Waimate District
Climate Resilience Strategy

Briefing notes for Land Use and the Built Environment Action Plan Workshop

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Waimate District Council

Waimate District Climate Resilience Strategy

Briefing notes for Land Use and the Built Environment

Below is a summary of the relevant Government Policies with associated links to help you make an informed decision when contributing to our online survey or workshop for our Land Use and the Built Environment Action Plan as part of our community engagement for our District's Climate Resilience Strategy.

Key policy documents pertaining to this Action Plan

Emissions Reduction Plan (ERP)

https://environment.govt.nz/publications/aotearoa-new-zealands-first-emissions-reduction-plan/

National Adaption Plan (NAP)

https://environment.govt.nz/publications/aotearoa-new-zealands-first-national-adaptation-plan/

Canterbury Climate Change Risk Assessment (CCCRA)

https://www.canterburymayors.org.nz/wp-content/uploads/Canterbury-CCRA-Report_FINAL_V5.0.pdf

Land Use and the Built Environment Action Plan: Outcomes

1. Reduce Land Use and the Built Environment related GHG emissions.
2. Ensure land use activities are resilient to climate change.
3. Improve the resilience of community infrastructure.

These briefing notes are grouped under our two strategy goals:

1. Net zero emissions for the district.
2. Build climate resilience through a just and equitable intergenerational approach to planning and preparing for the impacts of CC.

Background

Land use and the built environment are the foundation of our communities. They include the physical environment around us, the people in that environment and the interaction between the two. The built environment includes urban areas, the form, shape, and accessibility of homes, work, and play all have a direct influence on the quality of our lives. The form, design and characteristics of our homes, buildings and places play a key role in our health, wellbeing and quality of life by providing people with the systems and infrastructure they need for living, their mobility and their well-being. This includes critical infrastructure inclusive of clean drinking water and transport networks that are covered in separate Climate Resilience Action Plans. Climate change affects our homes, buildings and places, but where and how we build can help us adapt.

Communities within the Waimate District also rely on community buildings such as halls, public toilets, the Event Centre, museum, library and sites of significant cultural values to Māori including wahi tapu and cultural landscapes for their overall well-being. This action plan also considers the impact of climate change on these types of infrastructure.

Box 1: Representative concentration pathways (RCPs)

- *The Intergovernmental Panel on Climate Change (IPCC) Assessment Report 5* (ARS) set out a range of emission trajectories over the next century called representative concentration pathways (RCPs) . The NCCRA considers two RCPs. RCPS.S was used to screen risks in Stage 1, while Stage 2 considered risks arising under both RCP8.5 and RCP4.5. The RCPs are outlined below:
- RCP8.5, a high concentration pathway characterised by increasing GHG emissions driven by a lack of policy changes to reduce emissions. This pathway represents increased use of land for agriculture, a heavy reliance on fossil fuels and a high-energy Intensity with a low rate of technology development (NIWA, 2019).
- RCP4.5, a moderate concentration pathway consistent with low levels of emissions achieved through ambitious emissions reduction strategies. This pathway represents implementation of stringent climate policies, with a lower-energy intensity, strong reforestation and decreased land for agriculture due to improvements in crop yields and dietary changes (NIWA, 2019).

Key summaries from: The National Climate Change Risk Assessment (NCCRA) (p78, 82-87)

5.6 Built environment | Rohe tūranga tangata

Table 21: Built environment

Most significant risks	Ratings	
	Urgency	Consequence
B1 Risk to potable water supplies (availability and quality) due to changes in rainfall, temperature, drought, extreme weather events and ongoing sea-level rise.	93*	Extreme**
B2 Risks to buildings due to extreme weather events, drought, increased fire weather and ongoing sea-level rise.	90	Extreme
Other priority risks (Stage 2)		
B3 Risks to landfills and contaminated sites due to extreme weather events and ongoing sea-level rise.	85	Major
B4 Risk to wastewater and stormwater systems (and levels of service) due to extreme weather events and ongoing sea-level rise.	85	Extreme
B5 Risks to ports and associated infrastructure due to extreme weather events and ongoing sea-level rise.	70	Major
B6 Risks to linear transport networks due to changes in temperature, extreme weather events and ongoing sea-level rise.	60	Extreme
B7 Risk to airports due to changes in temperature, wind, extreme weather events and ongoing sea-level rise.	55	Extreme
B8 Risks to electricity infrastructure due to changes in temperature, rainfall, snow, extreme weather events, wind and increased fire weather.	55	Extreme

B2 Risks to buildings due to extreme weather events, drought, increased fire weather and ongoing sea-level rise

Risk summary

Many buildings in New Zealand (both residential, non-residential and cultural heritage) are at risk from climate change, mainly from extreme weather events, drought, increased fire weather and rising sea levels. Buildings are also at risk from associated natural hazards like inland and coastal flooding, landslides, groundwater rise and wildfire, all of which are projected to become more frequent and severe.

These risks could cause temporary damage and destruction of buildings, and make it necessary for them to be relocated. The failure of urban drainage systems (due to capacities being exceeded), as well as the potential overtopping and breach of stopbanks and other flood defences, could also result in significant impacts to buildings. The increased risk from flood defence is poorly understood, but the consequences are likely to be significant.

There is limited ability to adapt buildings in a cost-effective manner, given that buildings are generally designed as permanent structures, served by complex infrastructure. Buildings with suspended timber floors are considered to have higher adaptive capacity than buildings with concrete floor slabs, as they can, in some cases, be relocated. Similarly, new buildings can be located away from risk areas or be designed to accommodate projected changes to the climate.

For Māori, this risk may affect connectivity to whenua, the foundation of tūrangawaewae. This includes direct impacts of climate hazards and natural hazards on Māori land, communities and cultural buildings (including marae), along with impacts from adaptation responses such as relocating buildings (King, Penny and Severne, 2010; Smith et al, 2014; Stephenson et al, 2018). This poses a risk to the cultural functioning capacity of Māori. See risk H5 in section 5.4.2 for more about risk to cultural assets.

Exposure

Buildings are exposed to inland flooding, sea-level rise (and associated groundwater rise), coastal flooding, extreme weather events, wildfires and drought. These events disrupt communities and temporarily or permanently damage buildings. The number of buildings exposed is projected to increase under RCP4.5 and RCP8.5 (see Box 1) with greater exposure under RCP8.5.

In New Zealand, many communities live on the coast where rising sea levels will exacerbate exposure of buildings to coastal flooding and erosion. At present, there are over 72,000 people and 49,700 buildings exposed to coastal flooding (Paulik et al, 2019b).[1] For example, in 2015, 800 homes were flooded in South Dunedin from a high tide coinciding with extreme rainfall. This gave rise to over $28 million in insurance claims (Insurance Council of New Zealand, 2017; Stephenson et al, 2018). Exposure of buildings to coastal flooding will increase this century under both RCP4.5 and RCP8.5. Under RCP8.5, at 2100, about 117,900 buildings would be exposed to coastal flooding (Paulik et al, 2019b).

Exposure to inland flooding is high at present, with about 675,000 people living in flood hazard areas and an estimated 411,500 buildings exposed (Paulik et al, 2019a).[2] Overtopping and breaching of stopbanks and flood defences, and failure of pumped stormwater systems, are already resulting in exposure. For example, in April 2017, Cyclone Debbie hit the Bay of Plenty coast bringing rainfall and flooding of the Rangitaiki River. The aging Rangitaiki stopbank was breached, causing catastrophic flooding in Edgecumbe with $72 million in insurance claims from damaged and destroyed housing (Rangitaiki River Scheme Review Panel, 2017; Stephenson et al, 2018). A full evacuation of Edgecumbe's 2000 residents was maintained for eight days (Stephenson et al, 2018). Communities protected by flood defences could be more exposed to increased flooding, as flood defence schemes have a finite design capacity and often no secondary stormwater systems. Future exposure of buildings is likely to increase under RCP4.5, with greater exposure projected under RCP8.5.

Extreme weather events (strong wind and heavy rainfall) currently affect buildings across New Zealand. The data on insurance payments shows the magnitude of loss from storms has increased over the

[1] Paulik et al (2019b) undertook a high-level study on New Zealand's exposure to 1 per cent annual exceedance probability (AEP) coastal flood inundation under present-day and future higher sea levels.

[2] Paulik et al (2019a) undertook a high-level study to enumerate New Zealand's asset exposure in inland (fluvial and pluvial) flood plains. In the absence of a national flood hazard map, exposed areas were identified by creating a 'composite' flood hazard area map from modelled and historic flood hazard maps and flood prone soil maps. The analysis provides a representative sample of built assets exposed in New Zealand's fluvial and pluvial floodplains. It is noted the analysis cannot be attributed to a particular return period flood event at the present time, nor in the future with climate change.

past decade (Insurance Council of New Zealand, 2020). The future exposure of buildings and people is likely to increase under both RCP4.5 and RCP8.5 (Ministry for the Environment, 2018).

Groundwater rise is poorly understood in New Zealand. However, it is recognised as an emerging issue in many coastal communities. For example, the suburb of South Dunedin (about 4800 homes) is known to have high groundwater levels, which are tidally influenced. These contribute to surface flooding after heavy rain, especially in winter when groundwater is naturally closer to the surface (Otago Regional Council, 2016).

Erosion, including landslides, is frequent in New Zealand. Climate change may accelerate erosion, through extreme rainfall and sea-level rise, resulting in increased exposure of buildings (Rosser et al, 2017; Basher et al, 2012). Rising sea levels may also expose buildings to soils with higher liquefaction susceptibility, due to rising groundwater in coastal plains and reclaimed areas (Ministry for the Environment, 2017c; Quilter et al, 2015). Drought may also increasingly affect expansive soils, which can dry and shrink (BRANZ, 2008).

New Zealand has a history of wildfires, and exposure is projected to increase (Pearce et al, 2018). Buildings will be exposed to wildfire through direct impacts on structures, and the characteristics of vegetation surrounding buildings. Under RCP4.5 and RCP8.5, it is likely this exposure, particularly in rural areas, will increase throughout this century (Pearce et al, 2018).

Sensitivity

Buildings around New Zealand are currently sensitive to coastal inundation, flooding, extreme weather events, fire weather, and soil changes and movements, such as liquefaction, landslides and soil shrinkage and swelling. Sensitivity to climate and natural hazards is driven by a range of factors, including the design, age and condition of buildings.

Our building stock is largely comprised of wooden and masonry houses, and houses with reinforced-concrete frames (Uma et al, 2008). The average age of residential dwellings is about 50 years (Jaques et al, 2015). Dwelling condition is directly related to age and therefore informs sensitivity to damage. Older buildings (including cultural heritage buildings) are likely to be more badly damaged (Buckett et al, 2010).

Many buildings in New Zealand are sensitive to floods, which can cause structural damage, particularly if the floods reach or exceed floor level (Reese and Ramsay, 2010). The degree of damage depends on various factors, the most important being the flood characteristics (depth, velocity, duration), and the type of building (including structure and material) (Reese and Ramsay, 2010).

Rising groundwater could also impact buildings, leading to the risk of rising damp and impaired stormwater drainage (Tauranga City Council, 2019). Buildings in areas of high groundwater may experience prolonged exposure to floodwaters, with worse damage.

Historically, extreme weather events have caused damage, disruption and financial cost throughout New Zealand (Cenek et al, 2019). While there is limited information in New Zealand on the sensitivity of buildings to wind and weather-related damages, a number of events have caused significant damage over the past decade (Cenek et al, 2019). For example, in April 2014, when ex-tropical cyclone Ita struck the West Coast of the South Island, more than 60 houses in Greymouth lost their roofs (Cenek et al, 2019).

Prolonged periods of extreme rain can also damage buildings through moisture penetration in walls and damp conditions indoors, which can, in turn, degrade interiors (Department of Building and Housing, 2006). This has been linked to health consequences for occupants (Department of Building and Housing, 2006). Extreme wind can exacerbate the impact of rainfall on buildings by increasing moisture penetration and destroying

buildings, including roofing being blown off, broken windows, and other flying debris (Department of Building and Housing, 2006).

Knowledge of stopbank design, age and condition (which informs sensitivity to flood damage) remains sparse across New Zealand. This is exacerbated by inconsistency between formal and informal stopbanks (Crawford-Flett et al, 2018), which reduces the effectiveness of monitoring and maintenance.

Many types of buildings are also sensitive to wildfires. The level of sensitivity depends on a number of factors, which include density per hectare of buildings, the size and shape of groups of buildings, the type and amount of vegetation nearby, the distance between structures, the width and layout of roads and reserves, the climate zone, and the materials used (Opie et al, 2014).

Buildings in New Zealand can also be sensitive to liquefaction, which, as shown by the Christchurch earthquake sequence, is driven by a range of factors including land characteristics (soil type), groundwater levels and building design (MBIE, 2017). Buildings are sensitive to landslides, which are caused by factors including rainfall, soil stability, structural building type (including foundations), and intensity of land development (Guillard-Goncalves et al, 2016; Lin et al, 2017). Buildings are also sensitive to drought-induced soil movements, which can cause certain types of soil to dry and shrink (Corti et al, 2011). As buildings shift and subside, this can result in structural damages to foundations and cracked walls and ceilings (Kovats and Osborn, 2016).

Adaptive capacity

Existing residential and commercial buildings inherently have low adaptive capacity. They are built as permanent structures, which are served by complex, centralised infrastructure that requires large capital and ongoing expenditure. Buildings with a concrete floor slab are harder to relocate and repair, and would have lower adaptive capacity than older buildings with a suspended timber floor.

New buildings and settlements can be built with a much higher adaptive capacity, tolerant of a wider range of climate and weather extremes; there are many good local and international examples of this. For example, the Urban Growth Partnership approach to spatial planning includes climate resilience, and protecting and enhancing the natural environment as a key objective. This is a partnership between central government agencies, local government and iwi and is focused on urban growth areas around New Zealand.

Improving adaptive capacity would require funding, which has financial implications for households, communities, local and central government. Further research is needed to determine how financial institutions and government authorities can support the financing of adaptation measures. Ultimately, enhancing adaptive capacity will require strong leadership, governance, funding mechanisms and community engagement.

Consequence

Climate change impacts on buildings will have economic, social, cultural and public health consequences. Major floods can put financial pressure on individuals and households, for instance by lowering house and land prices. This could be compounded by insurance retreat from high-risk areas. For coastal communities – such as Haumoana, Granity, Waitara and Urenui, where homes are being undermined or swamped by wave action – the consequences will increase. Other low-lying settlements could also face growing social and economic impacts, including South Dunedin, Edgecumbe, Lower Hutt and Petone, which are already prone to major flooding (Stephenson et al, 2018). These consequences are far reaching across all domains.

The impact of flooding, sea-level rise and extreme weather on buildings could also result in loss of access to valued places, and in turn, impact physical and

mental health, identity and sense of belonging (Stephenson et al, 2018). Many communities have social and economic vulnerabilities, including poor health, lack of social connections and financial distress. These can reduce the capacity of people and communities to recover from shocks, such as the damage from floods and extreme weather events. The consequences may become more severe over time (Stephenson et al, 2018).

Increased moisture in buildings due to extreme weather events and flooding could also lead to poor public health and a range of economic and social consequences. At present, mould is visible to some extent in an estimated half of all houses in New Zealand, with a slightly higher prevalence in rental properties (White et al, 2017a). Mould is a key indicator of indoor air quality and is potentially harmful to the health of household occupants (Chang-Richards et al, 2018).

The failure of flood management and protection schemes could also have extreme consequences, given the number of people living in areas with these schemes.

Interacting risks

There are interacting risks to buildings due to transport connections (B6) and essential community infrastructure (B1, B4, B8). The climate change impacts on these supporting services could directly affect the utility of buildings and the viability of communities.

The risks to buildings will also flow on to people, the economy and governance. The risk to residential housing could exacerbate existing inequities (H2) and result in impacts on social cohesion and community welfare (H1). Risks to buildings (B2) may also affect cultural heritage sites (H8).

Impacts on residential and non-residential buildings may cascade into the economy, such as public sector fiscal risks from growing financial burdens and unfunded contingent liabilities (E1), risks to financial system stability and economic development (E2), and to the insurance sector (E6). The exposure and sensitivity of buildings to climate hazards could be compounded by uncoordinated and inconsistent governance between and within levels and agencies of government and private property owners (G2). There could also be maladaptive actions, such as supporting property owners with adaptation in high-risk locations that could create moral hazard problems (G1). Finally, hardening coastal environments (eg, sea walls) to defend settlements against erosion and flooding can lead to coastal squeeze and impacts on coastal ecosystems (N1).

Confidence: High agreement, medium evidence

There is high agreement that buildings are exposed and sensitive to climate and natural hazards. Further research is required to understand the level of exposure of buildings, particularly those defended by flood schemes (including stopbanks). Overall, the research on sensitivity is robust, with considerable evidence in New Zealand and globally.

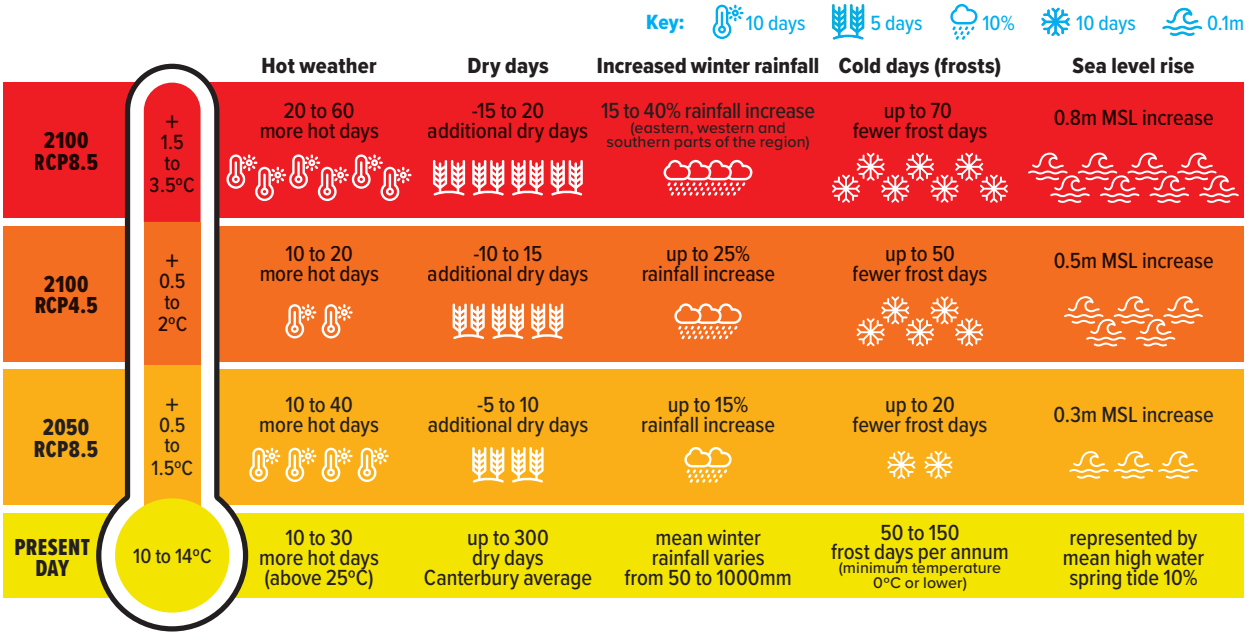
Adaptation

A number of initiatives are under way at the community, local government and central government levels to progress adaptation for buildings and broader settlements. Community (council-funded) coastal restoration projects are under way through Coast Care and the Coastal Restoration Trust of New Zealand, and the Ministry for the Environment is setting up community resilience groups to build resilience to flood risk. Regional councils monitor and manage flood protection schemes (including stopbanks), and many are actively assessing these in relation to climate change.

More broadly, most regional and district councils regularly plan for hazards. This includes mapping and monitoring flood risk, improving consent requirements for river and coastal flooding, and in some cases setting rules to allow for relocatable houses. Central government also has a

number of planned and ongoing initiatives, including a project led by the Ministry of Business, Innovation and Employment (MBIE) to review the evidence on how the building regulations could support the Government's climate change objectives. Heritage New Zealand Pouhere Taonga is also supporting marae communities with advice and specialist services to manage their own buildings and cultural practice.

Key summaries from: Canterbury Climate Change Risk Assessment (p5)



Key summaries from: Emissions Reduction Plan (p229 & 275)

Building and construction

Why building and construction is important

In 2018, nearly 9.4 per cent of domestic emissions were building-related. These emissions are largely accounted for in the energy and industry, transport and waste sectors. For example, they include:

- emissions from the energy and other resources used when operating a building
- the carbon emitted in Aotearoa by the manufacture, transport, use and disposal of the materials and products in a building across its life – including construction, maintenance and deconstruction.

As we reduce our emissions and build Aotearoa New Zealand's circular economy and bioeconomy, we can expect healthier homes, less reliance on global supply chains for construction materials and more sustainable living.

Key actions

- Reduce the embodied carbon of construction materials by supporting innovation and regulating to promote the use of low-emissions building design and materials.
- Accelerate the shift to low-emissions buildings by promoting good examples, providing incentives and supporting the use of low-emissions practices.

- Improve building energy efficiency by amending the Building Code and measuring energy performance to ensure buildings are designed, and retrofitted, to use less energy for heating and cooling.
- Shift energy use from fossil fuels by developing a gas transition plan and understanding the impacts of transition for households and communities.
- Establish foundations for future emissions reduction by improving emissions data for buildings and materials, building relationships with Māori, and progressing behaviour change and workforce transition programmes.

Key summaries from: National Adaption Plan (p115-116)

Chapter 7: Homes, buildings and places

Government agencies with actions in this chapter	• Ministry for Culture and Heritage (MCH) • Ministry of Business, Innovation and Employment (MBIE) • Te Tūāpapa Kura Kāinga – Ministry of Housing and Urban Development (HUD) 3
Why these actions are important for building resilience	Our homes, buildings and places are at the centre of our lives. They play a vital role in our health, wellbeing and quality of life. Many homes and buildings are in areas at risk of flooding and sea-level rise, and impacts of climate change can reduce their durability. The potential costs are high. How and where we build can help our communities adapt.
Significant risks addressed in this chapter B = Built	B2: Risks to buildings due to extreme weather events, drought, increased fire weather and ongoing sea-level rise.
Objectives relevant to critical actions HBP = Homes, buildings, places	• HBP1: Homes and buildings are climate resilient, and meet social and cultural needs. • HBP2: New and existing places are planned and managed to minimise risks to communities from climate change. • HBP3: Māori connections to whenua and places of cultural value are strengthened through partnerships. • HBP4: Threats to cultural heritage arising from climate change are understood and impacts minimised.
Critical actions relevant to this chapter	• Help building owners, renters and new home builders reduce and manage the impacts of climate hazards on homes and buildings. • Reduce the exposure of public housing tenants to climate hazards through a framework for adaptation options for public housing. • Ensure funding decisions for urban development and housing, including Māori housing, consider climate hazards. • Support kaitiaki communities to adapt and conserve taonga/cultural assets.

Why we need to take action

Climate change affects our homes, buildings and places, but where and how we build can help us adapt.

Homes, buildings and places[3] are the foundation of our communities. They include the physical environment around us, the people in that environment and the interaction between the two.

The form, design and characteristics of our homes, buildings and places play a vital role in our health, wellbeing and quality of life.

Significant risks

The actions in this chapter address the following significant risk identified in the National Climate Change Risk Assessment 2020:

- **B2:** Risks to buildings due to extreme weather events, drought, increased fire weather and ongoing sea-level rise.

These actions also address:

- **H5:** Risks to Māori social, cultural, spiritual and economic wellbeing from loss and degradation of lands and waters, as well as cultural assets such as marae, due to ongoing sea-level rise, changes in rainfall and drought
- **H8:** Risks to Māori and European cultural heritage sites due to projected ongoing sea-level rise, extreme weather events and increasing fire weather.

Most of our existing homes and buildings were located without ongoing climate change in mind and built to perform under climate conditions at the time. However, as the climate changes, an increasing number of those homes and buildings are at risk of becoming less liveable or being damaged or destroyed.

For example, a warmer, wetter climate may affect the durability of building materials and the lifespan of homes and buildings. This could include an increased risk of damage due to coastal erosion, or of subsidence during intense rainfall and coastal storm surges.

Damage to existing housing stock from climate change could have knock-on effects for the country's housing supply. It could further reduce the supply and affordability of housing, weaken social cohesion and prevent communities from growing. It could also reduce access to good-quality housing for tenants, individuals (particularly women) and whānau experiencing or at risk of homelessness.

The potential impact on our communities is high

About 675,000 (or one in seven) people across Aotearoa live in areas that are prone to flooding, which amounts to over $100 billion worth of residential buildings. Over 72,000 people live in areas at risk of storm surges. The number of people exposed to these hazards will increase as rainfall increases, storms become more frequent and sea levels rise.

A threat to our cultural heritage

Climate change presents risks to culture, cultural heritage, traditional knowledge and ways of life. Cultural heritage includes historic sites, structures, places and areas; archaeological sites; sites of significance to Māori, including wāhi tapu; and cultural landscapes. Many communities will face challenges in activities such as documenting and conserving their cultural heritage and managing their cultural infrastructure.

[3] In the context of this outcome area, 'places' refers to urban or rural areas, ranging from neighbourhoods to towns and regions. Adaptation must address both the physical elements of a place (eg, homes, buildings, infrastructure and spaces around them) and the social elements (eg, the identity of people and communities, cultural value).

Stresses on Māori, iwi and hapū

Climate hazards can affect homes and buildings on whenua Māori, and threaten the unique cultural and spiritual connection Māori have to whenua.

Whenua Māori and land returned through the Treaty settlement process is often on coastal fringes and lowland areas exposed to flooding, erosion and sedimentation.

Objectives

Resilient homes, buildings and places allow us to thrive.

The Government has identified four objectives to help make our homes, buildings and places resilient to the changing climate and support people and communities to thrive.

Table 6: Government objectives to build resilient homes, buildings and places

Code	Objective	Explanation
HBP1	Homes and buildings are climate resilient, and meet social and cultural needs	• Reduce exposure to climate hazards and support businesses and communities to understand and respond to climate risks. • Improve homes and buildings so they can withstand the expected range of temperatures, rainfall and wind and to improve energy and water efficiency. • Conserve valued cultural heritage.
HBP2	New and existing places are planned and managed to minimise risks to communities from climate change	• Improve resilience through effective planning, urban design and management. • Avoid development in places that may be more exposed to climate hazards. • Support existing places to adapt. • Relocate people and assets where risks are too high to manage otherwise.
HBP3	Māori connections to whenua and places of cultural value are strengthened through partnerships	• Support initiatives that identify and respond to climate risks specific to iwi and Māori. • Work in partnership with hapū, iwi and Māori on Māori-led adaptation solutions. • Identify and embed Māori knowledge, identity and values in urban design and construction to manage climate hazards. • Increase the resilience of cultural heritage, to strengthen the ties between whānau, hapū and iwi and their whenua.
HBP4	Threats to cultural heritage arising from climate change are understood and impacts minimised	• Understand where cultural heritage sites are, their values, who they are important to and how climate change could affect them. • Understand how the loss of cultural heritage can affect social, cultural, spiritual and economic wellbeing, including for Māori, and the positive role of cultural heritage in adaptation and wellbeing. • Improve disaster management for cultural heritage. • Enable communities to maintain and protect their taonga and assets. • Protect and conserve cultural heritage through appropriate regulation.

Actions to increase the resilience of homes, buildings and places

As shown in table 7 below, the actions critical to achieving the objectives relating to homes, buildings and places are set out in chapter 3: Enabling better risk-informed decisions, chapter 4: Driving climate-resilient development in the right locations and chapter 5: Adaptation options including managed retreat. These the actions work together to increase the resilience of our homes, buildings and places.

Table 7: Actions related to homes, buildings and places are located throughout the national adaptation plan

HOMES, BUILDINGS AND PLACES ARE RESILIENT TO A CHANGING CLIMATE, SO THAT PEOPLE AND COMMUNITIES CAN THRIVE			
HBP1 **Homes and buildings are climate resilient, and meet social and cultural needs**	**HBP2** **New and existing places are planned and managed to minimise risks to communities from climate change**	**HBP3** **Māori connections to whenua and places of cultural value are strengthened through partnerships**	**HBP4** **Threats to cultural heritage arising from climate change are understood and impacts minimised**
CRITICAL ACTIONS			
Action 4.4: Embed adaptation in funding models for housing and urban development, including Māori housing		**Action 5.8**: Support kaitiaki communities to adapt and conserve taonga/cultural assets	
Action 4.3: Establish an initiative for resilient public housing **Action 5.7**: Reduce and manage the impacts of climate hazards on homes and buildings			
ACTIONS THAT SUPPORT HOMES, BUILDINGS AND PLACES OBJECTIVES			
Action 4.1: Reform the resource management system			
	Action 5.16: Identify options to increase the integration of nature-based solutions into urban form		
FUTURE PROPOSED WORK PROGRAMMES RELEVANT TO HOMES, BUILDINGS AND PLACES OBJECTIVES			
Action 3.22: Work with community housing providers to enable effective climate hazard response **Action 3.25**: Design methodology for risk assessments of public buildings **Action 7.4**: Update regulatory requirements to ensure buildings are designed and constructed to withstand more extreme climate hazards **Action 7.6**: Manage potential impacts of adaptation related to regulatory change	**Action 7.5**: Update housing and urban settings	**Action 7.2**: Partner with Māori landowners to increase the resilience of Māori-owned land, homes and cultural sites **Action 7.3**: Partner with Māori to support Māori-led approaches to adaptation planning	**Action 3.26**: Produce guidance for disaster risk management for cultural heritage **Action 3.27**: Develop a framework for assessing exposure and vulnerability of taonga/cultural assets to climate change **Action 7.1**: Research how cultural heritage contributes to community wellbeing and climate change adaptation

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