Regional Coastal Environment Plan 2014 also signals the possibility of financial instruments to implement managed retreat, however, this is within the policy explanation where a range of options are presented.

The Proposed Otago RPS 2016 applies a unique expression to describe managed retreat, that being 'exit strategy'. This term is somewhat novel within the literature, but it is useful that the Council has further defined it as "a means of leaving a current situation that is likely to become difficult, e.g. as a result of natural hazards or climate change e.g. managed retreat or relocating dwellings" (Otago Regional Council, 2016, p. 207). Interestingly, the plan differentiates between 'relocation' and 'retreat'. It would be of benefit to further explain the differences between the approaches to provide clarity to plan users. Another

unique term found is the definition of ‘managed retreat’ as a soft engineering technique. The explanation to Policy 52 of the Greater Wellington RPS 2013 states: “Soft engineering methods may include, for example; hazard avoidance or controlled activity zones; setback or buffer distances; managed retreat or land retirement; a ‘do nothing’ policy; restoration projects...” (Greater Wellington Regional Council, 2013, p. 132). Despite this provision, the Proposed Natural Resources Plan 2015 for the Wellington Region (which is required to give effect to the RPS) provides a more narrow definition that does not explicitly reference managed retreat: “Soft engineering: Works such as beach nourishment and dune rebuilding that use non-structural materials (e.g. sand, cobbles, native plants) to mimic natural coastal features that can act to mitigate the impacts from natural hazards” (Greater Wellington Regional Council, 2015c, p. 32). These approaches are inconsistent and provide insufficient clarity as to the meaning of soft engineering methods. As recognised by The RMA Quality Planning Resource (2016c), consistency between plans increases certainty and familiarity and results in better experience of users across the board. This is an important consideration, particularly in the use of a technical planning term such as managed retreat. The definition or glossary chapters within RMA plans are critical to interpretation, administration and enforcement and are among the most referred-to sections (Nolan, 2011; The RMA Quality Planning Resource, 2016a). Of the 15 documents that referred to ‘managed retreat’, not one formally provides a definition for it (Table 13).

Table 13: Defining managed retreat

Document	Term	Definition	Informal explanation
Auckland Regional Policy Statement 2016	Managed retreat	×	×
Southland Proposed Regional Policy Statement 2012 – Decision Appendices	Managed retreat	×	×
Northland Regional Policy Statement 2016	Managed retreat	×	Managed retreat by relocation, removal, or abandonment of structures;
Proposed Regional Policy Statement for Otago: Incorporating Council Decisions 1 October 2016	Managed retreat	×	×
West Coast Regional Policy Statement 2000	Retreat	×	×
Greater Wellington Regional Policy Statement 2013	Managed retreat	×	×
Draft Nelson Regional Policy Statement For Discussion May 2016	Planned retreat	×	×
Hawke’s Bay Regional Coastal Environment Plan 2014	Managed retreat	×	Any strategic decision for the co-ordinated removal, relocation or even abandonment of public and private assets at risk of being impacted by coastal hazards is often referred to as ‘managed retreat.’
Auckland Proposed Regional Coastal Plan	Managed retreat	×	×
Bay of Plenty Proposed Regional Coastal Plan 2015- Appeals Version Number 9.0a	Managed retreat	×	×
Wairarapa Combined District Plan 2011	Retreat	×	×
Waikato District Plan 2013	Managed retreat	×	Moving buildings away from danger areas
Kāpiti Coast District Plan 1995	Managed retreat	×	×
Tauranga City District Plan 2013	Retreat	×	×
Thames-Coromandel Proposed District Plan 2016- Appeals Version	Retreat	×	×

Three documents include the term ‘managed retreat’ as examples when defining terms ‘exit strategy’, ‘soft engineering’, and ‘soft protection’ however, no explanation is provided as to what managed retreat involves. The Northland RPS 2016 provides a succinct explanation of managed retreat within its policy, and the Waikato District Plan 2013 defines managed retreat as moving buildings away from danger areas. Although these attempts go further than many plans, these

explanations do not recognise the complex nature of managed retreat, nor the strategic approach required. It is important to distinguish that managed retreat applies to people, activities, infrastructure and assets, as well as buildings. This analysis demonstrates a need for a consistent definition of managed retreat in RMA policy and plans, as only one plan (The Hawke's Bay Regional Coastal Environment Plan 2014) clearly provided an explanation of managed retreat (in relation to coastal hazards) as: "Any strategic decision for the co-ordinated removal, relocation or even abandonment of public and private assets at risk of being impacted by coastal hazards is often referred to as 'managed retreat'" (Hawke's Bay Regional Council, 2014, p. 46). Furthermore, the policy explanation provided a thorough description of managed retreat, including the various scales it can occur within and a range of options for implementation, including regulation, covenants, education, financial incentives and insurance (Hawke's Bay Regional Council, 2014, p. 46).

The Hawke's Bay RCP is the only comprehensive example of communicating managed retreat to plan users, including implementation options, however it does not formally recognise the definition within '*Section 1.3 Definitions*' of the Plan, providing it within the policy explanation. The significant lack of consistent and clear interpretive guidance on managed retreat in New Zealand planning instruments is a limiting factor. Although local variability is anticipated in policy and regulation, implementation may be confounded by variability or ambiguity in the definition of key terms. Inconsistency in terminology reflects the lack of national guidance provided on natural hazard risk management in New Zealand. A national standard or guidance defining and explaining managed retreat would be of use to practitioners and the public.

In summary, the terminology findings have highlighted three key messages. The first being that managed retreat is beginning to make its way into New Zealand policy and plans (particularly in recent RPS and district plans), either by formally referring to the term or by referencing relocation of structures. Secondly, there are few circumstances where a comprehensive, coordinated strategy is enabled or even recognised. It is identified that in most cases, as with relocation and abandonment, managed retreat is merely referenced as an option with no further explanation or implementation options within the plan provisions. This immediately indicates the limited approach taken to enabling managed retreat in most of New Zealand planning documents.

Finally, large gaps were found in the communication of the term managed retreat, with no formal definitions provided, and only one plan delivering users a satisfactory explanation of the approach and its potential application. To enable clear interpretation of the approach across New Zealand, a conceptual definition of managed retreat at the national level is paramount and should be included (with further explanation) within national level policy or environmental standards. The numerous terms found to describe managed retreat reflect the varied approaches nationwide, and the following section delves further into the provisions of planning documents, interrogating the strengths and weaknesses these (Categories 1-6).

5.2.2 Policy approaches

The inductive analysis resulted in the recognition of six approaches for enabling managed retreat under local RMA plans (discussed in detail below). Policy frameworks are critical direction setters and as shown in red outline, key approaches consistently found within RMA documents (categories one, two(a), three and four) are using limited provisions to enable managed retreat. This means that even where a managed retreat policy (by whichever definition) is present, it tends to have weak influence and direction. For example, under 'existing development' policy (category one), managed retreat was predominantly a matter for 'consideration', rather than being 'encouraged' or 'prioritised'. In simple terms, to 'consider' is not as strong as to 'prioritise'. On the more limited tiers of the spectrum, where managed retreat is included in the framework (mostly as something to be considered), it is not supported with provisions for implementation or further evaluation. Illustrating the policy approaches discovered, the conceptual policy framework (Figure 12) demonstrates a hierarchy of provisions, within each category, indicating the dominant variations of each approach, according to the strength of direction afforded. The following discussion analyses the policy categories using examples from the resource management policy and plans.

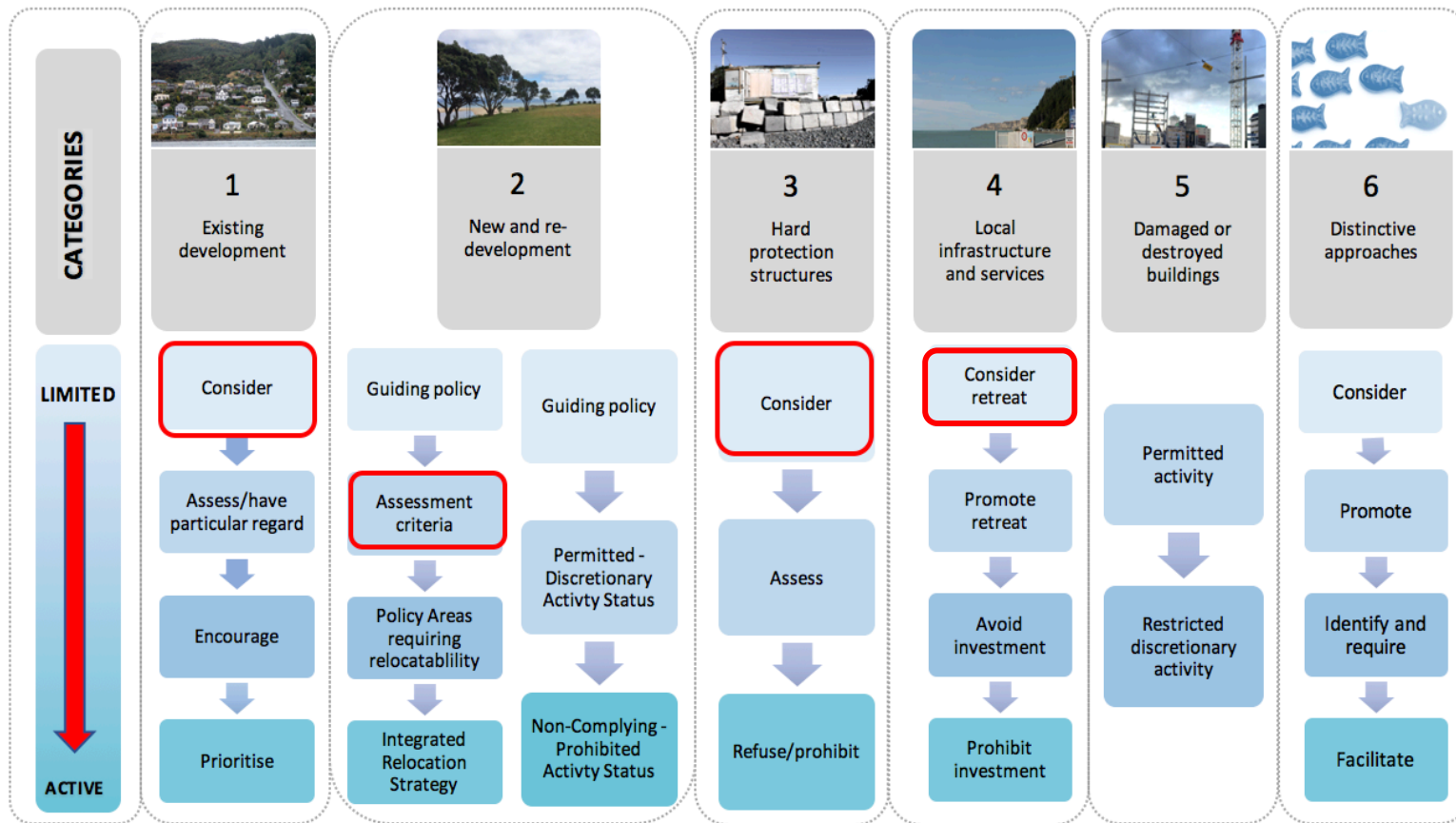


Figure 12: Policy analysis framework

I Existing development policy

In New Zealand, legacy development in hazardous locations has resulted in communities and assets that are at risk from natural hazards and the impacts of climate change. Avoidance of development in exposed localities is fundamental to enabling low risk communities, however it often conflicts with strong political and economic will, resulting in mitigation of adverse effects. *Category One: Existing development policy* incorporates policies that aim to provide for managed retreat as an option for managing the effects of natural hazards to existing development. Many policies refer to the need to consider the effectiveness or appropriateness of any works or activities, including the practicality of managed retreat/relocation of existing development. In total, 10/21 regional policy statements make use of this policy approach, 2/23 regional coastal plans and 10/83 district plans. Of the 22 RMA documents which use this approach, nine use the term ‘consider’ when referring to managed retreat as a mitigation option. For example, the Proposed Otago RPS (Incorporating Council Decisions) provides the following:

Policy 4.1.7: Reduce existing natural hazard risk to people and communities, including by all of the following :...c) Considering the use of exit strategies for areas of significant risk to people and communities (Otago Regional Council, 2016, p. 63)

Similarly, the Proposed West Coast RPS states that:

Natural Hazards Policy 4: Consideration should be given to the relocation of existing development and infrastructure away from areas prone to natural hazards, however it is recognised that this cannot always occur. Consequently, those who benefit from the works or services should pay for them (West Coast Regional Council, 2015b, p. 38).

Within this category there are clear differences between the approaches, for example, the ‘user pays’ principle of West Coast Regional Council. Although not uncommon in practice, in the context of Category One, this is the only plan to state that the recipients of hazard mitigation work (including managed retreat/relocation) are responsible for the costs. These differences highlight the spatiality of the policies and plans, where districts and regions may apply and fund managed retreat in diverse ways. However, regardless of the specific details of each provision, the use of ‘consider’ is important as it reflects the force of the policy. To consider means to contemplate mentally or to give attention to a matter (Deverson & Kennedy, 2005). In Category One, managed retreat is to be ‘considered’, among other approaches. Therefore, while its presence as an option

for hazard mitigation is highlighted, it is not necessarily enabled if it is only to be given attention to. In a similar vein, other policies highlight managed retreat as an alternative measure to protection structures, or use phrases such as ‘assess the practicality of alternative means’ (mentioning relocation/retreat). In these cases, although managed retreat and relocation are being recognised as mitigation options, in terms of enabling retreat, they are undemanding, particularly when ‘considered’ against the more popular and widely established approach of hard protection works. This form of terminology may not be strong enough to overcome the barriers to implementing managed retreat in New Zealand. In saying this, managed retreat will not be appropriate in all locations and circumstances, among social and economic factors, the level and nature of the risk must inform the strength of enabling provisions.

Developing upon the former approaches, the Bay of Plenty RPS 2014 takes the assessment approach a step further, by requiring that **particular regard** is given to the “environmental and social costs and benefits of a range of long-term sustainable coastal hazard risk reduction options over a 100-year time frame, including natural defences and relocation or removal of development or structures at risk” (Bay of Plenty Regional Council, 2014, p. 131). This policy is stronger than requiring consideration or ‘assessment’ of the options as it specifically states that particular regard is to be given to the costs and benefits of all options. In *Gill v Rotorua District Council* [1993] NZRMA 604 (PT) the court interpreted the obligation of having particular regard to mean a duty to be on enquiry [616]. In *Marlborough District Council v Southern Ocean Seafoods Ltd* [1995] NZRMA 220 ‘have regard to’ was determined to mean “to take the matter into account, recognising it as something important to the particular decision and therefore to be considered and carefully weighed in coming to a conclusion” [228] (Salmon & Grinlinton, 2015, p. 122). In *Foodstuffs South Island Ltd v Christchurch City Council* [1999] 5 E:RNZ 308, having particular regard to a matter is considered to be stronger than having regard (Salmon & Grinlinton, 2015). These interpretations disclose the relative strength of the term ‘particular regard’, however, in comparison to a phrase higher in the resource management hierarchy (s 6 RMA), ‘to recognise and provide’ for managed retreat would be the height of enablement. This terminology is reserved in the statute for matters of national importance, although could be appropriately employed in connection with areas where managed retreat is necessary for human health and safety. Another important strength of the Bay of Plenty policy is the reference to time.

Over a 100-year period, managed retreat may have a higher chance of presenting more benefits and less costs than a mitigation option such as a sea wall.

Among the typical approaches already discussed, there are three RPS and one RCP that stand out within Category One, due to their choice of terminology and approach to hazard risk mitigation. Firstly, the Auckland RPS (December) 2016 requires encouragement of managed retreat and avoidance of hard protection structures when replacing or modifying existing development:

B10.2.2. Policies—Management approaches

(g) Encourage activities that reduce, or do not increase, the risks posed by natural hazards, including any of the following:

(b) managing retreat by relocation, removal or abandonment of structures;

(c) replacing or modifying existing development to reduce risk without using hard protection structures (Auckland Council, 2016, p. 3).

The Northland RPS (May) 2016 also makes use of the word encourage when referring to mitigation measures, including managed retreat:

7.I.4 Policy – Existing development in known hazard-prone areas

In 10-year and 100-year flood hazard areas and coastal hazard areas, mitigation measures to reduce natural hazard risk to existing development will be encouraged. These may include one or more of the following: ...

(d) Managed retreat by relocation, removal, or abandonment of structures (Northland Regional Council, 2016c, p. 120).

Policy 25 of the NZCPS expects that in areas potentially affected by coastal hazards over the next 100 years, that there is **encouragement** of redevelopment or change in land use, including managed retreat by relocation, removal or abandonment of existing structures, and designing for relocatability or recoverability from hazard events. It is progressive to see these RPS giving effect to Policy 25 and taking it further than this, broadening the policy practice to flood hazard areas (Northland) and in Auckland’s case, to land affected by all natural hazards and climate change.

Following on from these strengths is the Greater Wellington RPS (April) 2013 which within the explanation of *Policy 52 Minimising adverse effects of hazard mitigation measures* states, “non-structural and soft-engineering methods should be the first option for hazard mitigation” (Greater Wellington Regional Council, 2013, p. 132). The explanation continues, describing managed retreat as a possible soft-engineering method. This is a stronger policy than those previously

mentioned as it prioritises managed retreat and ‘soft’ methods above protection works. However, as mentioned earlier, there are some issues with the definition of soft-engineering between Wellington policy and plans. Clarity issues aside, it is pragmatic that there is direction from the RPS as to which hazard risk mitigation methods are preferred.

The Hawke’s Bay RCP provides a prioritised guideline to manage coastal erosion and inundation risks. The guideline states that coastal hazard risks will be proactively managed in the following prioritised ways:

- (a) avoidance of new development in areas that are, or have potential to be, subject to coastal erosion or inundation*
- (b) maintaining and enhancing natural values and features that provide a buffer against coastal erosion and inundation*
- (c) relocation and removal of existing uses and development from areas at risk of coastal hazards will be evaluated, and implemented if appropriate;*
- (d) evaluating, then implementing if appropriate, activities which mitigate coastal hazards (for example, beach renourishment); and then*
- (e) evaluating, then implementing if appropriate subject to Guideline 12, permanent structures (for example, sea walls, groynes, artificial reefs) to mitigate coastal hazards (Hawke’s Bay Regional Council, 2014, p. 42).*

This policy is unique in the way that it prioritises the mitigation options. Prioritised first is the avoidance of increased the risk, giving effect to Policy 25 a) of the NZCPS, and directed at removing the need for mitigation measures in future. Secondly, the use of ecosystem services for mitigation services are prioritised and third, the relocation/removal of existing uses are to be evaluated and then implemented if appropriate. This is the strongest policy within Category One as it ensures that managed retreat is given an initial chance to be assessed as a mitigation option rather than being assessed alongside hard protection structures and other approaches which may be less effective. This policy is particularly progressive for its proactive nature where direction is given to the process that is to be undertaken for managing coastal erosion and not just considered on a case by case basis when resource consents are submitted for protection works (Category Three). The use of hazard risk mitigation prioritisation is something to be considered for all mitigation provisions, particularly at the RPS level where clear guidance is currently lacking.

The analysis of approaches found within Category One lead to the conclusion that the majority of provisions (15/22) are highlighting retreat/relocation as an option to be implemented, but are not taking it further

than considering, regarding or assessing it. While these are good initial steps, the three RPS, one RCP, and three district plans that are **encouraging** and even **prioritising** managed retreat, represent a small group of local authorities working towards enabling this approach in New Zealand. Bearing in mind that Category Six of this analysis reveals a few ad hoc policy approaches which are uniquely progressive.

Of the three operative RPS that specifically referenced managed retreat, only two plans (the Proposed Auckland RCP and the Operative Kāpiti Coast District Plan) consistently gave effect to their RPS by referencing managed retreat as management options for natural hazard risk management. Regarding Auckland, this consistency demonstrates the benefit of developing a Unitary Plan, where RMA policy and plans are developed together, forming a principal statutory planning document for the region. As the Northland RPS became operative in 2016, there is a lag between when the provisions in regional and district plans will be updated to give effect to it. Some regional and district plans in Northland use the term 'relocate', although others have yet to reflect the language of the RPS. This delay creates opportunity for inconsistent policies on a regional basis and limits the immediacy of the RPS. However, under s 74 of the RMA, when preparing or changing a district plan, the territorial authority shall have regard to a proposed RPS or proposed regional plan. Therefore, in the circumstance that territorial authorities are carrying out a plan review or change when a proposed RPS or regional plan is published, provisions of the relevant RPS or regional plan must be considered, thus reducing some potential for lag times where the timing is right. Until 2017, the RMA has only had one statutory process to prepare and change policy statements or plans, regardless of their nature. It can take a least two years to complete plan changes and resolve appeals, resulting in processes that are too lengthy to respond to urgent issues (Ministry for the Environment, 2017b). The Resource Legislation Amendment Act 2017 enables councils to make a request for a streamlined planning process for a proposed RPS, plan, plan change or variation. This amendment is intended to provide greater flexibility for urgent matters, to implement national direction, for changes required to meet a significant community need, to combine policy statements or plans, manage unintended consequences of an RPS or plan, or require an expeditious process for a reason comparable to the former (Ministry for the Environment, 2017b, p. 2). This streamlined process could allow for greater consistency between resource management plans, where they can be

updated more quickly, and even cohesively, to give effect to the direction of higher-level instruments in an integrated manner.

2 Regulation: New and re-development

Category Two, regulation of new and re-development, includes development constraints that require new structures to be relocatable, as well as the regulation of additions, alterations and extensions to existing developments (re-development). Provisions requiring relocatable structure design enable managed retreat as they encourage risk reduction over time by facilitating development that can be relocated, removed or set back when facing imminent risk. This policy approach is particularly useful when dealing with uncertainty of future risk such as sea level rise and is recognised by Policy 25 c) of the NZCPS as a risk reduction tool for coastal areas. Although regulation requiring the relocatable nature of structures can only assist decision makers and developers of new land use activities, it is a useful tool for balancing social, environmental and economic interests, providing flexibility and adaptability for the future. As RPS cannot contain rules, they generally provide policy to encourage design that facilitates relocation. In this circumstance, 5/21 RPS contain policies that encourage relocatable structure design. For example, the Taranaki RPS states that authorities should consider the need for consent conditions that require relocatable buildings (Taranaki Regional Council, 2010, p. 100).

District plans are a territorial authority's principal regulatory instrument for managing subdivision and land use. To control development by requiring relocatable structures, eight district plans make use of 'assessment criteria' for new developments to be evaluated upon during the consent process; including whether the proposed structure(s) is relocatable or not. Four deliver policies that refer to the need for relocatable buildings, but they do not specifically refer to this as assessment criteria. Eight district plans take a different approach to the former two styles, identifying hazard risk zones where any new structures must be relocatable. This approach is advantageous to plan users as it is very clear where relocatable buildings must be built, rather than general criteria for all applications in hazardous locations to be assessed upon.

The second approach within Category Two is the regulation of re-development, such as additions, alterations and extensions to existing developments. This approach enables retreat by discouraging re-development of existing sensitive land uses, therefore incentivising relocation or change in land use over time. For example, the Hamilton City District Plan states that additions

or alterations to buildings in the high flood hazard risk zone, which result in greater building site coverage or an increase in habitable floor area are a non-complying activity (Hamilton City Council, 2016, p. 22). The Whanganui District Plan also states that the erection, or extension to, any building or structure (other than structures for coastal management) in the Extreme Risk Area is Prohibited (Whanganui District Council, 2016, p. 11). This is a clear sign from the plan that no further development will be considered, let alone sanctioned in the policy area. Such a clear statement is an important step in implementing managed retreat over time as it recognises that the plan does not provide for further land use and development in these areas, serving as both an informative and regulatory intervention. In this category, ten plans use this regulatory approach, but with differing activity statuses according to the risk. In relation to additions and extensions, a range of plans hybridise the activity status approach with assessment criteria for relocatable building design.

Plans using relocation provisions provide little guidance on what constitutes 'relocatable' and important future considerations such as where the building will be relocated. It is expected that this will be negotiated via individual resource consents. However, some do go into further detail (Mackenzie, Ashburton and Waimate District Plans) requiring an assessment on the ability of the proposed building to be relocated, the estimated cost of this and the possible destination of the building relocation. The Western Bay of Plenty District Plan further develops this criteria by requiring information on design, location and materials of the structure, access available to remove it and the ability to rehabilitate the site (including removal of all parts and services and the reinstatement of land to protect both natural character and coastal dunes to act as an erosion buffer) (Western Bay of Plenty District Council, 2016, p. 9). These details are vital to ensure that future managed retreat is achievable and land is not just abandoned and left in an unsatisfactory state.

To clarify the type of building/structure allowed within the ambit of its rule, the Thames-Coromandel Proposed District Plan deems the term relocatable to include: "construction on wooden, concrete or other piles in a manner so that the building can be lifted and moved by vehicles and re-established in a new location" (Thames-Coromandel District Council, 2016, pp. 34-13). This definition is useful as it provides detail to plan users. Among the plans, the Proposed Bay of Plenty RCP provides the greatest detail on the requirements for relocatable buildings, entailing a relocation strategy detailing (as a minimum):

- (i) The monitoring to be undertaken to determine when relocation is required;*
 - (ii) The process to be used for relocation;*
 - (iii) Rehabilitation of the site, including removal of services;*
 - (iv) Timeframes for relocation to be completed; and*
 - (v) The site for relocation*
- (Bay of Plenty Regional Council, 2015, pp. 45-46)

This is a clear provision as it ensures that relocation will occur when appropriate (following monitoring), the process for relocation is pre-planned, the site will not be left in an unsatisfactory state, there are timeframes for the developer to be held accountable to, and a site for the relocatable structure/building is pre-determined to ensure the process can go ahead. The sole criterion absent in this provision is that relating to design and materials of the structure. This approach is the most robust of the provisions described, firstly for its detail and secondly because it is embedded within a unique policy of the Proposed RCP, which requires the inclusion of rules in district plans to manage coastal risks by specifying a relocation trigger for new development on open coasts and near river mouths and streams.

The Tauranga City District Plan 2013 is progressive in the resource management plan context as it already fulfils this requirement, taking an integrated, comprehensive approach to managing natural hazard risk in coastal areas. The Coastal Hazard Erosion Policy Area (CHEPA) identifies areas along the open coastline where coastal erosion may or will occur. Within this area, three hazard risk zones are identified; the Current Erosion Risk Zone (CERZ), the 50-year (2060) and 100-year (2110) Erosion Risk Zone (ERZ). These risk zones are adjacent to each other, beginning with the CERZ, with the 50-year ERZ landward of that and the 100-year ERZ landward of the 50-year zone. In the CERZ subdivision is prohibited as the potential for erosion and inundation hazard risk is too great. Within all CHEPA zones any new building or structure, including additions to or replacement of buildings must be relocatable, with confirmation that this can be practicably achieved from a Chartered Professional Engineer. Assessment of applications is restricted to whether there is provision for an alternative building site (within the same certificate of title), access is maintained for relocation to occur and that the alternative site remains vacant until it is required for the relocation of the building/structure. The relocation of buildings, structures and activities within these zones may be triggered when coastal erosion is within ten metres of the building/activity. The Plan states that a review

condition (pursuant to s 128 RMA) will be placed on new activities in these areas to ensure that the location of:

buildings, structures and activities within the CHEPA are reviewed when the crest of the foredune, or the top of any dune scarp, recedes to a point within 10 metres or less to the nearest part of a building or activity to assess the risk from erosion and inundation (Tauranga City Council, 2013, p. 2).

This condition strengthens and enables the plan provisions by ensuring that relocation (when necessary) is undertaken as required by the Plan. As stated by the Council, the review of conditions enables the “actual risk to be considered at that time, and appropriate mitigation measures implemented through changed consent conditions, should this be deemed necessary, including, but not limited to, requiring the relocation of any building, structure or other works to the alternative building site and/or further monitoring” (Tauranga City Council, 2013, p. 9). The review condition enables managed retreat where necessary, but provides for decision-making at the required time. It is expected that this review will be prompted through monitoring undertaken by the Council to ensure that actions are implemented as soon as required. Furthermore, when the crest of the foredune or dune scarp top recedes to a point within five metres or less from the nearest part of the building, requirement for relocation is triggered. The requirement ensures that relocation occurs once erosion is proximate to the building or structure. Once the relocation requirement is triggered, all building materials must be removed from the CHEPA (e.g. building foundations) and the old building site must be restored, to conserve the natural shape of the foredune.

In addition, a Coastal Protection Area (CPA) in the Plan is applied to future urban zoned land adjacent to the open coast that is currently undeveloped. All buildings and structures (including additions, minor buildings/structures, recreational facilities and structures in the Road Zone) are Non-Complying in this area, sending a message that development is not encouraged in this location. Within the CPA, the Plan enables future retreat of new public assets, including walkways, cycleways, boardwalks and signage, by requiring that they are relocatable or easily removed (Policy 8B.3.1.13). The plan restricts both private and public assets in the hazard zone areas, whilst simultaneously enabling continued access to the coastal marine area. Finally, for all zones within the CHEPA and the CPA, hard protection works for protecting private property and Open Space Zones are Prohibited. The Plan takes a comprehensive approach to applying managed retreat (for new use and development) through its use of risk

hazard zones, prohibition of subdivision in the area of highest erosion risk, regulations for development requiring relocatable buildings (with supporting standards and consent condition requirements), regulation over public and private assets, and the prohibition of protection works for private property and Open Space Zones within the CHEPA and CPA.

An interesting finding from Category Two includes the Operative Southland District Plan's stance on relocatable buildings:

Policy NHZ.II

To recognise that coastal erosion can be rapid and thus the perceived option of relocatable buildings is inappropriate.

Explanation: *Coastal erosion often happens during major storm events. Such events are impossible to predict and their speed of movement and severity makes the option of relocatable buildings in a coastal hazard zone inappropriate (Southland District Council, 2001, p. 102).*

Policy NHZ.II is juxtaposed to the policy and plans previously mentioned. Although much of the Operative Southland District Plan (including this provision) has been replaced by the Proposed District Plan, this provision, or one similar does not appear in the Proposed Plan, but there is no provision or assessment criteria for relocatable buildings, maintaining the stance of the ODP. This position is interesting for its distinct contrast to the approach used by many plans in New Zealand and Policy 25 of the NZCPS:

*In areas potentially affected by coastal hazards over at least the next 100 years: ...c) encourage...**designing for relocatability** or recoverability from hazard events (Department of Conservation, 2010, p. 24)*

Although the explanation to Policy NHZ.II of the Operative Southland District Plan that major storm events are difficult to predict is indisputable, the position that relocatable buildings are therefore inappropriate runs counter to the perceived utility of relocatable buildings and triggers to anticipate and manage risk seen elsewhere in New Zealand. The contrasting positions underscore the importance of assessing the nature of the risk prior to establishing policy. For example, relocatable buildings may not be appropriate in high energy, dynamic, coastal zones. These nuances highlight further inconsistencies between New Zealand policy and plans requiring greater investigation and alignment.

Category Two also reveals provisions that regulate new and re-development of land. Information gaps exist relating to the meaning of relocatable structures

and the process by which relocation will occur, when required. While some plans provide a high level of direction as to what a relocatable building comprises, when relocation must occur and how it shall be provided for, safeguarded and monitored, most are silent on these matters. It is expected that these concerns would otherwise be dealt with by consent conditions, however, it is more transparent for the requirements to be provided within the assessment criteria as part of a relocation strategy, to ensure consistent and clear guidance to both developers and the consenting regime. National and regional policy does not direct how relocation or removal should occur, under which circumstances it is appropriate, nor the need for further coastal management beyond structural relocation. This significant gap needs to be addressed by central government. The purpose of managed retreat is the strategic withdrawal of people and assets from hazardous locations over time, however, without a plan as to how this will occur, provisions requiring relocatable design are not strategic, effective or particularly enabling.

3 Policy and regulation: Structural protection work

According to Turbott & Stewart (2006, p. 60), to effectively realise managed retreat, regulation must include prohibition of hard protection works on land and in the coastal marine area. NZCPS Policy 25 requires discouragement of hard protection structures and promotion of alternatives in areas potentially affected by coastal hazards over at least the next 100 years. The textual analysis investigated plans that regulate hard protection structures, and specifically those which reference managed retreat (or related key terms). Overall, it was found that just 2/21 regional policy statements deliver policies which specifically reference managed retreat as an alternative to hard protection structures. In particular, the Proposed Southland RPS takes a strong stance to discourage hard protection structures, stating:

Policy NH.4 – Management priorities

Explanation...Physical works should only be undertaken in situations where existing development and infrastructure is unable to be relocated, i.e. managed retreat...(Environment Southland Regional Council, 2012, p. III).

Policy NH.4 does not go as far as the recommendation of Turbott and Stewart (2006) to prohibit protection works, but it does ensure that managed retreat must be evaluated as an option before such works are considered. However, as managed retreat is largely untried, and the reference is found within the policy explanation and not the actual policy itself, questions remain

regarding the strength of the provision and the likelihood of its role in enabling retreat. Without an underlying strategy or method by which planners can assess whether managed retreat is an option, and whether development and infrastructure can be relocated, this policy does little to operationalise managed retreat.

Of the 28 resource management plans that discourage, or control protection works and reference retreat, relocation or abandonment as an alternative, half state that the alternatives are something to be considered or given recognition to. Ten out of twenty-eight require alternatives to be assessed to determine whether they are feasible, practicable, or if they do not pose a greater community cost, or result in greater adverse effects on the environment. In many cases, managed retreat will result in a significant community cost, but it depends on the timeframe that is assessed as to how these costs are evaluated, in comparison to a rock wall or stop bank that may need maintenance and repair over many lifetimes. One regional plan references relocation in the context of discouraging protection works:

POL 6.6.10:

When assessing resource consent applications for river and flood control works, the Taranaki Regional Council will consider:

(e) the likely effectiveness of the river and flood control works and the practicality of alternative means of reducing flood risk, including the relocation of existing development or infrastructure away from areas of flooding risk (Taranaki Regional Council, 2001, p. 74).

This is a rare policy as it refers to flooding risk, which unlike most policies in this category, is not necessarily tied to the coastal marine area. Even without the direction of a NPS, some local authorities are using the NZCPS and applying it more broadly. The breakdown of the application of managed retreat provisions is further discussed at Section 5.2.3. Another uncommon approach is that of the New Plymouth District Plan. ‘Methods of Implementation 13.2b)’ states that resource consent for hard protection works will be refused where the developer (at the time of development) accepted the risk of the hazard event affecting that development (New Plymouth District Council, 2005, p. 83). This method sends a clear message that works to protect existing development (where the risk was known) are not encouraged and that alternative measures shall be taken.

The Nelson Resource Management Plan is unique in the way it allows temporary coastal protection works (with a duration of less than five years) if the works are removable, will result in no permanent adverse environmental effects

and are temporary. This allows time to formulate and implement a plan to remove or reduce coastal erosion risk without further use of protection works. Although this policy does not enable retreat, it ensures that decisions are not rushed, which may be beneficial to retreat strategies which need time to gain community acceptance. However, as argued by Turbott and Stewart (2006, p. 46) once hard protection works have been installed, it is politically and socially challenging to remove them, and they can end up becoming the long-term option, for example at Waihi and Wainui Beaches in the North Island of New Zealand.

Finally, a robust provision was identified in the Tauranga City District Plan, where hard protection works, for protecting private property and open space zones are prohibited in the CHEPA and the CPA zones. In the coastal environment, Turbott and Stewart (2006, p. 46) recognise that the use of a prohibited activity status for protection works sends a clear message about the importance of natural character and recreation values as well as the potential impermanence of land. This policy is considered the most directive of the Category as it prohibits hard protection works at the same time as enabling future relocation of new development (see Category One).

Protection works signify the tactic of holding the line against nature, rather than adapting to changing environments. White (2013), Vandenbeld (2013) and King (2009) acknowledge that when protection measures are established, property owners may be given a false sense of security which can result in additional investment in threatened areas, producing an intensification of residual risk. Many of the planning instruments only permit the establishment of new protection structures where they are the best practicable option for the future. From these provisions, it was established that 28 plans reference managed retreat (or other relevant terms) as an alternative to hard protection structures. This approach aligns with Category One, where managed retreat, is most often (14/28) referred to as an option to be *considered*, with just a few policies actively discouraging or prohibiting such works to enable risk reduction. Ten from twenty-eight provisions require assessment of alternatives to determine whether they are feasible, practicable, or if they do not pose a greater community cost, or result in greater adverse effects on the environment. Managed retreat is likely to result in significant community costs and adverse effects, but these will depend on the timeframe and approach taken. These findings highlight the need to further investigate the tools for assessing risk management options, with

particular regard to be had toward assessing costs and benefits over the short, medium and long-term, ensuring that costs and benefits that are more difficult to quantify, are not disregarded. Multi-criteria analysis is recommended by MfE (2017a) to avoid such bias.

4 Policy: Local infrastructure retreat

Local authorities have a responsibility for providing good quality local infrastructure and local public services to communities under s 10(b) LGA. Infrastructure includes assets to be used to provide services by or on behalf of the local authority, for activities including; water supply, sewerage and treatment and disposal of sewage, stormwater drainage and the provision of roads and footpaths. Ongoing viability of residential and commercial development depends on infrastructure provision and maintenance—infrastructure removal could result in de facto retreat. In certain areas, increasing hazard risk means that some local infrastructure will require relocation or significant investment in hard protection works. Roads are particularly important, providing connectivity within and between settlements, being the main location for key services including water, wastewater, electricity and telecommunication supply, and their association with pedestrian space and stormwater drainage. The sunk investments of existing infrastructure networks calls for strategic management to avoid path dependency, taking into account changing risks and long-term costs.

In total, only six local authorities refer to managed retreat specifically as an option for infrastructure risk management. In addition to this, ten resource management plans included infrastructure with other structures or development as a consideration for potential hazard risk mitigation or as an alternative to hard protection measures (Categories One and Three).

The Franklin District Plan 2000 (October 2012 Update), considers the option of managed retreat of the Seabird Coast road as a ‘future planning option’ particularly in areas where the road is less than 50 metres from the sea (Hauraki District Council, 2000, pp. 7-3). No further direction is provided. Objective 3.8.3C of the Proposed Gisborne RCP takes a much broader approach to considering managed retreat, stating that regionally significant infrastructure must be maintained by appropriate protection mechanisms, including the option of relocation where feasible (when threatened by natural hazards). This objective provides some direction to asset managers and planners, however, like many of

the policies discussed, further elucidation is required on how to assess when and where retreat may be 'appropriate'.

The Proposed Invercargill District Plan 2017 (Appeals Version) provides a method for initiating environmental advocacy to include "promoting long-term strategic withdrawal of key infrastructure and services from hazard prone areas where this is technically viable" (Invercargill City Council, 2017, pp. 2-47). This implementation method is in line with the managed retreat literature as it is promoting relocation over time and incentivising both public and private asset retreat due to the removal of key infrastructure and services from hazardous locations. However, it is limited, being non-statutory, simply signalling the option of relocation to developers, infrastructure providers, and the public.

Policy 2.4 of the Draft Nelson RPS 2016 states that infrastructure provision, capacity and upgrade in areas subject to high risks from hazards should be avoided, unless it is part of a comprehensive plan that addresses the long-term resilience of the asset (Nelson City Council, 2016, pp. 46-53). The anticipated environmental results of this policy include a combination of planned retreat and mitigation measures for infrastructure in high hazard risk areas. It is intended that this policy will be implemented through the 30-year Infrastructure Strategy, asset management plans, and resource consents. How this occurs is a matter for further investigation.

Finally, the Canterbury Regional Coastal Environment Plan 2005 (updated 2011) prohibits the construction of a new road or railway within Hazard Zone 1 and the Palmerston North District Plan 2000 (including Plan Change 15D) deems the development of any new Critical Infrastructure within the Flood Protection Zone as non-complying. Similar to the development regulations of Category Two, these provisions prevent new assets and potentially, activities from becoming established within the identified hazard zones, ideally resulting in a change in land use over time.

Overall, this review establishes that there is a low level of direction for managed retreat of infrastructure in RMA policy and plans, with very few instruments considering, promoting, facilitating or requiring the approach. A general lack of direction for managed retreat is appearing as a theme, as well as inconsistencies between approaches, and an absence of guidance to support policies that recognise retreat but require an assessment of its 'appropriateness'. Nevertheless, further investigation of infrastructure strategies and asset

management plans may prove that there is greater provision for infrastructure retreat outside of the RMA (see Section 5.3).

5 Extinguishment of existing use rights: Damaged or destroyed structures

The RMA delegates to district councils the responsibility to control the effects of activities on land. Control is exerted through district plan policy and methods. As plans are updated and new regulations are applied, some activities may no longer be consistent with the provisions of the current plan. However, s 10 RMA provides for 'existing use rights' and allows the continued use of land that contravenes a rule in a district plan or proposed district plan, if the activity was lawfully established before the rule became operative or before the plan was notified and if the effects produced by the activity are the same or similar in character, intensity, and scale to those which existed before. Therefore, rules in district plans cannot control activities which have existing use rights. This is a barrier for territorial authorities attempting to implement managed retreat as structures in hazardous zones may remain in place without mitigation controls until sufficiently significant changes are made to the structure.

However, there is still some capacity for local authorities to control existing activities where necessary. Under s 20A of the RMA, regional councils can extinguish existing use rights through the incorporation of new rules in regional plans, using their functions mandated by s 30 of the RMA. Therefore, any existing activity that was previously permitted may continue **until** the proposed plan becomes operative if the circumstances provided in sections 20A(1)(a) to (c) exist. The first regional council to make use of this power (in the context of natural hazard plan provisions) was Canterbury Regional Council, with its Regional Coastal Environment Plan 2005. Rule 9.1b) of the Canterbury RCP permits the reconstruction or replacement of habitable buildings damaged or destroyed by action of the sea, provided the site has not eroded to less than 450m², the building is to be replaced/reconstructed with similar specifications, the building is not positioned further seaward than before and the floor area does not increase (Environment Canterbury Regional Council, 2005, p. 140). This rule sends a clear message that compromised buildings may not be able to be rebuilt under existing use rights. However, this approach could be seen as maladaptive, as provided the land area is not reduced to less than 450m², no adaptation to existing or escalating risk is required to increase resilience against future hazard events and the impacts of climate change.

Another plan to adopt this approach is the Draft Northland Regional Plan 2016. Rule C.2.7.1 states that rebuilding of materially damaged or destroyed buildings in a high risk coastal or flood hazard area is a restricted discretionary activity (resource consent is required and it may be accepted or declined) (Northland Regional Council, 2016a). The activity status and matters of discretion are different and slightly more stringent than the Canterbury RCP, being the ability to design and construct the building to *ensure* natural hazard risk is reduced (compared to before damage to or destruction of the building occurred), the potential to exacerbate *existing* natural hazard risk and the ability to avoid increasing risk on other property (Northland Regional Council, 2016a). If space allows, the best way to *ensure* risk is reduced is likely to be retreat. Of material interest to this research (but unclear at this point) is the method to be applied by the council to assess the rebuild potential to exacerbate existing natural hazard risk.

A regulatory approach mandating rebuilding lacks elements of precaution as the provisions come into force following significant damage to assets and potential loss of human life. However, these provisions are still important tools for enabling retreat, particularly where community acceptance and social memory is low. Reactive retreat is not a preferred option but, in some cases, it may be the only way to avoid future risk to people and assets (following destruction). In saying this, the provisions in these plans may not necessarily result in retreat if the standards can be achieved.

6 Distinct policy and regulation

Categories One-Five have referred to provisions that can be collectively reviewed and categorised under specific approaches. The following discusses ad hoc policies that work to enable managed retreat in unique ways. First is the Waikato RPS 2016 ‘Coastal development setback (existing development)’ policy:

Regional plans shall identify the circumstances when it is appropriate to require existing development along the coast to be relocated, and shall include provisions for this relocation, to be sufficient distance from the coastal edge to allow for the following:

- a) preserving natural character values;*
- b) avoiding natural hazards;*
- c) protecting the values associated with marine water quality;*
- d) maintaining and enhancing public access to public areas; and*
- e) natural functioning of physical processes, including the ability of natural features such as wetlands, beaches and dunes, to migrate inland, and including the projected effects of climate change* (Waikato Regional Council, 2016, p. 93)

This is a unique policy as it is the only RPS to **require** regional plans to identify the circumstances when retreat shall be implemented, potentially in an anticipatory manner. While other regional councils have been reluctant to extinguish existing use rights, this is a possible outcome of the RPS via implementation within the RCP (Berry & Vella, 2010). This is a highly directive provision, emphasising the potentially strong role available to regional councils in enabling managed retreat. The extinguishment of existing use rights would be tested against s 85 of the RMA. In any such contest, the key issue will be “the level of risk which is posed to a particular property (supported by scientific information) and whether it could be considered ‘reasonable’ to build [or continue residential activity] on that property given that level of risk” (Berry & Vella, 2010, p. 36). As the Waikato RPS is a new document (2016), the Waikato Regional Council has two years (from the operative date) to give effect to this provision, a process that remains ongoing in 2019.

The Bay of Plenty Proposed RCP 2015 requires coastal hazard policy implementation to include the Regional Council proactively working with territorial authorities and landowners to **identify and implement** actions (which may include managed retreat) to adapt over time to the effects of sea level rise. This is a unique non-regulatory approach whereby the local authorities work with the community to determine and enact the required actions to combat sea level rise. This approach is signalling early consultation with affected parties and reflects an inclusive and transparent process which is likely to be more acceptable to local landowners, displaying attributes of equitable governance.

The Timaru District Plan does not provide a comprehensive approach to enabling managed retreat, however it does include a policy to encourage relocation of household units from the most hazard prone locations. The explanation suggests that Council will assist in investigating the options for relocation of dwellings or in finding safer alternative sites for landowners. If appropriate sites are found, the plan states that the Council shall “promote District Plan changes to facilitate obtaining of consent for that land” (Timaru District Council, 2005, p. 4). This is a useful approach to facilitating managed retreat by ensuring that land is available for people to move to. It is clearly stated that the Council will not make direct financial contributions for such relocations. This approach is non-regulatory, aiming to provide options to community members who are considering moving voluntarily.

The Waitomo District Plan does not have retreat policies for natural hazard or climate change risks within the Plan, however it features facilitation of managed retreat in the Te Maika Zone Structure Plan (Figure 13). Section 14A.6.1 of Te Maika Zone Structure Plan sets a coastal erosion benchmark line (red annotation) to trigger relocation of the existing dwellings on Te Maika Peninsula. The Structure Plan states that when any 'back' in Cluster 9 is determined by Council as threatened by coastal erosion (with reference to the coastal erosion benchmark line), the building shall be relocated to a safe location at the expense of the building owner (Waitomo District Council, 2009, p. 56). To facilitate this process, the Plan enables permitted activity status (with conditions) for relocation within the building site or to another residential cluster within the Structure Plan. This management approach was developed and implemented in conjunction with the Te Maika Trust and the owners of the houses, a unique approach using a Structure Plan.

In summary, this category has highlighted some unique approaches to enabling managed retreat. These approaches include assisting with privately funded managed retreat,

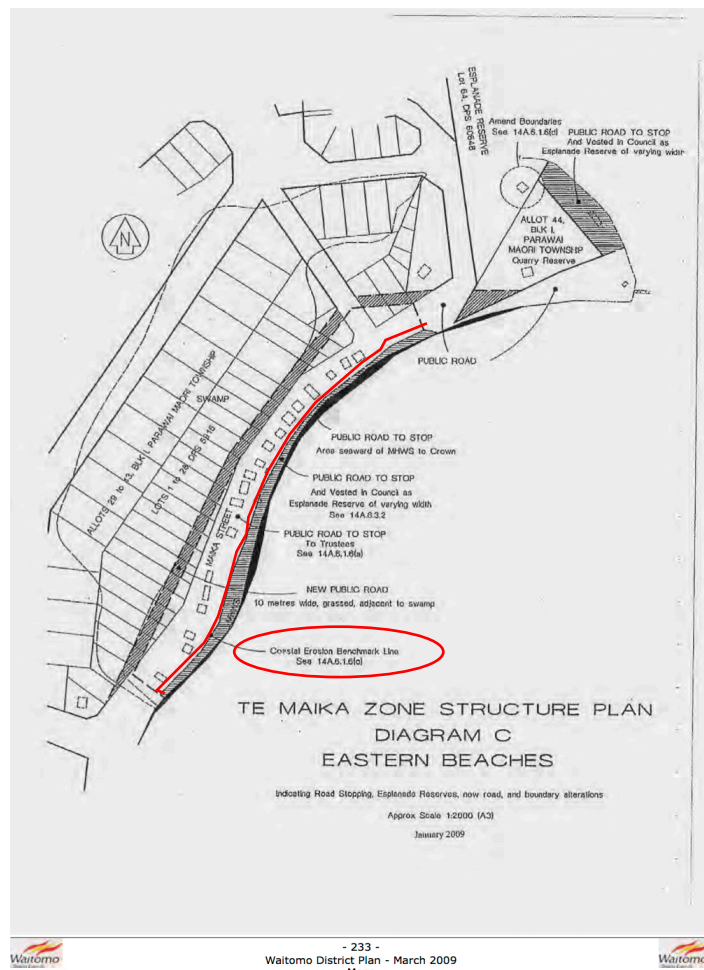


Figure 13: Te Maika Zone Structure Plan Diagram C Eastern Beaches. Source: (Waitomo District Council, 2009). Annotated by Hanna, C.

undertaking community engagement to consider management options, facilitating managed retreat by requiring thresholds within a regional coastal plan, and setting regulatory triggers to ensure managed retreat occurs, within a structure plan. The use of community strategies, investigation of alternative sites and the use of a structure plan to enable anticipatory managed retreat are rare

approaches identified by the analysis. The Waikato RPS is a bold step in the direction of enabling managed retreat, but policy implementation remains under development. What is particularly unique about these provisions is that they are attempting to enable managed retreat for existing land use activities rather than purely highlighting it as an option.

5.2.3 Provisions by type: Natural hazards and the influences of climate change

Among the policy type and content provision findings, discrepancies were also found between the types of hazards and the influences of climate change that managed retreat is applied to. Estimates for the global impacts of climate change with regard to sea level rise in the near term (mid-century) are known with ‘reasonable confidence’, but there remains uncertainty regarding longer-term sea level rise due to differing future greenhouse gas emission trajectories (Ministry for the Environment, 2017a). In the RMA documents, there is a greater focus on hazard events, with just 13 provisions recognising the compounding and cascading impacts of climate change (generally), 25 provisions explicitly addressing the slow-onset impacts of sea level rise, and just a few detailing expected increases (>) in the frequency and intensity of flooding (six) and erosion (three). With reasonable certainty of sea level rise known to mid-century, it could be expected that a higher proportion of the provisions are at least considering managed retreat as an option to address sea-level rise and the “complex interrelationship with weather events” (Ibid, p. 29). However, it is recognised that the inclusion of climate change influences may be less explicit than what has been captured by the analysis. Some plans include sea level rise in their definition of coastal hazards (e.g. Tasman RMP 2014), and others include the influences of climate change such as sea level rise projections from IPCC assessments in the development of hazard zones (e.g. Hawke’s Bay RCEP 2014), thus integrating climate change and natural hazards.

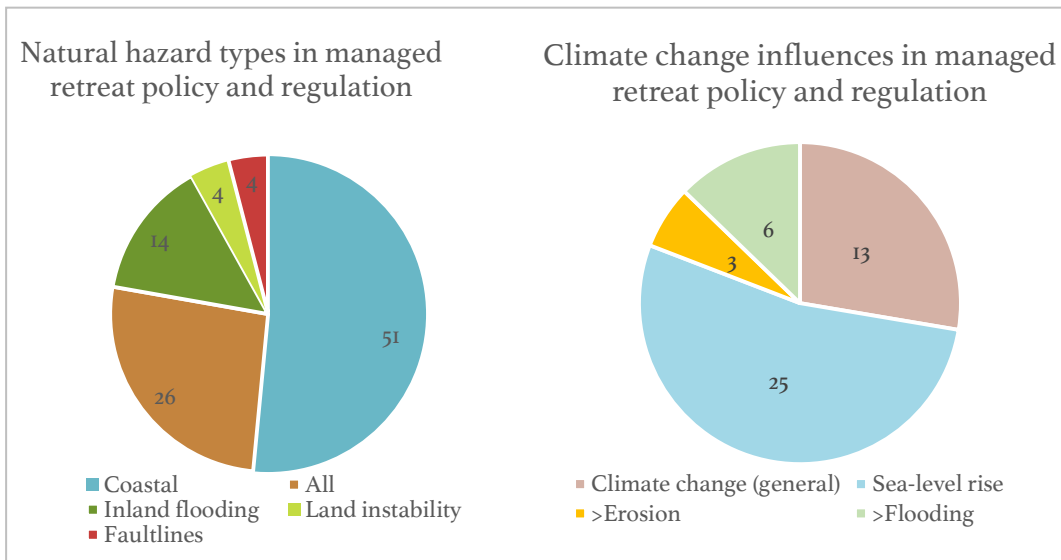


Figure 14: Natural hazard and climate change influences in managed retreat provisions

As depicted in Figure 14, most provisions are targeted at managing coastal hazard risks. Many plans consider ‘all hazards’ when applying managed retreat policy and rules, however it is clear that there is a coastal hazard focus for managed retreat in New Zealand, underscored by further recognition that the ‘all hazards’ approach encompasses coastal hazard risk management as well. Particularly within the proactive approaches recognised in Category Six, and the relocatable building, and hard protection structure provisions, it was found that there is an exclusive coastal hazard dominance. This dominance is likely due to references to managed retreat within the NZCPS, which requires that responses to climate change such as managed retreat are considered (Objective 5), and that changes in land use that reduce the risk of adverse effects from coastal hazards (including managed retreat and designing for relocatability or recoverability), be encouraged (Policy 25) (Department of Conservation, 2010). Managed retreat provisions may predominate in coastal locations due to the slower emergence of some coastal risks influenced by gradual sea level rise, where adaptation over time allows for actions to be taken as required. However, for event-based hazards such as earthquakes, if there is a high probability of a high impact event, retreat is most beneficial at the soonest time practicable, to avoid disaster. Therefore, a more active strategy is necessary to avoid harm to life and assets. In these cases, resource management plans may not be sufficiently dynamic to provide the necessary outcomes to achieve this, which helps to explain why non-coastal hazard provisions have reduced presence. The disparities found, and limited climate change adaptation focus signify the need for further research into other avenues for enabling managed retreat in New Zealand. To broaden the RMA

analysis and address this gap, examination of non-RMA instruments was undertaken, discussed in Section 5.3.

5.2.4 Summary of RMA findings

Sharp and Richardson (2001) argue that the struggle between different economic, social, and environmental discourses often dictate the nature of policies. The textual analysis identifies a range of dominant discourses emerging, particularly in Categories One and Three. Of the dominant discourses used to describe the movement of people, assets and activities away from harm, 'relocation' is the most established and widespread of all the terms investigated, with managed retreat dispersed in small numbers across the more recent RPS and a few regional coastal and district plans. This may be the result of the lack of effective national direction for managed retreat, or its relatively new exposure in the policy and planning fields. A further factor that may contribute to this position is negative associations with managed retreat and what it means for people and communities. Managed retreat is often considered a 'provocative term' (Reddish, 2015) which elucidates how policies may be side-lined or a softer discourse used for public and political communication. The discourse used may reflect public acceptance of policy approaches in New Zealand, however managed retreat also has the potential to slide under the radar as it is a term that is not consistently or comprehensively defined. This gap can be attributed to a lack of guidance and resulting confusion as to what managed retreat means, particularly as an umbrella term that can be applied across a range of temporal and spatial scales, using a variety of instruments.

The textual analysis made it apparent that although managed retreat has made its way into the policy arena, there are few circumstances where a comprehensive and coordinated strategy is enabled or defined. In most cases, as with relocation and abandonment, managed retreat is merely referenced as an option with no further explanation or implementation pathway. There is a significant absence of clarity around the key terms searched, firstly due to a lack of suitable definitions, and secondly due to the unique terms used. From 150 documents, it was found that the Hawke's Bay RCP provided the only clear and comprehensive definition of managed retreat which can be adapted to apply to all natural hazard and climate induced risks:

Managed retreat: Any strategic decision for the coordinated removal or relocation of public and private assets at risk of being impacted by

the effects of natural hazards and/or climate change. (Adapted from: Hawke's Bay Regional Council (2014))

This definition recognises the strategic, coordinated nature of 'managed retreat' whilst explaining that it can occur via removal or relocation of assets. The definition separates itself from pure relocation as it is planned and implemented in a deliberate, coordinated way, whereas relocation may occur in an impromptu or isolated manner. Further work is required to define managed retreat in New Zealand policy and plans to enable a clearer understanding of what is expected to occur under such a policy. Fundamentally, managed retreat encompasses a range of approaches to achieve risk reduction, underpinned by principles of working with, rather than against nature.

Implementation guidance within plans is an indicator of plan quality (Baer, 1997; Godschalk & Berke, 2009). Such guidance was generally lacking in New Zealand policy and plans, with only one plan detailing what the implementation of managed retreat would involve. Furthermore, in Category Two, better guidance is required to determine what the term 'relocatable' entails (when requiring relocatable building design), as well as providing a comprehensive strategy and imposing resource consent conditions to ensure relocation is achievable, and transpires when required. Continual monitoring of the environment and the consented land use activities is vital to ensure that adaptation occurs prior to harm to people and assets. This approach is valuable in enabling future managed retreat, however, there is still much to be done for existing land uses.

The analysis shows the tendency for relatively weak policy that may not provide a strong direction. Progressive examples were found, where managed retreat is encouraged, prioritised or facilitated, or alternatives were prohibited, and a unique structure plan requiring implementation with environmental triggers. The presence of directive provisions (although a minority) highlight the opportunity to provide greater direction for managed retreat, where appropriate. The limited direction found within resource management plans reflects the adaptation deficit that is recognised in New Zealand and abroad, which can partly be attributed to institutional and governance barriers including poor national leadership, limited local jurisdiction and resource constraints (Harker, 2016, p. 79), indicative of limits to effective, responsive and robust governance.

New Zealand's legislative framework has not been effective in curbing expansion and intensification of coastal development and settlement on flood

plains (Lawrence et al., 2015, p. 304). Development rights are generally granted in perpetuity, resulting in legacy developments which are highly inflexible to a changing environment. The responsibility to manage the effects of natural hazards and prepare communities to adapt to climate change is delegated to local government. However, as argued by Harker (2016, pp. 79-80) many local authorities in New Zealand do not have the financial capacity to sufficiently map areas affected by natural hazards, let alone fund significant adaptation strategies for existing development, particularly when confronted with community resistance. Due to this, local authorities may favour responding in ways that provide the most cost efficient and beneficial results to private property owners in the short-term, rather than longer-term options such as managed retreat which can benefit the immediate and wider community as well as future generations. White and Haughton (2017) recognise that political propensity to privilege present generations over those in the future is a significant challenge for longer-term resilience. The consideration of broader temporal scales has been highlighted within the analysis, with a few key policies referencing that the evaluation of managed retreat and other risk reduction options be given particular regard to within a 100-year planning timeframe (Bay of Plenty Regional Council, 2014, p. 131).

On a related note, to determine whether managed retreat/relocation is an 'appropriate', 'technically viable' or 'feasible' option for implementation, it was found that 14 plans referred to the need for an assessment of costs and benefits. This alerts us to the fact that the methodologies of cost-benefit analyses used by local authorities are significant, as in many cases, they may be the principal reason behind why retreat/relocation is or is not implemented. Cost-benefit analyses forecast the impacts of a decision in the future and therefore there will always be uncertainty surrounding the estimated impacts. To be comparable, costs and benefits must be calculated and expressed in the same units of measurement and within a common point in time (The New Zealand Treasury, 2015). As a result, such an assessment may give more weight to dominant human values such as economic prosperity, as it is difficult to monetise values such as natural character and ecosystem services, resulting in policies that reflect the dominant discourse. Thus, cost-benefit assessment methods undertaken by local authorities are an avenue requiring further investigation, to assist in determining key barriers and enablers to managed retreat. Recently, the Coastal Hazards and

Climate Guidance for Local Government provides the following guidance to councils to help overcome this limitation:

Where decisions involve values that are not readily translated into monetary terms...it is expected other evaluation methodologies, such as multicriteria analyses, will be applied. (Ministry for the Environment, 2017a, p. 38)

This guidance, while non-statutory, should assist councils in seeking out methodologies that deliver more balanced social, economic and environmental outcomes.

Approximately half of resource management policy and plans in New Zealand are applying managed retreat in one or many ways. Within this group, there are indicators of strong direction for managed retreat, however many RPS and plans are delivering constrained policies and regulation with insufficient interpretation and implementation support. The dominant discourse is relocation and relocatable design of buildings, but much of the terminology and policies are inconsistently defined and applied. Some plans are demonstrating more participative processes, developing mitigation strategies, structure plans, and facilitating voluntary relocation with landowners. However, the majority are simply highlighting managed retreat as an option to be considered, with little guidance on how it will be considered, let alone implemented. The need for strong and early community engagement in managed retreat processes has been recognised by some authorities, and the withdrawn Kāpiti Coast District Plan review provides a very real example of this requirement, as well as robust scientific evidence in the policy development process. With the understanding that discourse and in particular, policy and regulation, work to shape reality, it is not surprising that managed retreat has been so rarely implemented in New Zealand to date. But these implementation gaps are not a fault of local authorities alone, as there is limited guidance from regional and national authorities in a space that is socially, politically, and legally contentious. These findings demand further research on the application of managed retreat in New Zealand, to determine whether it is being promoted or applied under other legislation, or in non-statutory instruments. The following investigation broadens the scope, to further respond to Objective 2 of this research.

5.3 Textual analysis of local government planning instruments

Other local government instruments for managing natural hazard risk include long-term plans, asset management plans, reserve management plans, and non-statutory plans and guidelines (The RMA Quality Planning Resource, 2016b). The second textual analysis entailed a national review of non-RMA instruments, using the same process of document collection, review, interrogation and reduction applied in the former analysis. The evaluation methods differed slightly as many of the instruments are high-level guides to direct resource management policy and regulation. Therefore, many require a greater level of detail and implementation through a statutory plan (such as a district plan). The general inductive approach resulted in a more condensed evaluation framework, with just one category emerging (Figure 15) to determine the level of direction afforded in non-RMA instruments, delineated on a spectrum of limited to active. Documents were coded according to the four levels of the framework; consider, promote, facilitate and require.

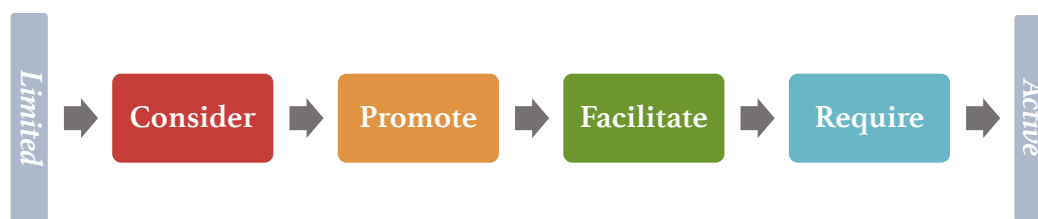


Figure 15: Non-RMA instrument direction setting framework

Across New Zealand, it was found that infrastructure strategies, asset management plans, structure plans, management strategies, spatial plans and a resilience plan reference managed retreat (and related terms). Additional documentation found during the data collection phase discovered that some local authorities are currently undertaking work to incorporate managed retreat into their RMA and non-RMA documents in future. These projects help to recognise instruments that are not yet developed and will be further discussed at Section 5.3.4.

5.3.1 Terminology

Local government plans and strategies were interrogated in search of key managed retreat terms. In contrast to the RMA documents, it was found that the most prevalent terms were managed retreat/retreat/planned retreat and relocate/relocation. In two circumstances, 'soft-engineering' was used as a reference to 'relocation' and 'managed retreat', and 'realign' was used once regarding the relocation of stopbanks in an infrastructure strategy. Seventy-nine per cent of the

documents referencing ‘retreat’ were published in the last five years and sixty-two per cent of those referencing the term relocate were published in this period (2012-2017). These figures support the assumption that more recent documents are using the managed retreat terminology. There is a correlation between the common use of ‘managed retreat’ in RPS and non-RMA documents due to their more strategic approach, as well as their more recent publishing dates.

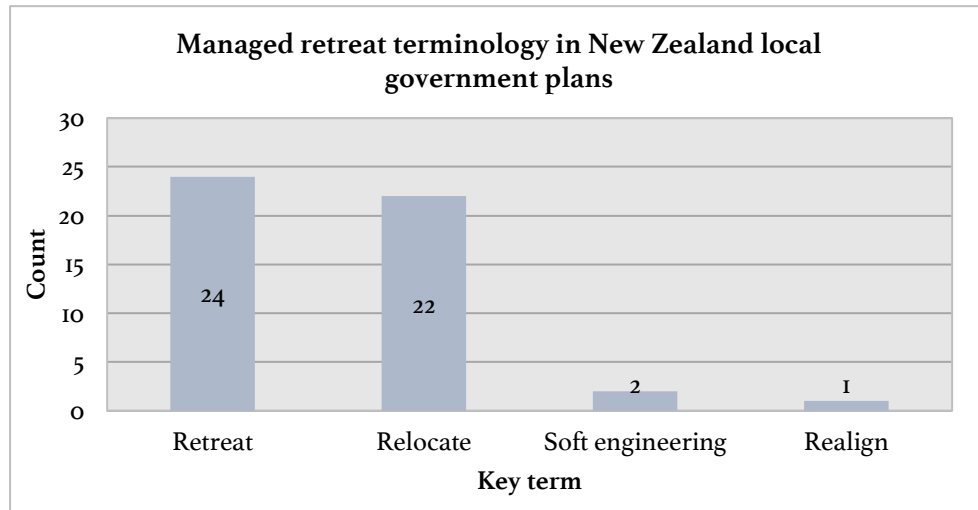


Figure 16: Managed retreat terminology in local government plans

Two documents that referenced the key terms provided definitions. The New Plymouth Coastal Strategy 2006 and the Wairoa Coastal Strategy 2004 provided the following:

Glossary: Retreat (from hazards)

When a community, infrastructure or property is at risk from a coastal hazard (managed) retreat involves moving away from the area of risk, as opposed to other hazard management options including promoting natural buffers, constructing structural defences or designing buildings to minimise the likelihood of damage (New Plymouth District Council, 2006b, p. 66; Wairoa District Council, 2004, p. 81).

This definition is not quite as well formulated as the Hawke’s Bay RCP version, however it provides more clarity to plan users on the meaning of managed retreat than an absent definition. When reviewing the non-RMA documentation, a non-hazard application of managed retreat was uncovered, demonstrating the need for further clarification of the term. The South Taranaki Infrastructure Strategy 2015-2025 referred to managed retreat as an approach to manage investments when experiencing a declining population: “In areas where demand is driven predominantly by population which may be declining there is no need for growth planning, rather potentially a managed retreat where capacities might be reduced when renewal is required” (South Taranaki District

Council, 2015). With eight different expressions and variables of these (such as planned/managed retreat) already located within the textual analyses, this finding emphasises that not only is managed retreat inconsistently applied within the hazard risk management context, it is used within other sectors to describe the withdrawal of service due to population decline, as well as often being used to describe natural processes such as shoreline retreat. The fluidity of managed retreat terms in both context and application justifies the need to provide better clarity by use of definitions.

5.3.2 Approaches

Of the 39 documents found to reference managed retreat, the majority (31) provide direction to consider the option of managed retreat, five promote managed retreat as a mitigation approach and just three facilitate its use (Figure 17 and Table 14). In no

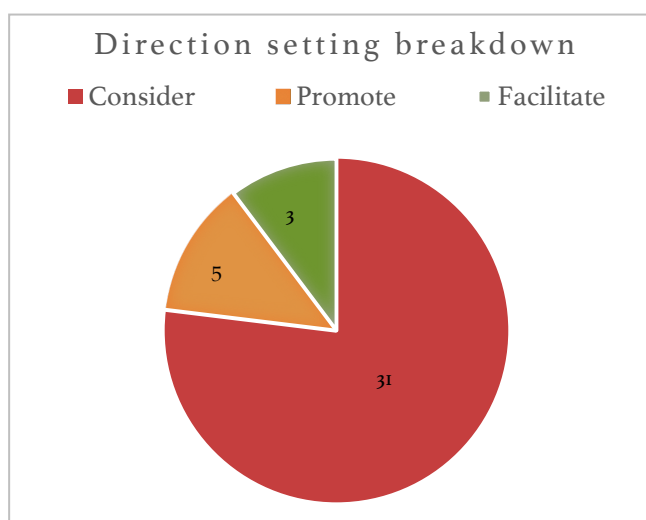


Figure 17: Direction setting breakdown

circumstance is there a requirement to implement managed retreat.

Table 14: Level of direction for managed retreat within non-RMA instruments

Local Authority	Document type and name	Level of direction
Management strategies		
Gisborne District Council	Wainui Beach Erosion Management Strategy 2014	Promote
New Plymouth District Council	Coastal Strategy 2006	Consider
Taupo District Council	Lake Taupo Erosion and Flood Strategy 2009	Consider
Wairoa District Council	Wairoa Coastal Strategy 2004	Promote
Environment Canterbury	Waihao River Floodplain Management Strategy 2004	Consider
Environment Canterbury	Pareora River Floodplain Management Strategy 2004	Consider
Environment Southland	A Strategic Plan for Environment Southland 2015	Consider
Environment Canterbury, Christchurch City Council, Waimakariri District Council, Selwyn	Greater Christchurch Urban Development Strategy Update 2016	Consider

District Council and partners		
Otago Regional Council	Milton 2060 Flood Risk Management Strategy for Milton and the Tokomairiro Plain 2012	Consider
Otago Regional Council	Learning to Live with Flooding: A Flood Risk Management Strategy for the communities of Lakes Wakatipu and Wanaka 2006	Consider
Asset management plans		
Bay of Plenty Regional Council	2014/2015 Rivers and Drainage Asset Management Plan	Consider
Kāpiti District Council	Stormwater Management Strategy 2008	Consider
Northland Regional Council	Awanui River Scheme Asset Management Plan 2015	Consider
New Plymouth District Council	Coastal Reserves Management Plan November 2006 (as amended June 2015)	Facilitate
Porirua City Council	Porirua City Reserves Management Plan 2016	Promote
Tasman District Council	Coastal Structures Activity Management Plan 2015	Consider
Waitaki District Council	Waitaki Reserves Management Plan 2014	Promote
Resilience plan		
Christchurch City Council	Resilient Greater Christchurch Plan 2015	Consider
Structure Plan		
New Plymouth District Council	Oakura Structure Plan 2006	Consider
Spatial Plan		
Dunedin City Council	Spatial Plan 2012 – Dunedin Towards 2050	Consider
Auckland Council	Auckland Plan 2012	Consider
Long-term plan		
Kāpiti Coast District Council	LTP–Parks, open space and wastewater	Promote
Nelson City Council	LTP–Tahuna Beach study funding	Consider
Tasman District Council	LTP–Coastal protection works	Consider
Far North District Council	LTP–Core risk assumptions	Consider
LTP infrastructure strategies		
Waikato Regional Council	LTP Infrastructure Strategy 2015-2045	Consider
Greater Wellington Regional Council	LTP Infrastructure Strategy 2015-2045	Consider
Auckland Council	LTP Infrastructure Strategy 2015-2045	Consider
New Plymouth District Council	LTP Infrastructure Strategy 2015-2045	Consider
Central Hawke’s Bay District Council	LTP Infrastructure Strategy 2015-2045	Consider
Western Bay of Plenty	LTP Infrastructure Strategy 2015-2045	Consider
Napier District Council	LTP Infrastructure Strategy 2015-2045	Consider

Tararua District Council	LTP Infrastructure Strategy 2015–2045	Consider
Hastings District Council	LTP Infrastructure Strategy 2015–2045	Facilitate
Whangarei District Council	LTP Infrastructure Strategy 2015–2045	Consider
Westland District Council	LTP Infrastructure Strategy 2015–2045	Consider
Nelson City Council	LTP Infrastructure Strategy 2015–2045	Consider
Environment Southland	LTP Infrastructure Strategy 2015–2045	Consider
Environment Canterbury	LTP Infrastructure Strategy 2015–2045	Facilitate

‘Considering’ managed retreat as an option is the most common approach found within the planning instruments. Most infrastructure strategies, resilience plans, structure plans and spatial plans recognised the need to consider managed retreat as a potential risk management option for the future. As high-level documents aimed at guiding development over the long-term, referencing managed retreat as a consideration is valuable to broaden the hazard risk management toolbox from the dominant legacy of protection and accommodation. All local authorities are required to produce 30-year infrastructure strategies, but only 14 reference managed retreat (or the related terms). This finding is in line with the RMA analysis, where policy providing direction for infrastructure retreat is emerging, but in a limited capacity. Many management strategies and asset management plans fell within the ‘consider’ category, which is promising for managed retreat when considering their ability to inform policy, or have an impact on management practices. However, consideration rests at the most limited end of the spectrum, and may not have much impact in enabling managed retreat in comparison to instruments that promote or facilitate its use.

Instruments that promote managed retreat provide a greater level of direction to plan users as they often determine a hierarchy or preference of management options. For example, the Porirua City Reserves Management Plan 2006 (reprinted 2016) states that for coastal reserves, “Relocation or managed retreat approaches will be preferred in addressing development in reserves subject to coastal hazards. These approaches encourage soft engineering rather than seawalls, may involve relocation or phased removal of structures (including buildings, facilities or other assets), and discourage new development in those reserves” (Porirua City Council, 2016, p. 32). The Waitaki Reserves Management Plan 2014 takes a similar approach, however, it states that soft engineering techniques such as managed retreat shall be given preference where costs of

protection outweigh the benefits to the community (Waitaki District Council, 2014, p. 54). Therefore, this approach promotes managed retreat to a somewhat lesser degree than in Porirua, as it is considered a secondary option for when hard protection does not stack up in cost-benefit analyses. The Wairoa Coastal Strategy 2004 provides a similar approach to the Hawke's Bay Coastal Environment Plan (RMA analysis), demonstrating a hierarchy of options to manage coastal hazard risk, with managed retreat as the second preference behind natural defences. As already discussed, this approach provides clear direction to decision makers by providing them with a framework to do so. The Wairoa Coastal Strategy goes further than most plans, identifying research to be undertaken to promote managed retreat of infrastructure, where required:

Identify infrastructure at risk (e.g. roading) from natural hazards and alternative locations for this infrastructure. This should include the feasibility of securing the land so that 'retreat' is available as the preferred option (Wairoa District Council, 2004, p. 14).

This approach advocates strongly for managed retreat and demonstrates forward thinking by identifying infrastructure that is susceptible and determining options for managed retreat in a precautionary manner. Compared to the general silence on infrastructure retreat in RMA plans, and the mostly limited approach found in infrastructure strategies, this plan recognises the need to actively investigate and promote retreat options to enable greater infrastructure resilience for the long-term.

The Wainui Beach Erosion Management Strategy 2014 promotes managed retreat as a response to coastal erosion. This document is distinctive, as a strategy developed through an engagement process where multiple stakeholders, including a working group have provided input to work through issues. This document promotes retreat by triggering the need for refinement of development controls in the Council's resource management plans to better avoid and reduce the risk presented by development in the area prone to coastal erosion (Gisborne District Council, 2014). Although it is close to facilitating managed retreat over the long-term, the strategy does not quite go that far:

There are locations along Wainui Beach where dwellings could be located further landward on property to reduce their exposure to coastal erosion. However, over at least the short term (i.e. next 10-20 years) this work can be left until the owners decide to replace or carry out major renovations that increase the existing building envelope, particularly with regard to any seaward extension—at which stage the development controls should ensure a more safe location. However, areas where existing houses are close to the top landward

edge of historic erosion scarps are clearly at higher risk in the event that a major storm occurs. Careful thought should be given to early relocation of these dwellings. (Gisborne District Council, 2014, p. 11)

The statement that careful thought should be given to relocation of dwellings in the high-risk areas promotes managed retreat, however the strategy fails to require action to facilitate this. Again, the following section does the same, by mentioning relocation of the surf club as one of two appropriate actions.

6.6.4 Triggers

The 8m setback from the crest of the erosion scarp is required to trigger consideration of appropriate treatments...The most appropriate action will generally be either reinstatement of the eroded dune using sand push ups or landward relocation of the surf club. (Gisborne District Council, 2014, p. 27)

Although this strategy does not quite facilitate managed retreat, it promotes it actively and delivers options for implementation to allow the facilitation of retreat through the District Plan and other instruments. It can be argued that this is the underlying purpose of a strategy, to guide management at a high level, however it is considered that greater direction on the early relocation of dwellings at high risk is necessary to be progressive in reducing natural hazard risk.

Aside from requirement, which is not present at all, facilitation of managed retreat is the least common category found within this analysis. The three examples found go further than actively supporting or promoting retreat, they establish managed retreat as a management approach. Firstly, the Environment Canterbury 30-year Infrastructure Strategy 2015-2045 details the major new infrastructure required for the life of the plan. This includes retreat of the Seadown drain, the extension of pipes inland to avoid coastal erosion impacts and realignment of the Hook Beach drain (Christchurch City Council, 2015a, pp. 14-15). By specifically determining the retreat actions required and stating the costs for this, the Council are enabling the process to occur in the future. In the national context, this approach is advanced, particularly when direction for infrastructure retreat is predominantly silent. The Hastings District Council 30-year Infrastructure Strategy takes a similar approach, stating that “financial provision has been made in the plan for Council assets at Haumoana (particular road and water supply assets) which may need to be relocated at some point in the future” (Hastings District Council, 2015, p. 200). The third instrument to facilitate retreat is at a similar scale, looking at a discrete area of land rather than

entire coastal environments like many of the documents already discussed. The New Plymouth Coastal Reserves Management Plan November 2006 (as amended June 2015) requires that the Urenui Domain:

...will be managed according to a policy of managed retreat from river erosion. As such, no management intervention will be undertaken to address erosion except to protect significant public assets such as the road. Future vegetation and structures will be placed away from the river banks. Changes in the riverbank will be monitored and assessments made of implications for local infrastructure (New Plymouth District Council, 2006a, p. 151).

This policy directly enables managed retreat by clearly stating the approach to be taken. In this case, managed retreat appears as to be fairly different to other forms considered or promoted, however it entails the principles of managed retreat (and particularly those of managed realignment in the UK) by making space for the river, to allow it to function naturally, and avoiding investments in its vicinity that will require hard protection or interference. The discrete scales being managed within the facilitate category indicate the difficulty of facilitating retreat on a much broader scale, and where private investments are at stake.

5.3.3 Provisions by type: Natural hazards and the influences of climate change

Much like the RMA textual analysis, the type of hazards that are associated with managed retreat reveal a dominance of coastal hazard policy, followed by inland flooding and ‘all hazards’ (equally) and finally, land instability (Figure 18). No faultline provisions were found in the non-RMA analysis. The RMA analysis identified hazard disparities that signified the need for further research. In turn, the non-RMA analysis follows a similar trend, solidifying the conclusion that managed retreat is most commonly applied to manage coastal risks, followed by an ‘all hazards’ approach. The non-RMA provisions demonstrated a higher proportion of general climate change influences and specific impacts of sea level rise, increased flooding, erosion and storm frequency and intensity. This is likely due to the more strategic nature of these documents, and their more frequent renewal (e.g. long term plans are reviewed every three years, whereas district plans and RPS are reviewed every ten years).

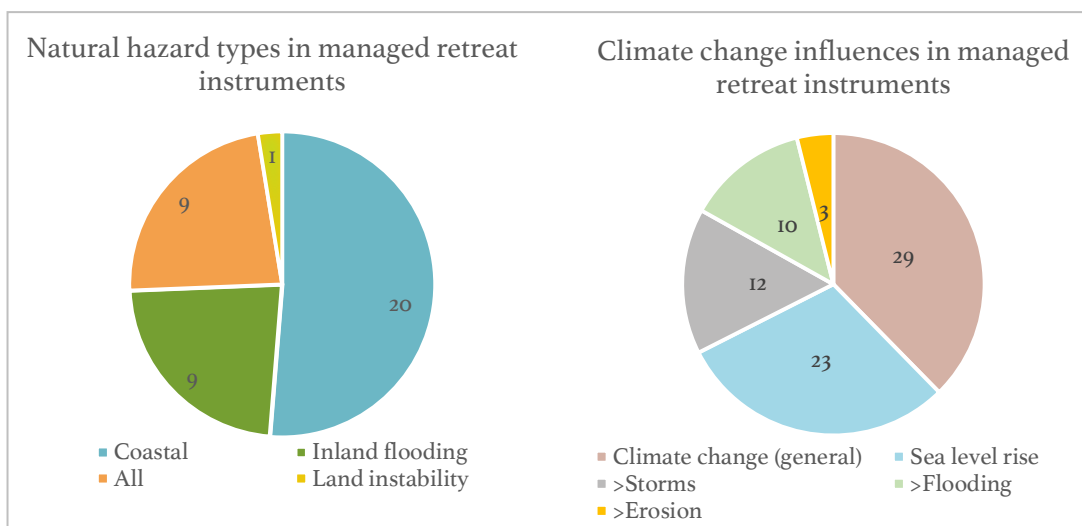


Figure 18: Natural hazard types and influences of climate change

5.3.4 Supplementary findings

In addition to the instruments located, several other council documents referring to managed retreat were uncovered, including scientific reports, issue and options papers and council projects. Although these documents were not in the initial scope of the analysis, and have not been captured by the quantitative assessments, they are useful as they help to reveal the status of managed retreat implementation in New Zealand. In particular, council projects provided insights into current work focused on achieving future managed retreat. Firstly, the Waikato District Council Sunset Beach Erosion Project 2016 aimed at facilitating the relocation of council assets at risk of coastal erosion. An assessment of possible adaptation options carried out by GHD consultants resulted in the recommendation to implement managed retreat (GHD, 2014). A community engagement process functioned to determine the type of retreat to be applied and the specific trigger points to initiate this (GHD, 2015). It was determined through this process, that if erosion continues at Sunset Beach, the community hall will be relocated to the Port Waikato rugby grounds, and beach access car parking will be retained (if possible) with new parking constructed as close to the existing car park as possible (Waikato District Council, 2016). Actions for the short, medium and long-term have been determined within the project documentation to advance the managed retreat process.

Following the catastrophic Matatā debris flow in 2005, Whakatāne District Council has been working to prepare a plan to mitigate the natural hazard risk. In 2015, Council staff worked as part of a Consensus Development Group to investigate risk mitigation options, identifying a voluntary managed retreat

option as the best way forward. The Council is currently progressing the voluntary retreat package for debris flow properties (16 occupied and 19 vacant sections) exposed to a high-annualised loss of life risk from future debris flows (Whakatāne District Council, 2016). This case study is explored in-depth in Chapter 6.

Another council project found during the document search is the Kaeo flood risk reduction project. A key initiative here, includes assisting with the relocation of people from fourteen high risk homes through financial subsidy, to encourage retreat from the floodplain (Northland Regional Council, 2013). In 2010, the Department of Internal Affairs approved \$500,000 of funding for the entire project with \$257,000 allocated to Kaeo flood vulnerable homes. By August 2016, works had been completed on 8/14 properties, including the demolition of 2 dwellings, the raising of 4 dwellings, removal of 1 dwelling and the registration of an encumbrance on the title of one dwelling to prevent use for accommodation. A variation to the funding agreement was applied for in August 2016 to include flood vulnerable homes in the Whangaroa Catchment however Northland Regional Council was not successful in this request (Northland Regional Council, 2016b). A final active project is the Hutt River City Centre Upgrade Project, (discussed in Chapter 2: Riverlink), which is at an advanced status in 2019, with property acquisitions nearly complete and resource consent procedures and ground investigations for the design of stop banks, bridges and other structures underway (Greater Wellington Regional Council, 2019b).

The textual analysis found six other council led projects that consider managed retreat to address rising sea levels, coastal erosion, river flooding, earthquake and rock avalanche hazards (Table 15). These projects are early in their respective processes, where initial scoping of a range of mitigation options, including managed retreat, is being carried out. Other authorities close to developing similar projects are Hauraki District Council and Kaipara District Council. Both councils are awaiting further hazard mapping/LIDAR information from regional councils to incorporate the data into district plans and develop appropriate mitigation methods in accordance with the level of risk. Northland Regional Council began a form of managed retreat as a reaction to severe flooding in Kaeo, however, it was waiting on the Ministry for the Environment to release the latest climate change and coastal hazard guidance to promote the development of strategies/adaptation pathways for at risk communities. With that information now public, planning and natural hazard staff are expected to

seek support to develop strategies for high priority areas. These examples provide insight to the status of managed retreat in New Zealand, but also the time required to obtain strong evidence, scope options and engage with the community before committing to an adaptation strategy or regulation.

Table 15: Council projects in progress

Local Authority	Project	Status
Waikato District Council	Sunset Beach Erosion Project 2016	Active
Whakatāne District Council	Awatarariki Fanhead Voluntary Retreat Offer 2016 (Matata)	Active
Northland Regional Council	Kaeo Flood Risk Reduction Business Case 2010	Active
GWRC, Hutt City Council & NZTA	Hutt River City Centre Upgrade Project	Active
Draft/future works		
Thames-Coromandel District Council	Currently developing a Coastal Management Strategy	Scoping
Nelson City Council	Tahunanui Coastal Erosion Study 2016	Scoping
Western Bay of Plenty District Council	Living with the Changing Tides Inner Harbour and Coastal Erosion Management Policy 2017	Scoping <i>*(Active in 2018)</i>
Hawke's Bay Regional Council & Hastings & Napier District Councils	Clifton to Tangoio Coastal Hazards Strategy 2120	Scoping <i>*(Active later in 2017)</i>
Rangitikei District Council	Whangaehu Flood Resilience Uplift Project (No formal plans—assessing options for Whangaehu, including relocation)	Scoping
West Coast Regional Council & Westland District Council	Franz Josef Hazard Mitigation	Scoping
Kaipara District Council	Waiting on hazard info	Information lag
Northland Regional Council	Waiting on MfE guidance	Information lag

5.3.5 Summary of other local government instrument findings

Overall, a small number (39) of non-RMA instruments were found to consider, promote or facilitate managed retreat in New Zealand. In line with the RMA analysis, most instruments provide a limited level of direction, considering managed retreat as an option, with little guidance on what it entails or a definition to explain. Many of the instruments considering managed retreat are high-level, strategic documents. It is considered that this level of direction is appropriate at the strategic scale, however, for documents managing smaller spatial scales, a greater level of detail and direction is necessary. Four documents promoted managed retreat above alternative options, with some making use of a hierarchical approach to prioritise actions. Two instruments took the direction further by determining implementation methods, or setting aside funds to facilitate a retreat process.

Both textual analyses highlighted that there is a lack of formal direction for managed retreat/realignment of infrastructure assets. In the non-RMA analysis, just 7/78 local authorities included managed retreat terms in their asset management plans. There was only a small improvement for infrastructure strategies with 14/78 authorities including managed retreat terms in their long-term plans. These numbers, and the overall number of 39 documents in total verifies the low level of attention towards managed retreat in local government instruments. Precluding managed retreat as an option for consideration will ensure that it remains a marginalised approach.

The local government instrument analysis resulted in supplementary findings that demonstrate the use of managed retreat outside of formal planning documents. Project documentation provided insight to the application of managed retreat in various council works, uncovering processes that are occurring outside of normal planning frameworks, such as land acquisition schemes. These findings also discovered projects early in their respective stages, being led by working groups to consider the mitigation options. To represent the status of managed retreat, Figure 19 synthesises cases where it is being actively scoped or facilitated in New Zealand, either by way of a strategy or project, combined with known cases of managed retreat implementation in New Zealand since 2000 (Chapter 2). Figure 19 does not refer to the RMA policy enablement of managed retreat as this is too complex to map, however it highlights the circumstances where practical application of this approach is advancing.

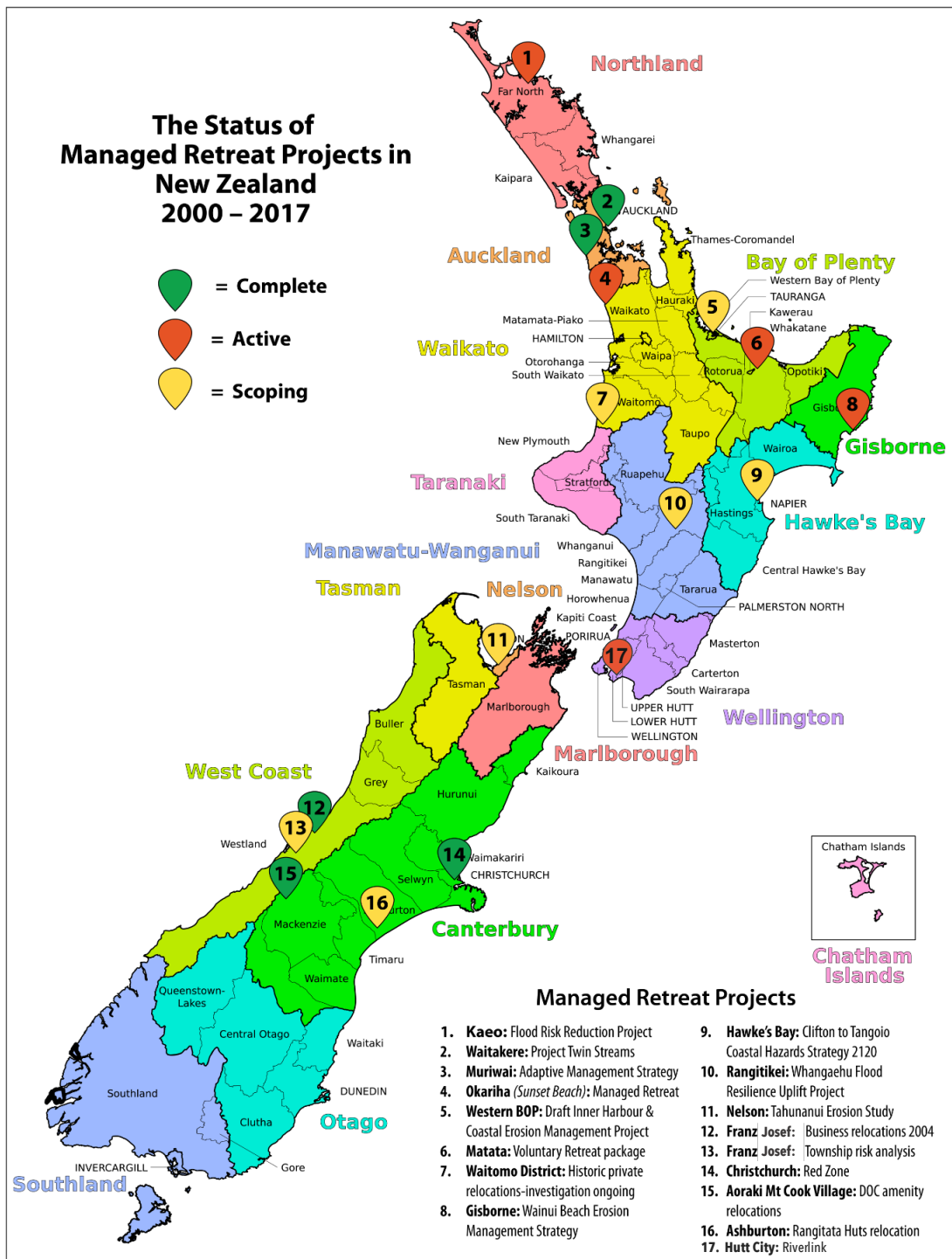


Figure 19: The status of managed retreat projects in New Zealand. Map base layer source adapted from Korakys (2017)

5.4 Summary

Chapter 5 has examined the regulatory and strategic planning instruments of the formal institutional framework for managed retreat. Keeping the numerous social, economic and political barriers in mind, and recognising that discourse and in particular, policy and regulation work to shape reality, this chapter helps to explain why managed retreat has been so rarely applied in New Zealand to date. Approximately half of RMA plans consider, promote or facilitate managed retreat by way of policy and regulation and very few other local government instruments were found to reference managed retreat. Direction and capacity for managed retreat is constrained; where it is being applied, the majority of planning instruments are delivering limited provisions to enable it. This is not a judgment of whether managed retreat should be facilitated or more strongly promoted, but a recognition of a barrier to its implementation.

Terminology analysis found that in RMA instruments, 'relocate' dominates 'retreat' but in other local government instruments the opposite occurs, although to a lesser degree. Further impacting effective governance outcomes (and essentially 'good' governance) is the lack of interpretive support which exists across all instruments, with only one comprehensive definition and explanation found amongst a plethora of variables to the term managed retreat. Not only are there numerous key terms, but diverse approaches for the enablement of managed retreat. Within the RMA analysis, five key approaches (and one distinctive category) emerged, all of which may require specific guidance for implementation. These policy categories may be of use to other researchers and policy makers investigating managed retreat mechanisms to foster learning and improve responsive governance. These include: policy to employ managed retreat for natural hazard risk management; regulation of new development; regulation of re-development/infill; policy and regulation controlling hard protection structures; strategic infrastructure policy and regulations; rebuilding regulations; and finally; a distinctive category capturing ad hoc methods. Within the categories, a wide variance in application and direction exists, but managed retreat is predominantly considered at best.

Amid terminology and interpretation inconsistencies, implementation support was also lacking in the RMA plans, particularly in Category Two(a). While some plans provided a high level of direction as to what a relocatable building comprises, when relocation must occur and how it shall be provided for,

safeguarded and monitored, most were silent on these matters. It is expected that these concerns would otherwise be dealt with by consent conditions, however it is more transparent and efficient for the requirements to be provided within the assessment criteria as part of a relocation strategy, to ensure consistent and clear guidance to both developers and the consenting regime.

Across New Zealand, managed retreat is most commonly applied to reduce or avoid the risks of coastal hazards, when it could be applied to a wide range of hazard risks. Another missed opportunity at present is the lack of attention towards infrastructure retreat across RMA plans, long-term plans and asset management plans. Overall, very few strategic or focused provisions were found. With long life spans and responsibilities to service to the public, managed retreat is a potentially significant approach to avoid harm to infrastructure and assets and the services they support.

These findings highlight concerns for the effective, equitable, responsive and robust governance of managed retreat, with a lack of direction, implementation support, strategic planning, and consistency across the nation, potentially affecting the function and legitimacy of institutions, and the fair distribution of socio-economic costs and benefits. An absence of anticipatory action, and a lack of capacity to deliver 'good' outcomes is clear.

Chapter 5 has critiqued the use of planning instruments to enable managed retreat. How directive planning for managed retreat is produced and used is the focus of Chapter 6, to examine a unique circumstance where implementation is occurring under the planning regime.

Chapter 6 Institutional deficits, uncertainty, and trust: Lessons from Matatā, New Zealand

6.1 Introduction

Chapter 6 begins by documenting the context of the primary case study, briefly covering local Māori history, the 2005 debris flow, and an in-depth analysis of key events that led to managed retreat in Matatā. Semi-structured interviews with council staff, experts, and politicians, and analysis of key risk, response, and planning documents examine risk reduction governance in Matatā, uncovering institutional, economic, socio-political-cultural, and environmental barriers and enablers to managed retreat. These



Figure 20: Case study location map

findings correlate to the themes of the literature review (Table 4). Analysis of interviews with members of the affected community further interrogates these themes, revealing key challenges experienced by those in the retreat zone and tensions between institutional constraints and private interests. Appendix 5 records the documents examined to make sense of the events that have led to managed retreat and Appendix 6 provides the interviewee list.

This case study exposes many lessons for managed retreat interventions, but essentially, the opportunity cost and path dependencies of absorptive resilience, and the risks of untested engineering solutions. Sipe and Vella (2014) recognise the profits of moving quickly post-disaster, including media attention providing awareness and donated goods and services. This research has identified that overcoming political pressures to rebuild is difficult, but something that strong national frameworks could alleviate. In Matatā, the governance network was not

sufficiently managed to avoid the long-term impacts generated by short-term decision-making. In the broad scheme, attempts at recovery and risk reduction in Matatā amount close to maladaptation. But, for some, the process has eventually allowed ‘place detachment’ where individuals and groups have considered the negative future consequences of remaining and have begun loosening their attachments and forming new ones elsewhere (Agyeman et al., 2009). However, for others, particularly those living on the debris flow fanhead, certain actions have had the opposite effect, due to feelings of alienation, uncertainty, and disempowerment, leading to legal challenge to retain property rights and resist all efforts to retreat. Fundamentally, the effectiveness of managed retreat governance is limited by weak direction, coordination, anticipation, and capacity. Stronger national policy frameworks, support, and mechanisms are required to avoid inequitable, ineffectual outcomes as a result of implementing managed retreat without operative tools, capacity, and policy frameworks.

6.2 Matatā

Matatā is a rural coastal community in the Bay of Plenty with a population of 645 (Statistics New Zealand, 2013). The socio-economic status is low, with a deprivation index of 9/10 (Department of Public Health, 2013), and unemployment at 13.7%—almost double that of general New Zealand (Whakatāne District Council, 2017a). The town has two schools and two preschools, three marae, a camping ground and a few shops. Matatā is exposed to a range of natural hazards including earthquakes, landslides, debris flows, floods, coastal erosion and inundation, with far-sourced hazards including tsunami and volcanic eruption from the Taupō Volcanic Zone (Ibid).

In Matatā, 59.9% of the population identify themselves as Māori and three Iwi, Ngāti Rangitahi, Ngāti Awa and Ngāti Tūwharetoa ki Kawerau and the Mataatua District Māori Council have ties to the area (Ibid, p.22). As recorded in *Te Rangatiratanga o Ngāti Rangitahi Inc v Bay of Plenty Regional Council* [2009] NZEnvC 35 cultural witnesses confirm that local iwi knew of significant debris flows in Matatā since Māori occupation of the land. Several major debris flows have occurred since the signing of Te Tiriti o Waitangi, the last major one in 1939, with geological evidence illustrating that there have been events both larger and lesser than May 2005 [at 4]. There has been long-term cultural occupation of Matatā, and the Awatarariki catchment and fanhead is of considerable cultural importance for many reasons. Firstly, the domain of the taniwha on the landward

side of Te Awa o te Atua (Matatā lagoon) [at 11]. Secondly, a number of Māori battles were fought in Matatā, particularly in the year 1863/4, involving approximately 700 warriors, who rampaged in the Clem Elliott Drive area, making it of significance due to kōiwi buried there. Finally, the 1939 and 2005 debris flows brought down further kōiwi, spreading them in the lagoon and Clem Elliot Drive areas [at 13 and 52].

Initial development of the Awatarariki fanhead was strongly opposed by local Māori due to the presence of a burial ground, however their appeals were disregarded due to no conclusive evidence (Brown, 2008). Participant 7 stated that the subdivision happened in the days when Council “didn’t go and consult with anyone, especially not Māori.” Participant 7 recalled:

There was this big hill that we were never allowed to play on and he bulldozed that hill out to flat—that was a graveyard...[e]veryone knew that’s where the bones were and sure enough they just came up everywhere... It was a big mess, but then it just carried on...

Participant 7 affirmed that the area is wāhi tapu and should not have been developed. Following the 2005 event, a Tūwharetoa kaumātua considered that the ancestors were angry, with much of the damage being in areas where ancestors were killed and buried (Masters, 2005). “A lot of us said, ‘that’s the ancestors, even the ones up in the valley, covering over’” (Participant 7). Not only is the area extremely sacred due to kōiwi, but the presence of the taniwha holds significance. Dr Hikuroa uncovered an indigenous legend in Matatā, known as pūrākau, which symbolises the powerful nature of waterbodies in the catchment during floods, potentially indicating why Matatā’s three marae were unscathed in the 2005 event:

The lizard is the stream, or resides in the stream, and its head is in the headwaters and the tributaries are its limbs. And the tail starts where the [Waitepuru] stream enters the flat plain...When you get floods, it naturally through centuries and millennia would flick from side to side and that was the tail (as cited in Wannan (2015, p. 1))

Indigenous knowledge can provide significant indication of environmental risks and Hikuroa (2016) argues that the presence of the taniwha is precautionary, signifying danger associated with the stream. From a traditional scientific perspective, this may be difficult to comprehend, but from a mātauranga Māori perspective, the pūrākau codifies local knowledge of the environment, including its inherent dangers (Ibid, p. 6-7). Such oral histories would have been useful prior to development, but unlikely to have been received.

The 2005 debris flow in the Awatarariki stream was catalysed by a significant amount of rainfall in the catchment resulting in severe flooding and a major debris flow. Rocks up to seven metres in diameter were transported at a velocity of 15-30 km/hr, before releasing an estimated 300,000+m³ of rock, wood debris, silt and slurry (Ibid, p. 24). The debris flow cut major transport links and caused significant damage to properties (Ibid, p. 25). With risk assessment modelling indicating a likelihood of five fatalities, it was incredible that loss of life was avoided (Ibid, p. 25). The most affected part of the community (on the Awatarariki stream fanhead) is located towards the western end of the township, consisting of 45 properties; 34 are privately owned and 16 occupied permanently.

It is expected that long-term disaster recovery can take five to ten years (Spee, 2008) yet Whakatāne District Council (WDC) recognise that some members of the community remain “severely traumatised” 13 years later (Whakatāne District Council, 2017a, p. 3). The effect of a drawn-out process is a significant theme in this case study, highlighting increased community vulnerability produced by a raft of factors, resulting in a 13 year wait to reach a solution. To understand key contributors to the 13 year wait, and eventual resolution to implement planning methods, a synopsis of the events leading up to managed retreat is required.

6.3 Key decisions 2005-2012

Following the devastating debris flow, WDC and central government developed a recovery plan with the agreed objectives of providing certainty to the community, reducing risk to an acceptable level and identifying long-term, cost-effective, sustainable and affordable solutions for current and future ratepayers (Turner & Christison, 2005). The Institute of Geological and Nuclear Sciences (GNS) determined a probability of around one every 35 years in Matatā, but a probability of a similar or larger flow than the 2005 event of approximately one every 500 years. GNS acknowledged that once in 35 years is an unacceptably high probability, especially considering the added danger of debris, declaring the risk to be “at a level widely acknowledged to be unacceptable for dwellings” (McSaveney, Beetham, & Leonard, 2005, p. 38).

In May 2005, Tonkin and Taylor (T&T) was engaged by WDC to undertake a review of responsibilities and identify regulatory risk management options. Significantly, its report stated that “recent events at Matatā would suggest that hazard identification has not been sufficient” and that in the Whakatāne District,

the extents of natural hazards were inadequately identified (Tonkin & Taylor Ltd, 2005, p. iii). While both councils had hazard identification responsibilities, these were not clearly defined. T&T considered that this lack of identification “undermined their ability to effectively manage development in hazard-prone areas” (Ibid, p.25)—an unfortunate lesson post-disaster. As later recognised by Davies and McSaveney (2008, p. 61):

Subsequent investigation of Matatā showed that it is sited on the debris-flow fans of a number of streams... A cursory inspection by anyone knowledgeable of debris flows would have identified the hazard if the question had been raised prior to the developments on the fans, but this did not occur.

While Davies and McSaveney recognised the 2005 event was a remarkable lesson in the need to identify hazards, they did not consider it the fault of WDC, as its officers had not been educated about debris-flow fan characteristics, highlighting governance capability deficits. This is an important aspect of effective governance, ensuring appropriately skilled staff are in-house to identify and manage such risks.

Further confusion around the responsibilities of the territorial authorities was apparent, highlighting governance coordination constraints. WDC sought advice on whether Bay of Plenty Regional Council (BOPRC) had a responsibility to mitigate the debris flow risk. T&T found it difficult to identify actual responsibilities, and from analysis of the RPS, considered that BOPRC had limited its responsibilities to existing flood control and drainage schemes, and that it largely passed the responsibility of natural hazard risk management to territorial authorities. However, they noted that provisions of the Soil Conservation and Rivers Control Act 1941 suggested that the Regional Council’s responsibilities lay beyond established schemes, leaving BOPRC with limited ability to pass on responsibilities (Tonkin & Taylor Ltd, 2005, p. 20). It was BOPRC’s opinion that protection of the urban area of Matatā was WDC’s responsibility (Bickers, 2012) and so WDC continued taking the lead. Alan Bickers, who independently reviewed the recovery process from 2005-2012 also considered that this should have been investigated further:

Irrespective of which local authority accepted responsibility, the estimated costs of the various options were likely to be similar and funded from similar groups of ratepayers. WDC sought to provide certainty to property owners as soon as possible and, therefore, progressed to investigation rapidly (Bickers, 2012).

In August 2005, T&T identified 11 preliminary engineering and planning options to manage the risks from future debris flows, option A1 being managed retreat, A1a including additional building floor raising and the remaining options comprising engineering protection measures. Following community consultation, WDC councillors considered the options proposed. Keeping in mind the project objectives, and the “majority” (Participant 1) of property owners’ wishes to remain on the fanhead, option A2 was selected, a debris dam in the catchment and flood channel based on it having the lowest discounted cost and lowest dis-benefits (Bickers, 2012). However, in November 2005, option A2, approved in principle, had been revised by T&T (from \$3.7m to \$5.6m) because the volume of the debris flow had been re-estimated, increasing estimated design costs (Table 16). T&T’s cost estimates allowed for contingency and risk, professional fees and contractor’s establishment, however, they did not include GST, escalation, land purchase, consents, operations, financing and project management (Bickers, 2012, p. 45).

Table 16: Tonkin and Taylor cost estimate comparison

T&T Estimates	Nov 2005 Estimate	May 2005 Estimate
A1 Retreat	\$1.75m	\$1.5m
A2 Debris dam	\$5.60m	\$3.7m
A5 Bund	\$3.45m	\$2.8m

In this view, A1–Retreat appears to be a more cost-effective solution (\$1.75m), however, when presenting the updated costs to Council, WDC’s Recovery Manager included some aspects of the factors excluded by T&T in the summary of costs (e.g. property purchase), but failed to include the estimates for project management, plan changes, financing, legal, sufficient consenting and escalation costs (Bickers, 2012, p. 46). The costs provided by the Recovery Manager and a summary assessed by the New Zealand Institute of Economic Research (NZIER) were as follows:

Table 17: WDC Recovery Manager cost estimates

WDC Recovery Manager Estimates	Capital cost	Property purchase	Annual costs
A1 Retreat	Nil	\$8.092 (2004 values)	1.123m
A2 Debris dam	\$4.590	\$0.302m	\$0.845m
A5 Bund	\$2.050m	\$4.215m	\$1.098m

Table 18: New Zealand Institute of Economic research cost summary

NZIER Summary	Discounted Cost	Discounted Benefits	Net Benefit
A1 Retreat	\$13.86M	\$2.28M	-\$11.58M
A2 Debris dam	\$7.94M	\$2.94M	-\$5.00M
A5 Bund	\$10.63M	\$1.76M	-\$8.87M

A key barrier to the selection (or further investigation) of retreat is recognised by Bickers (2012):

...notwithstanding legal advice of its lack of any clear obligation to do so, WDC assumed that under a “retreat” option that it would be required to purchase affected property. That was a significant assumption which had a material effect on which of the mitigation options was preferred (p. 8).

If costs of property purchase (\$8M) had been excluded from the economic analysis, it is clear that Option A1 would have been the preferred option on economic terms (p. 47).

In a post-disaster situation where buildings have already been damaged or destroyed, managed retreat is often more achievable, and efficient. The possibility for retreat without full compensation clearly existed following the event by allowing the EQC and private insurers to manage the majority of compensation within the scope of their contracts.

This is not to say that full compensation is not required for managed retreat. However, had further investigation been carried out on the range of retreat options and funding agencies, or as to be further examined, better engineering risk assessment applied, managed retreat may have been more favourable at the beginning, and the 13 year wait reduced. In this circumstance, cost, ‘bounce-back resilience’ and an assumption of a fully (council) compensated retreat were significant initial barriers to managed retreat. Further to this, Bickers (2012) noted that while some of the project risks were highlighted in the Recovery Manager’s report to Council, the potential engineering risks of option A2 were not. Although T&T outlined the limitations of cost estimates and potential engineering risks, these factors were “possibly not fully appreciated by WDC in its policy response” (Bickers, 2012, p. 8). As it will unravel further in this story of events, in hindsight, these risks are key contributors to extended uncertainty and part of the reason managed retreat has emerged as a last resort.

Following the resolution to go ahead with Option A2, the Ministry of Civil Defence and Emergency Management provided a grant of \$2.890 million for project costs and WDC budgeted \$3.558 million (Whakatāne District Council, 2017a). WDC considered issuing dangerous building notices to avoid people reoccupying their properties and applied to the Department of Building and Housing for a Building Act determination to help inform its considerations. However, in 2006, Determination 11912 from the Department of Building and Housing (DBH) reversed WDC’s intended decision path as it did not consider

that the estimated 200-500-year return period for triggering the high intensity rainfall event sat outside of the 'ordinary course of events'. This assessment became the basis of Council's subsequent administration of the Building Act (Whakatāne District Council, 2017a) meaning that by 2012, six homes had been rebuilt on the fanhead, subject to ss 71-74 of the Building Act and under the assumption that the risk would be mitigated.

With the budget approved, T&T began designing a debris earth dam, but community and iwi opposition saw that concept reviewed in July 2008. Mandated iwi representatives expressed strong opposition due to the potential to destroy burial caves, their preference for managed retreat, visual effects, increases in rates arising from the structure and ongoing maintenance costs (Te Rūnanga o Ngāti Awa, 2009). An alternative 'flexible ring net' debris detention structure concept was later approved by Council and a resource consent application was submitted in 2010. However, in 2011 peer review of the ring net raised concerns due to the scale of the project being internationally unprecedented, scenario modelling incompatibilities and safety and maintenance issues. In January 2012 T&T met with WDC's Chief Executive to express concerns about the maximum life span of the proposal (being only 50 years), its viability and mounting costs of the project, which by then, were estimated as ranging from \$5-7 million (Bickers, 2012). Subsequently, CPG New Zealand Ltd reviewed the project, concluding that there were inherent risks in applying an untested engineering solution, not to mention the cost of removing debris, estimated at \$5 million on top of the multi-million dollar project costs (CPG New Zealand Ltd, 2012, p. 18). With the expectation of reduced risk, new development could be anticipated on the fanhead. Should there be an event larger than 2005, or the structure underperformed, human life risk could be greater with a structure than without (Ibid). CPG concluded:

As such, with a return period established in the order of 100's of years and a current building property asset value within the unsafe zone, being less than half the current projected build and debris removal costs (\$2.6m vs \$5-12M), the proposal to proceed with the scheme as detailed, does not indicate a cost benefit incentive to proceed. (Ibid, p. 19)

Not only did changes to the engineering solution mean that complete construction costs were more than double the initial estimate, but the engineering solution was not sustainable, with ongoing maintenance and recovery costs and potential for increased risk (Bickers, 2012, p. 26). Bickers'

review provided a wide range of findings and recommendations, including that WDC's financial management had been "less than satisfactory" and that the situation the Council found itself in had been "substantially contributed to by the lack of project risk management." Public criticism of poor financial management and an absence of solutions were "legitimate" (Ibid, p. 76) as at this stage, WDC had spent 91.5% of the project budget (\$5.26m), with little to show for it. Proceeding with the ring net would have resulted in final costs likely to exceed \$11m (Ibid). Had there been better estimation of risk and costs, managed retreat would have been rated more favourably in the beginning and effective risk management would have triggered a project review earlier. Bickers (2012, p. 73) could not clarify the extent to which WDC and contractors sought to manage the risks which "with the benefit of hindsight, were critical in the development of the design solution." Bickers recommended WDC adopt a formalised governance layer to provide a greater level of oversight (2012, p. 69).

Bickers (2012) recommended that WDC take no further action to progress the protection works and in December 2012, it was confirmed that there were no viable engineering solutions, leaving WDC to pursue planning options (Whakatāne District Council, 2017a). From this point forward, T&T was contracted to undertake a Quantitative Landslide Risk Assessment which concluded an intolerable level of loss-of-life risk (exceeding commonly accepted values—there is no specific risk tolerance criteria in New Zealand) from future debris flows. WDC claims it did not carry out this risk assessment immediately following the event because all efforts were being directed towards engineering works (Whakatāne District Council, 2013, p. 11). This emphasis on protection, without a comprehensive risk assessment was a barrier to managed retreat.

With intolerable risk to life ascertained and a new governance structure and project staff, WDC began declining building consents in the area, later endorsed by MBIE Determination 2016/034. WDC engaged Stimpson & Co to assist in gaining consensus between landowners and Council to determine a way forward. A Consensus Development Group (CDG) was formed, consisting of six landowners, a WDC Councillor and staff, a BOPRC representative, expert advisers and the workshop facilitators. Between March and May 2015, the CDG attended four full day workshops, considering eight options, from 'stay' to 'full retreat' including; stay and accept risk, do minimum, implement a range of collective and site-specific engineering solutions or one of the various forms of managed retreat. An initial assessment of the eight options was carried out and

results were disseminated to the community. Following the CDG workshops, the WDC project team worked to prepare the details of a proposed settlement process. The project team identified three remaining options including do nothing, status quo and various forms of managed retreat, excluding engineering solutions due to cost (Ibid). Four short-listed options were chosen for economic analysis, including the following scenarios and ‘do nothing’ as a base comparison:

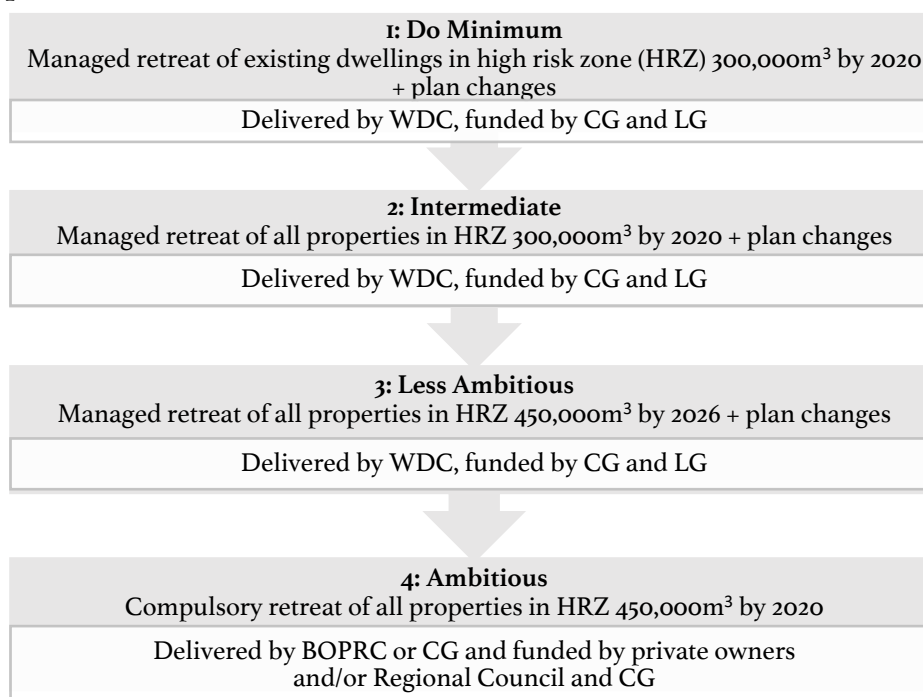


Figure 21: Short-listed options for assessment

By default, managed retreat was selected by WDC, as the do-nothing option was not supported by legal advice and the “status quo was viewed unfavourably by the CDG which left voluntary retreat with a range of variables as the preferred option” (Ibid, p. 6). The CDG believed that successful retreat would largely rest upon financial encouragement, referring to full market valuation of 2004 values.

Cost benefit analysis (CBA) and MCA were used to compare the shortlisted options. Overall, option two provided the highest proportion of benefits and was calculated as the second least costly option to deliver (between \$12.2 and \$14.2 million) recommended by the MCA summary as the preferred way forward (Whakatāne District Council, 2017a, p. 9). The initial proposals prepared were for all parties (landowners, WDC, BOPRC and central government) to meet 25% of the costs. CDG resident members rejected this because it had been over ten years since the event, and it would leave them unable to purchase a comparable property without incurring a substantial mortgage, particularly when considering the age of many residents (Whakatāne District Council, 2015).

At a similar time, policy was developing at the regional level. In July 2016, BOPRC's 'Change 2' was incorporated into the RPS. The variation introduced a risk-based approach to natural hazard management, placing responsibility on territorial authorities to map, assess and plan for landslide and debris flow risks. Significantly, the RPS classifies and defines risk according to likelihood and consequence assessments and requires high natural hazard risk to be reduced to medium levels (and low, if reasonably practicable) (Policy NH 3B). A public engagement process was a core component of establishing the thresholds, determining what level of risk the community wished to be safeguarded from and when can the risk of a natural hazard be regarded as acceptable, tolerable or intolerable. The RPS further cemented WDC's responsibilities to reduce risk to a 'tolerable' level. Should the voluntary retreat package be unsuccessful, they considered a regional plan change to be the only remaining avenue to meet their obligations.

WDC progressed to adopting the Acquisition Strategy developed by the Property Group Ltd which reflected key principles of Public Works Act 1981 (PWA) acquisitions; equivalence, liberality, ultra vires, and natural justice. The Property Group advised that confirmed funding is an essential element of meaningful acquisition, presenting WDC with a 'chicken and egg' situation (Ibid, p. 83). WDC decided that funding agencies would require financial certainty, being "unlikely to provide funding support if there is a risk of becoming embroiled in an on-going dispute" (Whakatāne District Council, 2015, p. 5). In December 2016, preliminary offers were given to property owners at individual meetings, including a non-binding registration of interest to indicate whether they wished to participate further. The proposal reflected an indicative offer based on the current market value of their property without recognition of the hazard risk, conditional upon funding support from Government and BOPRC. If funding was provided, an updated valuation would be undertaken and presented in the final offer. The purpose of undertaking the valuations at this time was to define the potential financial envelope to enable meaningful dialogue between the proposed funding agencies. This option was deemed as being voluntary, outside of a regulatory regime, however, residents were made aware that the proposal was on a one-time offer basis and BOPRC had statutory authority to extinguish existing use rights without compensation if voluntary retreat was not 100% successful. In addition to the purchase offer, a \$1,200 legal fees contribution, relocation subsidy of \$2,500 for fanhead residents, and potential

for deferred settlement of up to three years for special circumstances were included. By February 2017, 23 landowners had provided registrations of interest to WDC with 21 in support of continuing, two declining the preliminary offer and 11 non-responses (Whakatāne District Council, 2017a, p. 122).

WDC had begun formal engagement with funding agencies, but advice from the local MP was that the government wanted to “see some attempt from the district council around the plan changes—and so we proceeded with preparing our district plan change” (Participant 4). Subsequently, WDC received legal advice that the district plan changes would only address future development, not existing uses:

...on its own, the work we were doing wasn't sufficient to protect the council in the future if there was another event and people were killed... the advice was that in order to protect WDC, we needed to approach the regional council (Participant 4).

Hence, the liability of WDC became a significant driver of regulatory managed retreat. In April 2017, WDC staff formally presented to BOPRC councillors on the need for a regional plan change. BOPRC, unwilling to initiate the plan change, advised WDC that “a request for a private change to the relevant regional plan can be made” (Bay of Plenty Regional Council, 2017, p. 19). BOPRC did not wish to initiate the change, however, their planning staff assisted WDC in the preparation of it to ensure integrated management. BOPRC resolved to accept the plan change, rather than adopting it, meaning their role would be at “arm’s length and process-based with costs shared” (Bay of Plenty Regional Council, 2018, p. 6). BOPRC staff recommended limited notification of the plan on the basis that “it was not appropriate to open a discrete regional community issue up to a national audience for discussion and input...” Members of the affected community considered that notification interest was wider than those immediately affected given the potential precedent for wider New Zealand. Acting on advice from WDC that the limited notification test of the RMA around service of documents could not be satisfied, BOPRC subsequently reversed its decision, moving to public notification of Plan Change 17 (Awatarariki Fanhead) to the Bay of Plenty Regional Natural Resources Plan (WDC also moved from limited to public notification for the District Plan Change). In June 2018, Plan Change 17 was publicly notified with new objectives and policies to reduce the natural hazard risk on the fanhead from high to at least medium risk. A rule prohibiting residential activities on identified sites within the high-risk area was introduced, having effect after 31 March 2021. Changes to the District Plan to

rezone the land from 'Residential' to 'Coastal Protection Zone', to prohibit residential activities and require resource consent for any new activities were notified in this process.

6.4 Institutional barriers and enablers

With a general understanding of the process to date, one can begin to appreciate its complexity and implications for governance. From 2005-2018 certain actions described have resulted in great difficulty to achieve managed retreat in a manner that is acceptable to the community at risk. While some property owners are resolved to accepting the buyout, others (mostly those living in the high-risk area) wish to remain, at all costs. The following is an analysis of key institutional barriers and enablers experienced by project staff, experts, and politicians, organised in themes arising from the document analysis and semi-structured interviews.

6.4.1 Barriers

6.4.1.1 Post-disaster decision-making

Recovery in Matatā was emotionally and politically charged with “tension between normalcy-generated demands, to get things back to pre-disaster and mitigation-generated demands, to prevent a reoccurrence of the disaster” (Spee, 2008, p. 32). As often experienced following such events, there is a desire to rebuild as soon as possible, and therefore a focus on mitigation of risk, over avoidance. In this case, a speedy recovery was over-prioritised, thorough investigations were not carried out for all of the risk management options, particularly managed retreat. In hindsight, this was a major flaw. Had managed retreat been investigated more carefully, it is likely that the affected community could have relocated and recovered by now, not become entrenched in remaining on the fanhead, resorting to costly legal challenge, and unable to move on as many now find themselves. Participant 6 stated:

I've been led to understand through talking about it with various people that when it (the debris flow) happened, the district council basically put its hand up and said, 'we will make sure you can go back'. So, people then went back and re-built on the basis that the council promised they would be safe and then council spent far more money than it could afford to come out at the other end and say, 'oh it looks like we can't make this safe after all'. So again, part of my problem with the retreat package has been why are we even in this position in the first place?

This view highlights the politically charged rebuild mentality following the event and the lack of clarity over who was responsible for developing, leading and funding a solution for the affected residents. Participant 2 confirmed the rebuild mentality; “[e]veryone wanted progress to be made. People wanted to be able to move on with their lives. I think the Council is part of the community, they didn’t want that disruption.” As highlighted in Section 6.3, legal responsibilities should have been more thoroughly investigated and in hindsight, a more coordinated, collaborative approach at the local government level could have reduced the risks faced by WDC in depending not only on central government, but the regional council for funding and ultimately, BOPRC’s powers to extinguish existing use rights.

In addition to short-termism and political desires to avoid community disruption, protectionism was dominant, allowing continuation of the status quo. The debris flow dam and subsequent amended designs were significant structures that had never been tested at such a scale. Not only does engineering innovation present risks in terms of viability, but the planning requirements for such structures are not straightforward. A planning expert assessed the range of considerations for the structure including post-event maintenance:

*When we were looking at the resource consent for that structure, all those things started to play out... consents only go for 35 years, so in the life of this thing, we are going to have to renew this consent ten times. Do we go and find a piece of land to deposit this material and potentially hold a consent for the next 400 years?...The structure itself, the materials only had a 50 year design life, so, say over a 400 year return period, on average you might be renewing that thing eight times. So, it’s not just the first build, it’s the maintenance, the replacement and having to maintain monitoring and all of the mechanisms to enable that to be emptied...for hundreds of years.
(Participant 2)*

Participant 2 questioned whether having protection works that must continue for centuries is sustainable: “you’re giving this gift to future generations” and in the meantime, you also have increased risk by enabling development in the area. “Lack of insight into all of those things (because it takes a long time to work through)” (Participant 2) was a key lesson for dealing with significant works and the consenting and maintenance legacy they generate. The lengthy investigations required for the engineering solution yielded extended uncertainty and sunk costs for the community.

In Matatā, there was a focus on resilience with absorptive capacity, ensuring the system persisted and ‘bounced-back’ from its shock. As discussed in Chapter

2, such a focus on resilience as persistence can make adaptive (and transformative) resilience less achievable, as people attain a false sense of security, path dependencies are formed, and further investment into risky spaces make change expensive and politically problematic (Lawrence et al., 2017, p. 2)—the very situation that eventuated. The following barriers, in combination with initially uncoordinated, inefficient governance, and a focus on absorptive resilience, have thwarted the recovery and resilience of this community.

6.4.1.2 Recovery management governance

Managing disaster recovery is no easy feat, but it is vital that staff have the capacity to deal with the complexity of such projects. As recognised in Section 6.3, initial financial and risk management of the project was flawed, particularly in fully appreciating the limitations of cost estimates and the significant engineering risks involved. The governance structure lacked sufficient feedback loops to manage the various contractors, with a project review only being initiated in 2012—seven years on from the event, with nearly all of the budget spent. Participant 1 stated:

When a situation like this arises, and there's a need for rapid but robust decision-making at the early stage, you make sure decisions are in the hands of people that have a sufficient level of experience and competence. I suspect that there was some of that missing in the first instance, it was mostly done within WDC and I think they were pretty heavily influenced by Geobrugg and T&T early on...My strong personal impression was that there was quite a heavy sales job being done.

This spotlights issues of limited governance capacity in the face of a disaster, and the need to have an institutional response architecture in anticipation of shocks, to deliver strategic recovery governance. Participant 4 also recognised the technical capacity constraints of the initial project team:

A big issue was that we didn't have anybody in house in that works and services team who had a high level of technical knowledge to manage the complexities of the various engineering things. So, what happened as a consequence was the team was defaulting to external advisors, for parts of it, so there was no holistic perspective maintained and it wasn't until we had the peer review process that that happened because we brought in people that looked into the whole thing, and then we started to ask questions and the questions were being deflected from one person to another...I said, who is accountable if it fails? Which is a really fundamental question, but it was just finger pointing and that really brought it to light (Participant 4).

Even in 2009, three years prior to the independent review, the Court in *Te Rangatiratanga o Ngati Rangitahi Inc v Bay of Plenty Regional Council* [2009] NZEnvC 47 made the following comment regarding the engineering works:

[28]...Not unnaturally there is some concern both as to how such a system might be designed, constructed and maintained at reasonable cost and what the consequences might be if such a structure were overwhelmed.

Why these fundamental questions were not more thoroughly investigated following the Court decision is unclear. In dealing with a complex web of governance actors, there must be sufficient oversight of the network as a whole. Where unprecedented engineering works are being canvassed, their risks must be vigilantly assessed, thoroughly managed and clearly illuminated to the public and elected members voting on options. Pertinent lessons comprise the importance of governance coordination, capacity, efficiency, accountability, anticipation, learning, and nesting; where authority and responsibility are supported by adequate support and oversight (Bennett & Satterfield 2018) as well as the danger of underestimating innovation risk.

6.4.1.3 Inconsistent decision-making

A critical barrier to managed retreat has been the change of approach in managing risk, somewhat contributed to the two previous barriers. The change from an engineering solution to protect the locality and enable rebuilding, to managed retreat 13 years later, raises questions of negligence for residents who re-built on the basis that the area would be protected. Building consents were granted pursuant to s 72 of the Building Act, which according to Domain Environmental Ltd (2012) offers the Council protection against certain civil proceedings. Regardless of that, residents were led to believe that the risk would be mitigated and re-invested in the area as a result, causing significant stress when later told that managed retreat was the only available option. All participants have emphasised this change in approach as being a fundamental barrier to successful implementation of managed retreat which has “really soured the atmosphere between the community and WDC” (Participant 1). As it will be discussed in Section 6.6, some state that they would have relocated if absolutely required post-event, however as they have re-built, re-established and in some cases heavily re-invested, many are unwilling to leave.

6.4.1.4 Science communication

In 2015 WDC created the CDG to determine the preferred planning solution. Essential to gaining acceptance for managed retreat is gaining acceptance of the science. Participant 2 acknowledged that “one of the challenges is the actual risk assessment work, it’s incredibly complicated, it’s very hard to communicate, you know, some people, they just don’t believe it.” It is difficult when there has been disagreement between experts, which in the case of the engineering option “sort of suspended belief a bit” (Participant 2). Nevertheless, Participant 2 considers there are ways around this governance barrier, to build trust in the science and the determination of risk: “one of the things I’ve sort of advocated for, for a while, is for the Council to provide funding for experts for those residents.” Experts could include an independent engineer and planner:

[s]omeone who can give them independent advice to avoid the grievance or suspicion of the process. Someone who can map a process and say here’s what this may look like over time, this is where you’ll have to be involved and the costs....I mean the Council people can try to tell them, but it’s different. I think that if something had been done differently, it might have been that (Participant 2).

When questioned on the cost of that approach, Participant 2 argued that:

In relative terms, I think that’s very small. The benefit of doing it, I think is colossal. To me that would be best practice, if you’ve got a community that’s affected by retreat and they’re struggling to understand it, and the information is really complicated, there’s got to be an upside in the entities dealing with that to help people through that.

This is an important lesson from the case study, particularly when residents currently objecting to managed retreat were requesting a Memorandum of Understanding (MoU) with WDC to carry out independent engineering assessments at a late stage in the process (2018), as they do not accept the risk and do not consider that all of the mitigation options have been explored.

6.4.1.5 RMA jurisdiction and political acceptability

Elected officials make significant decisions for the communities they represent. At the district level, councillors are often embedded in the community. In the case of a natural disaster, these decisions come at traumatic and chaotic times with significant responsibility attached. Participants were asked about the level of political acceptance for managed retreat and how this was achieved (the majority of district councillors voted in favour of managed retreat). Participants 3 and 4 expressed it as being a journey:

It's fair to say they [WDC councillors] weren't in favour of much early on...A number of the councillors have changed significantly in their view of it over time. Even at Council level you need to socialise the issue and then build on it and it took a number of years. Which is why we have a little bit of understanding for the Regional Council because they came into at a later stage and haven't quite had that same journey (Participant 3).

Participant 4 also recognised the importance of having a tiered governance structure (post 2012) with a high-level governance oversight which “brought the political element in early.” Whilst WDC councillors had time to come to terms with managed retreat, political actors at the regional level were harder to convince:

We went to the regional council initially around joining us on the voluntary managed retreat strategy and at that point the regional council was sort of undereducated I guess around their roles and responsibilities. So, there was some political resistance to the Regional Council being involved (Participant 4).

When later consulted on the need for a regional plan change, BOPRC considered it a ‘draconian’ approach and resolved that WDC must prepare a private plan change rather than initiating it themselves. Participant 5 affirmed that although the RPS states (Policy NH 14C) that BOPRC may exercise its function to override existing use rights, “I don’t think the Regional Council has ever had any appetite to control existing use rights.” The “lack of engagement at the regional council level” (Participant 6) is a barrier to the enablement of managed retreat, however BOPRC cannot be too harshly criticised for this stance, as the step to extinguish existing use rights is severe and unprecedented in New Zealand, subject to legal and public scrutiny. In this case, the key enabler to overcome the barrier of political will and limited institutional coordination has been the Councils’ liabilities, and the guiding framework and thresholds of the RPS. Time, exposure to the issue definition, solution and implementation processes have also been important factors in the enablement of political acceptance at both levels of local government in this case. Nevertheless, there remains a lack of political will at the regional level to fund the voluntary retreat package, an essential piece in this managed retreat puzzle:

...I'm not convinced that the regional council is going to come to the party at all...It's going to be really traumatic if people they think they've got it [a buyout]and it doesn't happen. Council have raised that. We don't want to be promising people, so we are clear we haven't promised anything, but you can promise things without promising things, if you know what I mean (Participant 6).

Participant 6 identifies a significant barrier in this case. Offering an indicative buyout that is subject to funding confirmation may give people false hope and end terribly if unachievable. Section 6.4.1.7 explores these difficulties.

Mention of greater collaboration between WDC and BOPRC has already been raised, but it is likely that this would have improved the political acceptability at the regional level. It is contradictory that the RPS directs the reduction of high risk to an acceptable level, yet BOPRC refused to initiate a regional plan change to give effect to this. In saying that, it did not reject the private request from WDC. While the Awatarariki project had been managed solely by WDC up until 2017, the mismatch of responsibility and jurisdiction under the RMA, with the district council being responsible for managing the effects that arise from natural hazards, without any tools available to manage existing uses, is a significant barrier to implementing managed retreat, nationwide. Local authorities may have overlapping responsibilities in this area, but they have different tools and legislative capacities which require more integrated management in future.

The Waikato RPS (2016) has already anticipated this issue ahead of its time, providing a potential solution in the explanation to Policy 13.2 Manage activities to reduce the risks from natural hazards:

Because existing lawfully established activities have some protection under the Resource Management Act (section 10), there are limitations on how territorial authorities can manage existing development...To avoid unnecessary complications due to this overlap, the regional council will investigate transferring its functions back to the relevant territorial authority (refer to section 33 RMA). (Waikato Regional Council, 2016)

Under section 33 RMA, a local authority may transfer any one or more of its functions, duties or powers (except this power of transfer) to another public authority (including territorial authorities). It could be worth testing the transfer of powers before investigating legislative change, but this work-around still requires collaboration within local government and political buy-in at both levels. Participant 4 questions whether this is a cynical transfer of risk, accountability, and funding responsibility from a regional entity to a smaller local entity. It must be noted that where an RPS does not specify natural hazard risk management responsibilities, the obligation to avoid or mitigate natural hazard risk remains with the regional authority and therefore the functions and powers remain aligned (s 62(2) RMA).

In the case of Matatā, key enablers to overcoming the jurisdictional barrier included Councils' liabilities and the guiding framework and thresholds of the RPS which provides a strong directive that must be given effect to. Time, exposure to the issue definition, solution and implementation processes have been important factors in the enablement of political acceptance at both levels of local government in this case.

6.4.1.6 National guidance and tools

As recognised in Chapter 4, New Zealand is deficient in national guidance for natural hazard planning. In the case of managed retreat, the lack of a guiding policy framework (for all natural hazards) is significant, as it is a contentious and complex approach for planners and managers to implement. Participants involved in developing managed retreat policy consider that the key barrier to implementing it is the “[l]ack of national framework—I think that’s the fundamental one...if there had been that we could have just been down this track, straight through” (Participant 4). When asked whether a decision for Matatā could have been made sooner, Participant 2 considered that in terms of the district council, that was unlikely “[b]ecause they don’t have the powers to implement managed retreat.” Participant 2 argues that the RMA does not provide useful instruments for existing uses:

...in terms of an area that’s already developed, the tools are pretty weak, they are incredibly weak. I would have thought, that when it’s the district council making development decisions, they should really have the powers to go the other way and revert.

Not only is there no high-level framework to guide decision-making for managed retreat in New Zealand, but as recognised in Chapters 4-6, the legislative tools are blunt and constrained for managing existing uses. The lack of formal guidance has resulted in policy learning across the country, with authorities attempting to progress retreat in numerous ways, including provision of information and restriction of new and re-development through zoning and plan rules (Chapter 5). In Matatā, due to the intolerable risk to life, WDC has had to be creative in its approach, working outside of the statutory regime to develop a retreat package that attempts to compensate owners for their loss of property. As this approach is non-statutory, WDC cannot enforce it and it has no capacity under the RMA to reduce residual risk if people choose to remain. The regional council has potential to extinguish existing use rights via the introduction of rules into its regional plan. However, this approach has never been tested in New Zealand and it is likely that case law arising from this plan change will determine

the legality of the approach, and whether RMA s 85 can be applied in defence. Leaving confirmation of this mechanism to the courts presents uncertainties to authorities attempting to apply it and to affected persons. Work currently being carried out by GNS has identified that a land use consent may present a certain loophole in the ability to extinguish existing use rights, potentially causing a ‘rush of applications’ for existing use certificates under s 139A RMA (Grace, France-Hudson, & Kilvington, 2018). However, the authority could mitigate this risk by seeking a declaration from the Environment Court to ensure new rules have immediate legal effect, as demonstrated in *Tasman District Council* [2011] NZEnvC 47 (see Section 2.7.2). When mentioning the potential loophole to the regional council, the consequence of an untested framework was quite clear:

...Hmm I'm not absolutely certain about the interplay between a regional rule and a resource consent. Mmm. Geez. Because consents are 'one ring to rule them all'...The existing use rights are protection (s 10) against a rule in a district plan you can apply retrospectively, it doesn't say anything about resource consent. So, the subdivision would've been consented, but those land use consents would have been granted in perpetuity. It is a potential loophole—absolutely. (Participant 5)

WDC's legal advice, supported by MfE, contradicts this research (Participant 4). This currently leaves confirmation of the mechanism to the courts, presenting difficulties for authorities attempting to apply it.

When asked whether there should be more national guidance on managed retreat, Participant 5 stated: “Yea. I don't think central government is any wiser in this territory than anybody else. They're looking to us [Regional Council].” Not only is there a lack of a policy framework, tools and clear powers to deliver managed retreat, extinguishing existing use rights has its uncertainties in terms of timing and enforcement:

...nobody's got any appetite to be sending in bulldozers with protesters lying on the road... talking to one of our regulatory compliance team leaders he asked... 'How do you expect me to get these people out?' That's so far down the track for me that we just haven't even thought of it yet, we're a long way from being confident that we're going to get it through (Participant 5).

Among other details, the timing of the plan change has been carefully considered by planning experts and staff to try and ensure voluntary retreat is implemented prior to enforcement:

...it turned out to just be having a stab at when they thought the money might be available and nobody knows that – it's just a guess.

That's a factor that could change through the submission process.
(Participant 5).

By the way we have structured the timing, it really is a last resort...We looked at various things. One of the suggestions was you make it non-complying and it allows people to then seek a resource consent to set a departure date, which had a certain amount of appeal, but then we thought[what] if someone says, 'screw you, I'm not applying'? (Participant 2)

These details are relevant not only to this case, but to other councils intending on applying this process, regardless of the voluntary retreat strategy. As recognised by Participant 2, the RMA is not a retrospective piece of legislation, and when asked whether it requires amendment to enable managed retreat, they stated:

Yea definitely. The changes [2017 amendments] to the RMA really didn't make a lot of difference. There was a lot of hoopla about it, so councils will be a lot more focused on it—but on what? Finding out that there's a whole lot of problems but having no tools to fix it (Participant 2).

Attempting managed retreat of existing uses in Matatā has highlighted how “successive governments and the RMA have provided a high-level policy direction around natural hazard risk reduction without providing any appropriate tools in the toolbox” (Participant 4). In this case, the project team has had to overcome many barriers to arrive at and deliver managed retreat without a guiding framework. In saying that, the RPS has been a local enabler in this case, somewhat by chance of timing.

6.4.1.7 Voluntary retreat? Complications of ‘carrot’ and ‘stick’ timing

Since managed retreat eventuated (by default), WDC staff have worked towards an incentivised land acquisition package. While it is not legally required, WDC considers it has a moral obligation to “invest in retreat from high risk natural hazard situations that satisfy certain risk criteria” and that successful retreat requires financial incentive (Whakatāne District Council, 2017a, p. 56). WDC intended to pursue the voluntary retreat package before using enforcement under the regulatory framework, but pressure from central government and WDC’s liability in not reducing the risk to an acceptable level, forced the timing of the regulatory measures to be brought forward:

...early on, the feeling was that we would work through the acquisition process...and the plan change would only follow if it needed to...But that kind of shifted a bit because the other view was that the district council needs to do as much as it can do, under its

current powers... So, unless it's exhausted all of those possibilities first, why would regional and central government step in? (Participant 2)

Central government was not willing to step in until WDC had explored all of its powers under the RMA. While it may seem a logical argument from the top-down, on the ground, presenting a voluntary buyout whilst restrictive plan changes are being developed creates a sense of manipulation for affected residents. Planning experts who developed the regional plan change attempted to allow sufficient time for the voluntary proposal to operate, however it is only guess work of when (and if) funding may present itself. Unfortunately, the timing of the regulatory process has undermined the principles of the land acquisition strategy by giving the sense that it is not voluntary as residents feel trapped, with no choice but to take the offer. Clearly representing this view, some members of the community appeared at the plan change consultation wearing t-shirts exhibiting their version of the typical New Zealand Tui beer slogan for contradictory matters (Figure 22).

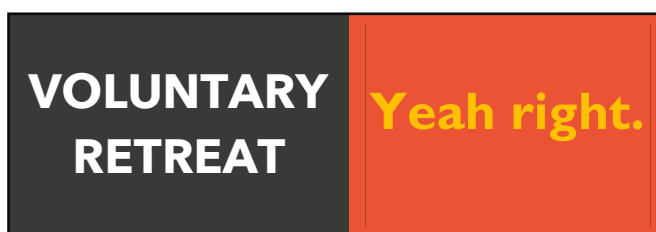


Figure 22: T-shirt visualisation

Taking a similar position to that of the Matatā residents, in *Quake Outcasts v The Minister for Canterbury Earthquake Recovery* the Court stated:

[140] It is true that the Crown did not use its powers of compulsory acquisition under the Act. However, it is unrealistic to describe the transactions that occurred as voluntary. The inhabitants of the red zones had no realistic alternative but to leave, given the damage to infrastructure and the clear message from the government that new infrastructure would not be installed and that existing infrastructure may not be maintained and that compulsory powers of acquisition could be used. [Emphasis added]

In *Quake Outcasts*, voluntary acquisition was used as a tool to reduce risk in the Canterbury red zones, but even the acknowledgement of the ability to use powers under the CER Act was seen as undermining the voluntary status of the acquisition. In Matatā, changes to the Regional Plan to extinguish existing use rights have always been implied as a last resort, however, by initiating the regulatory process so that residents must appeal the plan change before funding is confirmed for the 'voluntary' buyout results in a highly fraught situation for residents uncertain of their future and the worth of their assets. The parallel processes of the 'carrot and the stick' are somewhat in opposition, one of which is moving faster than anticipated as no external funding had been confirmed for

the buyout. As recognised by Participant 5, the regional plan change is “on a path now, it’s independent of that process.” This leaves affected residents in a tricky situation; if they do not submit on the plan change process (because they are expecting to accept the buyout) they will effectively be excluded from the statutory process of challenging the plan change; their only remaining avenue to defend their property rights. It is not necessarily the Council’s fault that this situation has arisen—WDC is working to secure funding, however, they have landed in difficulty by attempting incentivised retreat with limited capacity and resources, leaving forced retreat without compensation to be tested by the law, creating significant uncertainty for affected parties. Whether or not managed retreat in this form can be realistically deemed ‘voluntary’ is an important question for its future application. Many of the Matatā residents’ sense of threat, the lack of reasonable, alternative options, and the conclusion of the Supreme Court in *Quake Outcasts* certainly makes one think otherwise.

6.4.2 Enablers

6.4.2.1 Regional planning framework

In the absence of a framework for dealing with natural hazard risk, and particularly for employing managed retreat, the RPS, applying a risk-based approach, became operative just in time to support managed retreat intervention. The RPS is directive, requiring high risks to be reduced to medium, or as low as reasonably practicable. The timing and role of the RPS has significantly affected the enablement of managed retreat in Matatā. In 2013, WDC commissioned risk assessments and investigations for planning options at Matatā. However, the planning work was put on hold until the RPS became operative. Participant 2 discussed that a District Plan change was initially drafted but that it was important to align the policy amendments according to the RMA hierarchy to enable consistent policy frameworks:

...the RPS was still in a state of flux...That’s quite important I think, because they [WDC] thought ‘we are sticking our necks out all the time with this stuff, so we’re not going to do this cart before the horse, we’ve got changes to the RMA, RPS driving us where we need to go, and our district plan can follow that’...Whereas what it would’ve been before is a district plan change request before the RMA was changed and before the RPS came into effect (Participant 2).

The RPS timing somewhat decelerated the statutory managed retreat regime, but it also strongly supported the cause for managed retreat; “just having that policy framework in the RPS has been helpful to WDC, at the project level but also their councillors themselves have come along that path.” (Participant 5).

The framework of the RPS prescribes a methodology that allows authorities to make decisions based on risk and in taking the steps it has, WDC can say it is giving effect to it, as well as its statutory responsibilities. When asked how the risk-based approach came to fruition, Participant 5 recognised that they had been concerned since the 2004 Indian Ocean earthquake and tsunami about the lack of attention towards low likelihood, high consequence hazards;

...in about 2010, we decided to take a risk-based approach...[but] we were breaking new ground with that...A critical part of that was establishing levels of risk-thresholds for those three categories of risk... [and] the community needed to be involved in making calls about that. So, we went through a very structured, but very swift community engagement process where we got input...and that informed the makeup of the matrix that is now in the RPS.
(Participant 5)

As it is clear from the evolution of the RPS, policy learning is continually occurring, and research such as Saunders' (2012) risk-based framework is useful to enabling more responsive governance through learning and innovation, particularly whilst a national policy framework deficit exists. Participant 3 highlighted how this change in approach impacts how decisions get made:

...we looked at what we're used to doing, which is putting a line on it [map]...[but] you don't have any risk profile...if that framework had been in back in 2005, I think it would have been handled differently
(Participant 3).

While this framework provides clear policy direction, its focus on likelihood and potential consequences of risk (Policy NH1B) (and limited use under changing climate risk profiles) does not encourage action addressing the root causes of vulnerability (Section 2.4), nor the relentless drive of the private sector to develop in exposed localities, which remains entrenched. Institutional frameworks such as these influence power relations, risk perceptions, and in deciding how vulnerability, risk reduction, and adaptation are managed (Adger, 2000). In New Zealand, risk management continues to be technocratic, and 'swift' community engagement is unlikely to provide adequate recognition and participation (Bennett and Satterfield, 2018) of all stakeholder groups and dimensions of vulnerability.

6.4.2.2 Local leadership

Although some members of the community would strongly dispute this conclusion, experts who advised WDC recognised the importance of local leadership in gaining traction on managed retreat:

They've had a lot of meetings, a lot of quite difficult meetings, I've been at one or two of them and they've got professional people in to

run the meetings, they have had the risk analyses checked and double checked by outsiders, I think they have absolutely bent over backwards to do everything they can...in a very thorough and fair manner. (Participant 1)

In this case, as in many other post-disaster situations, there remain long-term repercussions of short-term decisions made immediately following the event (Sipe & Vella, 2014). Decisions made prior to 2012 have caused considerable difficulties for enabling managed retreat, particularly the rebuilding and sunk costs of the engineering investigations. Irrespective of that, the project team working on the planning solution (post 2012) has endeavoured to provide a fair solution, being creative with the few tools and resources available at this late stage in the recovery process. Many of the issues associated with managed retreat have not been due to a lack of leadership at the local level (post 2012), but a lack of guidance on managed retreat and a consequential process of learning by doing. As recognised by Participants 1 and 2, the project team has put in a significant amount of effort to deliver a sufficiently robust, inclusive, transparent and fair process, “relative to what’s involved” (Participant 2).

6.4.3 ‘Good’ governance deficits

Institutional deficits are a significant barrier to the enablement of managed retreat in New Zealand, hindering effective, equitable, responsive and robust governance (Table 1), and favouring absorptive resilience over adaptation. There is an absence of strategic response planning to support communities recovering from disaster, limited nested support (locally grounded, but externally supported action) and capacity to wrestle with inevitable strategic response choices. Governance capacity is further limited by the lack of national policy guidance, legislative mechanisms, and implementation support to manage existing land use activities. Apart from broad guidance from the NZCPS on risk reduction measures by development type (new and existing) (MfE 2017a, p. 32) there are no standard national risk assessment methodologies to determine the level of risks at which reduction actions are necessary. Furthermore, the process for funding managed retreat is ad hoc and uncertain, with potential to undermine the legitimacy of incentivised retreat. Whilst ‘voluntary retreat’ is the only tool currently available to territorial authorities to achieve (incentivised) managed retreat of existing uses, (where the Public Works Act 1981 cannot be applied) it is not perceived as being ‘voluntary’ by people and communities if it is combined with regulation to remove existing use rights or withdrawal of service. This

perception undermines trust in actors governing managed retreat, reducing its legitimacy, and emphasising the need for instruments that people consider fair.

Governance coordination and connections are weak due to a mismatch of responsibilities and jurisdiction in the management of existing land uses between territorial and regional authorities under the RMA. Clearer identification of governance roles, and greater integrated management are necessary to overcome this barrier. Early political alignment and collaborative policy development may help the political acceptability of managed retreat within local government. While regional councils are generally considered to have the ability to extinguish existing use rights, there is still legal uncertainty regarding the application of s 85 RMA, and the presence of existing resource consents as highlighted by Grace et al. (2018). It is likely that any case law arising from the Bay of Plenty Regional Plan Change 17 will provide legal clarity on these matters.

Policy learning is occurring across New Zealand, driven by local leadership. In the absence of a national framework, RPS may assist in the enablement of managed retreat where they provide a policy framework, including a community tested, risk-based approach with key risk thresholds and direction to reduce risk to 'acceptable' levels, however, addressing and assessing broad dimensions of vulnerability remains hidden.

6.5 Economic barriers and enablers

6.5.1 Funding and precedent

At the heart of managed retreat are questions of whether compensation is required, to what extent, and who carries the cost? WDC determined that while not legally required, it had a moral obligation to compensate owners for their loss of property under voluntary retreat, as well as the view that successful managed retreat entails financial incentive. Barriers exemplify governance gaps, particularly capacity to deliver on responsibilities. The lack of funds available to implement or offer a voluntary retreat that is not indicative has been a barrier, as the community do not see it as a 'real' offer and are reticent to accept something that is subject to confirmation by regional and central government. Complicating matters further is that local ratepayers have not yet been consulted on their contribution to the fund, escalating legitimacy concerns.

Questions arise with regard to setting a precedent, "[t]he worry I have is that the government see it and say, 'well we are hearing more and more of this now,

we don't want to set a precedent” (Participant 2). However, WDC has distinguished the business case to avoid this, stating that it only sets a precedent of a moral obligation to compensate where there has been a risk-based approach with community engagement to manage a situation that has no viable risk reduction solutions available, the risk to human life is intolerable and the costs to manage the risk are beyond the fiscal capability of the local authority to manage (Whakatāne District Council, 2017a). While the media has rapidly linked managed retreat in Matatā to the coastal climate change context, Participant 2 concurs that it is different:

I think it's really different to say, coastal erosion, where the real risk is to property not to people. Here we are talking about risk to life, it's quite a different package and I see that central government might have a role where there is a life risk. But...if it's just a property risk there will always be time to plan for that. For example, Councils might become active in acquiring land as it cycles through. (Participant 2).

Questions of funding and precedent are important, as not only do they present a barrier to managed retreat, but they are part of a wider governance debate relating to how managed retreat could be applied across New Zealand, and who pays? In considering precedent for land acquisition, the issue of moral hazard also arises. Participant 5 argued this stating: “I've got a sort of niggling concern of moral hazard, that the people become accustomed to being bailed out and then they'll just keep on taking risks.” In addressing this issue, it is important that land acquisition processes are clearly distinguished to avoid assumptions of compensation across the board. While it may be difficult to avoid all moral hazard risk, prerequisites, such as whether property owners knew of the risks associated with their location before purchasing can be imposed. This approach was applied in the funding model for Matatā to avoid speculative buyers profiting from the retreat package, sending a signal that the buyout is discreet, based on specific criteria.

A further avenue for precedent setting, which central government may view more favourably, relates to the collaborative contribution model proposed in Matatā. As reviewed in Chapter 2, previous buyout examples have been initiatives largely driven and funded by Government. The land acquisition process in Matatā is a multi-agency solution that was developed at the local level. Should there be a precedent set for funding managed retreat, Matatā prescribes a funding model that is spread across local and regional ratepayers and national taxpayers.

6.5.2 Property valuations

The Property Group (2016) developed a framework for the valuation process to be based on a combination of the three following values:

1. *Pre-event market values*
2. *Market value as at 1 July 2016 ignoring the event*
3. *Market value as at 1 July 2016 based on the future planning provisions*

Properties were valued by Telfer Young Limited and independently peer reviewed. Table 19 below provides recent media statements by landowners regarding their valuations and information voluntarily provided by participants:

Table 19: Property valuation statements

1.	Before the 2005 event “this place was valued at around \$390,000” Participant has been offered \$280,000.
2.	...purchased their home for \$305,000 and WDC offered \$305,000 (Shand, 2017).
3.	...was offered \$280,000 for their home that is insured for \$600,000 (Fleming, 2017).
4.	...was offered \$200,000 which is what the section is apparently valued at back in 2004 (Campbell, 2017a).
5.	...has been offered \$600,000 – ‘It cost us more to build the house, and I think they have deliberately devalued knowing they were going to go down this path’ (Campbell, 2017b).
6.	“We don’t believe their valuations; their valuation of our place was \$700,000. Which is less than what it was worth in 2005, before the event” (Participant).
7.	“Their indicative offer, we thought was fair” (Participant).
8.	“Well it was enough for us to go, it may not necessarily be the final remuneration that I expect, but it’s in a ballpark enough to go ‘I’ll work with this process’” (Participant).

Owners unhappy with the offers consider the valuations are not correct:

*When they gave us the house offers, there was a thing to say, ‘yes you’ll carry on talking to them’. Eleven of us said ‘no we’re not going to carry on because you’ve basically insulted us and its bulls**t’ (Participant 8).*

Those 11 property owners did not respond to the indicative offer because they felt disrespected by it and decided to work as a group to employ legal action against the plan changes. Whilst Participant 8 is not willing to move at all because their family does not accept the risk, they consider that other members currently rejecting the offer might be prepared to “[i]f they come in with [a] fair and reasonable package from the get go, then people would be more inclined to work with them.” Many use the term ‘like for like’ and consider that they should be able to purchase a similar property in order to move on. However, the fact that 21 property owners have indicated their interest in continuing with the buyout is a sign that those owners do consider it to be a fair enough amount to retreat. The majority of those fighting the process are people residing on the fanhead, not the empty section holders, highlighting an enabler for buyouts where land is undeveloped (or was not re-developed following a disaster).

6.6 Socio-political-cultural barriers and enablers

6.6.1 Barriers

6.6.1.1 Uncertainty

Inconsistent decision-making in Matatā has generated long-term uncertainty and taken its toll on the community. Many of the current residents experienced the 2005 event and some remain traumatised 13 years on. Those living on the fanhead feel trapped in houses that hold their life savings, unable to sell and move on. Property values have dropped and many still have mortgages, which for bare section owners requires payment (plus rates) for uninhabitable land. Between 2006 and 2012 six houses were rebuilt on the basis of a mitigation solution which did not ensue, with many upgrading their properties in the years that have passed. Some of the improvements have included sealing driveways, landscaping, installing a lift for elderly parents, new garages, decks and kitchens to name a few:

...they waited until they could see what was happening and then they put all of their insurance money into rebuilding... It was hundreds and hundreds of thousands, millions of dollars gone back into rebuilding ... then they say oh we're not going to do it now, you can get out. So that's why people are digging their toes in. (Participant 8)

Those who re-built had to manage their insurance pay-out, obtain building consent, prove the stability of the land with expert assessments, and ensure that their new house would be insured. With those hoops jumped, a sense of certainty and security was regained for a short while. However, that all changed in 2012 when mitigation was no longer viable and managed retreat eventuated in years to come. Participant 10, dismayed at the change in approach said, “we wouldn't have put our insurance money back into this if we knew—we're not that thick!” Participant 13 purchased their property in 2009 and spent \$140,000 in renovations between 2012 and 2015. As others are, they are angry that in 2012 council approved their additions and others' building consents “... all the new houses over there, they were all built in 2011/2012... they were still allowing people to build. So, how can they just overnight go ‘oh sorry get outta here?’” The ongoing uncertainty and change in approach have resulted in a continued state of stress and trauma for many, and for those who rebuilt and re-invested, an even greater intensification of financial stress.

6.6.1.2 Enduring trauma

The 2005 event was like nothing the residents had ever experienced. Some families were home when the debris flow came roaring down the catchment. A house was lifted off its piles and one family sailed a treacherous slurry of silt, mud, boulders, and logs. They climbed up into their roof as their house plunged back and forwards, holding on for dear life. Others escaped their homes just in time, and some watched from second storeys as the currents of debris swept through.

Some residents were displaced for periods of nine to 18 months, living out of suitcases, in a state of limbo (Spee, 2008, p. 17). Two years after the disaster, many had no certainty, and felt more stressed, frustrated and upset than in the first few weeks following the event (Ibid, p. 18). Psychological impacts recorded were sleeplessness, stress, anger, anxiety, vulnerability, sadness, isolation and depression (Ibid, p. 19). Spee described the impacts as reflective of a community that felt overwhelmingly powerless, stuck in a cycle of agitation, tension and sadness, a festering wound of anger and hurt (Ibid).

Many residents who experienced the event still display these impacts, 13 years on. Participant 11 says she has post-traumatic stress disorder and feels extreme anger towards WDC; “What I feel, is they have minimised what happened to us all along, it’s been minimised and swept under the carpet–‘oh you fullas are all right now, get over it, move on.” Participant 10 says “it’s been stressful the whole time” holding a strong sense of anger and disappointment at the way they have been treated. Others recognise the ongoing stress that has been inescapable for everyone, “you’re under stress...You can’t sort of get away from it” (Participant 9). One resident who recently passed away was a representative for the community:

I’m sure that was from stress, because he was helping a lot of people out ...[they] started to call him the Mayor of Matatā, but it just got too much for him. He had cardiac arrest. (Participant 9)

Look I’ve watched people have heart attacks... [people] taken, put into rest homes that they didn’t want, marriages split up, because it’s constantly there, it’s always there. (Participant 10)

The impact of this extended stress is not only health and resilience related. It breeds anger at the situation people have been left in and their lack of autonomy:

We're being dictated to...I won't move because this is where I chose to live out my life. We're all happy...nobody wants to leave... If offers had of come out in 2005 and were reasonable, people would've taken it. But it's 13 years down the track. (Participant 14)

Many feel they have not been able to recover from the event, finding the added burden of the planning process and impending loss of property rights extremely stressful:

The thing is, it's on your mind all the time. Because it takes your time, because you're constantly fighting them, constantly looking up things to find out about it, it's your family home, it's everything you've got, invested in it. (Participant 8)

...I'm on the pension, I haven't got any other money, it's all here. If I get kicked out with nothing, where am I going to go, what am I going to do? I don't get enough money to rent a place and survive, I can't get a mortgage... (Participant 9)

I'm stressed to buggery, I drink like a fish, I've put on that much weight you know... I don't sleep. (Participant 13)

After being in this situation for over a decade, for many, a resistance to the process develops, a 'digging in of the toes' somewhat triggered by a serious erosion of trust and a feeling of disempowerment.

6.6.1.3 Trust and legitimacy

Myatt, Scrimshaw, and Lester (2003) confirm that where there is trust in governance actors, a more positive perception towards adaptation policies such as managed retreat can be expected. For policies to be perceived as legitimate, organisational trust is required, something that takes time to develop, but is easily lost. Residents who do not accept managed retreat in Matatā also do not trust WDC, being very strong in their opinions: "no, not at all... They give us the right to live here and then they take it away. This is why there is no confidence in the Council" (Participant 8). Participant 10 recognises that this trust was "gradually eroded" stating, "there's just so many lies. The trouble is people have changed... the ones that are in there now have no idea of what they had done prior." Among uncertainty, staff turnover, and the change of approach contributing to the lack of trust, the participants cited informing the banks and insurance sectors of the retreat strategy as damaging to their trust in Council:

...that's manipulating the system, so they can get the houses cheaper, because they'll say well you can't sell them and you can't get loans on them so they're not worth that much ... if that was the stock market you'd be in jail (Participant 8).

I feel more and more ripped off, they've backed us into a corner, they have gone and seen the banks and the insurance companies. (Participant 10).

A recent report on managed retreat engagement (New Zealand Society of Local Government Managers (2016)) recommended involving these agencies in the process, which is what WDC did. This is a difficult barrier to overcome as many residents perceive it to be WDC overstepping its boundaries and manipulating residents into retreat, further degrading their trust.

The chicken and egg situation WDC faced with the funding application and indicative offers eroded faith in the Council with regard to the legitimacy of their intentions;

It's bogus! Because there's no money to back it up!!...You don't go around making bogus offers (Participant 10).

There's no trust there at all... I mean they made us all these offers for the houses, but they've got no money. So, they're not really offers at all (Participant 9).

In addition to these perceptions are the beliefs of some that WDC contributed to the risk by not rehabilitating a quarry in the catchment:

...the council owned a mine, and apparently when the quarry closed, the council just packed up and walked away and left it. When the 2005 event happened the boulders that came down, everyone said, they're from the quarry, they should have been removed...So what could happen now is if you wanted to you could ... say well technically... you've caused all this problem by not clearing out the quarry (Participant 14).

Essentially, for rejecting participants, their trust has been eroded because they do not perceive the process to be fair, transparent, inclusive, or legitimate (equitable, effective, and robust governance). This perception has developed significantly as a result of effective governance deficits (Section 6.4), which has resulted in a damaging snowball effect on the delivery of equitable and socially acceptable outcomes. In particular, procedural inconsistencies do not engender trust, particularly when changes appear to benefit the process, further feeding the lack of confidence in actors and organisations. For example, further loss of trust occurred when WDC changed their policy regarding the thresholds for uptake of voluntary retreat. In 2015, WDC determined a 90% acceptance threshold would be required to approach external funding agencies, but in 2017 it was decided that “a threshold should not apply as it could potentially disadvantage property owners who wanted to relocate” (Whakatāne District Council, 2017b, p. 13). This was considered a deliberate manipulation of the process as WDC had initially placed high significance on the threshold.

Other participants who are more accepting of managed retreat, have trust in WDC staff and consider that the key staff and experts have “acted in good faith”, but they are not so trusting of councillors, at both WDC and BOPRC, feeling disappointed that some have not shown stronger leadership to get the issue resolved. Regardless of their trust in the staff, they too are beginning to have doubts, stating that they think the process has been mostly fair and transparent, but the timing of the regional plan regulation makes it difficult: “are we being naive, are we trusting them too much?” (Participant I6). Even those who have maintained a trusting relationship with the authorities are beginning to feel nervous about the potential extinguishment of their rights without fair compensation—or compensation at all.

6.6.1.4 Perceptions towards community engagement

Residents on the fanhead have been consulted; their input has been sought, but they have little control over the goals and process. The six members of the CDG had the opportunity to provide input and ideas, with WDC making the final decision. This representation of the community amounts to placation, a step above consultation, but not quite empowerment. While WDC did work to independently engage the community to a higher degree than consultation, managed retreat was eventually selected by default, causing difficulty for some in accepting this:

They had all these scenarios across the wall and they talked us through it and we all discussed different options and stuff, but the writing was on the wall sometimes ... It's now been suggested to me that we were manipulated in that CDG. There seems to be this really strong feeling of conspiracy...I do tend to try and think we participated in good faith... I know you have to start with a template, so it's not about how are you going to manipulate me to give you information?...It's that I need some structures so when I come here we have something to work with. So that's how I felt the process was and I thought [the facilitators] did a very good job, they did bring in some very excellent people (Participant I6).

Participants IO and II hold a different view, feeling that the process was not genuine, and the outcome already determined:

I just felt like it was a game, it was a process that they had to go through, but they weren't listening to anybody... We never chose it... But all of a sudden, it just turned out that that was the option and that was it. It was never voted on (Participant IO).

*...on the third day when they said, 'well there's no funding for any of it so we're not going to do a thing, so we're looking at implementing a plan change.' Which is when the PLAN to kick us all off our land started. That's what made me so angry, why the F**K did you waste*

*my time? You could've just said to me in the beginning, actually we're not gonna f****g do anything. (Participant 11)*

While Participant 16 believed the process was robust, there was recognition it could have been perceived in two ways:

If you wanted to keep an open heart, you could say I understand this process, there were options, there was some logical kind of conclusions. If you wanted to think negatively of that whole environment, you could say 'oh they set us up, they came up with these options, they knew what they wanted'... and it might be the case, but I would like to think that [the facilitators] had nothing personally to gain from the outcomes other than the fact that they were being paid by one of the parties.

The use of independent facilitators and experts in this case has been an enabler in some instances, however many of the barriers already discussed have undermined the perception of the engagement for some. Damaged trust, legitimacy concerns, and the default selection of managed retreat significantly factored into perceptions of the engagement process and the decision to implement managed retreat. Participant 16, trusting of the process and staff, mostly believes that the process was fair and understands that retreat was a logical conclusion, but not everyone sees it that way:

The CDG came up with all options, from do nothing to retreat. The trouble is, they came up with that, but that's where the residents' consultation and input stopped. We never got a say in which one they were going to do, why they were going to do it, or anything else. (Participant 8)

As recognised by WDC, “more touchstones along the way” (Participant 4) would have been useful, and stronger engagement with the entire community. A key turning point for many has been the development of the plan change to extinguish existing use rights of those who do not accept the voluntary offer. Up until that point, many, including those who are still accepting of the process, considered that if they were not happy with the indicative offer, they would just stay anyway. The regional plan change has left many people feeling ‘powerless’, calling it ‘dictatorial’, leaving them without any choice in a matter that deeply affects them. Participant 10, 8 and 14 sum this up:

...when they threaten to cut your power and take your water and back you like a cornered rat, you're going to come out fighting alright. (Participant 10)

*It's the constant battle because you're not part of the process. Council is doing it to us not with us...But the thing is if that relationship is just push down push down all the time, you get to the point where you're like f**k it I'm going to fight and fight dirty. (Participant 8)*

If we keep pushing and pushing and resisting they may weaken their stance (Participant 14)

The lack of trust and agency felt by those on the Awatarariki Residents Incorporation has ultimately resulted in their challenge of managed retreat.

6.6.1.5 Belief in science and risk tolerability

Those with a lack of trust in the Council have a corresponding lack of trust in the science that determines an intolerable risk to human life. Participants in the Awatarariki Residents Incorporation do not trust WDC, do not believe that all of the mitigation options have been thoroughly explored and do not consider themselves to be living in a high-risk location. When asked if there was trust in the scientific evidence, Participant 10 stated:

No, I don't and for the simple reason that we've had so many reports that supersede, and you can just model anything to get the desired effect, the answer you want... To me it's a land grab. I don't believe it's a high-risk area at all. I think there's a plan somewhere. Railways is one that sticks with me. In that CDG I asked if you take our properties what are you going to do with the houses that can't move? [One of the Councillors] said 'oh well we'll probably have to rent them out to recoup some money'. I was so wild.

The inconsistencies experienced with the engineering solution and lack of trust in WDC have translated into a lack of trust in the science with a belief by some that there is a hidden agenda to use the land for other purposes. Whilst the Councillor who made the comment was later corrected, it still triggered questioning of the legitimacy. Careful consideration of the implications of such discussions is necessary when engaging with the community. Participants 8 and 9 do not necessarily have a conspiracy theory, but they consider managed retreat as “ass covering” to avoid liability of both BOPRC and WDC, holding the belief that with the correct monitoring and maintenance of the river bed and catchment the risk could be mitigated:

... it's only high risk if we have significant rain, soil moisture content that reaches a certain saturation point and if it blocks up. So, we're saying, yes, it's high risk if you're in the middle of a debris flow but at any other time, It's very, very low risk. If it's a 200-500-year event, then where's the significance of it? (Participant 8)

For three of the residents rejecting managed retreat, they do not consider that a fair amount of compensation would make them prepared to move, “no, because we don't think it's a risk. The thing is, if it was a risk and we thought it was a risk we would be gone” (Participant 8). Participants 16 and 17 hold a different view. Firstly, they consider “[t]here's evidence to say that it's happened

three times of significant size and we're telling you that 7 years ago a little mini one went through. We know in the last 100 years what has happened." (Participant 16). They believe that "if it's happened once, twice, it's going to happen again" and are "accepting the fact that there are educated people feeding us information" (Participant 17). Although they are trusting that there is risk, Participant 17 considers that the assessment determining intolerable risk to life "is a bit overstated" and they [WDC] are "covering their ass. So, they've got to take an extreme view. A precautionary approach. It may be right, it may be wrong." Whilst happy to live with the risk, Participant 17 recognises the economic pitfalls of doing so:

... if the regional council carry on and remove our existing use rights we have no value here. Personally, I'm not prepared to give up that value... that we've worked all our lives for... so I see the out here, the way I can recoup some value is to be part of this process.

Whilst they are not absolutely convinced about the degree of risk on the fanhead, they recognise that there have been and are likely to be future events and "trust the academics who are trained in that field" as well as Council staff that this is the right approach to take, even though they have a strong attachment to their property.

The quantitative risk assessment stated that "the risks to some properties in Matatā are considered to be moderate to very high and therefore in excess of the levels commonly adopted as being tolerable" (Tonkin & Taylor Ltd, 2013, p. ii). T&T stated that loss of life risks associated with the landslide and debris flow hazards in Matatā are greater than the 10^{-4} /annum level often adopted as the tolerable-unacceptable boundary. For comparison, the 10^{-4} /annum value is approximately equal to the risk of death in a road accident in New Zealand (Ibid, p.77). Loss of life risk levels calculated for areas in moderate to high hazard zones are classified as moderate to very high according to the Australian Geomechanics Society (2007) (AGS), where the risk level is moderate or higher, AGS consider risk reduction measures should be undertaken. From the outside looking in, it may seem obvious that the risk to life is too high to justify residential activity on the fanhead. However, the difficulty for residents in this situation is having someone else determine their toleration of risk. This is something Participant 6 was also uncomfortable with:

I am concerned about something which will essentially force people from their homes...Are we going to send police officers in to evict people forcibly from their houses?...Some of the people are really adamant they're not moving. They're going to challenge the Council

in court, and I suspect that some will have to be forcibly removed if they lose. Is that what we think our role is? To forcibly remove people from their homes? My point of view is that people do have a right to decide their own risks. We decide risk all the time. Every time we get in a car...cross the road, step on a plane—risk is a part of life and we all develop our own strategies to manage risk. Some people are more risk taking than others. I don't believe it is the role of any government or crown agency to decide for people what their own level of risk for themselves is...Risk is part of the flavour of life.

The lack of nationally consistent risk assessment methodologies makes it difficult for planners and managers to determine (with the community) when it is appropriate to require managed retreat. From a more civil-libertarian point of view, any risk tolerability criteria are too authoritative, as individuals should be able to determine their personal level of risk tolerability. Achieving the right balance of societal autonomy for risk determination and reduction is a challenging governance concern. The difficulty is that where there is risk of loss of life risk, it is not just the individual property owners, but family and visitors, tradespeople, and other service providers present on properties that may be less risk taking than the property owners.

6.6.1.6 Place attachment

Inducing detachment from the home, community, and whenua (land) is a difficult task for policy makers implementing managed retreat. Dandy et al., (2019) recognise that there is growing evidence which suggests that high levels of place attachment may constrain decisions to relocate, although it is not a simple relationship (Barcus & Brunn, 2009, 2010; Gustafson, 2001). In Matatā, there is evidence of high place attachment based on ancestral family ownership and use of land, important life events and experiences, inheritance, financial security and investment, the quiet, coastal lifestyle, spiritual connections through survivorship of the 2005 event, length of residence and community participation:

[He] bought the land in the early 50s from the council...and then in the late 80s he developed it. He bulldozed it flat and made it into sections...it was divided up amongst the family. Everybody got a piece...we lived there really happily...it was a beautiful lifestyle and I still miss it every day. So, I've got a really strong attachment to that land...how dare the council take my children's inheritance away from them. It's my tūrangawaewae...placentas were buried there.

Tūrangawaewae are places where we feel especially empowered and connected. They are our foundation, our place in the world, our home.

(Te Ahukaramū Charles Royal, 2007, p. 1)

Other residents of the subdivision recognise the ‘sentimental value.’ When asked whether they would move with full compensation, they stated:

No. Well it's been in the family for 70 years...It's the lifestyle too...my family is well known...they're well established...big and important events, we've had here...This is not just about a piece of land...It's always been about the family.

Participant 8 also has significant connections to the family home “...there’s a huge attachment there, it’s whanau, whare, and whenua (you know, family, house, and the land as well) for us...there’s a huge attachment to it.” Even with these strong cultural, psychological, and place-based attachments, it is interesting that Participants 10 and 11 said they would have moved immediately following the event if required. One family had temporarily moved their house off the land post-event, waiting to rebuild once permitted. One of the mitigation investigations included a partial buyout with a chute to sea:

They needed us [to relocate]...So, we said, ‘oh well’, because we hadn’t built or anything then. We thought alright, taking six [properties], if that was going to save 50 odd properties, price us up. So, when they valued us up, we valued more than what the dam was, so they said ‘na we’re building the dam’, so we said, ‘oh well suit yourselves.’

At that time, another family had indicated interest in the partial buyout as they did not consider living next to the bund to be appealing. Social capital among residents on the fanhead meant that some were willing to overcome their attachment to place to act in the common interest. Validating the importance of acting quickly following an event is Participant 11’s reasoning for being willing to leave in the first instance:

Interviewer: Would you have moved at the start?

Participant 11: I would’ve because at that time I was fearful, I realised it was a debris fan and I was thinking, you crazy people, what are you going back there for?

Social memory and experience of the event could have enabled immediate retreat for some, and for ‘greater good’ interventions. These families, now fighting managed retreat, would have overcome their individual attachments to place to relocate at that stage, however, time, rebuilding, distrust, disillusionment, and anger at their situation has affected their ability to detach from their significant places.

Participants who are more accepting of managed retreat recognise their strong attachment, but feel that there is no other choice, putting their attachment aside:

We don't actually want to do this...It's a pretty major upheaval...this has been our family home...We've only got two choices, one, civil disobedience, or be part of the process.

[I] want to be part of the constructive process. So, you couldn't say that we are prepared to go, we reluctantly will go.

Their ability to do so may be the fact that they did not have to rebuild, they remain (mostly) trusting of council and consider that the indicative valuation was mostly fair.

6.6.2 Enablers

6.6.2.1 Co-benefits

While the benefits of eliminating intolerable risk to life and potential liabilities of the local authorities are clear in this case, managed retreat also produces co-benefits, listed below:

Table 20: Managed retreat co-benefits (Whakatāne District Council, 2017a)

-
- Potential for new development in Matatā.
 - Improved hazard protection to the built environment from coastal processes through a wider coastal reserve area.
 - Passive reserve space created for community with improved links to coast
 - Improved visual amenity to the entrance to Matatā (and the gateway to the Whakatāne District)
 - Ease of future debris clean up on fanhead
 - Contribution to the national and international natural hazard knowledge base (particularly using a risk-based approach and applying managed retreat under the RMA and in a non-statutory manner).
 - Minimising risk to emergency management personnel
-

Many of these benefits will not be realised unless managed retreat is successful, and cannot be considered significant enablers to the process, but their presence in the Business Case may help influence funding decisions in support of retreat. In addition to these co-benefits, in a broader sense, is the application of an environmentally sustainable approach to managing risk to life from natural hazards, allowing nature to continue on its course, as well as ceasing human habitation of an area that is wāhi tapu. Future land management will be straightforward, and there will be no unsolicited 'gift' for future generations to manage.

6.6.2.2 Recognition of local and indigenous knowledge

Although Māori knowledge of debris flows was not initially considered to avoid risk, the wāhi tapu status of the land has eventually proven to be an enabler of managed retreat. There was strong iwi opposition towards the debris dam due to potential adverse cultural effects and cost, meaning that it did not eventuate. Managed retreat was always the preferred approach:

We all said to the district council in 2005 when it happened, leave it like it is. Don't put bulldozers in there and start it up again...they [the ancestors] brought down debris to bury themselves. Leave it alone. (Participant 7).

Following the initial opposition to rebuilding and subsequently the debris dam, managed retreat should have been reconsidered, rather than moving to the flexible ring net which eventuated as being impracticable. In 2017 local iwi “repeated their preference for retreat” (Boffa Miskell Limited, 2017, p. 23) and representatives from Mataatua District Māori Council, with their understanding of historical events, did the same, citing climate change as having the potential to increase the likelihood of more devastating events in future (Ibid p.23). Iwi never approved of development on the fanhead; managed retreat provides not only a risk reduction benefit but a cultural and spiritual one. Important lessons from this case study include understanding local and indigenous knowledge prior to development, and respecting mātauranga Māori and sacred land.

6.6.2.3 Section holders

Of the 34 properties affected in this case, 18 of them are vacant sections. Four of these were not vacant prior to 2005 but are now due to the event and the inability to gain consent to rebuild. While a couple of sites are used for camping, they are unimproved land. This presents a difficult situation for those who wish to build on the fanhead, but the vacant nature of the sections and the determination WDC was granted in 2016 are enablers of managed retreat due to the lower level of place attachment and financial investment in vacant land. It is likely that most retreat uptake will eventuate from the section owners (should funding be confirmed).

6.6.2.4 Independent experts

While there has been an erosion of trust since the event, WDC staff have been aware of this and worked hard to make the process as independent and robust as possible, from 2012 onwards. The risk assessment was peer reviewed and independent facilitators and experts were brought in to facilitate the CDG workshops which for some participants, reflected positively in their acceptance of the process. For others, this work has been marred by the impacts of managed retreat intervention with significant institutional deficits, uncertainty, and a process of learning by doing.

6.6.2.5 Social memory

It can be reasoned that the state of some sections in Matatā (Figure 23) do not promote complete loss of social memory of the event and the risks associated with living on the Awatarariki fanhead (not including rehabilitated properties (Figure 24)). The Environment Court decision for the Awatarariki Stream and lagoon restoration consent appeals specifically excluded clearance and removal of debris from the Clem Elliot Drive area due to the potential impact on kōiwi. The Court was concerned about the works having no clear hazard mitigation benefit and enabling construction in an area at risk from future debris flows (Boffa Miskell Limited, 2017). Participant 2 posits:

...there's never been a consent to clean anything up...it's just piles of boulders and rubbish everywhere...Which probably hasn't promoted attachment in the areas. I always felt that [Judge Smith] made that decision for that reason.

It is clear when visiting the area that the presence of the large boulders incites imagery of the event and recall its consequences. However, as noted by Participant 3, the social memory of the disaster has largely elapsed; “It’s been so long that many people didn’t experience it. Timing is a big thing.”



Figure 23: Empty Clem Elliot Drive properties (2018)



Figure 24: Rehabilitated Clem Elliot Drive properties (2018)

6.7 Environmental barriers and enablers

Some residents are not considering relocation, but those who are have recognised land availability as a significant environmental barrier to enable relocation, and their ability to maintain community, psychological, and livelihood ties and networks. Participant 16 stated they would have been keen on a land swap “because land is the hardest thing to access”, however little attention

has been given to relocation options for residents, albeit a small relocation subsidy. To avoid increasing vulnerability, individuals must have access to habitable housing, resources and services, and measures to restore/recover assets, livelihoods, land, and living standards (Weerasinghe, 2014). Participant I6 recognises that while the offer is better than nothing, they have limited capacity to re-settle:

The indicative price they offered us might've seemed like a good price, but it would be about \$80,000-\$90,000 to shift our house...first you've got to find a piece of land to put the house on...it would probably gobble up absolutely everything...we are very worried...it's a major headache.

The question of 'managed retreat to where?' has been left for individuals to manage, and there are concerns regarding the impacts on social and economic vulnerability, where capacity is limited. Again, this highlights the strategic planning deficit, where insufficient attention has been paid towards the capacity for relocation from a physical and socio-economic perspective.

6.8 Summary

Key lessons from Matatā include understanding local knowledge, identifying and assessing natural hazard risks to inform land use planning, having a clear division of responsibilities between local authorities for risk management and processes for determining project governance structures following significant hazard events to ensure thorough oversight and risk management. In a post-disaster situation, there is likely to be political propensity to promise a return to the status quo, to 'bounce-back' from the event, without enough insight of what it might mean for the future. Those who re-built in Matatā would confirm that in the long run, a speedy recovery is not superior to an effective one, having to recover once from disaster, and twice from a convoluted process. Cost benefit analyses cannot always factor in long-term costs of engineering solutions versus the long-term benefits of managed retreat, and engineering innovation carries significant risks, as well as uncertainty for consenting regimes.

Protection works create path dependencies that are hard to veer from once paved, as well as increased residual risk. Such pathways make adaptive and transformational resilience extremely difficult. In this case, arriving at managed retreat was not enabled by a specific action or tool, but the fact that there were no other options left, it was a last resort. In hindsight, a significant opportunity was lost in Matatā. Immediate post-disaster retreat would have been more

efficient and effective, and less harmful to the long-term resilience of the community. Overcoming the rebuild mentality for areas of repeat events is a challenge, one that could be alleviated with stronger national direction, local capacity, and strategic response planning support. Nevertheless, key factors enabling managed retreat include the risk assessment determining intolerable risk to life, the liability of local authorities requiring them to reduce risk (do nothing was not an option) and the regional policy framework determining the risk thresholds.

Gaining consensus on and understanding of the science can be problematic, particularly when it fundamentally drives managed retreat. The expert planning adviser recognised that if something was to be done differently, provision of independent planning and engineering technicians may have improved social acceptance towards managed retreat and trust in the science. In terms of community engagement, in this case “more touchstones along the way” could have improved acceptance and trust between WDC and the community.

The difficult reality of managed retreat is intensified in this case, with displacement following extended stress. Uncertainty and inconsistent decision-making over an extended period of time breeds distrust, confusion, fatigue and sometimes anger, particularly when financial investments and emotional stability depend upon confidence in the future. While managed retreat can be a sustainable long-term process, there are significant costs if it is not consistently and effectively managed. Institutional deficits, procedural inconsistencies, and extended uncertainty and recovery are momentous barriers to effective, equitable, responsive, and robust governance, damaging organisational trust and fundamentally, socio-political acceptance of managed retreat. Without guiding policy frameworks, mechanisms, and support, managed retreat remains a risky and difficult strategy for local government.

Strategically planned retreat and risk management is vital. Limited relocation options and capacity can undermine the benefits of managed retreat, increasing social and economic vulnerability. Furthermore, iwi have advised of active geological faults in Matatā and requested inclusion of homes within 20 metres of these faults in the managed retreat scheme (Boffa Miskell Limited, 2017, p. 24) —not to mention other hazards in the district. Due to the extremely slow recovery and life risk in Matatā, it has become the priority and addressed discretely. In future, strategic planning is required to address the range of risks and give effect to the RPS across the district.

Chapter 7 In search of New Zealand's stance on managed retreat

7.1 Introduction

To develop the policy analysis and case study findings, and contribute to the overall aim of the thesis, a questionnaire was employed to explore public perceptions of managed retreat policy. Successful managed retreat strategies may protect people and assets from harm, but they must be socially and politically acceptable to be effective. Further research is required to understand the acceptability of managed retreat instruments, public preferences towards the level and types of intervention by governing bodies, rights to self-determination, and the principles and funding models appropriate to different managed retreats. Participants were recruited online to take part in the questionnaire, which was advertised via email, social media, a magazine article, and organisational newsletters. The questionnaire examined where the costs of managed retreat should lie, participants' reasoning for this and fundamental social barriers to managed retreat uptake. Respondents raised further issues including the presence of governance constraints and a strong expectation of transparency and equitable outcomes. The findings of Chapter 7 contribute to the examination of alternative managed retreat governance modes in Chapter 8, where opportunities to build capacity for effective, equitable, responsive and robust governance are analysed.

In total, 556 respondents completed the questionnaire. Before analysis, all responses were screened for false data, with no cases being eliminated. As detailed in Appendix 6, the respondents included New Zealand residents across all age groups, with 80.55% owning property and 19.45% not. Before reading the information sheet, 49.19% of respondents did not know the meaning of managed retreat and 50.81% did.

7.2 Policy preferences: Managed or unmanaged retreat?

Respondents were asked to rank the methods that they considered most preferred for implementing managed retreat from the following options:

Table 2I: Policy preference options

a) Long-term council & community strategy, including: -Avoiding further development in hazard zones -Requiring relocation/removal of existing buildings/infrastructure over time, as risk triggers are met -Rehabilitating the land to its natural state
b) Provide communities with scientific evidence on short, medium and long-term risk to allow them to move if they wish
c) Central or local government buys property at market value and owners relocate to locations of their choice
d) When a structure/building is destroyed by a natural hazard event (that is expected to occur again), it cannot be re-built.
e) Land swap between high risk property and nearby available land. High risk land is converted to reserve and property owners relocate and re-establish themselves.
f) Central or local government buys property at market value and a new neighbourhood is planned for owners to purchase sites and relocate

As illustrated in Figure 25, the long-term strategy was ranked as the most appropriate approach overall, followed by provision of information, which is also referred to as ‘unmanaged retreat.’ While it is understood that different approaches will be required across the range of risks (for example, slow on-set or immediate risks), this ranking exercise provides insight into not only the form of intervention, but the actors facilitating managed, or unmanaged retreat. Respondents preferred a pure buyout much more than a buyout with planned relocation attached to it, recognising the desire for personal autonomy in choice of location among other things (Section 7.4.2.3). While 84 respondents ranked ‘no rebuilding’ as their first preference, 143 ranked it as their last preference (the most of all options) indicating that reactive retreat (prohibition of rebuilding destroyed assets) is the last method of choice for 26% of respondents.

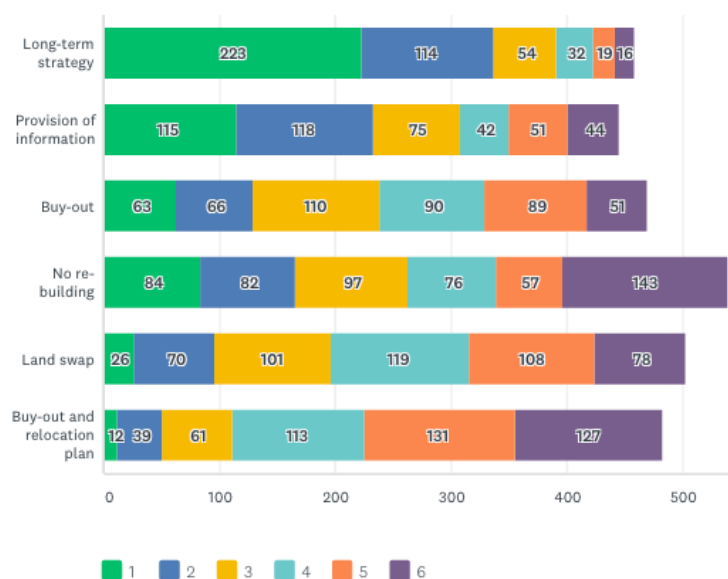


Figure 25: Policy ranking

High property values are often considered a barrier to managed retreat (Abel et al., 2011) combined with increased economic ability of owners to challenge local authorities (Hayward, 2008, p. 56). Interestingly, respondents' property ownership values did not have a significant effect on the balance of preferences for the top two policy preferences (Figure 26). This demonstrates that preferences for managed or unmanaged retreat are not necessarily related to investment value, but are more likely related to other factors such as age, self-determination and governance ideologies (see Figure 27).

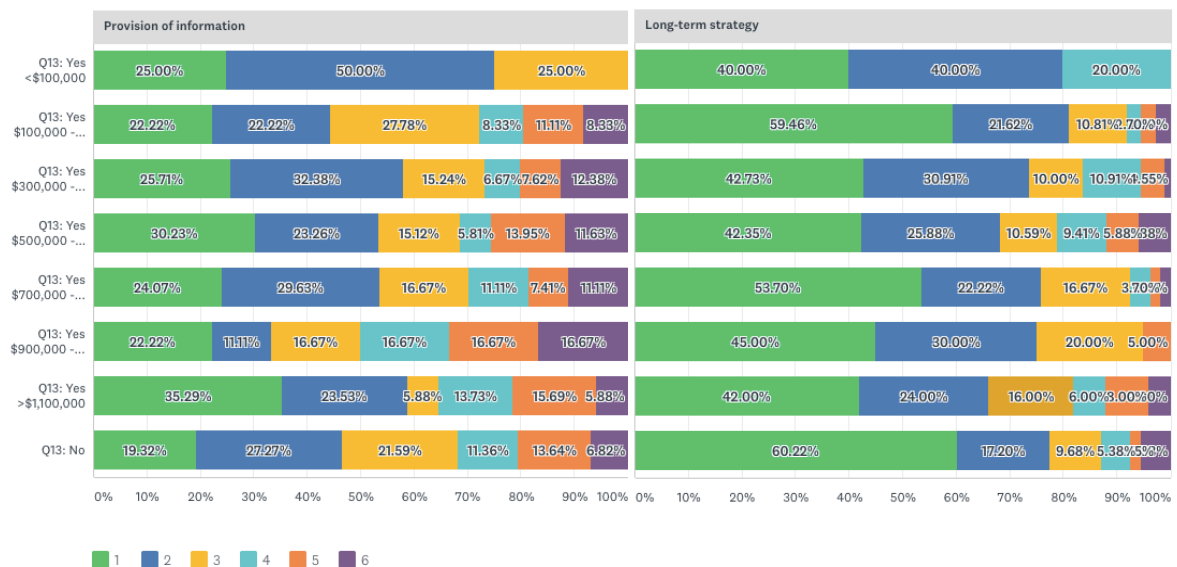


Figure 26: Policy preferences and property ownership

Comparing policy preferences and age, Figure 27 demonstrates that age is a key factor in this pattern; as age increases, preference for unmanaged retreat gradually increases and preference for managed retreat declines. Respondents who do not own property in New Zealand showed the lowest first rank for unmanaged retreat and the greatest first rank for managed retreat (Figure 26). More than half (51.4%) of the respondents who don't own property in New Zealand are under the age of 30, 28.04% between 30-39 years, 13.08% between 40-49 years and just 7.47% over the age of 50. It is clear that those with 'less skin in the game' (non-property owners) prefer managed retreat over unmanaged retreat, as well as the majority of respondents under the age of 50. This demonstrates the private-public tension of managed retreat governance, and the reality that longer-term benefits will favour those who are more likely to see them in their lifetime. Ellis (2018) argues that due to the disproportionate stake younger generations have in the success of climate change and hazard adaptation, engagement with young people (and renters) who are

underrepresented is critical. Recent student led climate crisis school strikes demonstrate young peoples’ desire for their voices to be heard, for action on both climate change mitigation and adaptation (Watts, 2019).

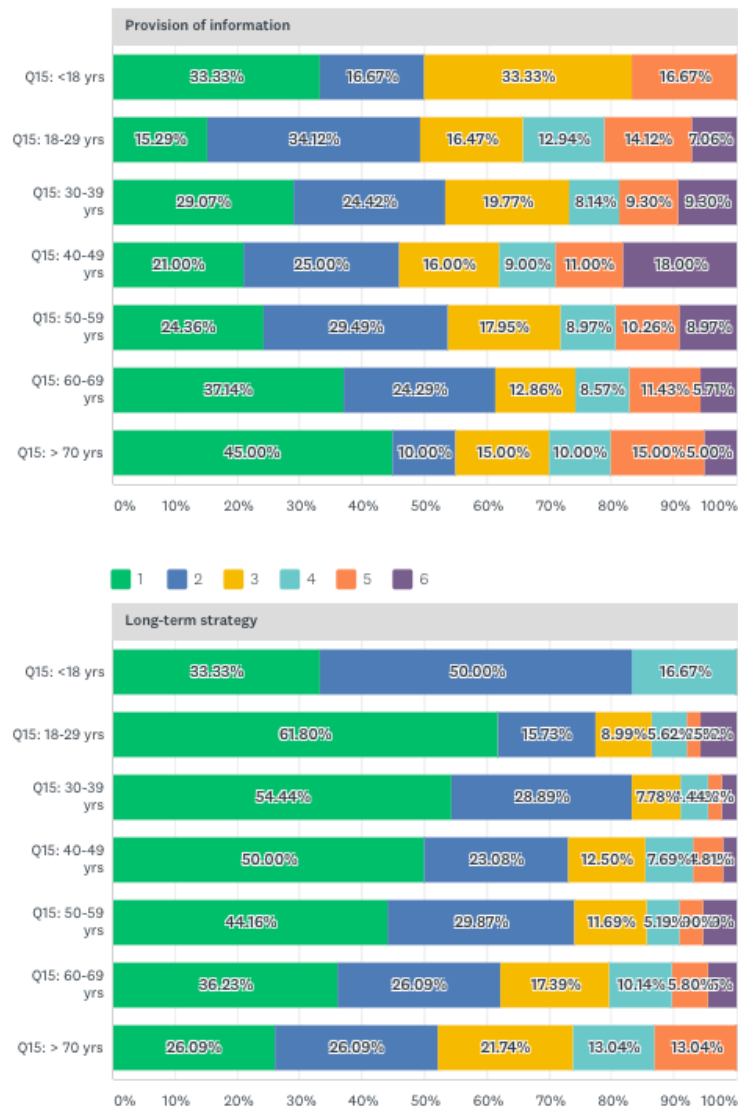


Figure 27: Policy preferences and age

The policy preference findings highlight the need to further investigate the governance of managed retreat versus unmanaged retreat, where either empowered institutions manage and coordinate retreat, or property owners make decisions to relocate autonomously. For many respondents, unmanaged, market-led retreat is an attractive option as it maintains personal choice and autonomy over property in the face of natural hazard risk: “If I really liked where I lived and was willing to accept the risk, that should be ok... I don't normally advocate for market mechanisms, but this seems like a decent way to organise managed retreat” (Respondent 502). However, as recognised by Turbott and Stewart (2006), Montz (1993) and Keys (2015), provision of risk information does not have a significant effect on the market value of at-risk properties or people’s

desire to develop or live on at-risk properties. Keys (2015) recognised that following hazard events there is often some immediate buyer resistance, however this lessens over time. At the coast, desirability of beachfront positions continues to override negative influences of risk factors such as periodic flooding and coastal erosion (Ibid). While provision of risk information by local authorities to enable unmanaged retreat may reduce their liabilities, it is unlikely to reduce risk to life, assets and ecosystems, especially not in an anticipatory manner. Therefore, relocation via unmanaged retreat is more likely to occur following an event, where lives and environmental features may have already been lost, and assets destroyed.

An ethical dilemma associated with unmanaged retreat is that as market values eventually decline and insurers retreat, more vulnerable members of society will be inclined to purchase at-risk properties as they will be more affordable. Wisner (2004) confirms that impoverished people are more likely to live in hazard exposed areas. This will not necessarily be a 'voluntary choice' as it will often be the only choice to obtain economic opportunity (Ibid). Poverty is both a cause and consequence of risk, as impoverished people are less able to invest in risk-reducing measures and may not be able to afford or attain insurance, forcing them to use their already limited resources to buffer losses, driving them into further poverty (Ibid). These issues, combined with the ineffectiveness of information provision, constrain the utility of unmanaged retreat despite individual preference. However, as will be discussed in Chapter 8, there may be other ways to provide the individual autonomy desired by many, to enable more voluntary managed retreat.

7.3 Who bears the cost?

As recognised in Chapter 6, the managed retreat funding void presents significant difficulties for its application. Respondents were asked to rank the groups they believe should bear the costs of managed retreat. Figure 28 demonstrates that central government was the predominant first preference for funding of managed retreat, followed by the regional community via rates, then private owners, the community at risk and lastly, the district community. Following central government's lead, private owners came in as the second most appropriate source for funding (with 142 #1 ranks) but were also ranked significantly by other respondents as the least appropriate source (with 179 #5 ranks). This acknowledges the polarising views on the allocation of costs for managed retreat (and CCA and DRR in general). Property ownership, property

value, and age did not have a distinct influence on the range of preferences for allocation of cost. Respondents were subsequently asked to explain the reasoning for their cost allocation ranking. The responses were coded according to key principles and tabulated according to the first rank chosen by respondents (Table 22).

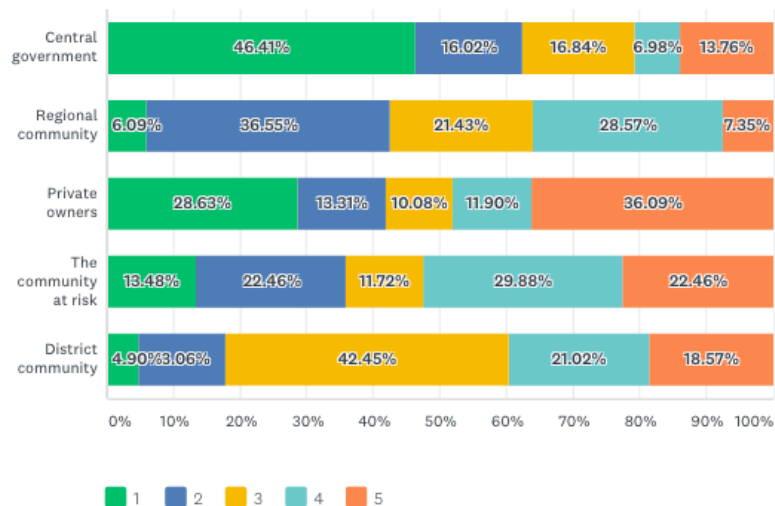


Figure 28: Cost allocation perceptions

Table 22: Cost allocation principles for managed retreat

Principles	First rank				
	Private owners	Central government	Regional community	District community	Targeted community
Responsibility	93	-	-	-	13
• Buyer beware, caveat emptor, due diligence, personal benefit – personal risk					
• Private responsibility with assistance from central government	11	-	-	-	-
• Authorities approved development, therefore their responsibility to compensate	6	26	7	6	3
• Dependent on whether or not owners of knew of the risk when purchasing property	16	52	10	5	-
National Solidarity	-	131	6	-	-
• National issue/capacity/national leadership/economies of scale					
• Local issue, local decisions and benefits	1	-	-	7	5
• Cost sharing, with all members bearing some portion of the cost.	9	6	3	3	8
Other	-	2	-	-	-
• Forced relocation requires compensation					
• Insurers will cover cost	9	9	-	-	-

The majority of respondents who consider private property owners to be the most appropriate group to fund managed retreat believe so due to principles of 'buyer beware' or 'caveat emptor' with many stating that the benefits of private ownership also come with costs and that you cannot 'privatise the benefit and socialise the cost'. One respondent mentioned that they believe in private responsibility as they "don't trust the politically appointed government representatives to make logical decisions on my behalf" (Respondent 2). Present in most of the categories, is a view that there is a need to assess whether owners knew of the risk prior to obtaining their property to determine how responsible they might be for costs of retreat. Nine respondents referenced the role of the insurance industry to assist property owners and 11 highlighted the need for central government to provide some support, but that primary responsibility is with the property owner. Participants who ranked central government as the most appropriate funding source did so based on the principle of economies of scale and capacity, natural hazards and climate change adaptation being a 'nationwide issue' and that government is best placed to lead. Fifty-two respondents also considered that knowledge of the risk is an important factor to be considered. Other respondents in this category highlighted that authorities have permitted development in areas of risk and therefore should be held somewhat accountable for costs. As with all of the categories, some respondents considered that a shared approach across all levels of government and the private sector would be appropriate. Respondent 508 argued against selecting 'who' should pay, rather asking key questions:

...across NZ private owners [are] living in high risk zones for three main reasons: 1. our previous knowledge of hazards was poor; 2. the risks have increased or changed over time; 3. as in my local area, previous regional and district council have knowingly allowed people to build in high risk areas and little is done to help them understand or manage the risk. I see that the question of who should bear the cost needs to be considered against why and how the need for managed retreat has arisen. It is not a black and white issue.

Other comments of interest highlighted principles such as means testing and exacerbator pays:

...a wealthy person who chooses to live in a seaside location or have a holiday home and who has the means to relocate, shouldn't get the same financial assistance as someone who has their entire equity tied up in a family home that is at risk and would be left with no financial means of re-establishing in a new location (Respondent 551).

Beneficiary should pay to avoid cross subsidisation and inefficient allocation of resources, but societal costs should be at central government level where appropriate to reflect exacerbator pays principle, i.e. we are all, as well as past generation responsible for rising seas, not just affected regional or local communities (Respondent 417).

The exacerbator pays (or ‘polluter pays’) principle is defined by the Department of Internal Affairs (2011) as reflecting the costs of the actions or inactions of others. This is a potentially important principle considering many respondents made comments about the liability of society as well as government authorities for not addressing or adequately mitigating contributors to global climate change. Boston and Lawrence (2018, p. 45) also recognise the importance of responsibility principles in this context, stating that “there is a strong case for taxing current citizens (e.g. taxpayers and ratepayers) and building up a public fund (or funds) which can be deployed to help cover the financial costs of adapting to climate change later in the century.”

Respondent 6 made the comment that as a community, there will be benefits of managed retreat which should be taken into account with the allocation of costs. Such benefits can include creation of new reserve areas and improved natural habitat or new beachfront properties with large setbacks and public access, where existing beachfront developments have been relocated. Another relevant comment was that ‘managed’ retreat implies an element of force and that in this case it is “unreasonable to expect private owners to be expected to find all the relocation costs unless they had been given a reasonable expectation this could happen when they bought, or can relocate with minimal loss” (Respondent 2). In summary, principles that respondents considered important in determining the allocation of costs are as follows:

Table 23: Primary cost allocation principles

	Responsibility
1.	Buyer beware, buyer responsibility to fund
2.	No formal knowledge of risk prior to property purchase = limited responsibility to fund
3.	Exacerbator/polluter pays principle (those who have contributed to the risk by action and/or inaction are accountable)
	National solidarity
4.	Nation-wide issues, nation-wide costs—shared cost allocation, with all levels of society bearing some portion of the cost.
	Need*
5.	Allocation of costs is dependent on the capacity to fund (means testing)
	Local solidarity*
6.	Local issues, local costs
	Other*
7.	Forced managed retreat requires compensation/incentives from the managing authority

Principles marked with a star (*) were less pervasive, with ‘responsibility’ and ‘national solidarity’ dominating the discourse for cost allocation principles. These findings are comparable to those uncovered by Rulleau, Rey-Valette, and Clément (2016, p. 371) in the South of France, where a principle of national solidarity dominates the case for funding managed retreat and “significantly and positively affected preferences in favour of a realignment policy.” Rulleau et al., (2016, p. 373) also found that principles of justice and solidarity are important to inform compensation models, with the two main determinants of preferences and willingness to pay based on “ a notion of solidarity towards those who have longest been owners and are most attached to their property and a notion of responsibility towards those who were informed of the risks.” Principles of responsibility and national government support are considered relevant in Cooper and McKenna (2007) and are more broadly applied in climate change literature (Paavola & Adger, 2006). These principles relate not only to costs, but to the governance of managed retreat, whether it is an individual matter and responsibility, or a collective problem, requiring policy, regulation and other instruments to manage society, or whether it should be left to the market and individuals. Developing climate change funding principles further, Boston and Lawrence (2018) emphasise that adaptation funding must have two overarching goals: cost minimisation and equitable burden sharing. Cost minimisation is particularly focused on delivering cost-effective decisions (including managed retreat) which reduce costly damage and loss and help to reduce future insurance costs, supported by robust planning and regulatory frameworks to minimise moral hazard risk (Ibid, p. 44). Similar to the principles of responsibility emerging from the questionnaire, equitable burden sharing must ensure that people are not discriminated against or suffer disadvantages from circumstances under which they have limited or no control, and that cases are ‘treated alike’ but that considerations such as ‘need’ and ‘capacity to pay’ can be applied. They also highlight the importance of applying the best science and expert advice available, minimising procedural costs, ensuring procedural fairness, transparency, fiscal sustainability, policy flexibility, and providing sufficient policy clarity, consistency, and stability to deliver adequate certainty for affected people, businesses, and organisations (Ibid, p. 45).

As managed retreat costs must fall somewhere, there is a need to determine how and to whom they will be allocated. Ellis (2018) argues that to deliver equitable outcomes, New Zealand must bring certainty to its funding framework,

avoid transfer of risk to the most vulnerable, and address spatial and temporal inequalities. There is a range of funding models that could be applied, for example, one that spreads cost across local and regional ratepayers and national taxpayers such as developed in Matatā, or a long-term managed retreat fund to assist property owners with eventual relocation costs, accumulating with the specific property regardless of the owner. These models require a willingness of authorities and from the public to contribute to what may often be a predominantly private benefit. However, the co-benefits of managed retreat that will be experienced in future are public benefits.

To determine the model(s) for allocating managed retreat costs, the principles in Table 23 are relevant to consider. Further deliberation will be needed upon who pays and how managed retreat is applied, but also, which costs are covered publicly and privately. Public costs of managed retreat will inevitably include project management, risk assessment, strategic planning, community engagement, and replacement of stormwater, roads, infrastructure and public amenities. Depending on the funding model and the cost allocation principles applied, these costs could extend to replacement of existing utility services, land rehabilitation and restoration, as well as loss of asset and land values and private relocation or demolition of structures. Public costs could be limited to the bare minimum, however, evidence from this questionnaire and experiences in Matatā demonstrate that incentives or compensation are often expected where managed retreat is forced, particularly when dealing with managed retreat in the short-term. As a central issue for its application, economic interests are prominent in the barriers discourse, examined next.

7.4 Barriers

Respondents were asked to “imagine property you own is at high risk of being affected by a natural hazard. Describe any factors that would cause you to object to managed retreat.” This question was open ended to enable respondents to provide examples of key barriers without leading them towards any factors. Fourteen themes emerged from the data coding, with many respondents listing more than one factor that would cause them to object. Table 24 lists the factors coded into key themes, providing a count that represents the number of times each theme was present in respondents’ answers (1 count per theme, per response). While this data is not representative of the New Zealand population, it provides a broad picture of key barriers to managed retreat important to the respondents, and correlates with the themes of the international literature

review (Table 4) and governance principles (Table 1). Ultimately, these barriers signify managed retreat governance deficits.

Table 24: Barriers to managed retreat

Category	Count
Economic	
1. Economic (general financial loss)	242
a) Income loss	9
b) Compensation	60
c) Cost of relocation	43
Socio-political-cultural	
Science communication and science–policy interface	
2. Scientific evidence/risk assessment	119
a) Different risk tolerance to community/decision-makers/council liability	23
b) Acceptance dependent on likelihood and consequence of event	46
c) Uncertain risk	12
d) A lack of confidence in the science/lack of evidence	53
e) Relocation depends on hazard type and its predictability	5
3. Perceived available mitigation/alternative land use options	46
Psychological	
4. Place attachment (general)	107
a) Ancestral connections	18
b) Māori cultural ties	6
c) Community/work/family ties	40
d) Age (being less likely to relocate if elderly)	8
5. Loss of autonomy	44
6. Lack of emotional support	5
Institutional	
Equitable, effective, responsive and robust governance	
7. Poor consultation	21
8. Unfair process	17
a) Inconsistent decisions	2
9. Unrealistic relocation timeframe	16
10. No trust in authority	16
11. Risk caused or increased by authorities	6
Environmental	
12. Limited relocation options (socio-environmental barrier)	60
No barriers	
	31

7.4.1 Economic barriers

Table 24 highlights a range of concerns raised by the respondents, with financial implications of managed retreat being the most commonly mentioned factor. In discussing this theme, respondents referred heavily to the need for financial compensation: “My home is my biggest asset. Adequate compensation

is essential” (Respondent 59). Others elaborated further, highlighting the importance of compensation to enable “purchasing power in a similar location” (Respondent 283) or to a “comparable property” (Respondent 239). It was made clear by many respondents that ‘agreed’, ‘acceptable’ and ‘sufficient’ compensation is expected in order to accept managed retreat. Other financial factors mentioned included the cost of relocation, loss of property equity, and property value decrease with a mortgage still to pay. These financial matters are important to the respondents, often cited as the first or only factor, and are recognised as barriers by property owners and non-property owners. Potential income loss was raised as a concern by those who work from home businesses, own farms or rental properties. Forty-three respondents discussed the financial barrier of relocation costs, with many referring to the burden of upheaval. While this is not the only barrier to managed retreat, it is the one that many prioritise and state first, concerned for their security, and of their families, illustrating the dependence on property ownership and investment, but also the vulnerability of those with mortgages that may not reflect the realistic value (risk factor) of their investment.

7.4.2 Socio-political-cultural barriers

7.4.2.1 Science communication, trust and evidence

In addition to economic barriers, trust in and validity of science are seen as essential. Figure 29 visually represents key words used by participants in addressing why they may object to managed retreat with regard to the validity and communication

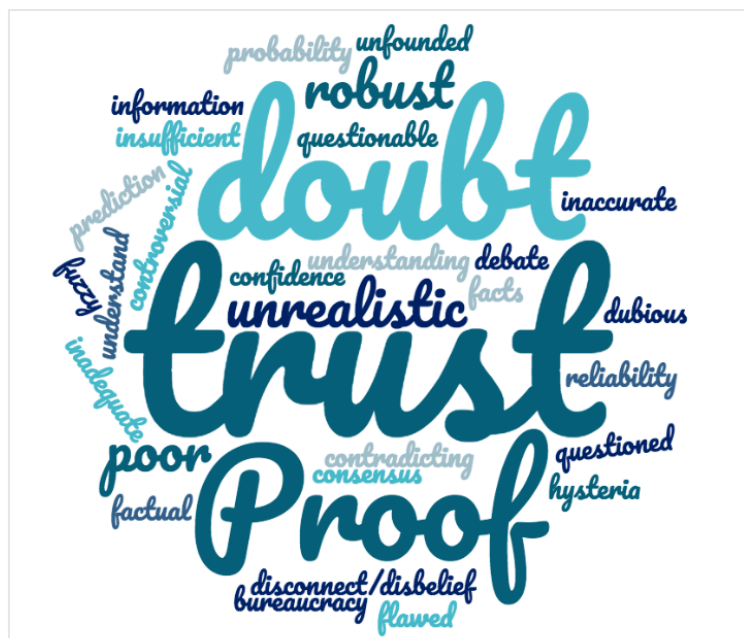


Figure 29: Question II word cloud: Scientific evidence and trust

of science. Lack of evidence or confidence in the science were significant matters raised. Participants highlighted the importance of “trusting the data that ranks the risk” (Respondent 447), having “confidence in the science” (Respondent 307) as well as “credibility in the council telling me to go” (Respondent 145). There is

recognition that political and individual risk tolerances may differ, highlighting tensions between public and private interests. Another argument worthy of consideration is the expectation of detailed analysis to avoid blanket provisions or a one size fits all approach; “[i]f the defined risk was at anything other than a “seriously micro” level, I’d object. Some rate Otaki as a high-risk area because of floods—my house is NOT at risk, being on a plateau.” (Respondent 333). Others stated that because “assessing natural hazard risk is subjective” (Respondent 331) they would be prepared to take the risk or may perceive the risk to be lower than what the science determines—“I’d judge it for myself” (Respondent 270). This is especially relevant to hazards exacerbated by climate change over time, with respondents emphasising that personal risk tolerance will be influenced by the temporal nature of risk, recognising the need to adaptively manage land uses:

The risk factor. For example sea level rise taking my property in 50 years. I wouldn't move. If it was a cliff eroding away in the next 5 years I would move (#27).

Differences in opinion of the time frame and the perceived risk. For example if the hazard such as flooding that had been experienced a number of times and would continue- then retreat may be a good option. Climate change based hazard- which is said to be possible, has shown no past hazard, has no local specific data to support and has no time frame. Why would you not use the land while you can- it might be 200 years - just build smarter (#537).

The risk profile may change over time (Such as in the case of sea level rise) (#3).

Inertia and the level of willingness to increase personal resilience were also cited as factors that would affect participants’ acceptance of managed retreat. These factors were dominant in Chapter 6 with participants finding it difficult to accept the risk analysis when according to the map, they could ‘jump over their fence’ and be safe from debris flow. Forty-six respondents consider that managed retreat should only be a last resort option, with many indicating their wish for mitigation works to be tried and tested first, or for alternative land uses to be considered. Some stated that they would object if they had invested in “significant, and effective adaptation measures” and “were willing to accept the risk” (Respondent 439). Participants also referred to hard engineering measures; “[i]t’s very simple and relatively low cost to implement solutions that hold the beach line” (Respondent 366). Others highlighted that it would depend on the “type of natural hazard and how easy it is to predict. I would expect council/central government to have done everything possible to mitigate potential risk first, before being asked to retreat” (Respondent 42).

Further comments of interest include that of Respondent 274: “If my building design was with managed retreat in mind, I would like my plan for retreat to be taken into account.” This highlights potential self-managed retreat occurring within communities as part of individual adaptation, or as a consequence of ad hoc relocatable building policies (Chapter 5). Robust engagement and policy alignment are necessary to enable an effective approach that integrates existing processes. Finally, five respondents referred to the risk type as a factor, referring to the ability to predict their occurrence. For example, Respondent 433 stated that tsunami risk is too unpredictable to enable the certainty required for managed retreat. This is aligned with disaster resettlement literature which considers flooding, landslides, high-energy impact volcanic eruptions and highly liquefiable soils to be generally applicable to resettlement, broadly excluding hurricane and related events, tsunamis and earthquakes as they impact vast areas or are highly unpredictable (Correa, Ramirez, & Sanahuja, 2011, p. 24). Respondent 168 stated that decisions will depend on the “nature” of the risk. Climate change will impact the nature of risks, resulting in compounding and cascading hazards, creating new hazards (e.g. ‘usteq’—catastrophic land collapse triggered by the combination of thawing permafrost, erosion, and flooding (Bronen, 2019)), and exacerbating the frequency and intensity of events. The CCA literature emphasises the applicability of managed retreat to adapt to the slow-onset impacts of sea level rise, increased flooding, erosion, storm surge, and inundation risks, rising groundwater, and usteq (Abel et al., 2011; Agyeman et al., 2009; Bardsley & Niven, 2013; Barnett et al., 2014; Bronen, 2015; Bronen, 2019; Harman et al., 2015; Kousky, 2014; Lawrence, Bell, et al., 2019; Lawrence, Haasnoot, et al., Reisinger et al., 2015).

7.4.2.2 Psychological: Place attachment

Attachment to place is multidimensional and the responses reflected this. As the third most common barrier, a range of concerns were raised. Emotional attachment featured strongly, whether it was due to family history, intergenerational land and memories, cultural ties, sentimental or intrinsic values or location: “I have a strong emotional bond to that property” (Respondent 502), “Even though my head would tell me it's time to go, my heart would be saying that I won't get another property on the harbour like the one I have got.” (Respondent 497). Farmers and pet owners raised concerns about stock welfare and the ability to relocate pets.

Thirty-seven respondents highlighted the importance of networks, including their current lifestyles, such as community connections, work and school routines and the need to care for elderly or dependent family members in their current locations. All of these reasons for objection raise valid



Figure 30: Question 11 word cloud: Place attachment

concerns to be considered when attempting to mobilise place.

Another dimension of place attachment is Māori cultural ties, also present in this category, with respondents recognising the importance of maintaining ancestral connections and cultural norms associated with places of significance, using key words ‘tapu’ ‘noa’ kōiwi’ ‘marae’ and ‘urupa’. Land is a locator and connective space for Māori, tūrangawaewae (a place to stand), providing a sense of belonging, cultural identity and vital resources. Land holds historical value, being an individual or group’s connection to the past, physically and spiritually (Fleming, 2016). As will be discussed in Chapter 8, managed retreat of Māori owned land, or land with cultural values and interests will require collaborative partnerships.

Age is an important factor to consider when considering acceptance of managed retreat, and it is relevant to place attachment. Eight respondents referred to age as a potential barrier; “if I was old and preferred to take the risk in my life-time” (435), “if I was retired and had lived there a long time, I wouldn’t want to move” (211). A 70+ year old respondent stated that due to their age they would “possibly risk staying put” (14). Respondents were asked whether their attachment to their property or place of residence is high, medium or low. When comparing place attachment against respondents’ age, there is a steady increase

of high place attachment as age increases and an increase in low attachment as age decreases (Figure 31).

Would you consider your attachment to your property or place of residence as high, medium or low?

Answered: 542 Skipped: 13

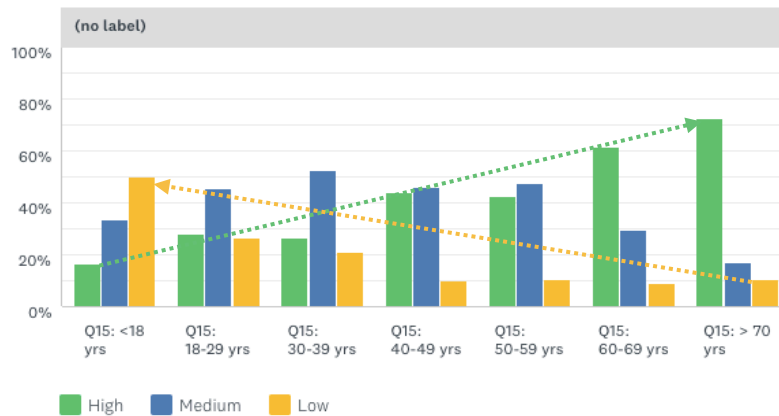


Figure 31: Place attachment and age

This is an important finding as it corroborates what respondents stated in Question 11 (and in Matatā), and highlights that the demography of an area is a relevant governance consideration, and a potential tension for efforts to detach people from place. A study of place attachment in New Zealand also found that the single factor common to all dimensions of attachment is being in an older age group. “Older individuals are more attached and in more ways than younger individuals, with elderly individuals (those aged 60 and over) more likely to be sentimentally attached, have relatives nearby, participate in the community, and feel relatively more satisfied with the area they live in” (Schroder, 2008, p. 207). Disruption of routine and upheaval at a late stage in life could be extremely stressful for those with a strong place attachment. Arrangements that are more flexible may need to be made to avoid permanently affecting the overall resilience of the community.

Surveys undertaken in Australia confirmed that those who considered relocation away from risky areas were “predominately young to middle-aged adults, earning middle range household incomes, predominantly vocationally qualified and living within a family structure of a couple with children...core members of the community” (King et al., 2014, p. 87). King argues that incentives to relocate are more likely to have a stronger impact on younger, more mobile members of the community, and that ageing rural settlements could face a downward spiral of economic and service contraction as younger members migrate to places with greater economic opportunities. Growth and

infrastructure planning must align with managed retreat policies to avoid increasing vulnerability, as “departure of just 10% of a community may be devastating to marginally viable small and rural settlements, where outmigration of young families exacerbates an already present economic decline” (Ibid, p. 89).

7.4.2.3 Psychological: Autonomy and emotional support

Emphasising both social and institutional barriers to managed retreat, many respondents referred to loss of autonomy. These individuals declared that it is their decision to stay and accept the risk if they wish to, making clear their need to be ‘in control’ of the situation, as well as their objection to being forced to abandon their property against their will. In many cases, participants referred to the need for strong consultation and democratic transparency, but ultimately, choice. Managed retreat exposes the tension between private property ownership and the extent that the state should exert control over people and the market. As discussed in Section 7.2, respondents ranked a planning method as the most appropriate approach to implementing managed retreat, closely followed by provision of information, (unmanaged) market-led retreat. This demonstrates the differing opinions of the role of the state (and of environmental planning) in enabling managed retreat, and an indication of the governance modes to examine. These themes will be further assessed in Chapter 8. Emotional support was cited as necessary by five participants, due to the significant life upheaval required to implement managed retreat, a theme also raised by case study participants who are experiencing detachment first-hand (Chapter 6).

7.4.3 Institutional: Equitable, effective, responsive and robust governance

Good governance attributes (Bennett & Satterfield 2018) such as legitimacy, effective and diverse information, accountability, transparency, recognition, participation, fairness and flexibility are relevant to many of the categories discussed (Table 24). Ineffective and inequitable governance are dominant barriers, with ‘poor consultation’ specifically mentioned by 21 respondents, as well as being linked to the need for ‘consistent decisions.’ Respondent 379 encapsulates the concerns of many by referring to key reasons for objection being “[a]n unfair or draconian approach; lack of consultation; iniquitous conditions/support.” Also related to this category is the timeframe for relocation and the importance of flexibility (responsive governance). Sixteen participants cited timeframes of relocation, including warning and planning time and terms

of exit. Respondent 356 stated, “If there was enough time to plan (for me that would be about 5 years so I could save to top up the payout and look for another job if needed) I wouldn't object.” Others affirmed their objection to ‘knee-jerk’ or ‘short-term’, ‘reactive’ options with little substantive financial and social assistance. Respondent 376 stated “[t]he process around retreat needs to have been firmly established over a number of years. Property owner needs to be well aware of both known risks, and what options are.” This perspective provides insight into the need for robust engagement with the community and planning for the long-term to enable sufficient time to implement retreat (where possible). This too must be balanced with clear, consistent and continual communication to ensure that over the period leading up to retreat, residents don’t feel as they are in a state of limbo and unease. Question 12 asked respondents how they would like to be involved in the decision-making process (Figure 32).

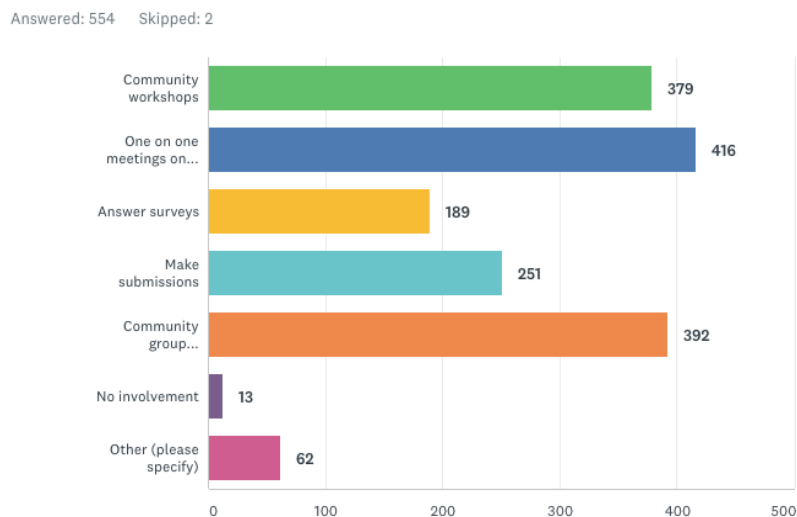


Figure 32: Community engagement preferences

The preferred method was individual meetings, followed by representation via a community group, community workshops, submissions and surveys. Thirteen respondents did not consider they would want to be involved and 62 provided other comments. These comments raised a range of matters from the need for technical information sessions to input from the Parliamentary Commissioner for the Environment, and an initiation of the conversation at a national level first. A range of responses was made with regard to community representation. Some put forward concerns about trusting a community group to make decisions about other people’s properties, an issue experienced in Matatā. Concerns were also raised regarding community workshops, such as:

I find community workshops to be intensely irritating as they can be hijacked by people with other agendas (Respondent 56).

I am a representative within a Community Board/Christchurch City Council (CCC) Working Party discussing and fact finding upon Hazards, risks, red zone future uses—it is valuable to be included—

but only if true transparency of agenda is given and only if we are listened to (Respondent 519).

Respondents stated that to be effective, engagement must result in unequivocal choices for communities, ‘not years of negotiation and uncertainty’. Respondent 346 highlighted the need for specific Māori engagement including whanau hui to consider the options and kaumātua support. Another made comment on the need for online engagement: “many families who have homes here have had people move away for work/study but are still home owners or invested in the community” (Respondent 124). For managed retreat at the coast, this is a particularly important tool as many holiday home owners may not be able to attend all engagement activities in person. Other comments included showing current mitigation efforts on individual properties, being physically and actively involved in decision-making, and working in collaboration with the managing authority. Finally, Respondent 166 stated the need for voting rights to a solution, again leading back to a key concern of autonomy.

Trust in authorities was raised as an engagement issue. Respondents discussed the need for ‘true engagement’ where it is not just ‘dissemination of information already decided’, to ‘gauge resistance’ and tick the consultation box. Respondent 514 stated “[m]any people don't trust councils to make decisions on their behalf...there should be some level of communication beyond simple ‘push’ communication.” Access to experts and decision-makers as well as advocates was also considered important.

Tracing back to Table 24, 16 respondents specifically referred to an absence of trust in authorities as a barrier, referencing potential ‘corruption’, lack of ‘credibility’, disapproval of ‘logic/rationale/science’, ‘hidden agendas’ and a general lack of trust, demonstrating institutional legitimacy constraints. Respondent 112 stated objection towards “[d]ubious science proposed by bureaucracy with a hidden agenda” highlighting the importance of trust, transparency and engagement throughout the decision-making and implementation processes to avoid a disconnect between empowered institutions and those affected by their decisions. A comment by Respondent 508 discusses a lack of trust caused by managed retreat in Canterbury:

Information needs to be from a trusted source and in our circumstance that may not be our district or regional council...I do not want to have to retreat to later see my land used for someone else's gain—vis a vis the Crown's "re-use" of the Red Zone for residential development when affected landowners were led to understand that the land would not be used for that purpose again.

As recognised by Respondent 508, distrust in implementing authorities will not engender acceptance of managed retreat, particularly where affected landowners are not convinced that the land will be retired and safeguarded via legal mechanisms. Three other participants recognised the need to ensure that the land would not be re-sold for development.

Relevant to this category is the perception of risk being contributed to by authorities due to “council inaction to seek out risks or even hold draft reports without sharing with wider community” (507) or risk being a “result of poor management, e.g. inappropriate seawall” (420). Respondents mentioned their objection to managed retreat as a ‘threat’ (lacking transparency of what it means), ‘death by 1000 cuts’ and ‘managed retreat by stealth’ where restrictive rules are imposed to stop investment without engaging with the community. Respondent 27 stated an objection towards unmanaged retreat via information on LIMs such as in Kāpiti.

Respondent 395 discusses the difficulty of providing hazard information in terms of the effect it has on property values, including those directly affected and surrounding properties. However, as respondents 395 and 509 stated, if government valuations were to reflect the risk level rather than sale prices, this would enable managed retreat over time and would reduce further investment in risky locations, a potential enabler of managed retreat:

...I appreciate that the CCC can't publicly discuss retreat because of the effect on property values...I pointed out that [government] valuations don't reflect future property values and the impact of sea-level rises...I was told that the present system of values only reflects actual sale prices. It was agreed that people are buying properties with high prices (\$500,000) that are actually worthless in the light of even slight rises in high tide levels...government valuations of properties could contain an element of reduction if there was an agreed natural hazard. The CCC attempted to have hazards listed on properties LIMs, but were forced to cancel this due to public displeasure at the inevitable decrease in sale prices (and THEN in the valuations of neighbouring properties) that this would bring (#395).

Two unique comments recognised the importance of covenants on the land to avoid development in future and avoiding land acquisition “without correct authority given by share/land holders” (Respondent 114). Another respondent discussed opposition to land use conversion that would not reduce the hazard risk profile, such “as children's playground or sports fields in a place where storm surges are likely to cause damage” (Respondent 7). These are all important

factors requiring consideration when implementing managed retreat or considering options.

7.4.4 Environmental barriers

Among economic and social concerns, participants recognised relocation options as a potential barrier. This is initially an environmental barrier (if there is nowhere to physically relocate to) but it is also influenced by the market and planning regime which can act as enablers. Fifty-seven respondents highlighted concerns of moving to a lower quality site (which is entirely subjective), the ability and viability of finding an appropriate, safe location within or near their community, the ability of their house to be relocated, and being forced to live somewhere they didn't want to live or to a location that did not meet their needs. This emphasises the need for strategic planning when applying managed retreat, to ensure that there is available, safe land for community members to relocate to. Anticipatory, deferred residential zoning could enable such provision of land to complement managed retreat, using community consultation to determine interest in the area, allowing people to begin imagining a new neighbourhood and lifestyle to commence the process of detaching from their current place. As argued by respondents in this questionnaire, many do not wish to have their relocation determined, but providing alternative land supply will ease some of the difficulties and provide options.

7.5 Additional questionnaire comments

One hundred and fifty-five respondents chose to provide further comments at the end of the survey. Of these comments, there were some representing strong anti and pro managed retreat views, and general comments about national guidance, local decision-making, and resources. The anti-retreat comments are valuable as they further develop upon the key barriers to implementing managed retreat, demonstrating the emotional response to this approach:

In my opinion, this is not a well presented survey nor does it reside well. The solutions provided are arguably the worst, and to rank horrible outcomes next to another, gives the impression that you need to choose from the lesser of all of these horrible solutions... no matter if a natural hazard occurred, people who are truly connected to their property will not relinquish their lands due to anticipation of fear (Respondent 114).

This respondent had not come across the term 'managed retreat' before participating in this survey and considers that private property rights cannot be taken away under any circumstance (Question four). This comment highlights the difficulty in gaining any acceptance for managed retreat, particularly from

those who do not understand the limits to private property rights in New Zealand. Property owners have the right to use land, but under the guidance of law and regulation, which is not always readily understood. Babie (2016, p. 612) further elucidates this, stating, “planning law is, in itself, property...For regulation is part of the inherent choice architecture that, together with the choice embodied in the bundle of rights is, in its totality, what property is. Or, put another way: regulation is property.” As Respondent 114 considered all managed retreat policy options to be highly unfavourable, the statement presents a cogent example of the emotional response of anger towards managed retreat, one that is likely to be held by many. Other comments emphasised that “managed retreat is the highest cost option both financially and socially” (Respondent 366) and that:

Any talk of managed retreat is counterproductive unless there is an imminent threat as it is destructive to communities, property prices and raises concerns with banks and insurance. The elderly, young people with high mortgages and people who cannot afford to move are likely to face high emotional and psychological stress and it undermines plans for maintenance, planning and hope for the future (Respondent 368).

These statements recognise the costs of managed retreat, especially if it is not developed with robust community engagement. It is clear in this comment and in many other survey responses that certainty in science is perceived as a public prerequisite for acceptance of a retreat strategy. However, science is unlikely to ever deliver full certainty: “assumptions in environmental modelling are virtually unavoidable as models always represent a simplified view of a complex reality” (Özkundakci, Wallace, Jones, Hunt, & Giles, 2018, p. 59). The potential negative impacts of managed retreat on people’s security, livelihoods, and emotional wellbeing (Chapter 6), calls for robust, peer reviewed assessment of risk, adaptation options and cost-benefit analysis (and MCA) with a parallel focus on effective science communication, consistency, and early engagement to enable trust. A national methodology for assessing risk (including vulnerability) could enable greater consistency, robust decision-making, and trust in science.

Further comments highlighting key barriers to managed retreat included the lack of available housing to relocate to, current market values making early relocation unachievable, the lack of available properties with certain ‘character’ or space, the need for science to be ‘factual’ and ‘unbiased’ towards clients and a lack of ‘faith in the system.’ A comment from a Christchurch respondent

highlighted the negative impact of a “poorly managed approach” to provision of hazard information within the district plan review:

There wasn't enough engagement occurring, things weren't communicated properly, it was the [territorial authority] considering things but not properly considering consistency nationally and things were very rushed...public opposition and the resulting removal of the natural hazard section from the plan review was an appropriate result given the approach (Respondent 382).

Communication, national consistency and early, robust engagement are important for public acceptance, and as highlighted by Respondent 228, so too is trust in local authorities to avoid the sense of being ‘bullied’ into managed retreat; “...You can prepare for known risks but to expect agreement to unknown will always be difficult and prone to bureaucratic bullying.” A more philosophical comment deepens the enquiry into an entrenched barrier of managed retreat, New Zealand’s dependence upon property investment to ensure economic security:

...the difficulties of retreat are to do with our assumptions about property rights and retirement. In NZ, if you don't own your own property, you will be a pauper during retirement. There is a specific government expectation that people will own property, and that this will help see them through retirement. The government no longer puts any serious effort into building housing en masse. People hold onto their property rights because they have good reason to believe that they will be made desolate without them. This relationship to fixed pieces of land is obviously directly 'challenged' by natural hazards...Over the next 100 years of climate change, paying everyone out market rates to leave their homes may be unsustainable. Alternatively, NZ's own history shows us that building housing en mass is very achievable and cost effective strategy to get people into decent shelter (Respondent 232).

While there were barriers identified in question 16, enablers were also recognised, including the benefit of “compelling evidence, perhaps recent events with high risk of repeated events in near future (5-10 yrs) to accept a managed retreat”, “[a] collaborative approach where the science is sound and the local councils are up front.” Respondents who showed support for managed retreat consider that it is the “most cost-effective long-term option” (460) and recognise the cost of hard protection: “I’d rather people moved than we spend millions and millions on rock walls and temporary measures” (455). Others recognised the importance of managed retreat, but also the barriers present in terms of decision-making processes, timing, and public acceptance: “I support managed retreat, but expect authorities to wait too long to put details on LIMs and action the staged retreat” (225). “Sooner or later we won’t be able to afford to fund recovery

from natural disasters, yes managed risk therefore a good idea but you'll have a hard time selling it to kiwis" (112).

Other general comments discussed the issue of needing to address the loss of public land (such as beach access) as private individuals try to mitigate hazard risks, the impact of managed retreat policies on development and investment in local communities, the 'precious' nature of land and 'high social and economic costs of retreat. Two comments stated the need for a better definition of managed retreat (as uncovered in Chapter 5) to ensure accurate cognition of what retreat scenarios may actually look like, to provide transparency to communities and avoid managed retreat as a 'threat':

It's hard to envisage 'managed retreat'—perhaps you could develop a scenario or two that you could compare? Almost like a role playing game, perhaps in focus groups. But something that provides more detail so that some of the context dependent questions can be addressed and assumptions stated (Respondent 425).

Retreat is a term that should not be used or surveyed upon or discussed in the communities—without a properly and fully explained definition... I asked MP's, and Councils before the last election what their definition of retreat was—they did not and could not define what the retreat looked like or entailed. This is appalling—when they are bandying around the word 'retreat' (Respondent 395).

Taking this further, Respondents 395 and 519 alert us to equitable governance attributes of fairness and justice, relevant to the acceptability of managed retreat in practice. In Matatā the community felt that they were being picked on as the 'poor cousin' compared to mitigation methods proposed in more wealthy, neighbouring communities:

Local authorities, Government and agencies are reluctant to define this 'retreat.' For some they mean removal for some they mean reinstatement for others they mean annihilation. Make them be honest so discussion can be had. Clearly in post disaster Christchurch it is annihilation of property rights—remove with inadequate consultation or observed cost analysis and retreat of less affluent parts of the city...Careful analysis of who/which areas are given 'retreat' as an option and who is given 'recovery' as an option may shed light upon the true reasons for land acquisitions in name of future proofing—future proofing for who? (Respondent 395).

We should be able to fight for our communities...and to be funded to equally. Those properties without 'identified' hazards may well be funded for other deficiencies in planning and strategy—a modern day witch hunt to remove people from their land so that the rest of the population do not have to contribute is not democratic or good Governance—it is discriminatory. It is apparent that less affluent parts of cities, towns have retreat given as an option—whereas the

more affluent are given 'sustainable development' ...I am not buying this inequity at all. (Respondent 519).

Where government intervenes in the market, it must not engender inequality. This issue is difficult to manage when incentivised managed retreat is more viable in certain areas than others due to lower property values. However, managed retreat should be surveyed on a range of values rather than purely economic ones. For example, the Hawke's Bay Coastal Hazards Strategy's (see Chapter 2) use of multi-criteria analysis fed a wide range of values into adaptation pathway decisions. In addition to this concern of justice within current generations is the equally important notion of intergenerational justice:

A narrow interpretation of social justice sees it as being about "fairness" or "just deserts" or "equality." A wider interpretation sees social justice as being inextricably linked to and influenced by other "virtues" such as long-term sustainability. There is little advantage in having a fair share of very little or nothing...It is wrong to purchase justice for the relatively few today at the expense of the many tomorrow (Cooper & McKenna, 2007, p. 303).

Final comments by respondents relate to the institutional barriers for managed retreat, highlighting the tensions between public and private interests and local and central government interventions and direction:

A very topical issue across the country in dire need of national direction from the government. Councils cannot successfully address this issue without higher-level legislative documents in place such as an NPS or NES, or meaningful amendments to the RMA which set bottom lines (Respondent 281).

We also urgently need clear national direction and leadership, to provide a framework for climate change adaptation/managed retreat, including financial support for disadvantaged permanent residents who might be under financial stress. National direction would avoid multiple regions and districts and countless communities all figuring the same thing out for themselves, and would significantly assist local government in implementing adaptation policies (Respondent 272).

These calls for national direction are not standalone, corroborating the findings of Chapters 5 and 6, demonstrating fundamental barriers to effective, equitable, responsive and robust outcomes for managed retreat. As stated by Respondent 56, there is a significant capacity deficit for managed retreat governance: "I do not believe local government has the resources and skills to deal with these issues." Other respondents are also concerned with the lack of consistency across the country, and the ongoing development of at-risk locations in New Zealand:

...I am disappointed that local and central govt continue to allow people to build on land so close to the coast. Council may indemnify

themselves but I am concerned by shortsightedness of owners investing in coastal properties (Respondent 273).

I think some councils whilst actually acknowledging the problems continue to issue consents. We left our seaside home after continual inundation by the sea. The council said ours was the property they would sacrifice (by using flood gates etc) to save the rest of the area... Nothing was entered on the LIM report. 2 years after we left they gave consent for a million dollar property to be built there...which of course has subsequently been flooded by the sea.... (Respondent 321).

While these are only the views of some respondents, they indicate that the issue is not only existing property at risk, but that in some areas, risk is still escalating due to continued development in inappropriate locations. Infrastructure is also at risk, providing vital access to homes, services, utilities and goods.

...Much more needs to occur at all levels of government to (a) assess the risks, (b) communicate those risks, (c) implement policies to curtail development on vulnerable land (e.g. canal based residential development), (d) assist communities to understand the meaning of new data (e.g. sea levels) and available options. Central government needs to provide for future funding required to maintain (whilst still possible) and ultimately redesign key infrastructure (e.g. low lying roads in Hauraki/Coromandel districts) (Respondent 375).

These comments consolidate a range of constraints raised throughout the thesis, including differing preferences for the governance of retreat, be it managed or unmanaged, questions surrounding the allocation of costs across private and public scales, the need for clear risk assessment methodology, and the requirement for strong national direction and capacity building to better understand current and future risks, and to guide and support local authorities working with communities in managing these. Chapters 4-7 have recognised that arbitrary government interventions, national regulatory framework voids, hard protection legacies, and poor funding support have resulted in nationwide inconsistencies, and unsupported local strategies demonstrating trial and error, generating public contention, and distrust in local government. There is a clear tension in New Zealand between individual autonomy and collective action for the greater good, necessitating a broader examination of the governance of managed retreat.

7.6 Governance constraints

Ultimately, many of the challenges arising in Chapters 5, 6, and 7 refer to governance deficits in natural hazard and climate change planning. New Zealand has not yet decided how managed retreat is to be governed, it is a process that is unfolding. Consequently, policy learning is underway at the local level,

but institutional barriers hinder fair management of risk. When dealing with managed retreat and the significant implications it brings, these barriers breed public distrust in authorities, confusion, fatigue, distress, and anger, particularly when financial investments and livelihoods depend on confidence in the future. Where a legitimisation deficit exists, it “undermines public support and commitment to programs of change and ultimately undermines the ability of power-holders to mobilize resources and promote co-operation and partnership” (Stoker, 1998, p. 20).

Environmental planning in New Zealand is guided by the institutional framework which transfers duties and powers to local authorities under a devolved governance system (Ericksen, Berke, Crawford, & Dixon, 2003). Glavovic et al. (2010) recognise that the ‘promise’ of the RMA in delivering sustainable management of resources for natural hazard planning has not been realised, which is due to limited local capability and inadequate involvement of central government in addressing these needs, among other issues (Ericksen et al., 2003). Schneider, Glavovic, and Farrelly (2017, p. 21) state that “successive New Zealand governments have exercised dubious climate change leadership at best.” These governance constraints are pertinent to the barriers that exist in enabling managed retreat, and the ‘good’ governance principles (Table 2) are a means to navigate them. The constraints reflect continual inadequacies inhibiting the de-centralised governance framework which expects local councils to develop high-quality plans to meet collective goals, deliver sustainable management of resources, and recognise and provide for matters of national importance, particularly (RMA s 6(d)) and (RMA s 7(i)). While it is recognised that there are three groups common to all modes of governance, (the state, the private sector and civil society) and a greater focus on governance beyond government (Kooiman, 2003), the de-centralised, hierarchical mode environmental planning in New Zealand exists under necessitates strong direction and support from the state, to build the capacity of institutions at the local level. However, as recognised in Chapter 2, and to be further explored in Chapter 8, hierarchical government is not the only mode available to society in overcoming challenges.

7.7 Summary

Managed retreat is socially, culturally, and politically perplexing. Individuals and communities face detachment from their familiar spaces, disrupting human routines, security, livelihoods, networks, identity, culture and history. The questionnaire uncovered competing interests for retreat interventions, including polarising stances between public and private interests, particularly with regard to managed and unmanaged retreat. However, there is a distinct preference for national solidarity, pertaining to central government funding support, should managed retreat be applied. Principles for compensation/incentives are strongly connected to the principle of responsibility, with means testing and local solidarity present. Economic concerns are the most significant barrier expressed by respondents, followed by socio-political-cultural barriers of science communication, validity and quality, and psychological dimensions of place attachment. Mistrust of authoritative actors is apparent throughout the responses, triggered somewhat by expectation of self-determination and respondents' experiences of the Canterbury red zones, Kāpiti Coast, and Christchurch district plan reviews, and other local consultation and decision-making processes. A desire for personal autonomy over private property is strongly evident, particularly the need to make decisions individually on managed retreat, which was also evident in Matatā. Effective, equitable, responsive and robust governance is a clear imperative, with institutional deficits consolidating research findings from previous chapters. To enhance recognition, suggestions highlight the need for creative community engagement solutions to ensure capture of all members with interests in affected areas, both resident and mobile. Fairness and justice are primary concerns throughout questionnaire responses, demonstrating a clear demand for equitable governance.

Perceptions of managed retreat policy support many of the findings of Chapters 5 and 6, including the governance constraints of limited national direction, local capacity, information, coordination and connections, and unsupported nesting. The questionnaire reveals a preference for government policy guidance and in particular, funding for managed retreat in New Zealand, clearly divergent from current practice, where local government is undergoing policy learning to enable managed retreat, funded via ad hoc processes, with the exception of arbitrary government interventions (Appendix 10). The findings of Chapter 7 enhance understanding of New Zealand's stance on managed retreat, and justify further exploration of its governance, to be examined in Chapter 8.

Chapter 8 Managed retreats: By whom and how?

8.1 Introduction

Chapters 5-7 have uncovered that arbitrary government interventions, institutional framework voids, hard protection legacies, and poor funding support have resulted in nationwide inconsistencies, and unsupported local managed retreat strategies demonstrating trial and error, generating public contention, and distrust in local government. A process of policy learning is underway at the local level, but weak institutional frameworks and policy direction, legal uncertainty, jurisdictional constraints, and a lack of capacity hinder effective, equitable, responsive and robust risk governance. When dealing with managed retreat and the significant implications it brings, these limited governance approaches breed public distrust in authorities, confusion, fatigue, distress, and anger, particularly when financial security and livelihoods depend on confidence in the future.

Socio-political-cultural, economic, environmental, and institutional enablers and barriers are key themes emerging from the international scholarship and New Zealand experience (Chapters 2 & 4-7). Whilst segregated as categories that drive and deter the implementation of managed retreat, they are symbiotic, and illustrative of constraints arising from limits to third-order governance principles. The policy analysis, case study, and questionnaire have realised significant challenges for managed retreat in New Zealand, highlighting tensions (Figure 33) between societal interests and institutional constraints. Social demands are not being met, attributed significantly to institutional capacity, direction, coordination, information and legitimacy deficits, all of which hinder the ability of decision-makers to deliver good outcomes. Private property interests escalate tensions, where in a globalised political economy driven by the neoliberal agenda, human well-being is expected to be progressed via “maximisation of entrepreneurial freedoms within an institutional framework characterised by private property rights, individual liberty, unencumbered markets, and free trade” (Harvey, 2007, p. 22). As recognised in Chapter 2, the market is not focused on addressing the drivers of vulnerability but on individual responsibility and choice (Chapters 6-7), where the needs of

society are met through wealth creation and subsequent volunteer assistance to the impoverished (Bankoff, 2018). Similar to the Australian experience, reliance upon ‘the market’ instead of taking leadership and building institutional capacity offers governments an escape from the contests of managed retreat (O’Donnell, 2019; O’Donnell et al., 2019). What makes it even more challenging is the pervasiveness of the capacity deficit in resolving complex, dynamic, and contested issues of the Anthropocene. This is present throughout aspects of governance, from government hierarchy, across civil society, to private sectors, and the science community. As it stands, while existing institutions (and actors) may surpass these challenges, it takes significant effort and successful outcomes are uncommon. Figure 33 illustrates the key tensions between expectations from society of good governance, and the various ways that institutions are constrained in responding to these concerns.

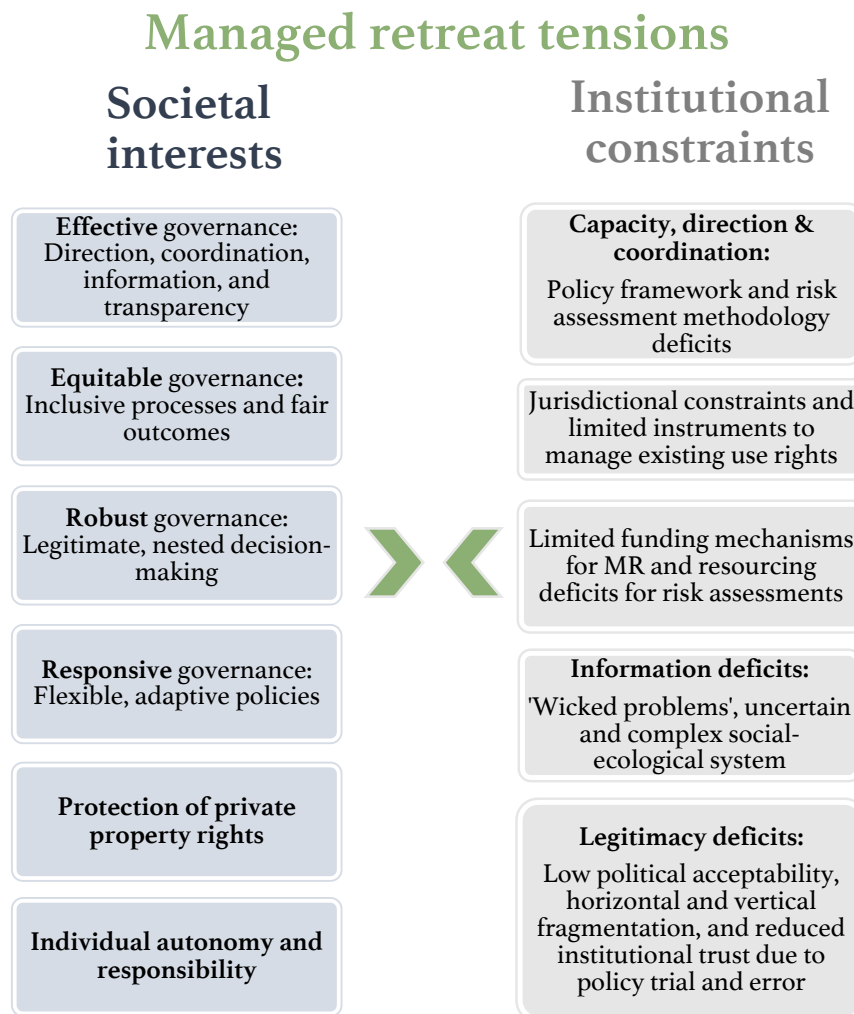


Figure 33: Managed retreat tensions

On the whole, this research has emphasised the need for stronger institutional frameworks and essentially, more hierarchical direction and support to build local capacity and overcome institutional barriers to implementing managed retreat. This direction can set a clearer framework for various types of managed retreat (rather than just hierarchical). This, however, can contrast with individual concerns, such as regarding the level of governmental intervention in private property, with strong expectations of rights to self-determine and individual autonomy. These tensions highlight that to progress the enablement of managed retreat, a greater focus on its *governance* is required, to consider opportunities to overcome the institutional barriers limiting its potential, and those affecting its socio-political-cultural acceptability.

Chapter 8 analyses more deeply the governance of managed retreat, supported by semi-structured interviews of local government planners across New Zealand localities, where authorities are dealing with significant natural hazard and climate change risks, and are attempting to facilitate managed retreat (Appendix 8). The interviews cover local issues, but fundamentally, opportunities to build institutional capacity in ways that may increase socio-political-cultural acceptability, and more effectively enable managed retreat.

This thesis demonstrates that managed retreat is an umbrella term, which can be applied at a range of spatial and temporal scales and through a variety of government and governance interventions. Therefore, it is more appropriately addressed in plural, as ‘managed retreats’. To emphasise this, Chapter 8 examines four ‘retreats’ across a governance spectrum of state intervention to societal autonomy (informed by Chapter 2). In this discussion, the types of retreat and governance modes, elements and orders are analysed and distinguished, contributing to Objective five of the research: to examine opportunities to build institutional capacity, and help alleviate the tensions uncovered.

8.2 Governance framework

This thesis has investigated barriers and enablers to facilitating managed retreats in New Zealand. Remedies for many barriers depend on changes in governance. Chapter 2 reviewed the governance literature, recognising that it is a complex concept, generally conceptualised as encompassing a range of *modes* situated on a spectrum delineated (not necessarily in opposition) by ‘hierarchy’ and ‘market’ (Hysing, 2009; Treib et al., 2005); *elements*, the instruments which enable governing action, and; *orders* of governance, including interactions such

as rules and procedures, and those between actors, and the principles required for effective governability (Kooiman, 2003; Kooiman & Jentoft, 2009). Governance theory acknowledges that the public sector is not the only authoritative actor in dealing with environmental issues. Recently, attention has been drawn to more nuanced arguments regarding hybrid forms of interactions across the spectrum, joining markets, states, and communities (Driessen et al., 2012; Lemos & Agrawal, 2006).

Chapter two (Section 2.3) examined archetypal governance modes with reference to the academic literature. In summary, this recognised the high capacity but rigid and reactive nature of hierarchy; the benefits of local decision-making under de-centralised government, but the pitfalls of incapacity and a complex operating environment; the flexible, adaptive nature of network governance, requiring judicious network leadership and management; and finally, the self-organising, far reaching autonomy of self-governance which can be self-interested and short-term focused, susceptible to failing to address underlying causes of social and environmental problems. Each of which can contribute towards the effective operationalisation of managed retreat. The governance modes across the spectrum have informed the discussion in Chapter 8, and the development of a framework by which to practically assess the governance of managed (and unmanaged) retreats.

The framework in Figure 34 helps structure the discussion in Chapter 8, revealing the potential for 'retreats' across a spectrum of state intervention to societal autonomy. *Hierarchical government* (often functioning in a de-centralised structure) encompasses the far-left mode of the spectrum, representing the legitimate actions of central and local government, enabled by legislation, standards, policy and regulation. Moving along the spectrum is *network governance* (sometimes referred to as co-governance or co-management (Kooiman et al., 2008)) where power is shared rather than exclusive, and government agencies, the private sector and civil society collaboratively engage in negotiated agreements or strategies, sharing knowledge and resources. At the far end of the spectrum is *self-governance*, where civil society is broadly influenced by societal structures, such as markets, via voluntary price/cost contracts. Individual autonomy is high, and power is diffused. The spectrum is fluid in recognition of the hybridity ever-present in reality, as actions rarely represent one governance mode, and different risks and contexts require diverse governance arrangements.

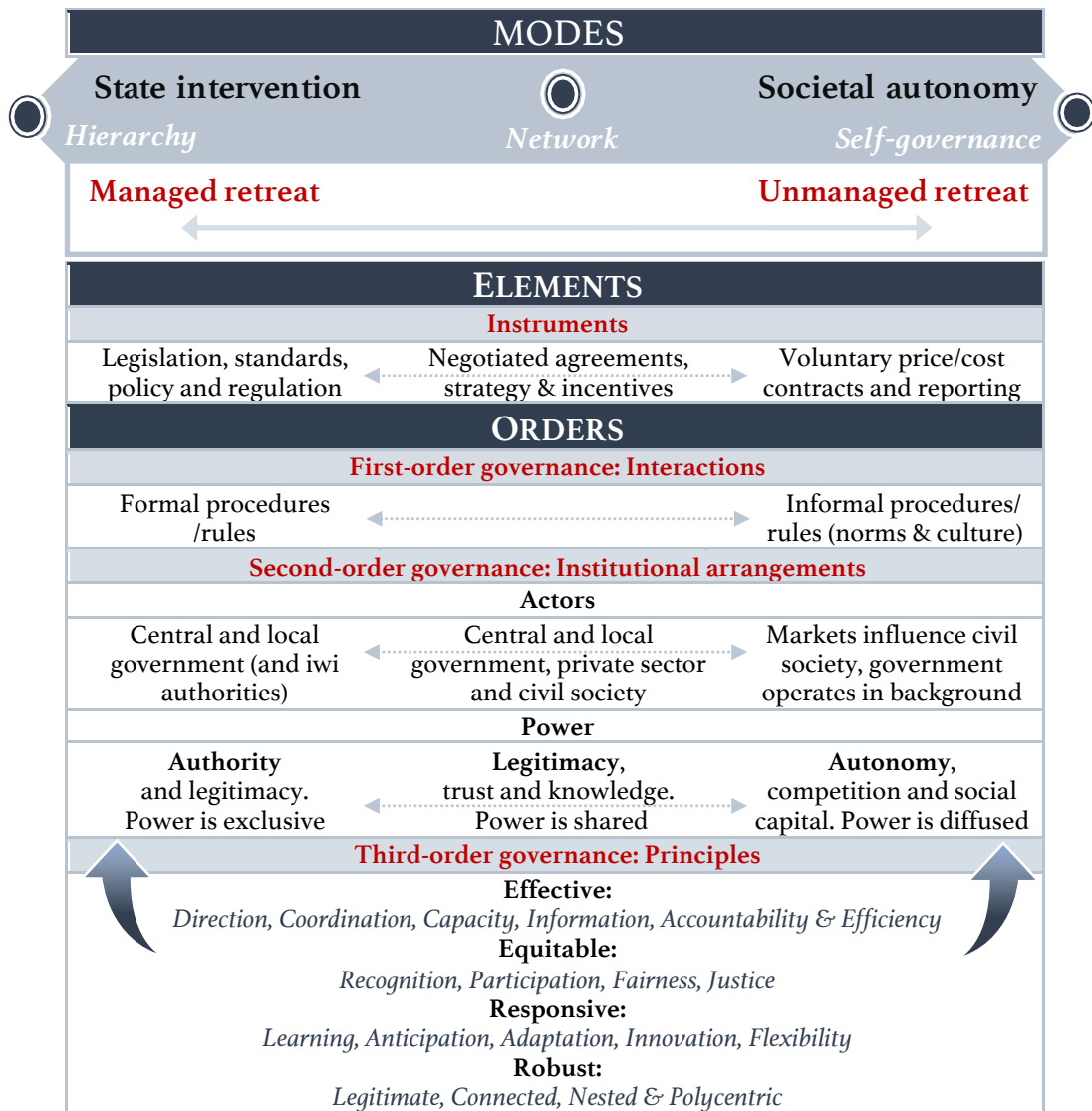
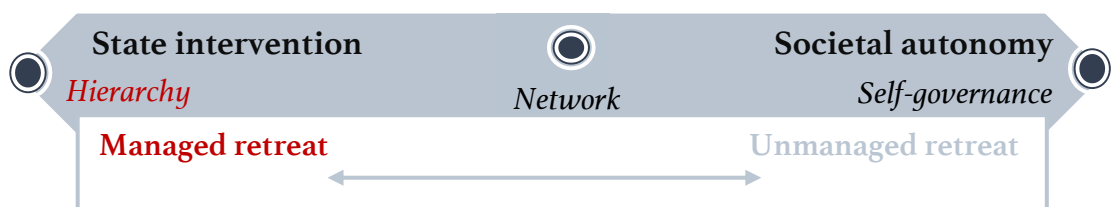


Figure 34: Retreat governance modes, elements and orders

We can see that in New Zealand, managed retreats have evolved to be governed across the spectrum from hierarchy to self-governance, with limited understanding of who adapts, which climate and hazard risks are being adapted to, and how (including autonomy, timing, process and scales) (Smit, Burton, Klein, & Street, 1999; Smit, 2000). Chapter 2 provided examples of collaborative governance strategies; Chapters 4-6 examined hierarchical governance instruments applied via central and local government legislation, policy and regulation and; throughout the thesis there has been recognition of unmanaged retreat, voluntarily delivered by civil society, with its diverse appetite for risk, influenced by the market and insurance sector. Across the spectrum, power may be exclusive, shared, diffused, or a combination. Power is an important element of retreat governance and its resulting social acceptance, with self-determination and autonomy a clear demand for some members of society, as highlighted in

Chapters 6-7. The answer to the question, ‘managed retreat by whom and how?’ is central to its facilitation, in New Zealand and abroad. This thesis has revealed that thus far, it has not been clarified who is responsible for facilitating retreat, allowing its application to evolve through ad hoc government interventions, fragmented policy and planning application, and influences of the market. Understanding the modes of governance informs which actors are empowered and which mechanisms can be applied, to assist in answering the fundamental questions of ‘managed retreat by whom, how and to what?’ The line of inquiry for Chapter 8 is guided by reflecting upon the governance framework, drawing from the systematic assessment of policy and qualitative critique of planning practice in New Zealand (Chapters 4-7), to examine capacity building opportunities to improve upon the shortcomings of the current regime. With an understanding of the various modes within the framework, the elements and orders of retreat government and governance are assessed, combining New Zealand case studies, international literature, and interview data, with a view to informing opportunities to support and enhance prospects for improving the enablement and outcomes of managed retreats. The following analyses begin at hierarchical state intervention, examining managed and anticipatory managed retreat, followed by opportunities for voluntary managed retreat, and finally, unmanaged retreat.

8.2.1 Managed retreat



Managed retreat is an encompassing term (Chapters 2, 4 & 5). This thesis is focused at a discrete scale—investigating local and regional managed retreat—the strategic relocation of people, assets, and activities away from natural hazard and climate change impact exposures. Unlike pure relocation, the term ‘managed’ infers a strategic, controlled approach to land use change, a task aligned with the planning regime. Managed retreat at this scale can be reactive, or anticipatory, and applied over the short, medium or long-term.

In New Zealand, the question of ‘managed retreat by whom?’ is somewhat answered by default, via the devolved resource management hierarchy, where central government is expected to provide technical guidance and policies to be

applied at the local level. Towards this end of the spectrum, central and local government take the lead, and civil society is the recipient of formal rules, regulations, policies and procedures developed for the public good (Driessen et al., 2012)—subject to statutory requirements for public participation in the New Zealand institutional context. De-centralised government is aimed at affording citizens and their elected representatives more power in public decision-making. It anticipates decisions that have been informed by strong public participation, reflecting the diverse values and interests of local communities. However, in practice, it does not always meet expectations (see Section 2.7.2 Kāpiti).

In theory, managed retreat under de-centralised government involves the application of resource management policy and rules to reduce development in risky locations, to enable future managed retreat where risk is not yet high and there remains time for reasonable use of land (for example, to manage the influence of slowly emerging climate change risks), and to regulate or extinguish the use rights of existing activities, either before, or after significant natural hazard and climate change impacts occur. Managed retreat under de-centralised government has the ability to be anticipatory, and legitimate, subject to Schedule 1 of the RMA, requiring robust community consultation with opportunity for judicial review or Environment Court appeal. However, local government barriers such as poor leadership, resource constraints and limited jurisdiction exist, heightened by central government inadequacies which inhibit the de-centralised governance framework, impacting the enablement of managed retreat in New Zealand and fundamentally, the ability to recognise and provide for matters of national importance, priority three of the Sendai Framework for Disaster Risk Reduction 2015-2030 and Article 7(1) of the Paris Agreement. Notwithstanding broad guidance for managed retreat to reduce coastal risks under the NZCPS, key elements and orders of hierarchical managed retreat government are currently deficient or hidden from practice.

As detailed in Chapter 7, the devolved hierarchy which frames environmental planning necessitates strong direction and support from the state, to build the capacity of institutions at the local level. This research has identified that overcoming pressure to maintain the status quo is difficult, but stronger national direction for managed retreat could alleviate this, to improve local government's capacity to facilitate managed retreat and overcome unsustainable path dependencies. To gain traction on CCA (and mitigation), Palmer (2015, p. 134) argues that “most important is the provision of an effective policy

framework.” Reisinger et al. (2015) similarly emphasise that managed retreat requires long-term policy commitment which can be challenging due to short-term planning and election cycles in New Zealand. This signifies the importance of central government direction and capacity building to ensure commitment to actions over the long-term. The following discussion considers practical opportunities to alleviate these institutional constraints, to enhance the elements and orders of hierarchical government to enable managed retreat.

8.2.1.1 Institutional framework to guide local decision-making

The affected community of Matatā is still suffering from the demands of both absorptive and adaptive resilience, stemming from an unsupported policy process and strategic response planning framework void. Environmental planners have recognised that this issue is nationally widespread;

Participant 4: ...after the Edgecumbe floods [2017] it [managed retreat] was also talked about, but no one in government was prepared to actually grasp this and run with it. It was all push back and that's the issue with reactive planning.

Participant 5: We were told we weren't allowed to do a risk assessment...

Participant 4: ... there was nothing in place to support it. If there had been a model in place and there was funding available, then you work through that risk assessment...But because there's no framework around that assessment, then the initial short-term fix is what people go for.

Participant 4 agreed that governance actors are stuck in path dependencies because there is not a statutory framework providing clear guidance and instruments towards more sustainable ways of making decisions. This is a deep and far reaching governance capacity deficit, common to managed retreat and risk reduction more generally, with complexity, uncertainty, dynamism, and contention limiting effective action. Participants 2 and 18 developed this theme further, expressing the need for leadership and direction:

If central government doesn't really have the heart to push through tools that enable managed retreat and lead the way, don't pretend that that is actually on the table. If that's not really where our society wants to go to, take it off the table... don't pretend that through the matters of national importance that somehow you need to be doing this... (2).

There needs to be genuine desire by all parties, central government, regional and district councils, infrastructure providers and land owners to actually move forward together if managed retreat is going to be a genuine widespread policy action to adapt to the impacts of

climate change. It's going to need bold central government leadership (18).

Confirming these statements is the 2017 Stocktake Report from the Climate Change Adaptation Technical Working Group (CCATWG) which broadly highlights that coordinated national leadership and direction is sought by local government to provide a clear adaptation mandate and prioritise action (CCATWG, 2017, p. 56). Councils are not fully autonomous as they derive their powers from the state, meaning there is a clear role for robust central government lawmaking (O'Donnell, 2019). To progress, a national conversation with the public and key stakeholders around the acceptability and applicability of managed retreat is required. Chapter 7 found that there are polarising views surrounding managed versus unmanaged retreat, necessitating broader analysis and discussion of retreat governance. If retreat is to continue to be managed by environmental planners under the devolved structure, a clear policy framework for risk reduction must be developed to guide decision makers and stakeholders at the local level;

It's not just managed retreat but disaster risk reduction as a concept, and I think there's some policy thinking to the front end of that but not at the back end, where the rubber meets the road...we're trying to deal with implementing those policies and that framework isn't clear enough to guide people through (Participant 4).

When asked what useful national guidance would look like, Participants 2 and 4 considered that a hierarchy of risk management approaches (including managed retreat) with a priority system to determine which risks to focus resources on would be useful:

To me, guidance should suggest you should go to the things of greatest consequence – particularly loss of life risk, get rid of those first. (Participant 2)

There needs to be a prioritisation of what you put resources into based on national guidance of what those priority levels are for the country. (Participant 4)

Some very clear triggers and direction for when it will occur, how it will happen and who is responsible. Taking away some of that uncertainty and trying to minimise the argument. (Participant 19)

This is aligned with Policy 24 of the NZCPS which directs that priority is given to the identification of areas at high risk of being affected by coastal hazards. The NZCPS 2010 guidance note recognises the time consuming and expensive nature of risk assessments as the justification for such prioritisation (Department of Conservation, 2017). When asked how national guidance for

managed retreat might be delivered, Participants 18, 22, 3 and 5 referred to the need for a National Environmental Standard (NES) to ensure efficiency, consistency and robust policy creation:

Central government probably needs to provide more robust leadership – probably through a National Environmental Standard... when councils are promulgating rules and policies and put it through a RMA Schedule 1 process, anyone is able to challenge those provisions, and what tends to happen is the council tends to put out something in a notified plan or plan change and the final product, once it's been through the appeals process/environment court is often quite different to what it started out. It tends to be, not your lower socio-economic people in flood plains, but more the affluent, lobby group individuals who have money and time to challenge councils through the appeals process that end up quite well off in the appeals process. We've got multi-million-dollar properties and investments in the coastal environment...for councils to introduce a rule that there should be no new development in 'X' environment that would be challenged by very wealthy landowners and probably wouldn't stack up – so it's tricky and heading in a convoluted way, which is why I think it's better for central government to take it through an NES or RMA s 360 approach. (Participant 18)

An NES is helpful because it would explain that 'this is the trigger'... they are easier than NPS because they are actually directing to implement 'X, Y, Z'...we all understand what we have to do, and we do it, because it's a regulation... it's clear. (Participant 22)

Participants were firm that general, non-statutory guidance would not be preferred as from their experience:

...most guidance is extremely unhelpful, because it is developed at a level completely devoid of the realities on the ground and often is theoretical rather than actually providing the practical applications...You need guidance developed that is practically implementable – that everyone can pick up and see how it applies to their context or hazard. Rather than guidance that just says you should develop an adaptive, relocatable framework, you should use a range of SLR scenarios and here are some planning principles. That type of guidance is extremely unhelpful. (Participant 20)

...guidance isn't guidance. That sounds strange but having a discussion document doesn't do it. If it's going to be applied nationally it needs to be required to be applied nationally. (Participant 3)

An NES would ensure national consistency and help deliver more equitable outcomes, a growing concern in the managed retreat space. It is considered necessary as an NES mandates immediate and consistent policy and standards, superseding conflicting guidelines and plans, ensures efficiency in implementation and administration, and is legally binding on local government, ensuring adequacy. District Councils in the Waikato Region have had a stroke of luck with policy consistency due to the use of the same coastal scientist for

developing district plan coastal hazard policy, but “that doesn’t mean that’s happening in any other region” (Participant 22). Participant 22 considers that under the current system, if national level capacity building doesn’t occur “the regions need to be really clear about what they expect in their RPS” by prescribing methodology to inform risk-based planning decisions about when and where managed retreat should occur (Chapter 6), however:

they don't, and they don't want to...When you write an NES or NPS, you have a team of people dedicated to it who are answerable to government ministers...When the regional council has to do it, they have to find the money to implement that change, consult on that change, they've often got very complex iwi situations that they have to deal with. It's not efficient. It's more efficient to put something in at a national level.

While Participant 5 recognises that developing an NES would be challenging, “a loss of life measure would be really easy to get through, for the thresholds, the different levels of risk. That could be done tomorrow. It’s generally accepted practice worldwide...” This in itself would be progress for enabling managed retreat of communities to reduce high consequence, high likelihood risks. But as recognised by many participants, an NES with a set methodology to guide local decision-making and in line with principles of good governance highlighted in this thesis would be the most efficient approach to enabling consistent and equitable managed retreat across New Zealand. The Stocktake Report also recognised that having each unit of local government “using different assessment and implementation approaches is inefficient and creates duplication of effort”(CCATWG, 2017, p. 55).

Past managed retreats in New Zealand set informal governmental intervention precedent, which could inform national guidance where there is high risk to life. Appendix 10 is a sample from a larger database of recorded managed retreat endeavours in New Zealand from 1910-2018. It provides examples where managed retreat has occurred due to a determined high risk to human life. At this risk level, the management approach has generally been land acquisition, and in all but one case (in 1910 and not including the Mt Cook policy which relates to conservation land) central government has provided some form of procedural support and funding assistance to enable managed retreat. In this manner, an informal precedent for government intervention and funding of managed retreat where there is relative certainty of high risk to human life has been set. This is pertinent to de-centralised governance as it indicates a level of risk intolerability to trigger managed retreat, particularly for known, immediate

risks, as well as precedent of central government intervention and funding to support managed retreat. Pursuant to Part 2 of the RMA, the health and safety of people is simultaneous with the responsibility of sustaining natural and physical resources, safeguarding ecosystem services and avoiding, remedying or mitigating adverse effects on the environment. Triggers for environmental risks such as irreversible harm to natural character are also necessary. For example, local 'coastal squeeze' (Esteves, 2016) triggers could be informed by the avoidance policies for natural character, biodiversity and walking access of the NZCPS (Policies 11, 13 & 19).

National direction

NES are regulations issued under s 43 RMA that prescribe standards to ensure consistent management of activities and resource uses. An NES for natural hazards would have benefits of: avoided local plan changes and associated submission costs; improved controls to reduce the risks of inappropriate development; direction for assessing and managing vulnerable activities to improve public health and safety, service provision and community resilience; potential for improved environmental outcomes (such as recognition and provision for matters of national importance (RMA s 6)); and reduced potential for local planning disputes and litigation. Costs would likely include: development and administrative expenses to implement the NES; compliance costs and; potential for reduced property values and disruption to livelihoods (with social and economic implications) due to standards limiting or affecting rights to existing and future land use, development and subdivision.

To regulate managed retreat, an NES (which would address natural hazard and climate change adaptation standards more broadly) would need to include a definition, principles, strategic planning requirements, clarification of local authority functions, and standards for existing, new, and re-development of public and private property for the avoidance, reduction, or cessation of land use activities. This would include regulations for the avoidance of new subdivision, land use, and development (including infrastructure), managed retreat of public lands and assets, intensification/re-development restrictions and relocatable building regulations (or time-limited resource consents) including implementation and monitoring requirements, and the mechanisms and procedures to manage existing use rights according to risk profiles. The NES could incorporate a risk management hierarchy to prioritise actions and would need to provide methodologies which ascertain how natural hazard and climate

change risks must be assessed. The CCATWG (2018) recommendation report further develops this need, also recommending consistent methodologies, and incorporation of tools to assess compounding and cascading risks, and both quantifiable and qualitative losses, including risk and vulnerability of social, cultural, economic, environmental and infrastructural dimensions. Nationally-consistent datasets, climate change projections, and scenarios would also be required.

Guidance on decision triggers could direct action, such as at the coast, erosion within a set distance to the seaward point of a structure, where legal access to a property is no longer available, when essential services such as potable water, sanitation, or power are at risk/no longer available, or when coastal squeeze will cause irreversible loss of high tide beach, habitat, or natural character. Ideally, regulations would be supplemented with tools and guidance materials to demonstrate the approach required and provide processes to follow.

In recognition of central government's slow progress developing NPS and NES, especially for the management of natural hazard risks, the development of a National Climate Change Adaptation Plan (NAP) (proposed under the Climate Change Response (Zero Carbon) Amendment Bill 2019 which was informed by the CCATWG (2018) report) could potentially fulfil this role instead, extending beyond CCA to integrate natural hazard risk management. Based on the recommendations provided by Tait and Ungaro (2017), such a plan would inform local governments, the private sector and citizens by providing a vision, guidance, and set of actions, applying a statutory Adaptation Strategy and Action Plan based on a comprehensive national risk assessment and prioritisation process (also recommended under the NES approach). This plan would provide the strategic direction required for Ministries and local governments to develop their own implementation plans, following a defined framework, assisted by a funding plan, local training (capacity development) and specific vulnerability assessments. As has been experienced internationally, supporting the action plan with national legislation is imperative, as well as clarification of roles, responsibilities and expectations of private and public sectors (Ibid). To be effective, a NAP would benefit from having the same immediacy and power that is afforded to NES (s 44A RMA).

Effective action requires strong connections between science, and directive, coordinated governance, however capacity is only demonstrated when actors are enabled to undertake action (Wyborn, 2015). Implementation support and

resources are essential to give effect to regulatory frameworks and enable effective governance.

8.2.1.2 Implementation capacity

If managed retreat under de-centralised government is to be effective, it is not just about national policy guidance, but support, power, and resources:

What would be more valuable would be giving planners the backing and the resourcing to actually implement it...there's going to be a huge battle when push comes to shove...but backing planners up when it comes to the fight would be invaluable. (Participant 19)

The current devolved system works well if the councils are funded...the councils can't afford the expertise that they need...the funding model is wrong, devolving it all to councils is a recipe for disaster. (Participant 22)

This support is vital to enabling managed retreat. For example, the Waikato RPS (2016) provides a strong policy directive for identifying where managed retreat should occur: “there was very conscious use of the words ‘will’, ‘shall’ and ‘should’, and actually tackling some of the hard issues and saying this is what we want to achieve.” (Participant 19). However, due to the lack of policy and risk assessment guidance and funding availability, implementation of this method has lagged, because managed retreat remains in the ‘too hard basket’; politically, economically, technically, culturally, and administratively. National and international imperatives for capacity building are clear (Chapters 2, 5, 6 & 7), supported by a growing body of governance scholarship (Armitage, Berkes, & Doubleday, 2010; Bennett & Satterfield, 2018; Lebel et al., 2006; Lockwood et al., 2010; Wyborn, 2015).

In New Zealand, managed retreat funding is ad hoc, causing local government to develop inconsistent strategies. Boston and Lawrence (2018, p. 43) recognise that this will create inequities across New Zealand: “without a fair, consistent and nationally mandated approach to adaptation funding, affected residents are likely to resist locally crafted proposals for managed retreat.” Existing funding arrangements are reactive, such as the Natural Disaster Fund administered by EQC, the Adverse Events Fund administered by MPI for adverse rural effects and the National Civil Defence Plan provision for up to 60% repair costs for underground water and sewerage services post-disaster (Ibid). Funding for anticipatory action is lacking for managed retreat of private and public assets. Boston and Lawrence (2018) recommend that central government establish a national Climate Change Adaptation Fund with a statutory mandate to fully, partially, or co-fund adaptation-related costs such as managed retreat to enhance

capacity for anticipatory governance. It is argued that such a fund is necessary for anticipatory action to allow integrated management of all natural hazard risks, not just the impacts of climate change. Such a fund could be built up over several decades to distribute the burden of managed retreat, among other management approaches, across several generations.

The tripartite funding model proposed for Matatā is an example of a potential approach to funding managed retreat which, if applied nationally could build local government capacity. If it were enabled through a comprehensive funding application process supported by an adaptation fund, this would reduce uncertainty and mistrust caused by current planning approaches. Such a model would need to consider the cost allocation principles discussed in Chapter 7, and principles recommended by Boston and Lawrence (2018): long-term cost minimisation, equitable burden sharing, using the best available scientific evidence, procedural fairness, flexibility to accommodate changing risk profiles, transparency, fiscal sustainability and sufficient policy clarity, consistency and stability to bring certainty to the funding framework (see Section 7.3). Answering the question of ‘which specific managed retreat costs should be funded and to what extent?’ requires further analysis and public debate. Much like the question of ‘managed retreat by whom and how?’, ‘who pays?’ is unclear at present. As stated by Participant 6, responsibility for funding managed retreat may need to include property owners, which would go some way in reducing moral hazard risk. Boston and Lawrence (2018) argue that if central government is to become a major funding body for adaptation such as managed retreat (albeit in a de-centralised governance structure) this would require greater influence over long-term spatial planning, something which could be enabled under an NES, as well as being facilitated as part of anticipatory managed retreat (Section 8.2.2). This would also help reduce moral hazard risk, especially for pre-emptive managed retreat (Ibid).

In this regard, participants were asked about the benefits of a national risk assessment to assist in identifying natural hazard and climate change risks using a prescribed methodology. Participant 3 considered that this could be useful, but again, it would require funding support:

The risk with that is, you identify a significant risk for a small town that can't afford to do anything and then just hand it to them. Opotiki is an example where the regional council assisted them to identify the risk and then they put their hands up and go 'that's the wrong answer – what are we going to do now?' If you did that at national level, it's

kind of big brother-ish, to then say, we've done your risk assessment, here you go.

A significant portion of the costs of managed retreat lie in the identification of risk, consultation and analysis of options. Emphasising the importance of the principles of 'need' and 'capacity to pay' (Section 7.3) is the reality that "small councils in New Zealand struggle to undertake even basic inundation assessments, let alone more comprehensive risk and cost-benefit assessments" (Reisinger et al., 2015, p. 302). The limited capacity to undertake strategic adaptation planning and consultation makes the necessary preparation, let alone implementation of managed retreat unattainable: "there is a desire for better data and information on local scale impacts...[but] the costs of obtaining this information is a barrier..."(CCATWG, 2017, p. 55). As has been seen in New Zealand and abroad, resource constraints lead to self-perpetuating short-term fixes rather than long-term integrated solutions (Measham et al., 2011). Funding support should be available so councils can identify risks and strategically prioritise actions to deliver locally nuanced solutions. "Without some form of national cost sharing, the principles of need and ability to pay will almost certainly be violated. Equally, it will be hard for poorer communities to find the resources necessary to fund proactive measures to mitigate future risks" (Boston & Lawrence, 2018, p. 46). However, as recognised by Participant 2, a further implementation restraint for managed retreat is that:

...if you go through that prioritisation ... and it's a retreat scenario, the tools aren't actually there...They are there in the sense that you can use a [regional] plan rule and you can do 'work arounds' and be creative around voluntary managed retreat.

Among issues of national direction and funding support, there is a lack of effective instruments to apply managed retreat of existing uses under the current system. The following section considers new opportunities to overcome existing institutional deficits. Apart from re-zoning and re-development regulations to reduce investment and encourage managed retreat over time, extinguishment of existing use rights is the only tool (although it currently has some legal uncertainty) to effectively relocate sensitive activities away from risky locations.

Chapter 6 uncovered the jurisdictional incompatibilities and significant public concern with this approach, with private actors wishing to pursue legitimate property and business interests, competing against civil society and state interests of community safety, liability, and sustainable management of resources for current and future generations. Similarly, Chapter 7 highlighted

expectations of compensation for ‘managed’ retreat (with varied perceptions of quantity and qualifying principles). In Matatā, local government staff recognised property owners’ expectation of financial incentives, applying voluntary retreat in combination with regulation, attempting to reduce contention and overcome the planning mechanism deficit. However, the voluntary and regulatory processes were not compatible, and the lack of legal certainty and funding hindered equitable management of risk. The national policy framework deficit and legal uncertainty regarding statutory powers and interpretation of these results in the courts having to fill the vacuum (Chapter 4) illustrating the need for managed retreat to be enshrined in legislation (Harvey, Clarke, & Nursey-Bray, 2012).

8.2.1.3 Managed retreat instruments

Chapters 5 and 6 examined existing managed retreat planning instruments, revealing the regulatory deficit for managing existing land use activities. Chapter 6 provided clear evidence of the tensions involved in attempting managed retreat without effective mechanisms, hence compulsory acquisition powers for territorial authorities have been discussed with participants. Other non-central Crown agencies such as Heritage New Zealand and the River Boards have been similarly empowered to acquire land (under The Heritage New Zealand Pouhere Taonga Act 2014 (s 14(1)) and The River Boards Act 1908 (s 74)) and most participants consider it to be a useful tool, avoiding the difficulties of ‘voluntary’ retreat (i.e. that which is not perceived to be genuinely voluntary). Participant 2 highlights that it would be of benefit to high-risk situations to enable effective and efficient managed retreat, as well as part of anticipatory managed retreat, including progressively buying properties at risk, potentially renting them out over the short-term and offering first right of purchase to original property owners in future if the risk levels are unexpectedly reduced to an acceptable level (depending on the level of risk and if the land is not immediately converted to reserve). Whilst compulsory acquisition may be viewed as being imperious, the exercise of such powers is subject to legal process as well as judicial review if necessary, providing legitimacy and accountability.

Some councils have been able to achieve managed retreat using negotiation or compulsory property acquisition under the Public Works Act 1981 (PWA), however this approach requires some form of public work, such as a stop bank, and is therefore more correctly termed as managed realignment. Such property purchase has been occurring to manage inland flooding across New Zealand as

part of catchment management works (for example in Edgecumbe and Lower Hutt) however, without a mechanism or budget to acquire land, property acquisition is more difficult where no public works are involved. At a 2018 Society of Local Government Managers Conference on Climate Change and Coastal hazards, it was observed that senior planners also discussed the need for compulsory acquisition tools to enable managed retreat (in particular, a panel member from Tasman District Council where increasingly extreme events are proving difficult to manage).

Participant 2 acknowledged potential for a more strategic approach to managing existing land uses, with an opportunity to align with the proposed Urban Development Authority (UDA) powers aimed at improving the supply of land for housing to address affordability concerns. Under the proposal, government was attempting to clarify ‘urban development’ as a ‘public work’ to enable land acquisition under the PWA for urban renewal on the grounds that “wider public interest in housing justifies overcoming third party hold-outs” (Ministry for Business Innovation and Employment, 2016). As stated by Participant 2 “I would put the importance of acquiring land to reduce life risk of a higher order of significance than buying land to facilitate a pipe, to get more urban development.” As further discussed with Participant 2, rather than using the proposed Urban Development Authority singularly for urban renewal, it could also encompass management of existing natural hazard risks, to sustainably re-allocate and re-organise land use activities through property acquisition and strategic planning. Whether or not government would extend its approach to encompass a more holistic purpose is unclear, however, the fact that it is considered achievable to ‘clarify’ urban development as a public work delivers potential for managed retreat to be clarified as a public work. Particularly where managed retreat has co-benefits (additional to managing significant natural hazard risks) such as restored ecosystem functioning, provision of public reserve and protection of amenity values, it is considered that there is potential for it to be a ‘public work’.

Section 18(1)(d) of the PWA requires the minister or authority attempting to acquire land to first “make every endeavour to negotiate in good faith with the owner in an attempt to reach an agreement for the acquisition of the land.” The Productivity Commission’s review of local planning and development to inform potential legislative change for UDAs stated that “[i]n many cases the exercise of compulsory acquisition powers may be unnecessary where the existence of such

powers is sufficient to encourage a negotiated acquisition.” (New Zealand Productivity Commission, 2015, p. 282). Whilst negotiated acquisition has a number of benefits, the threat of compulsory acquisition is coercive, and not dissimilar to ‘voluntary’ retreat that is more forced than voluntary (Canterbury and Matatā). Should such powers be enabled, greater consideration of their social impacts are needed, including avoiding coercion (there must be intent to exercise the compulsory acquisition powers rather than coerce) as well as inequity, where it is more achievable to acquire land in poorer areas due to lower property values and reduced formal resistance capacity of communities (Lopez & Clark, 2013). The adversarial nature of the legal system requires integration with the consultative imperative of environmental planning, including partnership with Māori, recognising the importance of mode hybridity.

Participant 5 recognised a further limitation of compulsory acquisition powers, highlighting that council having the ability to buy is closely associated with the obligation to buy: “if they have the ability to buy, but they don’t buy, what happens then?” This is an important consideration, particularly if funding is unattainable at the local level, or if political support is lacking. However, if managed retreat (particularly where high risk to life, irreversible adverse impacts on ecosystems, public access and other matters of national importance are concerned) is funded nationally (with support from local rates) and delivered locally (under NES/NAP direction) compulsory acquisition would be enabling from a strictly procedural perspective, and strategic under UDA renewal. However, due to the greater balance of power afforded to local authorities under this mode, managed retreat in a more genuinely voluntary manner may be more acceptable to New Zealanders who have a preference closer to societal autonomy (discussed in Section 8.2.3).

8.2.1.4 Māori governance

Iwi authorities are important governance actors in the New Zealand institutional context, and land is of special significance to Māori. The Waitangi Tribunal argues that compulsory acquisition of Māori land for public works is most often a breach of the Treaty of Waitangi (New Zealand Productivity Commission, 2015). There are also ethical concerns with the compulsory acquisition of settlement land (land re-claimed as cultural redress for historic breaches of the Treaty of Waitangi). Therefore, any strategy to compulsorily acquire Māori land must carefully and collaboratively work towards positive *partnership* opportunities (Ibid, p.284).

Managed retreat governance of Māori land is a hybrid arrangement located between hierarchy and network governance. Te Tiriti o Waitangi/The Treaty of Waitangi signified a partnership between Māori and Pākehā, with each partner responsible for acting towards the other with the utmost good faith (Waitangi Tribunal, 2016). The obligations of partnership include the duty to consult Māori, who gave kawanatanga (governance) of the country to the Crown in return for a guarantee that tino rangatiratanga (full authority) over their land, people, and taonga would be protected (Ibid). The Crown must actively protect Māori interests and make informed decisions, based on consultation (Environment Foundation, 2018). The Minister for the Environment must seek and consider comments from iwi authorities when preparing NPS and NES (s 46 RMA) and local authorities must consult local tangata whenua when preparing policy statements and plans and take into account any relevant iwi management plans. IMPs may include preferred hazard management options, risk reduction techniques and engagement processes to assist with the transfer of natural hazard knowledge (Ibid). For example, the Ngāti Rangitihi IMP states that for natural hazard risk management, “the abandonment or relocation of existing structures and the use of non-structural solutions should be considered among the options.” (Te Mana o Ngāti Rangitihi Trust, 2011, p. 35). IMPs reflect tino rangatiratanga (sovereignty) and kaitiakitanga (guardianship), fostering co-governance of resources. However, this may not be explicitly enabling for managed retreat if not detailed in IMPs, but it may develop through engagement and collaboration during planning processes.

Representing a hybrid arrangement, further opportunities for co-governance with Māori under de-centralised government include joint management agreements (JMA), allowing local authorities and iwi authorities to jointly perform or exercise any local authority functions, powers or duties. This power goes further than consultation, giving an iwi authority an equal share of statutory resource management decision-making power. Further investigation of how this might be applied for managed retreat is required, but it is considered particularly relevant to plan change processes and the allocation of land use activities. While these regulatory processes may exist, better understanding of their application is needed, as well as opportunities to manage the internal governance barriers of multiple land owners in adaptation planning and decision-making for Māori land. Iwi and hapū are the source of mātauranga Māori which is essential to informing adaptation. Māori communities are

particularly vulnerable to climate change due to reliance on land and natural elements for cultural, social and economic well-being, low socio-economic conditions in many areas, and physical exposures such as coastal settlement patterns (CCATWG, 2018). A range of tools for collaboration with iwi authorities exists under the RMA, and collaborative involvement of Māori in decision-making can be non-statutory, as demonstrated in the following section.

8.2.2 Anticipatory managed retreat



Whilst there is a need to manage immediate risks to human life, assets and ecosystems, it is important that adaptation efforts are made to address escalating and longer-term risks. Particularly at the coast, long-term planning is required to manage creeping, uncertain, but inevitable risks (see Section 5.2.3). With a focus on adaptive decision-making to manage uncertainty, Kwadijk et al., (2010) suggested strategies include the concept of ‘adaptation tipping points’ to determine the effectiveness of actions under various climate change scenarios and the points at which alternative strategies or actions may be required. This enables decision-makers to answer key questions such as, what are the initial challenges of climate change, when can we expect them, and what might cause adaptation strategies to fail? (Ibid, p. 736) Combining the concepts of ‘adaptation tipping points’, ‘adaptive policymaking’, and ‘adaptation pathways’, Haasnoot et al., (2013) developed the concept of ‘Dynamic Adaptive Policy Pathways’ (DAPP) to guide decision-making under uncertain global and regional changes. Moving away from static planning, DAPP enables responsive governance, to anticipate how the future will unfold over the long-term, providing a decision strategy and sequence of steps, triggered by ‘adaptation tipping points’ with different types of actions available to handle vulnerabilities and opportunities over time (Ibid). The process can be understood as a series of interlinked pathways, developed on the principle that policies and decisions have a shelf life, eventually failing to meet objectives, requiring revision as operating conditions change (Haasnoot et al., 2013; Kwadijk et al., 2010). Once a decision or action fails to meet objectives, or a trigger is met, the pathway can dynamically change to continue to progress towards the objectives, or to reassess the objectives entirely.

Further progress has been made with regard to monitoring of the DAPP process, including experimental development of potential social-environmental triggers (Barnett, 2014), and the importance of taking into account the presence of multiple actors in decision-making, implementation, and evaluation to support collaborative learning (Hermans, Haasnoot, ter Maat, & Kwakkel, 2017). In particular, technical ‘signposts’ (indicators which help determine if conditions critical to policy success are still being met) are necessary to monitor the external environment, but political signposts are also required to monitor progress in the implementation of agreed policy actions and achievement of policy objectives (Ibid). Identifying practical trigger values for these variables requires different approaches and collaborative involvement of different types of actors (Ibid, p. 37).

In the Hawke’s Bay of New Zealand, a collaborative strategy has been developed by the local authorities and groups representing mana whenua and tangata whenua to manage coastal hazard and climate change risks within a DAPP framework (see Chapter 2). The *Clifton to Tangoio Coastal Hazards Strategy 2120* represents a hybrid of de-centralised government and network governance, offering innovation and flexibility under its non-statutory status, in an adaptive, long-term manner, meaning that it is more suited to dealing with uncertain and complex problems such as sea level rise. This is essentially a shift along the governance spectrum from hierarchy to network governance and enables greater integrated management of local institutions, functions, powers, resources, and risk than what is possible under regulatory plans:

RMA planning documents are just one potentially small piece of that overall big jigsaw. You have many other pieces that need to come into place for a coordinated, strategic relocation of communities. From house insurance to community wellbeing, social infrastructure, physical 3 waters, roading, which goes way, way beyond RMA planning documents... Maybe in our first generation of RMA planning documents, we thought these were one of the only tools that we could use to achieve big environmental outcomes...RMA planning documents nowadays are being designed to deliver what they are designed to best deliver on. (Participant 21)

Under the collaborative strategy, dynamic adaptive pathways have been developed that set the actions for the short, medium and long-term. Managed retreat is a long-term action for a number of pathways, not present in any of the earlier time periods. Whilst this strategic, non-statutory approach has proven the power of collaboration and delivers a forward-thinking, flexible, and adaptive governance framework, it has limitations which require further attention

(Lawrence & Bell et al., 2019). For example, governance capacity is limited if actors are unable to undertake action, and there remain implementation constraints for adaptive pathways that need to be addressed for it to be effective in practice.

8.2.2.1 Implementation constraints

The *Clifton to Tangoio Coastal Hazards Strategy 2120* paves the way for determining long-term adaptation actions, however it comes with implementation risks. The strategy is non-statutory to allow the flexibility, co-creation and collaboration that is not as readily achieved under de-centralised planning processes. But to give effect to the selected adaptation pathways and ensure legitimacy, the strategy actions must be incorporated into local RMA plans, and key approaches such as hard protection works will be subject to the consenting regime of the RMA and the various politics at play (Ibid). Because the consentability of key pathway actions was not assessed in the MCA for pathway development, there is a risk that some actions may not be achievable due to significant public opposition, adverse environmental effects, and the need to have regard to the provisions of the NZCPS and other resource management regulations. For example, Policies 25 and 27 of the NZCPS discourage hard protection works (25(e)) especially on public land, to protect private assets (27(4)). However, Policy 27 (e) does recognise that hard protection structures may be the only means to protect infrastructure of national or regional importance and that a range of options for areas of significant development, including *transition* mechanisms and timeframes should be assessed. Depending on the outcome of resource consent assessments, what may have been extensively developed as adaptation pathways with a range of options over time, could result in just one (or very limited) action(s) being available, representing more static decision-making, rather than dynamic adaptive policy pathways. The implementation risk in this case recognises the need to incorporate consentability (and feasibility) assessments within the decision-making framework for long-term adaptation pathways. Otherwise, the collaborative process and resources spent on developing the pathways are futile if they cannot be legitimately applied. The hybrid nature of anticipatory managed retreat means that pathway decisions cannot circumvent statutory requirements. Lapse of consents (s 125 RMA) is another potential constraint for long-term decision-making. Implementation via RMA planning documents may require creativity to deliver the flexibility

required for DAPP, due to the legal context that is accustomed to linear decision making frameworks, finality and certainty (Frohlich et al., 2018).

Further lessons include the impact of pathway simplification, which reduces flexibility and responsiveness by applying a single sequence of actions, rather than many possible options and pathways to dynamically adapt to environmental fluctuation (Lawrence, Bell, et al., 2019). The flexible, adaptive nature of network governance requires judicious network leadership and management to sustain legitimacy. Monitoring the effectiveness of governance arrangements and ongoing political leadership will be vital to deliver a robust approach which spans the life of the strategy (Ibid).

Participant 21 emphasised that a strategy such as the Hawke's Bay model is not a cheap exercise:

It's involved a heck of a lot of external resource, but also from the three councils, massive amounts of staff time. And not every council, not every community for that matter would have that luxury. So, they might in their circumstances attempt to roll in bits and pieces into their RMA documents because that's about the only planning document processes that they can afford to have on the go. It doesn't make it wrong, it's just the way that their operating environment is.

The Hawke's Bay Strategy has had significant funding, technical, cultural, and academic support to deliver pathways and work towards solving complex issues in a holistic and collaborative manner. Approximately \$1.6 million of council funding contributed to the strategy itself (Beaven, 2017). 'Gratis' support provided by the National Science Challenge 'Edge Programme' and other partners influenced the process with contemporary academic insights and innovation, thus building capacity for this project and future cases applying the 'Hawke's Bay model', incorporating lessons learnt. This differs from typical planning practice where consultants predominantly support large projects, instead this approach provides a more diverse co-production of knowledge and learning, demonstrating adaptive, responsive governance. Final recommendations from the Assessment Panels provide a way forward in determining which adaptation approaches are most appropriate and when they may occur. The assessment models applied in this strategy are an important progression in this policy learning and collaborative decision-making space, as well as being able to inform governance discussions. The timing of managed retreat across the governance spectrum, and particularly for anticipatory managed retreat, can assist in the delivery of equitable governance outcomes.

8.2.2.2 Discount rates and value judgements

In situations where risk is not yet high, but it is increasing over time or unclear due to the variability or uncertainty of environmental change, it is more difficult to determine when or if managed retreat is appropriate, which presents challenges for political discussions as well as effective governance. Regardless of this difficulty, “waiting until uncertainties are reduced before making decisions, or holding back on making decisions under uncertain conditions, is usually not viable or acceptable to those most exposed to the risk.” (Ministry for the Environment, 2017a, p. 12). Adaptive planning can provide flexibility in decision-making, applying technical assessment of key decision pathways in order to most effectively manage risk and allocate resources. In the Hawke’s Bay, Infometrics applied Real Options Analysis to gain insight into the development of DAPP. ROA is an expanded version of cost-benefit analysis that assesses whether there is value in waiting for more certainty before an expensive and potentially irreversible pathway is implemented, and whether an alternative might suffice (Infometrics, 2017). For example, the analysis questions whether it is more effective to retreat in the near future, or to construct temporary defences in case the effects of climate change are less severe than anticipated (Ibid). This analysis is not singularly based on economic costs and benefits, as MCA scores (including social, cultural and environmental values) are counted, by dividing them into the investment costs to produce a measure of ‘value for money’ (Ibid, p.16). For Northern and Southern area units analysed using ROA in the Hawke’s Bay, the summary of results includes managed retreat in just one of nine unit pathways that are considered ‘best value for money’ (long-term retreat in Clifton) and in no pathways is it considered to be the least expected cost, based on discounted future values with a base rate of 3% (but managed realignment/partial retreat is determined as the least expected cost for two of the units).

As recognised by Infometrics, preferences may change under different discount rates, values of assets, protection costs and climate scenarios. A key area of sensitivity in this modelling is the base discount rate because “a lower discount rate tends to strengthen the case for moving to managed retreat sooner than later” (Infometrics, 2017, p. 3). This is a significant consideration, as the timing of options is influenced by a mathematical equation based on value judgements about the economic welfare of future generations. Infometrics adopted a 3% default rate in their analysis, based on Parker (2009) and the fact that the pathways span over 100 years. Infometrics recognised that following The Stern

Review (2007), a lower discount rate could be justified when dealing with climate change, hence their testing (but not application) of a 1.5% rate for sensitivity. Stern recommends a low (1.4%) discount rate on the basis of intergenerational justice, “if we know a future generation will be present (that is, apart from discounting for the small chance of global annihilation), we suppose that it has the same claim on our ethical attention as the current one.” (Stern & Great Britain Treasury, 2007, p. 160). The Stern Review assumes the probability of human extinction to be 0.1% per year, which implies almost equal weight to all generations to enable intergenerational justice. As uncovered in the Hawke’s Bay ROA “the more weight one attaches to the economic welfare of future generations, the more the optimal path tends towards managed retreat sooner rather than later” (Infometrics, 2017, p. 11).

Final DAPP recommendations of the Hawke’s Bay Assessment Panels do not include managed retreat over the next 100 years in the Northern Cell. But in the Southern Cell, there are three units where managed retreat may be triggered in the long-term (50-100 years) following hard protection, groynes or beach nourishment actions. In the case of the Hawke’s Bay, anticipatory managed retreat is very much a long-term adaptation strategy for the three units, but had a lower discount rate been applied, it is plausible that it would have been more applicable to the short-medium term.

Local authorities are the “trustees of the community’s long-term interests...obliged to adopt a long planning horizon” (Reisinger et al., 2015, p. 304). Distribution of adaptation costs (and benefits) must be weighed against social, environmental, and cultural values that are less quantifiable (Ibid). While each analysis and location will be different, greater transparency and debate about the social and ethical implications of discount rates is required, to avoid presentist bias and clarify how future generations are valued in adaptation pathway decisions.

Fundamental to this ethical question is the influence of cultural values on the judgements made to determine discount rates. Kilvington and Saunders (2015, p. 22) recognised that some iwi participants of a risk tolerability workshop in the Bay of Plenty were less inclined to discount future risk than in the predominantly Pākehā workshops, as iwi regarded risk to children or grandchildren as equally or more significant than risk encountered in their own lifetime. To improve upon pathways planning to enable anticipatory managed

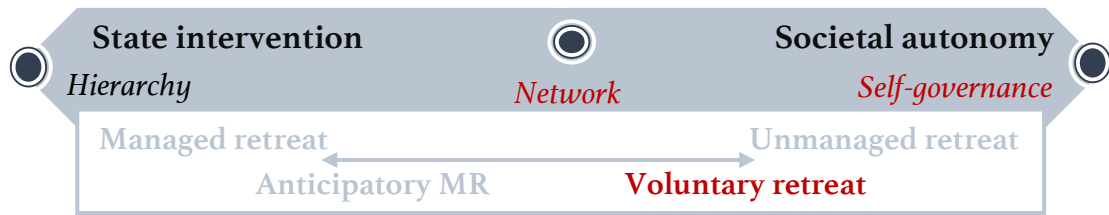
retreat, communities need to undertake transparent debate on discount values for adaptation.

As discussed earlier, the governance of anticipatory managed retreat and its application of non-statutory instruments relies upon a hybrid approach to ensure it can effect change. Boston (2016a) suggests ‘commitment devices’ to bind governance actors and organisations to particular courses of actions. Incorporation of the strategy actions (particularly policy and regulation) into RMA plans would be one such device to formalise and bind the strategic actions and provide security in changing political settings, governance arrangements and economic conditions. In terms of the instruments to enable implementation, once triggered, anticipatory managed retreat could be enabled by the capacity building opportunities discussed for hierarchical governance (8.2.1 Managed retreat) or in the following Section (8.2.3 Voluntary retreat).

Strategically managed retreat ensures that property owners are thoroughly engaged, have time to come to terms with it, and will experience changes in the environment that consolidate the need to relocate. Recognition of the different levels of incentivisation is something that some respondents in Chapter 7 advocated for, particularly at the coast where the impacts of sea level rise and increased storm extremes are experienced, and therefore more likely to be understood. Funding principles to guide incentivised decisions would allow negotiations applicable to local contexts. Irrespective of these principles, public funds will inevitably be required for planning costs, land rehabilitation and restoration, maintenance, and infrastructure removal/realignment.

The Hawke’s Bay Joint Committee has begun a process to develop a ‘contributory fund’ with public rates collected (from 2021/2022) for adaptation actions deemed to provide a public good, and a targeted rate for those providing a private good (Clifton to Tangoio Coastal Hazards Strategy Joint Committee, 2019). At this stage, the proposal for public actions include potential land rehabilitation costs of managed retreat, but not private relocation costs. The fund is also likely to receive support from central government and other agencies, such as utility companies (Ibid).

8.2.3 Voluntary managed retreat



Potentially coercive compulsory land acquisition, illegitimate ‘voluntary’ retreat (Matatā and Canterbury), issues with institutional trust, and desires for personal autonomy (Chapters 6 & 7) lend towards a more empowering rather than controlling managed retreat governance approach, affording greater societal autonomy. Replacing the prescriptive 1974 Act, the Local Government Act 2002 (LGA) changed the power delegation from ultra vires to empowerment, giving local authorities a partial power of general competence. Section 12(2) of the LGA affords local authorities this power for the purpose of performing their roles, providing them with “full capacity to carry on or undertake any activity or business, do any act, or enter into any transaction.” This power provides the opportunity to achieve managed retreat via land acquisition, but it has proven difficult to achieve in practice. For example, in Matatā, differing community risk tolerability, a lack of trust in the authorities, and a lack of funding certainty resulted in partial interest in the voluntary offer, necessitating regulation to enforce managed retreat to reduce risk to life and Council liability. However, there is potential to enhance institutional capacity to manage public and private tensions by considering other governance approaches that facilitate more autonomous managed retreat. Before delving into the opportunities of this mode, it is important to clarify the meaning of voluntary, which also sits on a spectrum. By strict definition, voluntary means acting on one’s own free will, however the presence of risk inevitably influences individuals’ decisions, and therefore does not allow for absolute freedom of choice. Voluntariness exists where realistic choices are still available (Kälin, 2013).

Tauranga City Council (TCC) in the Bay of Plenty already has a process for voluntary retreat without regulatory mechanisms. TCC have a ‘Reactive Reserve Policy’ which provides funding for property purchase, flood mitigation and emergency response actions. The policy states that Council may consider purchasing property through the Stormwater Reactive Reserve Fund if it is a residential property with documented history of habitable floor flooding occurring more than once in the previous ten years, and if the purchase could alleviate neighbouring flood risk via a constrained overflow path or ponding

area, or if documented flood events have resulted in negative effects to human health (Tauranga City Council, 2015). TCC established a \$2 million per annum rates funded reserve for the policy which allows owners to apply to Council voluntarily for support. As of 31 October 2017, six applications have been received, on behalf of more than 10 properties. A combination of property purchase and stormwater initiatives have been considered, with one property acquisition complete (Tauranga City Council, 2017). While this policy is deemed 'reactive', it is a progressive approach to locally funded, entirely voluntary retreat where property owners take on the initiative themselves, when they consider it to be the appropriate circumstance, and are ready to detach from their property. TCC has created its own buyout mechanism, however it only addresses stormwater flooding risks.

This model could be applied to a range of risks, empowering communities to voluntarily retreat over time. The limitations of this approach are that it is reactive and ad hoc. This means that retreat will occur in a sporadic manner, however it allows individual site risks to be taken into account, where risk tolerability is determined by property owners, based on their discrete vulnerability. While this tool is not strategic, it could be incorporated into a wider strategy as a mechanism to achieve voluntary managed retreat where it is determined that the community will respond better to empowerment rather than control.

The TCC reserve fund is not a new concept; it is similar to natural hazard buyouts applied internationally. Particularly in the US, buyout programmes demonstrate the same level of voluntariness. Buyout programs in the US are usually funded by the federal or state government, but are managed at state or county levels, enabling residents who no longer wish to live in high-risk zones to sell their properties and move to safer locations (Freudenburg et al., 2016). The federal government guidelines for the buyouts recommend programme administrators (e.g. state agencies, tribal agencies, federally recognised tribes and local governments who are the eligible sub-applicants) designate priority acquisition areas to target residents for the programmes. The buyouts remain voluntary as programmes take a 'willing seller' approach where areas are "identified by the state and then outreach is conducted to identify owners willing to sell—or a hybrid approach—the state collaborates with county and local governments to identify areas and then reaches out to willing sellers. Other programs take a hybrid approach that combines the willing seller method with a

targeted risk management strategy” (Ibid, p.24). The US buyout programmes are strictly voluntary, but administrators use tools to educate and encourage homeowners to consider, seek out and accept them. Incentives are used to enable more strategic and whole relocation of communities. For example, New York State identifies areas regularly at risk of flooding and property owners in these areas can receive the pre-storm ‘fair market value’ plus a ten per cent incentive if all property owners in the area decide to participate in the program. A five per cent incentive is offered to owners who relocate within the same county (Ibid). This incentive helps to overcome the political disincentive to support retreat caused by reduced rateable property numbers (Kousky, 2014).

A voluntary buyout programme for managed retreat would require central government leadership and funding (depending on the level of financial assistance deemed appropriate), but it could improve upon the established US model by ensuring that local authorities strategically plan for voluntary managed retreat within local, long-term adaptation/risk management plans that deal with the range of hazard risks in an area and align with spatial planning. Voluntary retreat typically involves property purchase, however it could also be formulated as a relocation subsidy incentive, rather than a compensatory model, to allow spreading of costs between private and public actors. Ideally, such a programme would have a nationally consistent framework to be implemented at the local level. As recognised by Freudenburg et al. (2016) buyout programmes could facilitate greater anticipatory governance if at risk communities finalise adaptation plans before an event occurs. But even if voluntary managed retreat does not occur just in time, at least a strategic plan and framework will be established for a more efficient response process, with the potential to avoid the path dependency constraints currently experienced. Voluntary retreat is useful for dealing with risk that is certain and is more likely to be successful when communities have experienced multiple events (Ibid, p.30). Fundamentally, it allows property owners to determine the point at which risk is intolerable and facilitate detachment in a voluntary manner. Bronen (2015) argues that human rights principles are an important foundation for managed retreat, with the right to self-determination being the most important. In this context, self-determination ensures that people have the right to make decisions regarding when, how, where, and if relocation occurs (Ibid). Voluntary retreat protects the right to self-determination, requiring mutual agreement between governing bodies and exposed people and communities.

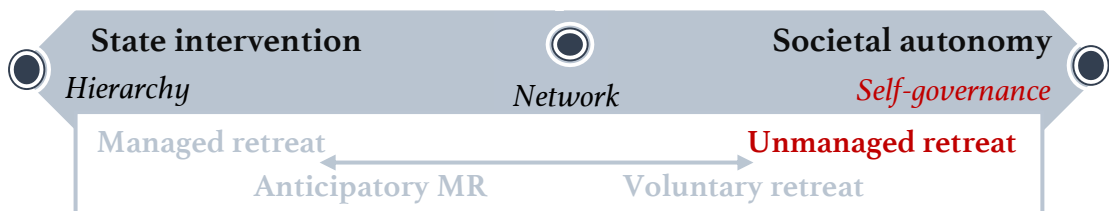
The collaborative nature of voluntary managed retreat can be progressed further, by what Bronen (2015, p.5) cites as ‘community-based integrated social-ecological assessments’ to afford communities the capacity to assess and document environmental changes and sociological vulnerabilities, in collaboration with technical experts. Particularly for climate change risks, instead of governing institutions determining relocation timing and risk tolerance via expert risk assessments, collaboration is integrated into conventional risk management, whereby those directly affected actively participate in risk assessment, capturing the unique nature of a community’s vulnerability (May & Plummer, 2011). Therefore, affected people and communities can consider and set the social and ecological indicators to assess vulnerability by, and subsequently collaboratively determine managed retreat triggers (Bronen, 2015). This approach relies on a range of information sources and worldviews, inclusive of local and indigenous knowledge. Under this approach, both affected persons, groups and institutions cooperate to anticipate vulnerability and implement a dynamic, locally nuanced, institutional response (Ibid).

A New Zealand research project involving Māori land in the Horowhenua-Kāpiti region demonstrates an innovative approach to community based social-ecological (and economic) assessments, collaborating with iwi and hapū to identify culturally informed adaptation strategies, testing strategic, economic, environmental and cultural implications of holistic adaptation scenarios (Bryant, Allan, & Smith, 2017). Māori land and farm-owners, scientists, and architecture students co-designed resource management solutions, converging mātauranga Māori and climate change risk knowledge. Through collective learning, supported by the incorporation of art and design exhibitions, hui (meetings) and wānanga (workshops) on the affected land, the project identified possibilities for adaptation. Significantly, relationships between atmosphere, land, water, and people were identified using both mātauranga Māori and western science, interpreting and aligning these through mappings and exhibitions (Ibid). A toolbox of adaptive solutions was collaboratively developed to empower the community to adapt autonomously, identifying five site-specific ecosystem thresholds. Triggers were designed as landscape signs, diverging from traditional quantitative monitoring, towards a qualitative understanding, based on everyday reading of the land. The adaptation toolbox comprised nine holistic strategies, including coastal dune, wetland, and habitat restoration, protection of arable

land, making room for water, diversifying economic activities, developing adaptive infrastructure and celebrating the high ground. To make the transition, infrastructure will be developed for cultural festivals that might become the basis to settle the high ground, and plans will be made for existing and new papakainga to be resited on unproductive high ground, above the 5m level (Ibid). This project provides a unique model for collaborative, community based strategic planning that could be applied nationwide, supported by buyout or adaptation funding, to assist communities to adapt together, responsive to the Māori worldview, scientific and local knowledge, and community interests.

A national buyout or subsidy program is a valuable opportunity to enable voluntary managed retreat, and if developed correctly, could address capability and capacity gaps, political barriers, and risk tolerability difficulties for local government. In particular, such a programme would enable New Zealand to deal with the “transition period” (Dahm, 2018) of managing legacy development without increasing people’s vulnerability in other ways. In keeping with the higher degree of societal autonomy of voluntary managed retreat, (compared with national standards) community-based integrated social-ecological assessments can empower communities to develop their own strategies and thresholds to trigger retreat, when/if it is required.

8.2.4 Autonomous unmanaged retreat



Affording the greatest level of societal autonomy on the governance spectrum is self-governance, where action is led from the bottom-up, translating into unmanaged retreat (or at the broader scale, migration). Self-governance encompasses the free market, civil society, and private stakeholders such as the insurance industry—without evading broad ground rules of societal and governmental ‘control.’ Left to the market, unmanaged retreat would see that as risk increases and natural hazard events become more frequent or damaging, property values decrease, and people relocate regardless of policy and regulation, if they are able to do so. This approach affords the greatest amount of power to property owners in managing their risk, but also potential exposure to great harm and social injustice. Where ‘do nothing’ or unmanaged retreat is

applied, there are adverse consequences. Particularly in coastal areas, owners may attempt to protect their properties, even if this requires illegal action. This has occurred in Mōkau, New Zealand and it has left the authorities with no option than to leave the illegal sea wall and ignore local attempts to maintain it, as it is providing protection in the short-term and capacity to enforce or incentivise managed retreat is limited. Property owners believe that the wall will continue to protect them, and many do not wish to relocate; a typical example of path dependence facilitated by protection.

The market is unlikely to enable effective, equitable or responsive retreat. For example, the dry beach provides public and environmental benefits. Public access to the coast and the natural character of the coastal environment, wetlands, and lakes and rivers and their margins are matters of national importance (RMA s 6). Loss of access to the beach and coastal squeeze due to autonomous private protection measures may not be environmentally, economically or socially optimal, legal, or equitable (Kousky, 2014). Property owners do not bear the full costs of their decisions to live in high risk locations under unmanaged retreat (Kousky, 2014). Response to events (which may be influenced by compounding and cascading impacts of climate change) and slow-onset climate induced environmental change is borne by the wider community through risk and emergency management and maintenance or repair of public utilities and infrastructure supporting those areas. Pilkey and Cooper (2014) argue that globally, many natural beaches and their associated public amenity and ecosystem functions are at risk of extinction. Due to misplaced reliance on hard engineering to remedy (and ultimately sustain) poorly planned development, thousands of miles of densely developed beachfront settlements (such as those in Florida and Spain) are backed by seawalls, squeezing natural beaches and leaving them unable to absorb the impacts of storms (Ibid). “In this diminished state, beaches provide a small recreational platform and impaired ecosystem function” (Ibid, p. 431). In short, while unmanaged retreat can play a role, it displays conflicts with many of the good governance principles revealed in this thesis.

As provisions in most home insurance contracts (and EQC cover) do not provide for ‘betterment’, insurers may repair a home which is at risk of future flooding but they will not subsidise relocation of the home or the construction of a new home on a safer site (Boston & Lawrence, 2018). Therefore, the insurance sector is highly reactive and transient, only redistributing risk, rather than

lessening it, and eventually many property owners will be unable to maintain adequate insurance, thus creating a transfer of risk back to the individual and the taxpayer (O'Hare et al., 2015). It is likely that as insurance companies retreat and property values decline, that affluent households will be able to relocate, but exposed areas may become populated with poorer people, potentially increasing the vulnerability of the community. If unmanaged retreat (and other adaptation responses) is only delivered by the sum of local actions, it will not only be inequitable and sub-optimal, but will fail to challenge the land use legacies that create and sustain vulnerability (Waters & Barnett, 2018, p. 710).

Unmanaged retreat is an inevitable form of risk management, where individuals make autonomous decisions based on their level of risk tolerance, to protect private interests. While it has its place as a background mode of governance, by redistributing risk between populations, it is likely to produce inequitable outcomes for current and future generations, and the environment where irreversible risks are high or increasing over time. Evidence is emerging that climate change litigation due to failures to implement adaptation measures may put pressure on councils to act, making 'do nothing' choices unlikely (Hodder, 2019). Although, regulations to restrict development and deliver unmanaged retreat may be seen as reasonable action, particularly if capacity deficits for managed retreat remain.

Without the capacity building discussed for managed or voluntary managed retreat, unmanaged retreat will be one of the few options available where local government resources are extremely limited, political acceptability is low, and risk of escalating vulnerability due to a lack of capability is high. Unmanaged retreat will always be influenced by provision of natural hazard and climate change information, and land use regulations 'in the shadows', and planners can develop policy and rules to halt further investment in exposed locations (sending the market a signal) and avoid greenfield development in risky locations in the first instance. While this is not effective for existing development at risk, in some areas it may be the only option until stronger policy frameworks, mechanisms and funding support are provided.

8.3 Governability

This thesis has identified that there are opportunities to alleviate the constraints holding back the enablement of managed retreats in New Zealand. Fundamentally, 'managed retreat' is a broad concept that cannot be applied in

the same way to different risks, and one governance mode will not be able to guide it in a way that is appropriate under all circumstances. This thesis, and principally this chapter, has examined a range of modes and corresponding elements and orders to achieve ‘retreats’ from hierarchy to self-governance, reflecting varying levels of societal autonomy and power distribution between actors.

The retreats explored develop our understanding of where opportunities exist to enable fit for purpose governance. For managed retreat to better contribute to risk management in New Zealand, key opportunities include building capacity for de-centralised government, or developing mechanisms to deliver strategically planned, voluntary managed retreat, affording greater autonomy to those affected. While the level of autonomy differs between these forms of retreat (with one resulting in managed retreat via regulation or compulsory acquisition if negotiation cannot be achieved, and the other delivering genuinely voluntary managed retreat) they require national funding support (not exclusively) and strategic policy guidance, reflecting international CCA literature (Bronen & Chapin, 2013; McLeman, 2018; Weerasinghe et al., 2014), DRR practice (US buyouts, UK Pathfinder, Kiribati climigration (Caramel, 2014)) and more consistent messaging from New Zealand law, politicians, and practitioners.

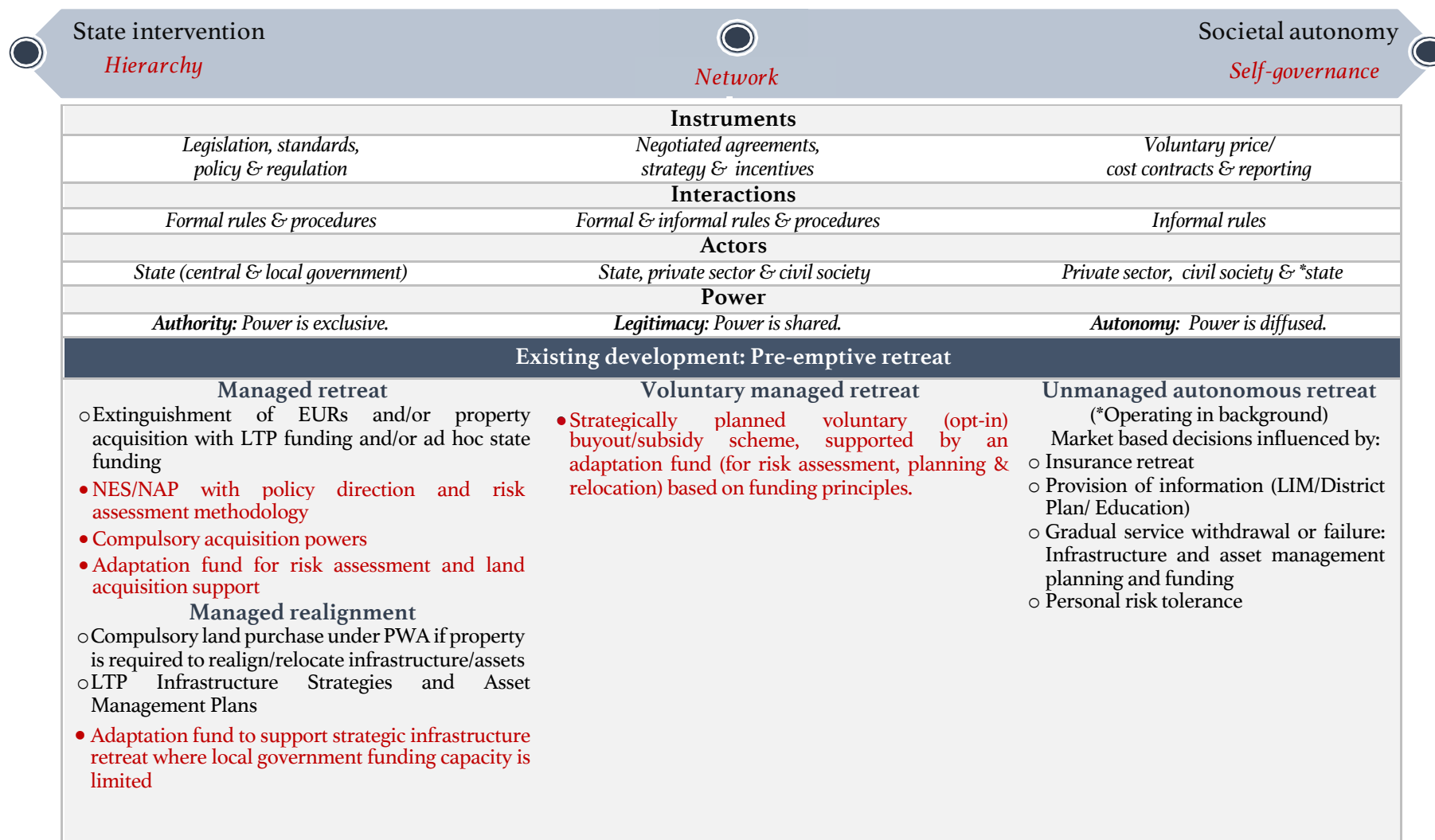
In terms of public assets, managed realignment of infrastructure under de-centralised governance already has legal (PWA) mechanisms available to it, but it would also benefit from funding assistance to enable adaptation, particularly in areas with limited rating bases but important infrastructural connections. Given the long lifetime of infrastructure, adaptation must be factored into new and renewal infrastructure decisions. At present, there is limited evidence of adaptation planning for infrastructure (Chapter 5 and CCATWG, 2017) but a growing recognition of vulnerability (Local Government New Zealand, 2019).

For slow-onset risks, where there is risk to life and property that is increasing over time, there are opportunities for anticipatory managed retreat, applying adaptive pathways, which is more closely aligned to network governance, but with support from the capacity building under either managed or voluntary managed retreat (to enable legitimate implementation of pathways). This reflects the understanding that “empirically, only hybrid forms may be found since one mode of governance always entails elements of other modes of governance” (Treib et al., 2005, p. 5). Managed retreat of new and re-development is achievable

under the planning system, however policy guidance from an NES/NAP would ensure a consistent, effective, and enforceable approach nationwide (such as discussed in Chapter 5).

Anticipatory action is preferable, but reactive managed retreat will be required in circumstances where wildcards emerge, and risk thresholds are rapidly exceeded. The process and outcomes of the Canterbury red zones (Chapter 2) provide lessons for improvement, should it be required. In particular, these include following the correct procedures and consultation requirements of disaster recovery legislation rather than resorting to coercive retreat. However, if a national voluntary managed retreat scheme is enabled for pre-emptive action, that system would facilitate reactive voluntary retreat in response to disasters. Having such a framework in place would make disaster recovery more efficient, providing an effective response, delivering certainty and national consistency. Figure 35 summarises the opportunities explored to build capacity and enable fit for purpose governance (highlighted in red).

Figure 35: Governance capacity building summary



Anticipatory managed retreat	Voluntary managed retreat	Unmanaged autonomous retreat
<ul style="list-style-type: none"> ○ Adaptation pathways facilitated by regional & district plan regulation, or by negotiated property purchase (with potential to lease-back where there is uncertainty of risk escalation). ● Build capacity for Anticipatory MR via adaptation fund or voluntary buyout/subsidy scheme. If applying the adaptation fund model, this will also depend on capacity building of de-centralised governance in terms of an NES/NAP for natural hazards with risk assessment methodology and policy direction. 		
Existing development: Reactive retreat		
<p style="text-align: center;">Managed retreat</p> <ul style="list-style-type: none"> ○ Compulsory land acquisition via special legislation (e.g. CER Act) with spatial planning/re-zoning ○ Regional plan rules to limit re-building of damaged or destroyed assets from repeat events (asset loss compensation from insurance). *Flexibility depending on the risk and hazard type, e.g. a setback/in-site relocation of asset ○ Refusal of building consent under s 71 BA (but a potentially weak approach if s 72 waiver can be granted) ○ Prohibition of building occupation or forced demolition under s129 BA ● NES/NAP to direct consistent policy approach, and national risk assessment methodology. 	<p style="text-align: center;">Voluntary managed retreat</p> <ul style="list-style-type: none"> ○ General competency powers (Local Government Act) ○ ‘Third source of power’ (State) ● National voluntary buyout/subsidy scheme administered locally and supported by an adaptation fund for strategic retreat 	<p style="text-align: center;">Unmanaged autonomous retreat (Operating in background)</p> <p>Market-based decisions influenced by:</p> <ul style="list-style-type: none"> ○ Insurance retreat/payout ○ Provision of information (LIM/ Building Act/ District Plan/ Education) ○ Service withdrawal or failure: Infrastructure and asset management planning and funding ○ Personal risk tolerance ○ Social memory
New and re-development: Pre-emptive retreat		
<p style="text-align: center;">Managed retreat</p> <ul style="list-style-type: none"> ○ District plan rules and zoning (e.g. ‘closing’ of residential zones, relocatable building design and monitoring, avoidance of re-development and intensification in at-risk areas). ○ Resource consent review: relocatability conditions ○ Provision of information (LIM/District Plan/ Education) ● NES/NAP to direct consistent policy approach, relocatability requirements, and national risk assessment methodology. 	<p style="text-align: center;">Voluntary managed retreat</p>	<p style="text-align: center;">Unmanaged autonomous retreat (Operating in background)</p> <p>Market based decisions influenced by:</p> <ul style="list-style-type: none"> ○ Insurance retreat ○ Provision of information (LIM/District Plan/ Education) ○ Gradual service withdrawal or failure: Infrastructure and asset management planning and funding ○ Personal risk tolerance

The illustrative governance spectrum has helped frame opportunities to build capacity for managed retreats and manage the underlying tensions revealed, examining managed, anticipatory, and voluntary retreat, combined with practical instruments to deliver fit for purpose governance. Governance includes both the structure and capacity for governability (Kooiman, 2003), including the modes, elements, and orders of governance; the interactions and principles required for effective governability (Kooiman, 2003; Kooiman & Jentoft, 2009). The opportunities raised help recognise the *potential* to enable good governance and essentially, good outcomes. It has also been recognised throughout this chapter that across the governance spectrum, political power and short-term cycles remain. While political risk and acceptance is likely to be improved with greater institutional capacity and direction, early alignment, local leadership and commitment devices will be required to ensure politically risky approaches such as managed retreat are not only available, but attainable.

The thesis identified how good environmental governance has four principal objectives; to be effective, equitable, responsive, and robust (Bennett and Satterfield 2018). This research has helped reinforce the importance of these principles to achieve managed retreats (Chapters 2, 5, 6, 7 & 8) in a manner that is not only operational, but socially acceptable. To be effective, governance structures must have clear direction, coordination, capacity (capability and resources), information, transparency, and a focus on efficacy (Ibid). If the opportunities discussed are in place, all forms of managed retreat examined, (excluding unmanaged retreat due to its lack of direction and coordination) have this potential. The second principle, equitable governance requires respect of values, public participation, fair distribution of costs and benefits and access to justice (Ibid). As discussed, unlike managed, anticipatory and voluntary retreat, unmanaged retreat is unlikely to enable fair outcomes or protection of public goods and values. However, the former modes still require judicious management to deliver equitable outcomes. Responsive governance expects attributes of adaptation, anticipation, innovation, learning and flexibility. The three *managed* retreats discussed have capacity for anticipatory action, adaptive management, and flexibility via negotiation and locally nuanced solutions. Anticipatory managed retreat in particular provides adaptive actions for long-term change.

Finally, robust governance requires legitimacy (which is possible across the governance spectrum) connections between and within organisations to support learning, nesting whereby decision-making is conferred to the lowest level possible with state or outside support, and polycentric structures. Again, the three forms of *managed* retreat are more able to deliver on these attributes, provided the direction, coordination, information, and capacity building is undertaken—demonstrating the interdependencies of the attributes for good outcomes.

With the opportunities examined, managed, anticipatory and voluntary retreat have *potential* to produce effective, equitable, responsive and robust outcomes. Empirical governance modes are hybrids and Pahl-Wostl (2009) argues that rather than one governance mode dominating, a more diverse system has greater adaptive capacity and is therefore likely to produce more sustainable environmental governance. Examples of hybridity include the dependence of anticipatory managed retreat governance on the commitment devices provided by regulation, compulsory acquisition, or voluntary buyouts, as well as national legislation and local regulation which continue to operate in the shadows of all governance modes. Depending on the level of societal autonomy preferred by New Zealand, capacity building must occur to better enable managed or voluntary managed retreat, and anticipatory managed retreat for slow-onset risks and conditions of *uncertainty*. Unmanaged retreat will continue to operate organically, with changes in the market and insurance sectors driving retreats as property values adjust. Figure 36 broadly illustrates what managed retreats could encompass under these three modes, with conditions of increasing uncertainty requiring long-term, anticipatory managed retreat.

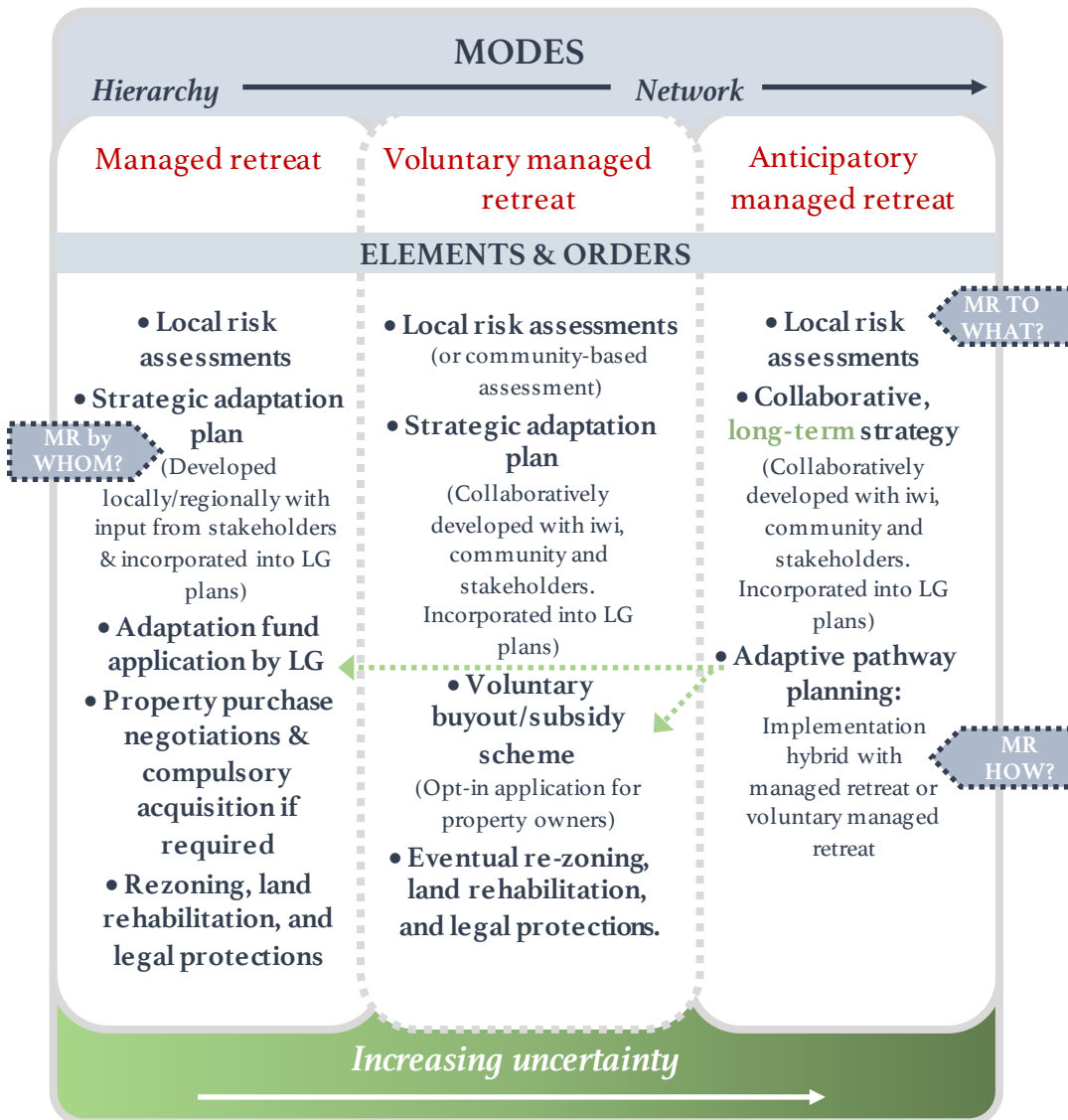


Figure 36: Managed retreat governance outcomes for private property

Managed retreats are fundamentally focused on sustainable allocation of land uses and providing space for natural processes. Ideally, adaptation planning should occur at a level higher than property or discrete community scales, via a strategic adaptation plan/long-term strategy. An example of the support for this approach is provided by Participant 21 who stated:

...there needs to be a high-level strategy in the first instance, for general direction...Because it is not only about relocating homes, it is about providing the infrastructure and the servicing. And if it's relocating homes, not all of the community members will move together, some will disperse... My view is that there needs to be some sort of high-level strategy/coordinated plan of attack and then that strategy may provide discrete roles for RMA plans, rezoning, structure plans...The high-level strategy might call on other agencies, not just local government.

The need for a high-level plan may go further than a strategy for a select piece of vulnerable land such as the coast, to encompass an entire region, as part of a long-term spatial plan with integrated policy making, and a focus on sustainable development and inclusivity (Haughton, Allmendinger, Counsell, & Vigar, 2010). Gurran (2012) and O'Donnell et al. (2019) define this as 'integrated planning', where strategies intersect broad portfolios such as strategic land and resource use, adaptation, transport, infrastructure, financial, and growth planning over the long-term. Such an approach could help address spatial adaptation inequities at regional scales that may arise under exclusive local solutions (Ellis, 2018). However, in New Zealand (and abroad) we are often dealing with legacy development issues that need addressing more urgently than that which can be provided by broad spatial, multi-sectoral, collaborative processes. Therefore, depending on the local context, it is likely that in some cases managed retreats may need to occur immediately, via land acquisition as part of a specific local adaptation plan, or it may be that the local authorities are unable to build the leadership, trust, political backing, or funding required for collaborative planning. Regardless of this, capability building is required to enable managed/voluntary and anticipatory retreats that facilitate prevention and avoidance of irreversible harm to human life, ecosystems and assets. Key opportunities exist for enabling more anticipatory adaptation to build resilience in New Zealand. Greater analysis and public deliberation are needed, particularly in relation to preferences between voluntary and managed retreat, and cost allocation principles.

New Zealand is in need of a governance framework which clearly outlines the roles and responsibilities of actors, directs policy making, and delivers mechanisms to facilitate, strategically plan, and assist in the funding of managed retreats, depending on the contextual, ethical principles deemed appropriate. Retreat interventions must ensure that people and communities are subject to a common rule to allow ethically robust intervention (Rostbøll, 2016). This thesis has revealed that 'managed retreat' is a broad term in both theory and practice, which can be applied to manage a range of hazards, scales, levels of risk, and uncertainty. There will not be a one-size fits all solution, not one form of 'managed retreat.' However, the best outcomes will be coordinated and nationally consistent, with risks and burdens distributed fairly. Without a framework and instruments for undertaking managed retreats, local authorities (and individuals acting alone) will not deliver fair or efficient outcomes. In the

meantime, strong local leadership is required to overcome these barriers (Bronen & Chapin, 2013; Sipe & Vella, 2014).

8.4 Summary

The tensions revealed reflect Campbell's (2016) 'Planners Triangle' which illustrates fundamental planning priorities: equity, environmental protection, and economic development, and their associated resource, development and property contests, which require continual balancing efforts in perpetuity. This research identifies these tensions as inherent to managed retreats and examines new opportunities to provide governance actors with the capacity to manage them. To improve current practice, effective, equitable, responsive and robust governance requires more supportive relationships between central and local government actors. New Zealand needs a policy framework which clearly outlines the roles and responsibilities of actors, sets consistent methodologies for ascertaining risk (including vulnerability)—or a framework for empowering and supporting communities to collaboratively set adaptation thresholds—and delivers mechanisms to facilitate and fund managed (and anticipatory) or voluntary retreat. This concurs with Waters and Barnett (2018, p. 5), who argue that while there is widespread understanding of the need for participatory planning, public input into key questions, such as 'managed retreats by whom and how?' is lacking:

Public preferences for governance in this sense are important, not least to avoid elite capture, but more fundamentally because the public are the majority stakeholder in any governance regime. They are also the largest holder of risk, arbiters of legitimacy, and in democracies, the key actors in the implementation of policy.

The evidence presented in this thesis demonstrates that while we can make some progress, pertinent governance questions remain regarding the extent of state intervention, how managed retreats should be applied, cost allocation principles to be employed, and in answering the question of 'when?', informing risk tolerability decisions and relocation triggers. Answers to these questions are likely to be more robust if informed by a national debate with New Zealand citizens, stakeholders and governance actors. Uncertainty of institutional responsibility and public appetite for intervention are significant barriers to effective, equitable, responsive, and robust governance. By applying the governance framework, Chapter 8 has examined a range of opportunities to alleviate these constraints, but to move forward and deliver fit for purpose governance, greater public input and national support are primary imperatives.

Chapter 9 Conclusions and recommendations

9.1 Introduction

This research responds to the objectives set out in Chapter 1, investigating managed retreat theory and practice, and the various opportunities to develop its application. Designing and using a governance framework provided a means to identify and examine the differing elements and orders of managed retreat interventions, and the common threads of third-order governance deficits that emerged as barriers in chapters 2 & 4-7. This led to deeper analysis of governance modes in Chapter 8, where new opportunities were considered to deliver managed retreats, synthesising the research findings and international scholarship. Important contributions of the research include the discovery of the significant constraints disabling the use and acceptance of managed retreats in New Zealand, and new opportunities to strategically pursue interventions in a more effective, equitable, responsive, and robust manner. Application of the governance framework also contributes to scholarship on the governance of managed retreats, providing a foundation to consider and evaluate governance modes which better align to the nature of the problem. This research strongly emphasises that there is no ‘one size fits all’ approach—retreats can occur on a range of scales, be applied to reduce different risks (including the compounding, cascading, and slow emerging influences of climate change) and timeframes, via multiple governance modes, instruments and interactions. Chapter 8 frames this diversity to provide guidance on the circumstances differing governance modes and instruments are useful, and opportunities to build capacity to manage public and private tensions.

An additional contribution is to the research and policy environment of New Zealand, being part of a collaborative National Science Challenge where findings have been shared with researchers and practitioners as the research has evolved. This has included delivering presentations to local authorities to further their understanding of the legislative, policy, and social barriers and enablers, as well as disseminating important lessons from current practice and theory. With practice continually evolving via policy learning in New Zealand, provision of up to date findings on case study research has proven to be useful to planners and

researchers navigating this contested and complex field. Practical recommendations to overcome the constraints holding back the enablement of managed retreats are a significant contribution of the research that will be further developed and disseminated. A national discussion is recommended to assess the suitability of the government-governance modes and the level of autonomy to be afforded, with regard to the management of private property. Further details of the findings and recommendations now follow.

9.2 The functions and practices of environmental planning:

Objectives 1-4

The aim of this research is to critically analyse the functions and practices of environmental planning in enabling managed retreat(s) in New Zealand. Contributing to Objectives one and three, Chapter 2 clarified the scalar boundaries and scope of various retreat terminology and delivered the conceptual foundation for the research, using this to examine broad instruments, institutional arrangements, and barriers and enablers of managed retreats, further recognised as being comparable to the New Zealand experience (Chapters 4, 5, 6 & 7). Chapter 4 examined the formal institutional framework and its key enabling instruments and actors. Extending the inquiry and responding to Objectives two and three, Chapter 5 critiqued New Zealand planning instruments to determine the nature and direction of managed retreat policy and regulation.

‘Managed retreat’ is often referred to in the singular, but as discovered in the international literature and policy analysis, it is an ‘umbrella term’ encompassing a range of diverse methods. A lack of consistent terminology and definition contributes to reduced transparency across New Zealand. In this regard, further work is required to define managed retreat in New Zealand planning policy to enable a clear understanding of the approach, and to avoid perceptions of ‘managed retreat by stealth’ (Chapter 7).

Managed retreats may have made their way into the policy arena, but there are few circumstances where a comprehensive and coordinated strategy is enabled (Chapter 5). For example, a lack of implementation support exists for relocatable building policies enabling future managed retreat, and in the enforcement of extinguishing existing use rights (Chapter 6). It is expected that these concerns could be dealt with by assessment criteria and consent conditions under NES direction. Among implementation and transparency concerns is the largely restrictive use of the approach to manage coastal risks alone, constituting

a failure to recognise its versatility and suitability in other risk contexts. It is plausible that this dominance stems from the NZCPS, the only NPS referring to 'managed retreat', highlighting the influence of national guidance. Another missed opportunity is the lack of attention towards infrastructure retreat in policy and plans. Overall, local policy direction for managed retreats is currently weak, stemming from institutional barriers uncovered in Chapters 6-8.

The governance framework is a means to understand the structure, aims, and instruments of governing actions across the spectrum, and to evaluate governance processes and outcomes, applying the third-order principles. Key attributes of the governance principles have cause-effect relationships with the socio-political-cultural, economic, environmental, and institutional enablers and barriers. For example, reduced institutional capacity and direction limits the effectiveness of managed retreat interventions, which in turn hinders social and political acceptability. The research has found that barriers often emerge where there are third-order governance deficits, hindering governability. Appendix II summarises the primary barriers and enablers uncovered in this research, synthesising the literature review, policy analysis, case study, questionnaire and policy interview data. Text highlighted in green demonstrates information additional to the literature review, and in blue, emphasising correlations between the literature and thesis findings.

The social demand for good governance, principally, equitable outcomes, was revealed throughout the thesis (Chapters 2, 4, 6 & 7). To deliver this, community engagement must incorporate the desires, concerns, needs, knowledge, and values of communities into policy development, strategic planning, decision-making, implementation and assessment (Smith et al., 2016). In particular, effective community engagement is vital for managed retreats, to achieve understanding and acceptance of the knowledge sources that determine the risk, trust in authorities managing the process, and fundamentally, to facilitate decision-making. Having knowledge diversity; sharing and integrating local, indigenous, and scientific knowledge is vital to inform adaptation planning. Indigenous legends, known as pūrākau, can capture vital environmental knowledge, alerting us to environmental dangers and past events. Indigenous knowledge that has long been overlooked should be afforded greater recognition and integrated into adaptation planning processes, supported by genuine partnerships with local iwi (Nurse-Bray, Palmer, Smith, & Rist, 2019).

Additionally, clear science communication is vital to inform people of the risks, and the consequences of remaining. Consistent national methodologies to enable robust local risk assessment are necessary, but it has also been recognised that provision of independent planning and risk assessment technicians for residents, or community-based social-ecological assessments may be required to improve transparency, trust, and local empowerment in the determination of risk (Chapters 6 & 8).

Managed retreat can be an enduring and fraught journey to embark upon, from scoping, to risk assessment, engagement, options analysis, negotiations, and implementation. Extended uncertainty of the process and outcomes of managed retreat, including implications for cultural identity, livelihoods, networks and personal autonomy can have detrimental impacts on people and communities, as well as affecting organisational trust. Effective, responsive, and robust processes, with regular touchstones, meetings, updates and support are imperative to avoid extended community uncertainty and disillusionment with the process. As demonstrated in many cases, communities often desire unequivocal options that deliver short-term certainty (Chapters 2, 6 & 7), and for many, managed retreats can be difficult to imagine. In addition to scenario planning tools already developed for decision-makers (Lawrence & Haasnoot, 2017) community-based 'serious games' (Flood, Craddock-Henry, Blackett, & Edwards, 2018) could benefit communities coming to terms with what it might mean for them, to build certainty and understanding of the process and outcomes. Local politicians are also part of the community, and early political alignment can foster greater political acceptance (Chapter 6).

9.3 Opportunities to build governance capacity: Objective 5

De-centralised government: Managed retreat

This research has demonstrated that the application of managed retreats is inconsistent. Influences of agency function, public contestation, policy learning, and political will alter its course and application, resulting in uneven treatment of people and communities. Relevant to this inconsistency is the problem of institutional integration and jurisdiction. Planning processes are often siloed and non-strategic, representing an inefficient use of resources. Institutional and resource constraints have resulted in weak local policy direction, continuation of the status quo, uncertainty, maladaptation, and horizontal fragmentation.

National direction

Governance actors are affected by path dependencies due to a failure of the law to provide clear decision support guidance and tools to implement managed retreat, making it difficult to overcome presentist and optimism biases. Among constraints arising from the national policy vacuum, getting consensus on the level of risk can be problematic, particularly where it fundamentally drives managed retreat of private property. Without standard methodologies for assessing natural hazard and climate change risks, it is difficult to determine when and why managed retreat (and other risk management approaches) should occur. To build capacity for managed retreat (and natural hazard risk management more broadly), a national risk assessment methodology, as part of an NES for natural hazards is recommended to guide and enable locally informed risk assessment and reduction, incorporating vulnerability. Additionally, managed retreat is not singularly focused on strategically reducing risks to human life and property, but making space for nature and protecting the intrinsic value and services of ecosystems. As such, criteria for assessing tolerability of risk to ecosystems and other matters of national importance are necessary.

Enabling instruments

Managed retreat challenges development decisions of the past, but the RMA delivers only limited capacity to operate retrospectively. One of the greatest barriers to implementing managed retreat is the political challenge of existing use rights. Significantly, the research establishes that there is a lack of effective instruments to apply managed retreat of existing land uses under the current system. If managed retreat is to be applied under the planning regime, it requires both national guidance and implementation support, to enable legitimate strategies and foster cooperation. Compulsory acquisition powers (undertaken by genuine negotiation in the first instance) would enable territorial authorities to reduce risk in primary hazard zones (including the influences of climate change), supported by community tested risk tolerance thresholds and robust community engagement. However, this research has uncovered that New Zealanders at risk may have an expectation to 'choose' or 'vote for' managed retreat, that it should be selected by the individuals at risk. This is not dissimilar to international experience (Shishmaref, Chapter 2; Hino et al., 2017). Applying this power of compulsory acquisition first necessitates a degree of national

leadership in making the case for change, and to determine governance mode acceptability and distribution of decision-making power (Section 9.3.2-4).

Funding capacity

Managed retreat funding is currently ad hoc, causing local government to develop inconsistent strategies. Boston and Lawrence (2018, p. 43) recognise that this will create inequities across New Zealand and recommended a national Climate Change Adaptation Fund. This research helps provide the evidence base that such a fund is also necessary for action to manage significant natural hazard risks, not just the impacts of climate change. The funding model would need to consider the cost allocation principles (particularly national solidarity and responsibility) discussed in Chapter 7 and those recommended by Boston and Lawrence (2018). To answer the question of which specific managed retreat costs should be funded, and to what extent, requires further economic analysis in the first instance.

9.3.1 Recommendations: De-centralised government

The problems discussed thus far highlight the need for substantive increase in local government capacity. Not only is the substance of regulation lacking, but implementation support constrains the enablement of managed retreat in New Zealand. The lack of national imperative to engage with managed retreat significantly hinders its use.

The following recommendations are made to address these shortcomings:

1. National Environmental Standard for natural hazard and climate change risk management including:

- a) A definition of managed retreat, recognising its broad, strategic nature, and anticipatory and reactive potential for natural hazard risk reduction and climate change adaptation. *Informing the standardisation of plan definitions under the forthcoming national planning standards.*
- b) Guiding principles, strategic planning (and response planning) requirements, clarification of local authority functions, and standards for existing, new, and re-development of public and private property and assets, for the avoidance, reduction, or cessation of land use activities and subdivision.*
- c) Standard methodologies for risk assessments to:*
 - i) Determine how natural hazard and climate change risks are to be locally assessed (including guidance for developing decision trigger values);*

- ii) *Prioritise actions according to a risk management hierarchy;*
- iii) *Incorporate assessment of national climate change projections, compounding and cascading risks, quantifiable and qualitative losses, including risk, and social, cultural, economic, environmental, and infrastructural dimensions of vulnerability (CCATWG, 2018);*
- iv) *Provide baseline triggers to avoid adverse environmental impacts e.g. to avoid coastal squeeze that will cause irreversible loss of high tide beach, habitat, and/or natural character.*

Rather than duplicating efforts, if a National Adaptation Plan holds greater currency in government than an NES, these same recommendations could apply. However, the immediacy and power of NES is of assistance to achieving effective governance. Nonetheless, the policy framework must be supplemented with instruments, funding support, and guidance materials to demonstrate the approach required and provide a process to follow, including procedures for strategic disaster response planning:

2. Mechanisms/powers for territorial authorities to undertake managed retreat of existing land use activities (e.g. compulsory acquisition powers).

3. Strategic planning:

- a) *A greater focus on strategic planning and integration is required to balance growth (and decline), infrastructure planning, tourism, asset management, reserves, conservation planning and risk management. Managed retreat planning must include provision of accessible land, rehabilitation, and adequate community services to mitigate impacts on receiving and relocating communities.*

4. National Fund (with guiding principles) to:

- a) *Financially support managed retreat strategies for risk reduction and climate change adaptation*
- b) *Financially support local risk assessments*

9.3.2 Alternative governance opportunities

To effectively enable managed retreat, the current institutional framework requires stronger policy direction and instruments, a more strategic and integrated planning approach, and funding support. But this research has recognised significant tensions between public and private interests and expectations of individual autonomy and responsibility.

In this regard, instruments to deliver strategically planned, voluntary managed retreat can be designed to bring greater autonomy to people and communities. To be effective and robust, a voluntary buyout or subsidy programme requires central government leadership and an institutional framework to inform, direct, and coordinate action, providing administrative and resource capacity at the local level. To ensure responsive action, local authorities will need to strategically plan for voluntary managed retreat within local, long-term risk management and adaptation plans that deal with the range of natural hazard and climate change risks in an area. Ideally, adaptation plans are finalised before events occur to enable anticipatory, or efficient, reactive retreat. To be equitable, such a programme would have a nationally consistent framework to be implemented at the local level, prioritising voluntary retreat zones based on the highest levels of physical, social and environmental vulnerabilities. Policy direction from the NES recommendations discussed could inform risk assessment and application of the zones, or these may be derived instead from collaborative, community based risk assessments, to fully embrace network governance and enhance third-order governance principles of recognition and participation (Chapter 8).

While the level of individual autonomy differs across the governance spectrum, each require fit for purpose institutional frameworks and resourcing. With the capacity building recommended, managed, anticipatory, and voluntary retreat have potential to produce good outcomes. Depending on the level of societal autonomy preferred by the New Zealand public, and the expected degree of state duty of care, capacity building must occur to better enable either managed retreat or voluntary managed retreat, as well as anticipatory managed retreat for slow-onset risks. Self-governance (unmanaged retreat) will continue to operate organically, with changes in the market and insurance sectors supporting managed or voluntary retreat as property values adjust.

9.3.3 Pertinent governance questions: Managed retreat by whom, how, when, and who pays?

The governance framework is a device to examine the structure and capacity for governance, providing a means to answer to the question of managed retreat by whom and how? Across the spectrum, differing governance modes and their corresponding elements and first and second orders deliver a frame to determine the instruments and therefore, approaches that may be expected under each mode, the governing actors involved, and the likely level of societal autonomy and power sharing. The framework also provides opportunities to consider hybrid modes which relate to contextual realities. Importantly, the third-order principles are useful for evaluating the governance process, and throughout the thesis, have assisted in illuminating key barriers and enablers to implementation and opportunities to overcome these (Chapters 2, 5, 6 and 7).

However, further questions essential to the enablement of managed retreat include socio-political choices about which activities, assets, and values shall be retreated, when, and who pays? Such difficult decisions cannot be made “fairly, justly or effectively within small, time and group-bound forums alone. Local voices must be heard in decision-making, but local councils cannot be left to wrestle with difficult temporal spatial and procedural justice questions unaided” (Hayward, 2008, p. 59). This thesis is not designed to solve these complex, value-based questions, but the framework developed provides avenues to interrogate them further.

Justification for state interventions imposed on local communities, and the point at which tax payers should contribute to local managed retreats are at the heart of the state intervention vs autonomy tension. There may be circumstances that society considers it appropriate for the state to intervene and compulsorily acquire property, for example, if there is a significant, imminent risk to human life and assets or a disaster. The state has demonstrated informal precedent of this in the past. The questions of ‘when and who pays?’ relate not only to risk tolerability, but to social equity values and expected degree of state ‘duty of care’. The framework presents various arrangements of governing actors, interactions and levels of autonomy, which opens up space for debate about what the expected responsibilities of actors are, to assist in determining the values necessary to unravelling questions of managed retreat ‘when’ and ‘who pays?’ Further political and economic research is needed to determine values specific to New Zealand, to assist in answering these questions, and in delivering the ‘art

of governance’—managing trade-offs between notions of national solidarity and responsibility, and possible implications such as moral hazard or inertia risks.

The opportunities discussed for building governance capacity broadly represent what Bovens and ‘t Hart (1996) argue to be an ‘optimist governance philosophy’ based upon resolving functional and procedural barriers to governance, and aspects of ‘realist governance philosophy’, where it is recognised that inherent tensions, complexities, and power plays restrain action. While the governance framework addresses power sharing with regard to the intervening authority, it must also be recognised that political power and vested interests will continue to constrain the governability of managed retreats and impact upon decision-making processes and outcomes. Building institutional direction and capacity for managed retreat will go some way in tempering existing constraints, including limiting political power which aims to protect private property rights at the expense of temporally and procedurally equitable decision-making (Hayward, 2008, p. 57). However, it will inevitably encounter local contention, and to progress, will continue to require strong local leadership, and political will in government to discontinue ‘wait and see’ tactics and reliance upon the market or future generations.

In recognition of the tensions, values, and interests surrounding managed retreat, ‘realist’ governance perspectives attempt to balance competing values and interests to prevent them from escalating (Biesbroek, Termeer, Klostermann, & Kabat, 2014). Hence the following recommendations are made to begin this socio-political debate more formally, to better understand preferences for and tensions between the modes of managed retreats, and to reveal expectations and duties of the state and individuals in reducing natural hazard and climate change risk. Finally, applying the ‘pessimist’ philosophical lens, it is important to recognise that increasing capacity and managing tensions is not representative of transformational resilience (Section 2.2). It is difficult to overcome the structural constraints of neoliberalism and capitalism, which continue to increase individual and societal vulnerability (Ibid). Managed retreat will not transform the fundamental structure of the governance system however, it is a vital component of successful adaptation to build resilience. This research examines how we can mitigate the influence of barriers to adapt, and provide opportunities for more effective, equitable, responsive and robust outcomes, whilst acknowledging the complex and pervasive restraints of transformational change.

9.3.4 Recommendations: Governance debate

The following recommendations are made to develop managed retreat governance in New Zealand:

5. National inquiry and discussion on retreat governance to determine:

- a) Preferences for and implications of retreat governance modes, intervening actors, and instruments across the spectrum*
- b) Preferences for standard risk assessment methodologies or collaborative, community social-ecological assessment models*
- c) Cost allocation principles including; which costs of managed retreat are funded, who bears the cost (including discount values), and which principles should be applied to determine the level of financial incentive for retreat.*

9.4 Recommendations for future research

Further research is required to continue to develop this field. This research examines the question of managed retreats ‘by whom, and how?’ and it has identified gaps in understanding of managed retreats at ‘what point?’, ‘for whom?’, and ‘who pays?’ Further gaps include understanding how best to use land that has been retreated from, and how to ensure its protection from inappropriate development in perpetuity. Engaging with mātauranga Māori can provide early indicators of natural hazard exposure, and greater appreciation of Māori sensitivities towards managed retreat is required. This must include examination of whether it is an acceptable approach (which is not expected to be unanimous nationwide), how to manage relocation of people, cultural assets and values according to tikanga Māori (if possible), and assessing Māori risk tolerability towards cultural lands, resources and future generations. Understanding of how risk and adaptation policy can realise Treaty obligations and support Māori communities is vital. Making use of new, potentially enabling instruments must also be canvassed, such as the Urban Development Authority powers being surveyed by government.

This is interdisciplinary work beckoning research from planners, social scientists, iwi, infrastructure managers, engineers, economists, scientists, and lawyers. To enable truly transformational change, attention is required to address social, economic, cultural, and environmental drivers of vulnerability, reconsider perpetual property rights, and fundamentally move beyond binaries of ‘Man v Nature’, to make progress on longer-term resilience and sustainability goals.

9.5 Final words

This research reveals the complexity of managed retreats, which are shaped and restrained by diverse barriers, and require new arrangements of the law, planning, and funding mechanisms, and potentially, alternative governance modes.

Resilience thinking is useful in altering perspectives aiming to control change in systems that are presumed to be stable, to managing the capacity of social–ecological systems to cope with, adapt to, and shape change (Berkes et al., 2003; Pisano, 2012; Smit & Wandel, 2006). Managed retreats are an important adaptation strategy, but to enhance their contribution to resilience we need to acknowledge the governance contexts and challenges. Attending to the constraints revealed as recommended by this research, is a means to help ensure more equitable outcomes. By deliberately progressing towards forms of governance that are effective, equitable, responsive, and robust, we can reduce the burden of environmental change in New Zealand, both now and in the future.

Detachment from place is a significant undertaking, requiring effective and robust planning and community engagement, immense care, sensitivity, flexibility, empowerment, and time. But the perils of loss of life, loss of amenity, habitat and natural character, and increasing maintenance and emergency management costs over the long-term are inherent, and demand attention. Managed retreats challenge the presentist bias, beckoning people and communities to think beyond their time, to remedy unsustainable land use legacies and forge a more resilient future.

*It is not the strongest of the species that survive,
nor the most intelligent, but the ones
most responsive to change.*

*Meggison (1963) interpretation of
Darwin (1859) 'On the
origin of species'.*

Glossary

Dynamic Adaptive Policy Pathways - a decision strategy of interlinked pathways which guide decision-making under uncertainty, to anticipate how the future may unfold over the long-term, but which allow for dynamic decision-making with a range of potential actions to handle vulnerabilities and opportunities as they emerge over time (Haasnoot et al., 2013).

Governance - the organisation and guidance of society, functioning under diverse modes, elements, and orders.

Institutions - agreements, rules, rights, laws and decision-making procedures and programmes. Institutions include both formal rules and procedures and informal rules such as norms and culture (Kooiman et al., 2008).

Managed retreat - the strategic relocation of people, assets, and activities to reduce natural hazard risk and/or adapt to the impacts of climate change

Managed realignment - a planned process of establishing new defence lines for river corridors or coastlines, often set back from the existing position, to improve the sustainability of the defence and/or contribute to other aims such as habitat creation, tourism, and blue carbon sequestration.

Nesting - tasks are assigned to appropriate governance levels. Authority and responsibility for making decisions are devolved to the lowest level possible and are supported by adequate state or other outside support and oversight (Bennett & Satterfield, 2018).

Polycentric - system of several centres of decision-making that are formally independent of each other, operating across jurisdictions and scales towards a common goal (Bennett & Satterfield, 2018).

Presentist bias - limited consideration and representation of future interests in present decisions

Residual risk - risk remaining after risk reduction measures

Resilience - the ability of a system to absorb, adapt to, or transform with the effects of disturbance

Unmanaged retreat - autonomous and involuntary relocation or abandonment under the influence of risk, economic, insurance and regulatory factors

Usteq - catastrophic land collapse triggered by the combination of thawing permafrost, erosion, and flooding (Bronen, 2019).

Te Reo Māori:

Hui - gathering, meeting, assembly

Iwi - tribe

Kaumātua - elder - a person of status within the *whānau*.

Kāwanatanga - government, dominion, rule

Kōiwi - human bone, corpse

Marae - formal greeting and discussion place

Mātauranga Māori - the body of knowledge originating from Māori ancestors, including the Māori world view and perspectives, Māori creativity and cultural practices

Mana whenua - territorial rights, power from the land, authority over land or territory

Noa - to be free from the extensions of tapu, ordinary

Pūrākau - myth, ancient legend, story

Taniwha - water spirit, monster, dangerous water creature, powerful creature, chief, powerful leader

Tapu – sacred

Tangata whenua - local people, hosts, indigenous people - people born of the land

Tino rangatiratanga - self-determination, sovereignty, autonomy

Tūrangawaewae - domicile, place where one has rights of residence and belonging through kinship

Urupā - burial ground

Wāhi tapu - sacred place, sacred site - a place subject to long-term ritual restrictions on access or use

Whare - house

Whenua - land

Whānau - extended family, family group

Te Reo definitions sourced from:

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Appendices

Appendix I: Ethical approval, information and consent forms

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THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

Christina Hanna
Iain White
Bruce Glavovic

Environmental Planning

17 July 2017

Dear Christina,

Re: FS2017-29 Mobility of space and place: A critical analysis of managed retreat to build community resilience to nature's challenges.

Thank you for submitting your revised application to the FASS Human Research Ethics Committee. We have reviewed the final electronic version of your application and the Committee is now pleased to offer formal approval for your research activities, including the following:

- semi-structured interviews with planning professionals from local authorities in New Zealand who have had experience in developing directive managed retreat policies.
- web-based survey with community organisations and corporate companies in New Zealand.
- semi-structured interviews with policy planners, council staff and community members in three case study areas.
- workshop with professionals that are dealing with managed retreat in New Zealand.

We would ask that you please provide Eileen Fenner, the FASS Ethics Committee Administrator, with a paper copy of your final application that has been signed by yourself and your supervisors.

We encourage you to contact the committee should issues arise during your data collection, or should you wish to add further research activities or make changes to your project as it unfolds. We wish you all the best with your research. Thank-you for engaging with the process of Ethical Review.

Regards,

A handwritten signature in blue ink, appearing to be 'C. McLeay'.

Colin McLeay, Chair
Faculty of Arts and Social Sciences Human Research Ethics Committee.

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THE UNIVERSITY OF
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Christina Hanna
Iain White
Bruce Glavovic

Environmental Planning

18 September 2017

Dear Christina,

Re: FS2017-29 Mobility of space and place: A critical analysis of managed retreat to build community resilience to nature's challenges.

Thank you for sending the Committee details on the addendum to your research plans.

This letter confirms the ethical validity of your addendum and the ongoing applicability of the ethical approval you received in 17 July 2017.

I wish you well with your research.

Kind regards,

A handwritten signature in blue ink, appearing to be 'C. McLeay', written in a cursive style.

Colin McLeay, Chair
Faculty of Arts and Social Sciences Human Research Ethics Committee.

Environmental Planning
School of Arts Faculty of Arts and Social Sciences
Te Kura Kete Aronui
The University of Waikato
Private Bag 3105
Hamilton 3240
New Zealand



Date _____

Dear _____

Re: Mobility of place and space: a critical analysis of the role of environmental planning in managing retreat in New Zealand

Thank you for taking the time to consider this research. I am a full-time student at the University of Waikato undertaking a Doctor of Philosophy in Environmental Planning. I am researching natural hazard planning within New Zealand, with a focus on the concept of managed retreat. The key aim of my research is to investigate how to build community resilience in New Zealand by analysing ways in which to plan for managed retreat and better understand public perceptions towards it.

As part of the research, I am undertaking interviews of individuals with experience in managed retreat policy and application. The purpose of the interview is to determine the reasoning, barriers, enablers and lessons learnt from managed retreat application in New Zealand. As someone who has detailed knowledge of the topic, I would like to invite you to participate in an interview.

The interview should not take longer than 60 minutes.

If you chose to participate in the interview, you have the right to:

- Decline to answer any question(s)
- Withdraw up to a month after the interview
- Ask any questions about the research at any time
- Decline to be audio recorded
- Request that any material be erased
- Request that your participation and responses be kept anonymous through pseudonyms (e.g. Participant 1) in the understanding that the researcher will endeavour to ensure you remain anonymous but that, given the small number of working professionals in this area in New Zealand, absolute anonymity cannot be guaranteed.

With respect to confidentiality, your name will not be attributed to any interview responses. I will solely have access to the interview responses, which will be password protected. The results of my research will be used as a component of a research thesis to fulfil the requirements of a Doctor of Philosophy in Environmental Planning, which will be publicly available. Up to four copies of my thesis will be produced: three hard copies and one that will be available online. The findings of this research may also be used in presentations, conferences and journal publications. All records held by myself for the purpose of this Doctoral thesis will be destroyed five years following the completion of the thesis.

If you would like to take part in my research, or if you have any questions, please contact either myself or Professor Iain White (supervisor), via the details below.

Kind Regards,

Christina Hanna
cjh41@students.waikato.ac.nz
Professor Iain White
iainw@waikato.ac.nz

Environmental Planning
School of Arts Faculty of Arts and Social Sciences
Te Kura Kete Aronui
The University of Waikato
Private Bag 3105
Hamilton 3240
New Zealand



Date

Dear _____

Re: Participant consent form

Please read the following information carefully and if you wish, sign the consent form:
Description of project: The aim of this research is to investigate how to build community resilience in New Zealand by analysing ways in which to plan for and implement managed retreat.

I have read the information sheet and understand that:

- I can decline to answer any question(s)
- I can withdraw up to a month after the interview
- I can ask any questions about the research at any time
- I can decline to be audio recorded
- I can request that any material be erased
- All information collected will remain secure in a private office or on a computer accessible by password only and will be destroyed after five years.
- Information will be analysed and used for a Doctoral Thesis (accessible on the internet), presentations, conferences and journal articles.
- I may request that my participation and responses be kept anonymous through pseudonyms (e.g. Participant 1) in the understanding that the researcher will endeavour to ensure I remain anonymous but that, given the small number of working professionals in this area in New Zealand, absolute anonymity cannot be guaranteed.

I consent to the interview being audio recorded

YES / NO

(please circle)

I (your name) _____ agree to participate in this research and acknowledge receipt of a copy of this consent form and the research project information sheet. I understand my rights as a participant in this research and that my identity will remain confidential and anonymity guaranteed unless I state otherwise. I have had adequate opportunity to discuss the above information and I am satisfied with the answers that have been provided.

Participant Signature

Date

Your details

Name:

Address:

Phone number:

Email:

I agree to abide by the conditions set out in the information sheet and I ensure no harm will be done to participants due to this research

Researcher Signature

Date

This research has been approved by the Human Research Ethics Committee of the Faculty of Arts and Social Sciences. Any questions about the ethical conduct of this research may be sent to the Secretary of the Committee, email fass-ethics@waikato.ac.nz, postal address, Faculty of Arts and Social Sciences, Te Kura Kete Aronui, University of Waikato, Te Whare Wananga o Waikato, Private Bag 3105, Hamilton 3240.

Contact information: Christina Hanna cjh41@students.waikato.ac.nz

Professor Iain White iainw@waikato.ac.nz

Managed retreat survey

University of Waikato

Faculty of Arts and Social Sciences

Mobility of place and space: a critical analysis of managed retreat to build community resilience to nature's challenges

Thank you for taking the time to consider this research. I am a full-time student at the University of Waikato undertaking a Doctor of Philosophy in Environmental Planning. I am researching natural hazard planning within New Zealand, with a focus on managed retreat; the strategic relocation of people, assets, and activities away from natural hazard risk. The key objective of my research is to examine the nature and effect of managed retreat within the New Zealand context.

I am undertaking surveys of the general New Zealand public to determine public perceptions to managed retreat. By undertaking the survey, you are confirming that you have read this information sheet and have given me consent to use the results of the survey in my research. This research has been approved by the Waikato University Social Science Ethics Committee and adheres to the Ethical Conduct in Human Research and Related Activities Regulations.

The survey should not take longer than 9 minutes to complete. If you choose to participate in the survey, you have the right to:

- Refuse to answer any question(s)
- Ask any questions about the research at any time

With respect to confidentiality, your name and identity will not be attributed to any survey responses as it is anonymous. I will solely have access to the survey responses, which will be password protected. The results of my research will be used as a component of a research thesis to fulfil the requirements of a Doctor of Philosophy in Environmental Planning, which will be publicly available. Up to four copies of my thesis will be produced: three hard copies and one that will be available online. The findings of this research may also be used in presentations, conferences and journal publications. All records held by myself for the purpose of this Doctoral thesis will be destroyed five years following the completion of the thesis.

If you wish to take part in this research, scroll down to begin.

If you have any questions or comments about the survey or my research in general, please do not hesitate to contact either myself or Professor Iain White (supervisor), via the details below.

Kind Regards,

Christina Hanna - cjh41@students.waikato.ac.nz

Professor Iain White - iainw@waikato.ac.nz

Appendix 2: International example key terms summary

Nation	Location	Time period	Key term	Hazard type	Leadership	Status	Reference
NZ	Muriwai Beach, Auckland	2002-	Managed realignment Managed retreat Adaptive management	Coastal erosion	RC & independent consultant	Stage 1 complete, Stage 2 in progress	(Carpenter & Klinac, 2015) (Blackett et al., 2007)
	Urenui Beach, Taranaki	2002-ongoing	Managed retreat	Coastal erosion	DC and independent consultant	Failed—sea wall constructed	(Blackett et al., 2007) (Lee, 2016)
	Haumoana, Hawke's Bay	2011-	Managed retreat	Coastal erosion	Hastings District Council	Initially failed due to public backlash but recently ongoing	(Merestone Planning and Resource Management, 2011; Sharpe, 2011) – updated with (Lawrence & Bell, et al., 2019)
	Kāpiti Coast District	2010-	Managed retreat	Coastal erosion	Kāpiti Coast District Council	Failed—significant public backlash to policy	(Allan & Fowler, 2014; Kāpiti Coast District Council, 2010)
	Matatā, Bay of Plenty	2016-	Managed retreat Acquisition	Debris flow post 2005 disaster	Whakatāne District Council	Ongoing	(Whakatāne District Council, 2016)
	Christchurch City Red Zone	2011-2015	Acquisition Relocate Abandon Purchase offer	Earthquake	National Government	Complete (but approximately 300 people remain in the red zone)	(Blundell, 2014; MacDonald & Carlton, 2016)
	Riverlink – Hutt City	2015-	Acquisition Purchase	Flooding	RC & DC	Ongoing	(Greater Wellington Regional Council, 2015b).
	Kelso - Clutha district of Otago	1978-1980	Relocation Abandon	Flooding	Community	Complete	(Becker, Saunders, Hopkins, Wright, & Kerr, 2008)
	Waitakere - Twin Streams	2003-2012	Property purchase 'Buy property'	Flooding	Waitakere City Council	Complete—156 properties purchased	(Vandenbeld, 2013) (Atlas Communications & Media Ltd, 2011)

	Little Waihi village, on the shore of Lake Taupo	1910	Relocation	Landslide	Unknown	Complete—majority of village relocated	(Taig et al., 2012).
Australia	Byron Shire Council	1980-	Planned retreat Relocation	Coastal erosion	Shire Council	Failed—significant public backlash to policy however new work in progress	(Bardsley & Niven, 2013)
	Grantham	2011	Relocation Acquisition Land swap	River flooding	The Lockyer Valley Regional Council (LVRC)	Success	(Okada et al., 2014; Sipe & Vella, 2014)
	Alexandrina District, Fleurieu	2010	Retreat Adaptation	Coastal erosion	District & City Councils	Failed	(Bardsley & Niven, 2013)
USA	Shishmaref, Alaska (island)	1973, 2002, 2015	Relocation & Resettlement	Coastal erosion & river flooding	City government & AECOM	Ongoing	(Bronen, 2015; Marino, 2012; Mele & Victor, 2016)
	Isle de Jean Charles, LA	2015-	Relocation & Resettlement	SLR	National Government	Ongoing	(Davenport & Robertson, 2016; Lowlander Center, 2016)
	Newtok	1996-	Relocation & Resettlement	River flooding (melting permafrost)	?	Ongoing	(Bronen, 2015; Semuels, 2015)
	Staten Island	2014-	Land acquisition	Coastal inundation	NY State	Ongoing	(Wagner, Merson, & Wentz, 2016)
	FEMA: Hazard Mitigation Grant Program 1988, Flood Mitigation Assistance 1994, Pre-Disaster Mitigation 2000, Repetitive Flood Claims 2004, Severe Repetitive Loss 2004	1988-	Property acquisition (x5)	All hazards	Federal Emergency Management Agency (FEMA)	Ongoing	(Robinson, 2013)
	Allenville, Arizona	1980s	Relocation Resettlement	River flooding	Arizona Department of Emergency Management	Complete	(Perry & Lindell, 1997)
	Population near Mayon Volcano, Albay	2013-	Resettlement Relocation	Volcanic lahar	Department of Social Welfare and Dev & Municipality Disaster	Complete—however loss of community and livelihood options; 38% houses provided are occupied	(Usamah & Haynes, 2012)

					Management Office		
China	Shangnan County (16 villages)	2011-	Resettlement	Droughts, floods and landslides	Shaanxi Province People's Governance Office	Between 2011 & 2015 7,991 people have been resettled across the region.	(Lei et al., 2015)
Kiribati	Residents - general	2010-	Migration Resettlement	Coastal hazards	National Government	Not commenced	(Wyett, 2013)
Japan	Great East Japan	2011-	Relocation	Earthquake	Japanese Government	Ongoing	(Ranghieri & Ishiwatari, 2014)
UK	Medmerry	2013	Managed realignment	Coastal erosion and inundation	Environment Agency	Complete	(McAlinden, 2015)
	Wallasea, Essex		Managed realignment	Coastal erosion and inundation	Environment Agency & RSPB - Rewilding England	Complete	(ABP Marine Environmental Research Ltd, 2004)
	Blackwater Estuary - Northey Island, Essex	1992	Managed realignment	Coastal erosion and inundation	The National Trust and the Environment Agency	Complete	(DEFRA, 2002; Esteves, 2013; Rupp-Armstrong, 2007)
	Orphlands (Blackwater Estuary)	1994	Managed realignment	Coastal erosion and inundation	Environment Agency	Complete	(DEFRA, 2002; Rupp-Armstrong, 2007)
	Tollesbury	1995	Managed realignment	Coastal erosion and inundation	Environment Agency	Complete	(Abel et al., 2011; DEFRA, 2002)
	Thorngumbald/ Paull Holme Strays (Humber Estuary)	2001-	Managed realignment	Coastal erosion and inundation	Environment Agency	Complete	(DEFRA, 2002; Esteves, 2013; Rupp-Armstrong, 2007)
	Pathfinder programme – Variable locations	2009-2011	Rollback scheme/Buyout Relocate	Coastal hazards	Coastal Change Pathfinder programme (5 pilot tests)	Complete	(DEFRA, 2011)
Germany	Variable	-	Managed realignment	Coastal erosion and inundation	National Government	Complete	(Rupp-Armstrong, 2007)
India	Pune	1997-2004	Resettlement	Riverine flooding	Local NGO Shelter Associates	Complete	(Cronin & Guthrie, 2011)

Papua New Guinea	Carteret Islands	2005-present	Resettlement	Coastal erosion and inundation	National Government	Ongoing	(Edwards, 2013)
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Key term summary	Count
Relocate/relocation	12
Acquisition	10
Resettlement	9
Managed retreat/retreat/planned retreat	8
Managed realignment	8
Abandon	2
Buy/buy-out	2
Purchase offer/purchase	3
Adaptation/ Adaptive management	2
Migration	1
Rollback scheme	1

Appendix 3: Broad interview questions

Planning staff, experts, iwi representative and politicians
<p>BACKGROUND</p> <ol style="list-style-type: none"> 1. Please explain your involvement in the managed retreat strategy 2. Would you say managed retreat has been a last resort option? Why?
<p>COMMUNITY PERCEPTIONS & ACCEPTANCE</p> <ol style="list-style-type: none"> 3. What were public and political reactions towards managed retreat? <ul style="list-style-type: none"> • <i>Did it take time to gain political and public acceptance of MR?</i> 4. What approaches, tools or incentives were most effective in gaining acceptance for managed retreat? 5. Do you consider the community's trust in Council to be strong or weak – how does this affect the process? 6. Do you consider that the process has been sufficiently fair, inclusive, and transparent?
<p>BARRIERS, ENABLERS & LEARNINGS</p> <ol style="list-style-type: none"> 7. What have been the greatest barriers to implementing managed retreat? 8. What have been the greatest enablers? 9. What have been the key lessons learnt to date? <ul style="list-style-type: none"> • <i>Had the decision to retreat been determined earlier, instead of mitigation, do you think the community would be better off?</i> • <i>Is there room for improvement in the coordination of hazard management between regional and district councils? Should this have been a collaborative project?</i> 10. Do you consider there to be any ways of getting around these challenges for other retreat projects? <i>E.g. managed retreat implementation guidance from central government?</i>
<p>GOVERNANCE</p> <ol style="list-style-type: none"> 11. What do you consider the role of planning to be in enabling and implementing managed retreat? 12. Do you consider that Councils should have legislative powers to compulsorily acquire land to enable retreat from high risk hazard areas? 13. Should there be a national fund for managed retreat from high-risk natural hazards? 14. What are your thoughts on the extinguishment of existing use rights? Do you think it is an appropriate mechanism to enable retreat, or only in the case where compensation has been offered already?

Community members
<p>BACKGROUND</p> <p>1. Did you experience the 2005 event?</p>
<p>PLACE ATTACHMENT</p> <p>2. Do you consider that you have a high, medium or low attachment to your place of residence? Explain whether this attachment has changed over time</p>
<p>TRUST</p> <p>3. Do you have trust in the scientific evidence and accept that there is intolerable risk to life?</p> <p>4. Do you have trust in District Council to make the right decisions? Has this changed throughout the process?</p>
<p>GOVERNANCE/PROCESS</p> <p>5. How has the process affected you, your family and the wider Matatā community?</p> <p>6. Had the decision to retreat been determined earlier, instead of mitigation, do you think the community would be better off?</p> <p>7. When was managed retreat first considered and how did it emerge as an option?</p> <p>8. When did you find out about the voluntary retreat package and how was it presented to you?</p> <p>9. Do you consider that the process has been sufficiently fair, inclusive, and transparent? Why/why not?</p> <p>10. What lessons could be taken from the process?</p>

Appendix 4: Questionnaire sample group

Community Boards	
Ahuriri Community Board	Otorohanga Community Board
Albert-Eden Local Board	Oxford-Ohoka Community Board
Banks Peninsula Community Board	Paekakariki Community Board
Bay of Islands-Whangaroa Community Board	Papakura Local Board
Bluff Community Board	Papanui-Innes Community Board
Cambridge Community Board	Paraparaumu/Raumati Community Board
Clifton Community Board	Patea Community Board
Coastal-Burwood Community Board members	Petone Community Board
Coromandel-Colville Community Board	Pleasant Point Temuka Community Board
Cromwell Community Board	Puketāpapa Local Board
Dannevirke Community Board	Raglan Community Board
Devonport-Takapuna Local Board	Raglan Community Board
Eastbourne Community Board	Rangiora-Ashley Community Board
Edendale-Wyndham Community Board	Rangitāiki Community Board
Egmont Plains Community Board	Ratana Community Board
Eketahuna Community Board	Riverton-Aparima Community Board
Eltham Community Board	Rodney Local Board
Fairlie Community Board	Rotorua Lakes Community Board
Featherston Community Board	Ruapehu National Park Community Board
Fendalton-Waimairi-Harewood Community Board	Saddle Hill Community Board
Foxton Community Board	Spreydon-Cashmere Community Board
Franklin Local Board	Stewart Island Community Board
Geraldine Community Board	Strath Taieri Community Board
Golden Bay Community Board	Tahape Community Board
Great Barrier Local Board	Taihape Community Board
Greytown Community Board	Tairua-Pauanui Community Board
Halswell-Hornby-Riccarton Community Board	Taneatua Community Board
Hanmer Springs Community Board	Tāneatua Community Board
Hastings Rural Community Board	Taupiri Community Board
Hawera-Tangahoe Community Board	Taupiri Community Board
Henderson-Massey Local Board	Tawa Community Board
Hibiscus and Bays Local Board	Te Anau Community Board
Howick Local Board	Te Awamutu Community Board
Huntly Community Board	Te Hiku Community Board
Inangahua Community Board	Te Puke Community Board
Inglewood Community Board	Tekapo Community Board
Kaiapoi-Tuahiwi Community Board	Teviot Community Board

Kaikohe - Hokianga Community Board	Thames Community Board
Kaipātiki Local Board	Tirau Community Board
Kaitake Community Board	Tuatapere Community Board
KatiKati Community Board	Turangi Tongariro Community Board
Kawhia Community Board	Twizel Community Board
Lawrence-Tuapeka Community Board	Upper Harbour Local Board
Linwood-Central-Heathcote Community Board	Vincent Community Board
Makara-Ohariu Community Board	Waiheke Local Board
Maketu Community Board	Waihemo Community Board
Malvern Community Board	Waihi Beach Community Board
Mangere-Otahuhu Local Board	Waikanae Community Board
Maniototo Community Board	Waikouaiti Coast Community Board
Manurewa Local Board	Waimarino-Waiouru Community Board
Martinborough Community Board	Wainuiomata Community Board
Mataura Community Board	Waitākere Ranges Local Board
Maungakiekie-Tāmaki Local Board	Waitara Community Board
Mercury Bay Community Board	Waitematā Local Board
Methven Community Board	Wallacetown Community Board
Mosgiel-Taieri Community Board	Wanaka Community Board
Motueka Community Board	Wanganui Rural Community Board
Murupara Community Board	West Harbour Community Board
Ngaruawahia Community Board	West Otago Community Board
Omokoroa Community Board	Whakatāne-Ōhope Community Board
Onewhero-Tuakau Community Board	Whangamata Community Board
Opotoki - Coast Community Board	Whau Local Board
Ōrākei Local Board	Winton Community Board
Otago Peninsula Community Board	Woodend-Sefton Community Board
Ōtara-Papatoetoe Local Board	
Otautau Community Board	
Technical communities with wide reach	
AgResearch	Maori Women's Welfare league
Auckland Council	Mental Health NZ
BECA	Ministry of Health
Coastal Restoration Trust of New Zealand - Tahuna Ora	MSD
Community Housing Aotearoa	New Zealand Civil Defence
DIA	New Zealand Community Trust
DOC	New Zealand Property Council
Earthquake Commission	NZ Coastal Society
Environment Canterbury	NZ Maori Council
Federation of Maori Authorities Inc.	NZPI Emerging Planners
GNS Science	Property Council 'Property Voice'

Engineering NZ	Rebuild ChCH
Landcare NZ	SOLGM
LGNZ	Te Puni Kokiri
LINZ	Waikato Regional Council
Community groups - Facebook	
Akaroa Noticeboard	Rotary of Tuakau
Cambridge NZ Grapevine	Sunny Otkai Community Group
Coastal Ratepayers United	T3 resilience group in Thames
Culverdan Noticeboard	Taihape Community Noticeboard
Dannevirke Community Page	Tapanui West Coast Otago
Environmental Planning - UOW	Tararua Buy, Sell, info
Fairlie Community Council Hub	Taupo Noticeboard
Hanmer Springs Discussion Board	Te Awamutu Community Group
Hawera / Stratford /Eltham	Temuka pay it forward
Huntly Notice Board	Thames to Coromandel Community Grapevine
Lawrence Noticeboard	The Franz Josef Collective
Malvern Residents' Handbook	The Kawhia Connection
Methven Noticeboard	The Paihia Noticeboard
New Plymouth Community	The People's Choice in Christchurch Local Government
NZ Boards - The Online Kiwi Community	Twizel Community Care Trust
NZ House Surveys	Upper Hutt Community Page
Otorohanga Community Connection	Whakatāne Community Hub
Patea Community Noticeboard	Whanganui Community Foundation
Rangitikei Community Noticeboard	
Rebuild Christchurch	

Appendix 5: Case study document review

1. Awatarariki Debris Flow Risk Management: Project Update – August 2017 The purpose of this report was to present the Indicative Business Case associated with the Awatarariki Fanhead retreat package to the Projects and Services Committee.
2. Indicative Business Case - Debris Flow Risk: A way forward for the Awatarariki Fanhead August 2017 This Indicative Business Case outlines options for investing in a managed intervention to prevent a predictable disaster.
3. Report on Draft Indicative Business Case - Debris Flow Risk: A way forward for the Awatarariki Fanhead December 2016
4. Mitigation of debris flow risk - Awatarariki fanhead Matatā - Update Report to Council - 10 November 2016
5. TPG Base Value Methodology – Property Group Ltd October 2016
6. Mitigation of debris flow risk - Awatarariki fanhead, Matatā - update July 2016
7. Awatarariki Acquisition Strategy - The Property Group Limited July 2016
8. Awatarariki debris flow fan risk to life and retreat zone extent - Peer Review: M.J. McSaveney, T.R.H. Davies 2015
9. Awatarariki Fanhead Update - Policy Committee, 8 October 2015
10. Supplementary Risk Assessment - Debris Flow Hazard - Matatā Tonkin and Taylor July 2015
11. Policy Committee Report - 2 July 2015
12. Awatarariki fanhead strategy – December 2013
13. Quantitative Landslide Risk Assessment - Whakatāne and Ōhope Escarpment
14. Managing Landslide Hazards from the Whakatāne and Ōhope Escarpment Summary
15. Quantitative Landslide Risk Assessment - Matatā Escarpment
16. Managing Debris Flow and Landslide Hazards from the Matatā Escarpment Summary
17. Landslide and Debris Flow Hazard Management - Issues and Options
18. Review of Awatarariki Catchment Debris Control Project - Final Report from Alan Bickers – June 2012
19. Review of Awatarariki Catchment Debris Control Project - Summary
20. Tonkin & Taylor Ltd, (August 2005); “The Matatā Debris Flows – Preliminary Infrastructure and Planning Options Report”.
21. 22 AECOM, (25 February 2011); “Awatarariki Stream Debris Flow Control System – Peer Review of Resource Consent Application Technical Approval”. 23 AECOM, (23 June 2010); Awatarariki Stream Debris Flow Control System – Peer Review of Resource Consent Application Technical Approval”.

Appendix 6: Case study interviewees (Matatā)

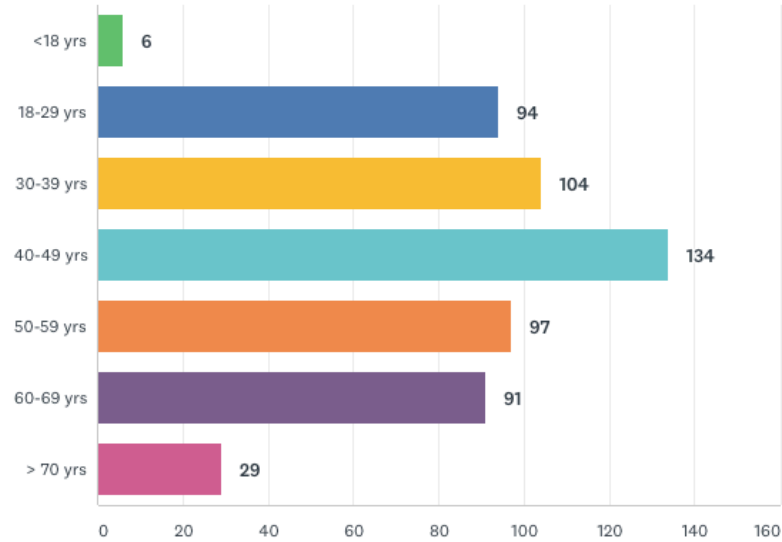
Participant	Job title
1	Expert Advisor
2	Planning Advisor
3	District Planner
4	Manager
5	Regional Planner
6	Councillor
7	Rangitahi Kaumātua

Participant	Job title
8	Property owner
9	Property owner
10	Property owner
11	Property owner
12	Property owner
13	Property owner
14	Property owner
15	Property owner
16	Property owner
17	Property owner

Appendix 7: Age and property ownership graphs

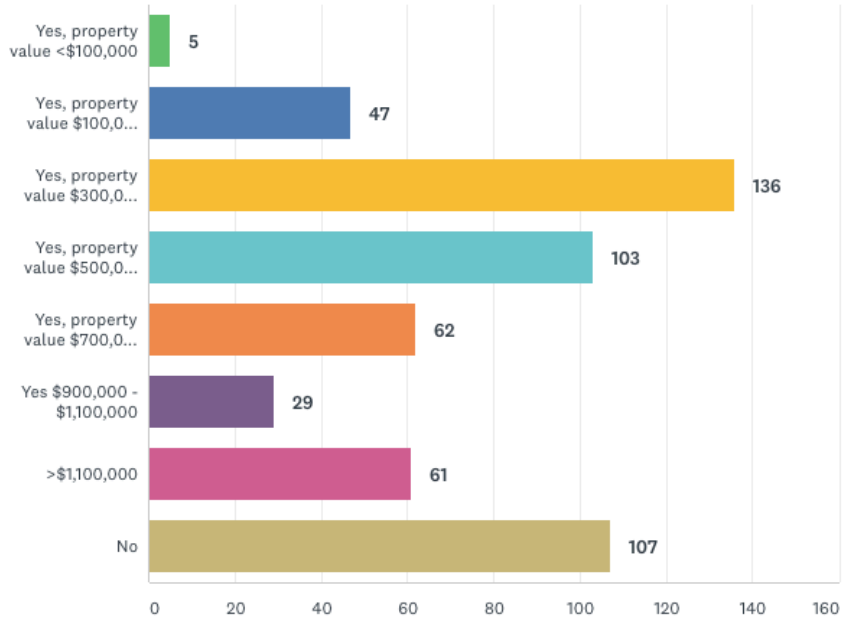
Please select your age bracket

Answered: 555 Skipped: 1



Do you own property in New Zealand?

Answered: 550 Skipped: 6



Appendix 8: Questionnaire

Managed Retreat Survey

1. PRIOR TO READING THE INFORMATION SHEET, DID YOU KNOW THE MEANING OF 'MANAGED RETREAT'?

Yes

No

2. HAVE YOU EVER EXPERIENCED A NATURAL HAZARD EVENT BEFORE?

No

Yes: briefly describe the hazard type(s) (e.g. earthquake) and any damage or loss experienced (e.g. house destroyed).

3. WHEN DID YOU EXPERIENCE THE HAZARD EVENT(S)? (YOU MAY SELECT MORE THAN ONE TIME PERIOD)

<1 year ago

1-2 years ago

3-4 years ago

5-6 years ago

7-8 years ago

9-10 years ago

>10 years ago

N/A

4. DO YOU CONSIDER THAT PROPERTY RIGHTS:

Cannot be taken away under any circumstance

Can be surrendered to benefit the public if the property owner is compensated

Can be surrendered to benefit the public under special circumstances, without compensation

Can be taken away if property becomes unsafe to live on or use

Other (please specify)

5. IF PROPERTY YOU OWNED WAS AT HIGH RISK OF BEING AFFECTED BY A NATURAL HAZARD WITHIN 10 YEARS, WHEN WOULD YOU CONSIDER RELOCATING?

As soon as possible - retreat to avoid damage and loss

At the latest possible time before a hazard event - retreat once an unacceptable level of risk is reached

Following a hazard event - retreat rather than attempt to rebuild in the same location

Never

Other (please specify)

6. IF PROPERTY YOU OWNED WAS AT HIGH RISK OF BEING AFFECTED BY A NATURAL HAZARD WITHIN 50 YEARS, WHEN WOULD YOU CONSIDER RELOCATING?

As soon as possible - retreat to avoid damage and loss

At the latest possible time before a hazard event - retreat once an unacceptable level of risk is reached

Following a hazard event - retreat rather than attempt to rebuild in the same location

Never

Other (please specify)

7. WHAT LEVEL OF TRUST DO YOU HAVE IN NATURAL HAZARD AND CLIMATE CHANGE SCIENCE IN NEW ZEALAND?

Low

Medium

High

Other (please specify)

8. RANK THE FOLLOWING METHODS FOR IMPLEMENTING MANAGED RETREAT, (1 BEING MOST APPROPRIATE AND 6 BEING THE LEAST APPROPRIATE):

Provide communities with scientific evidence on short, medium and long-term risk to allow them to move if they wish

Long-term council & community strategy, including:

Avoiding further development in hazard zones

Requiring relocation/removal of existing buildings/infrastructure over time, as risk triggers are met

Rehabilitating the land to its natural state

Central or local government buys property at market value and owners relocate to locations of their choice

Central or local government buys property at market value and a new neighbourhood is planned for owners to purchase sites and relocate

Land swap between high risk property and nearby available land.

High risk land is converted to reserve and property owners relocate and re-establish themselves.

When a structure/building is destroyed by a natural hazard event (that is expected to occur again), it cannot be re-built.

9. RANK THE FOLLOWING GROUPS THAT YOU BELIEVE SHOULD BEAR THE COST OF MANAGED RETREAT (1 BEING MOST APPROPRIATE, 5 BEING THE LEAST APPROPRIATE).

Private owners whose property is at risk

Central government (via taxes)

Regional community (via regional rates)

District community (via district rates)

The community at risk (via targeted rates calculated on the risk reduction received and the benefits gained)

10. BRIEFLY EXPLAIN YOUR REASONING FOR QUESTION 9

11. IMAGINE PROPERTY YOU OWN IS AT HIGH RISK OF BEING AFFECTED BY A NATURAL HAZARD. DESCRIBE ANY FACTORS THAT WOULD CAUSE YOU TO OBJECT TO MANAGED RETREAT:

12. IF PROPERTY YOU OWNED WAS AT RISK OF BEING AFFECTED BY A NATURAL HAZARD, HOW WOULD YOU WANT TO BE INVOLVED IN THE RISK REDUCTION PROCESS? (YOU MAY SELECT MORE THAN ONE ANSWER)

Community workshops

One on one meetings on your property with council

Answer surveys to voice your opinion

Make submissions to council

Be represented through a community group working collaboratively with the relevant authorities

I wouldn't want to be involved

Other (please specify)

13. DO YOU OWN PROPERTY IN NEW ZEALAND?

Yes, property value <\$100,000

Yes, property value \$100,000 - \$300,000

Yes, property value \$300,000 - \$500,000

Yes, property value \$500,000 - \$700,000

Yes, property value \$700,000 - \$900,000

Yes, property value \$900,000 - \$1,100,000

Yes, property value >\$1,100,000

No

14. WOULD YOU CONSIDER YOUR ATTACHMENT TO YOUR PROPERTY OR PLACE OF RESIDENCE AS HIGH, MEDIUM OR LOW?

High

Medium

Low

15. PLEASE SELECT YOUR AGE BRACKET

<18 yrs

18-29 yrs

30-39 yrs

40-49 yrs

50-59 yrs

60-69 yrs

> 70 yrs

16. IF YOU HAVE ANY OTHER COMMENTS PLEASE ENTER THEM BELOW. THANK YOU FOR TAKING THE TIME TO COMPLETE THE SURVEY, IT IS GREATLY APPRECIATED.

Submit

Appendix 9: National interviewee list

Participant	Job title
2	Planner, Boffa Miskell
3	Planner, Whakatāne District Council
4	Manager, Whakatāne District Council
5	Planner, Bay of Plenty Regional Council
18	Manager, Northland Regional Council
19	Policy Advisor, Waikato Regional Council
20	Project Leader, Tauranga City Council
21	Manager, Hawke's Bay Regional Council
22	Planner, District Council in Waikato Region

Appendix 10: Government interventions

Table 25: Managed retreat endeavours: High risk to human life

	Location	Hazard type	Values at risk	Approach	Instrument	Actors	Funding	Status
Franz Josef township 2016-present	Franz Josef Businesses 2003	Geologic hazards and river flooding	High risk to life (fault rupture)	Undetermined	-	DC RC Independent consultant (CG funded)	\$200,000 CG funding for Options Assessment (T&T). Further funding TBC.	Scoping
Matatā, Bay of Plenty 2015-2020	Mt Cook Village 2004	Geologic hazard (Debris flow)	High risk to life	Voluntary retreat supported by Regional Plan Changes	Property acquisition and plan changes to extinguish use rights	DC RC Independent consultants	*TBC DC 1/3 CG 1/3 of ~\$14.2M	In progress
Christchurch Red Zones 2011	Franz Josef Businesses 2003	Geologic hazards	High risk to life and property (highest degree)	Voluntary retreat: (CER Act only used for rezoning new land)	Property acquisition using 'residual freedom' & CER Act to rezone land	CG	CG and EQC: \$1.9billion	Complete (but ~300 people remain)
Mt Cook Village 2004	Franz Josef Businesses 2003	Geologic hazard (Landslide)	High risk to life	Management Plan with relocation policy where risk unacceptable	National Parks Act 1980 & the General Policy for National Parks 1983	DoC	DoC (public land)	Ongoing policy
Little Waihi Village (Te Rapa) 1910	Franz Josef Businesses 2003	Land slide and debris flow	High risk to life	Abandonment	-	Private	Unknown	Complete
						CG DC RC	CG: \$862,000 LG: \$334,000 + \$1m loan finance + consent fees NZTA: \$300,000	Complete

Appendix II: Barriers and enablers

Key:

Green text: Information additional to the literature review

Blue text: Correlations between the literature and New Zealand experience.

Table 26: Primary managed retreat barriers and enablers

Enablers	Barriers	Sources
Socio-political-cultural		
Prevention of risk to life and assets	May be viewed unfavourably by affected property owners and politicians	<p>(Abel et al., 2011; Agyeman et al., 2009; Bardsley & Niven, 2013; DEFRA, 2002; Esteves, 2013; Fazeya et al., 2016; Fletcher et al., 2013; Fried, 1963; Hayward, 2008; Hino et al., 2017; Hogg et al., 2016; Lei et al., 2015; Linham & Nicholls, 2010, 2012; Mortreux & Barnett, 2009; Ryan et al., 2012; Townsend & Pethick, 2002; Turbott & Stewart, 2006; Usamah & Haynes, 2012; Wenger, 2015)</p> <p>Cases: Urenui, NZ Byron Bay, AUS Kāpiti, NZ Hawke's Bay, NZ Muriwai, NZ Waitakere, NZ Tasman, NZ Canterbury, NZ Medmerry, UK Grantham, AUS Riverlink, NZ</p>
Can increase adaptive capacity & resilience of communities	Disruption to attachment of place (ancestral, cultural, livelihood, community and mobility ties), culture, and sense of identity	
Opportunity for collaboration between community and decision-makers	May result in community division (for receiving and retreating communities) and political contestation	
Protection of wider community values (access, amenity, urban renewal, reduced maintenance/emergency management costs)	May result in loss of social networks, distress, uncertainty, feelings of lost control, and may increase vulnerability	
Can be a flexible option for managing uncertainty, action may not be required until a certain threshold is met (e.g. DAPP)	Existing use rights and the expectation of permanent use of land when land may not be permanent. This is worsened by increasing property values, particularly in coastal areas, however, this may eventually be mitigated by insurance retreat and risk reflective pricing.	
Reduction of social discomfort from emergency	People directly affected may have a sense of loss	
Community empowerment and agency	Visible and hidden power within the community can influence decisions (e.g. wealthy property owners exerting political and legal pressure to protect properties)	
Efficient strategy for managing risk with potential for anticipatory risk reduction	Incremental protection measures can decrease the feasibility of retreat - path dependency, escalator effect, safe development paradox, levee effect	
	Livelihood incompatibilities or inadequacies – 'like for like' property expectation	
Recent social memory of disasters	Diverse risk tolerability between public and private sectors and civil society.	
Enablers	Barriers	Sources
Environmental		
Protection of environmental and amenity values, including carbon sequestration benefits of wetlands (managed realignment).	Abandonment/relocation resulting in low-quality environment if restoration is not staged and adequately funded, or the institutional enablers are not in place	(Abel et al., 2011; Bardsley & Niven, 2013; DEFRA, 2002; Linham & Nicholls, 2010; McNamara & Jacot des Combes, 2015; Sipe & Vella, 2014)
Prevention of coastal squeeze and habitat loss		

Nearby, available land for resettlement		Cases: Muriwai, NZ Medmerry, UK Waitakere, NZ Grantham, AUS Riverlink, NZ
	Lack of available land	
Economic		
One-off cost with limited maintenance expenditure	Potentially significant costs; risk assessment, strategic planning, stakeholder and community engagement, collaboration, relocation, funding, restoration and resettlement.	<i>(Abel et al., 2011; Bardsley & Niven, 2013; Cooper, 2003; Cooper & McKenna, 2008; DEFRA, 2002; Gibbs, 2016; Hino et al., 2017; Linham & Nicholls, 2012; Roca & Villares, 2012; Townend & Pethick, 2002; Turbott & Stewart, 2006)</i> Cases: Waitakere, NZ Kāpiti, NZ Hawke's Bay, NZ Muriwai, NZ Franz Josef, NZ Medmerry, UK Riverlink, NZ
Reduction of future emergency management and hard protection expenses	Potentially higher risk management costs for individual property owners directly affected than other methods (but long-term, public benefits).	
	Potential for reduced property values, equity, income loss and market uncertainty	
	Authorities who re-zone land to afford space for ecosystems may become liable for consequent decrease in property values, even if risks to properties are expected to increase on that land in future.	
	Numbers of coastal residents and value of properties at risk may have thresholds where retreat becomes less likely.	
	Moral hazard and precedent risks of incinivatisation.	
Institutional		
Local leadership	Insufficient institutional direction, coordination, capacity, information, transparency, and supported nesting	<i>(Bronen, 2015; Bronen & Chapin, 2013; Linham & Nicholls, 2010; McNamara & Jacot des Combes, 2015; Sipe & Vella, 2014)</i> Cases: Shishmaref, US Grantham, AUS Franz Josef, NZ Kāpiti, NZ Canterbury, NZ Riverlink, NZ Hawke's Bay, NZ
Flexible, adaptive governance	Inequitable processes and outcomes (e.g. poor consultation, unrealistic relocation timeframes, extended uncertainty, inconsistent and unfair processes)	
Knowledge and respect of local and indigenous space and place	Flawed science and science communication	
Organisational support and capacity building (i.e. NZCCRI for Riverlink, National Science Challenge support Hawke's Bay, Department of Fisheries support in Vunidogoloa village, Fiji & MCDEM support Franz Josef).	Lack of institutional trust and legitimacy	
	Limited national leadership under de-centralised government	
	Deficient strategic disaster response frameworks	
Effective governance, transparency and legitimacy		
Political certainty – demonstrating short-term progress of long-term strategies		