



KĀPITI COAST
DISTRICT
PLAN
REVIEW

DISCUSSION DOCUMENT
NATURAL HAZARDS &
MANAGED RETREAT

The Council is reviewing the District Plan and invites you to
have your say.

Be involved and help shape Kāpiti for future generations.

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INTRODUCTION

This discussion paper is one of a set of papers which look at a range of sustainability issues that are important to consider during the District Plan Review process. The District Plan is Council's main regulatory tool for managing development, subdivision and land use.

By law, each provision of a District Plan has to be reviewed every 10 years. Much of the current District Plan hasn't been changed since it was completed in 1999.

Some of the thinking in the current Plan is now 15 years old, so it is also important to respond to new issues, opportunities and community direction.

Some of the principles underlying the Plan may remain the same but we also need to think about new pressures on the environment that have arisen or increased in the past decade.

It's also important to respond to "community vision" as expressed in the Community Plan and in Local Outcome Statements from communities such as Greater Ōtaki, Waikanae North, Otaihanga, Paraparaumu Beach, Paraparaumu Town Centre, Raumati Beach, Raumati South, and Paekākāriki.

The Review is carried out as one of Council's obligations under the Resource Management Act 1991 (RMA), which has a focus on the sustainable management of natural and physical resources, and management of the effects of activities on the environment.

The intention of these papers is to ensure that the District Plan Review successfully converts a range of concerns and directions into RMA 'speak' without losing integrity.

The Council aims to have a District Plan Review that:

- Addresses implications of significant global issues (including climate change)
- Increases the ability of the community to deal with change, through resilience and innovation
- Reduces pressures on the natural environment and resources
- Increases the ability of people to work and live locally in a sustainable way
- Reduces pressure on people's day to day lives (e.g. cost of travel, noise); and
- Respects Kāpiti Coast culture

We have written this round of Discussion Papers to provide a sustainability framework for discussion and consultation on various aspects of the District Plan Review, and to stimulate discussion and feedback on some of the initial ideas being considered. Topics we have dealt with in this phase include:

1. Global Change: Issues and Pressures
2. Biodiversity
3. Natural Hazards and Managed Retreat
4. Food and Rural Productivity
5. Landscape, Character and Heritage
6. Infrastructure and Essential Systems
7. Urban Form and Transport

Readers are invited to complete the submission form at the end of the paper, supporting conclusions they agree with, as well as offering additional ideas and constructive feedback.

After feedback is received on these discussion documents the next steps in the District Plan Review process will be as follows:

- Publication of additional discussion documents including potential objectives and policies
- Production of the Draft District Plan for consultation, based on community feedback
- Notification of Proposed District Plan provisions for formal public submissions
- Submissions and Further Submissions under the RMA
- Hearings
- Council Decisions (providing some legal effect)
- Appeals to the Environment Court (if any)
- The new District Plan Provisions become Operative (with full legal effect)

For more information on the District Plan Review visit: www.kapiticoast.govt.nz, particularly www.kapiticoast.govt.nz/DistrictPlanReview, where you can find the Scoping Discussion Document (March 2010).



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EXECUTIVE SUMMARY

This paper considers the impacts of natural hazards on the Kāpiti Coast and the role of the District Plan in minimising the impacts of these hazards on the Kāpiti Coast environment.

The majority of the 46,000 people who live in the Kāpiti Coast District, live on a fairly flat coastal plain that extends along the western margin of the Tararua Ranges. Much of this coastal plain is only marginally above the existing sea level and is split at various points by a series of relatively swift flowing streams and rivers with steep catchments, all of which present varying levels of flood risk to the settlements which have grown up around them. Flooding is the most frequent environmental hazard in the District.

The District extends along more than 40km of coastline with most (approximately 25km) of the coastline having urban development directly adjacent to the coastal edge. In southern parts of the District there has been long term coastal erosion which has led to the development of hard structures along the coast to prevent further erosion. Climate change projections of sea level rise and increased storm intensity will put increasing pressure on coastal systems.

Other natural hazards facing the District include earthquakes, tsunamis, wildfires and landslides. These hazards create further risks of property damage and loss of life. All natural hazards need to be considered in the District Plan Review as the result of the Resource Management Act 1991 provisions.

The District Plan plays a key role in helping the Council ‘reduce’ the potential severity of natural hazards by defining hazard zones where land use restrictions, structural defense measures and higher building standards reduce risk or improve survivability for residents.

This is why the District Plan is so important in helping build community resilience to natural disasters. Trying to find a balance between risk reduction and community growth pressures is a challenging exercise however, and the District Plan Review is an important opportunity to gauge what the community feels are acceptable risk reduction measures given the known natural hazards and the desire for further development.

Managed retreat from natural hazards has been indicated in the Long Term Council Community Plan 2009 (LTCCP) and this needs to be explored as part of the District Plan Review since relocating existing development and infrastructure away from known hazard risks is a key method of risk reduction.



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ISSUES, CHALLENGES AND TRENDS

Climate change

The major issue related to natural hazards worldwide is the impact of climate change on the hazard risks facing communities. The increased frequency of floods and landslides occurring worldwide is a clear indication of this impact.

These impacts are also projected to occur on the Kāpiti Coast. Concerns about the increased flood and erosion risks associated with increased storm intensity, and the anticipated rise in sea level, combined with the degree of ice cap and glacial melt, are causing climate change impact projections to impact a wide range of areas.

There have been two possible futures related to climate change impacts that the Council has explored as part of the considerations for the Long Term Council Community Plan 2009 (LTCCP). These are outlined briefly below.

Scenario 1- Resource Scramble

In this world, events outpace actions.

- Globalised economy, growth focus
- Disruption from 2012 peak in conventional oil production, move to coal
- Petrol \$5-\$10/litre from 2012 to 2025
- Long term sea-level rise 1m per century

KĀPITI	2030	2090
Temperature	+1.7C	+5C
Sea Level	+20cm	+80cm
Intensity of Extreme Rainfall Events	+9%	+40%

Based on the following scenarios:

IPCC A2 scenario, CSIRO Fuel for Thought peak oil scenario, Waikato Choosing futures “Crowded House” scenario, Landcare Research “No8 Wired” scenario, Shell “Scramble” scenario.

Scenario 2 – Managed Transition

In this world, actions anticipate events.

- Greater global co-operation, sustainability focus
- Petrol \$2-\$3/litre from 2012 to 2025 (CSIRO)
- Managed transition away from oil because of economics and climate change, so no catastrophic “peak oil”

KĀPITI	2030	2090
Temperature	+0.7C	+2C
Sea Level	+10cm	+25cm
Intensity of Extreme Rainfall Events	+6%	+16%

Based on the following scenarios:

IPCC B1 scenario, CSIRO Fuel for Thought peak oil scenario (slow decline/fast response), Waikato Choosing futures “Nature Counts” scenario, Landcare Research “The Shire” scenario, Shell “Blueprints” scenario

The Council has decided to work towards a managed transition but prepare for the worst possible impacts as well.



Key Concepts

Natural hazards

Natural hazard means any atmospheric, earth or water related occurrence (including earthquake, tsunami, erosion, volcanic and geothermal activity, landslip, subsidence, sedimentation, wind, drought, fire and flooding) the action of which adversely affects or may adversely affect human life, property, or other aspects of the environment— a disaster is the realization of this hazard.

Flood hazard

Much of the coastal plain is only marginally above the existing sea level and is split at various points by a series of relatively swift flowing streams and rivers with steep catchments, all of which present varying levels of flood risk to the surrounding settlements which have grown up around them. The flood hazard is further exacerbated by:

- the frequency and severity of rainfall in a relatively small catchment area
- poor natural drainage in coastal dune areas
- urban sprawl into flood prone areas
- coastal storm surges backing up flood water at the river mouths
- increased run-off as a result of urbanization
- the destruction of natural water retention areas such as wetlands, dunes and lowland forests
- the potential future effects of sea level rise, and
- increased storm intensity as a result of climate change

Floods in themselves need not constitute a hazard. In fact floods in a natural context can bring many benefits: rejuvenating wetland areas, improving soil fertility and flushing out toxins or salt build-up. It is only when floods conflict with human settlement that they become a problem, and it has been argued that a flood is not a hazard unless it threatens life and property.

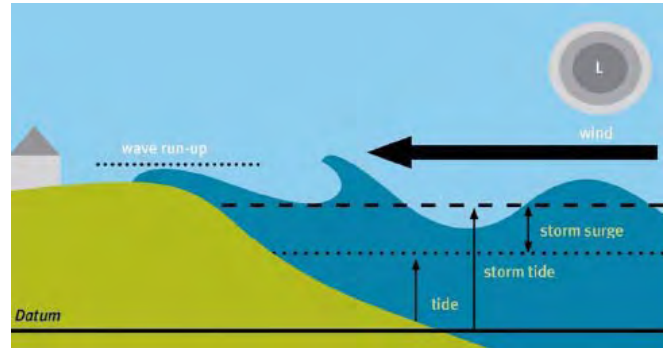
The Council has involved the community in developing its flood management strategies. The Stormwater Strategy 2008 was the culmination of an extensive consultation process with the community seeking their input at a catchment level on flood responses. A key outcome of this process was a desire to see stormwater defences increased to a 1% risk design standard and urban planning/design standards improved to:

- reduce flood impacts
- avoid any further development in high risk flood prone areas; and
- increase the survivability of new and existing homes by new or improved flood proofing standards

Sea level rise

Sea levels have been recorded as rising over the last 150 years with an acceleration of the rate of rise in the last 20 years. The rising sea level is attributed to climate change (See the *Global Change: Issues and Pressure* paper for more information) and is projected to continue at an accelerated rate for several centuries.

Components of Sea Level Rise



Projected sea level rise in Kāpiti

The science behind sea level projections is changing rapidly. There were site specific assessments undertaken in 2007 to estimate the likely sea level rise for the Kāpiti Coast in 50 and 100 years. This study indicated that the worst case would be 80cm by 2100 but more recent international data is predicting a higher level between 1m to 2m in the next 100 years. There is also an expectation that the sea level will continue to rise 5 to 10 times more in coming centuries.

Western New Zealand coasts are a high-energy wave zone. The waves are steep and respond to the regular passage of weather systems across the Tasman Sea. This means that waves on the Kāpiti Coast run up the beach or dunes to approximately 3m above mean sea level in storm events.

According to the Ministry for the Environment's report "*Coastal hazards and climate change – A guidance manual for local government in New Zealand*", the sea level in New Zealand has risen 17cm over the last century, and at a rate of 1.8mm/year on average over the last 40 years. This is due to expansion of the ocean as it warms, and to some melting of ice. As warming increases further, sea level rise is expected to accelerate.

Earthquake and tsunami hazards

The Kāpiti Coast area is subject to most earthquake hazards including strong ground shaking, liquefaction, earthquake induced slope failure and active fault shifts. To a lesser extent Tsunamis also present a risk.

The Council has spent considerable time and effort mapping known fault traces in the District. This information has been used in the District Plan to establish building restrictions in areas surrounding fault zones. In addition to this, the Council checks and enforces building code design standards so that all buildings meet national earthquake hazard standards. Recent civil defence maps and plans have also been developed to highlight tsunami risk areas and establish warning procedures and evacuation path plans.

Landslide hazards

The term landslide covers movements of rock and soil debris that have become separated from the underlying slope. The actual type of movement, which may include falling, sliding and flowing, depends largely on the nature of the geological environment, including material strength, slope configuration, and pore-water pressure.

In the Kāpiti Coast District landslides pose a significant risk to not only some existing individual properties, but also important communication routes, such as State Highway One and the rail corridor passing through the District. The Kāpiti Coast area is prone to significant earthquake and weather induced slope failure hazards in the southern and southeastern parts of the District between Pukerua Bay and Paekākāriki. In this area the terrain is steep and slopes have a very high susceptibility to slope failure. They present a significant potential risk to commuters using the road and rail corridors.

North of Paekākāriki, earthquake and weather induced slope failure is restricted to river banks, old sea cliffs, road and rail cuttings and the foothills of the Tararua Ranges (particularly in areas which have suffered deforestation or vegetation loss). Slips in the Ōtaki Gorge and on Akatarawa Road are examples of this. The adverse effects of landslides in this area are usually very localized and of medium to low severity and risk.

Wildfire hazards

The nature of the Kāpiti Coast climate varies greatly resulting in the District developing a high fire danger sometimes earlier than rest of the Wellington region. Some areas of the District are more prone to wildfire than others. The coastal dune area is very quick to dry out following periods of low rainfall or sustained north-west winds. The lowland hills of the Tararua Ranges are also being increasingly planted in exotic pine which increases the fire risk. The wildfire hazard (risk to life and property) has also increased due to increasing development in these high risk wildfire zones. Climate change projections pose an additional wildfire threat, with increased propensity for drought and stronger or more sustained wind events.

Risk

Risk is the result of the interaction of physically defined hazards with the properties of the exposed systems - i.e. their sensitivity or social vulnerability. Risk can also be considered as the combination of an event, its likelihood, and its consequences - i.e. risk equals the probability of a natural hazard multiplied by a given system's vulnerability. The level of risk is generally expressed as a probability, for example an event with 1% probability of occurring in any year (the 1% risk) is known as the 1 in 100 year event.

What is managed retreat?

Managed retreat means that the community would gradually withdraw investment in public assets in affected areas and actively pursue withdrawal of settlement in some areas over time. This withdrawal will be on the basis that the cost of trying to maintain assets (public and private) is simply unsustainable. This option is relevant when considering coastal erosion, stormwater and flood risks.

Managed retreat

Large areas of the Kāpiti District are low-lying and at risk from sea level rise. River-mouth communities are particularly threatened, due to the combined effect of increased river flooding and sea level rise.

There are two basic strategies for managing coastal hazards: holding the line of the shore, or adopting a strategy of retreat from the hazard.

The Council's current policy is to maintain and protect 'essential' public assets. There is no particular obligation to do so but there may be instances in the case of roads where it could be deemed unreasonable not to do so. This test of reasonableness would be affected by the extent and frequency of failure, the cost of repair and the extent to which the risk profile is likely to increase over time given climate change impacts.

The increased awareness of climate change has also raised the issue of considering a shift to a managed retreat policy.

The draft LTCCP proposes that a multi-year community discussion on managed retreat is a possibility for Kāpiti. While the primary focus will be to address the general issues involved, the option of retreat will also need to be considered as existing coastal protection structures reach the end of their lifetimes.

Issues

The Kāpiti Coast with its flat alluvial flood plain, steep catchment areas, high rainfall and spread of low lying coastal settlements is prone to many natural hazards. In this environment Kāpiti's communities need to accept that the Council, in meeting its legislative responsibilities, must place controls on development in high risk hazard zones to mitigate the worst potential effects of a natural disaster and improve the chances of this community to survive and recover.

The development of the towns of Waikanae, Paraparaumu and Ōtaki have necessitated the building of structural flood defense works to mitigate the adverse effects of flooding and erosion on existing and future development.

Whilst these flood defenses have provided many Kāpiti communities with a certain level of security over the years, they have also contributed in many ways to the flood hazard problem. Protection from low to mid level flooding events (e.g. 1 in 20 year to 1 in 50 year flood return period events) has been a contributing factor in the District's continued urban sprawl into flood prone areas.

In some cases, as more information and awareness of natural hazards improves, new hazard zones are identified and additional controls need to be put in place. An example of this is that new coastal and flood hazard zones will be identified as a result of the latest climate change projections. It is likely that these new hazard prone areas will extend beyond those currently identified in the District Plan.

Reliance on purely structural defenses (e.g. stormwater pipes, culverts, stopbanks) to protect Kāpiti from flooding is an unsustainable option. They encourage further urban growth into flood prone areas, invite community complacency toward larger potential flood hazards (greater than flood defense design standards), have little capacity or flexibility to adjust to climate change, are expensive to maintain and continually upgrade, have adverse visual and environmental impacts, and ultimately increase the level of flood hazard when used in isolation.

Many people underestimate the damage or danger created by floods. This danger is not confined to just the depth or velocity of flood waters but rather the residual affects of flooding, such as health risks resulting from floating sewage, chemicals and fuel. A big storm event can also cause significant landslips in the surrounding foothills, damage the District's river crossings, potentially overwhelm the District's stormwater or sewer network, and create significant ponding issues within many low lying settlements. This could severely disrupt communications and delay the time it takes for the District to recover.

It is important to recognize that individual or council actions, including mitigation measures and ongoing development in hazard prone areas, can cause, or increase, the risk and consequences from natural hazards. For example if a coastal protection structure is developed for a property there is likely to be a worsening of erosion on surrounding properties as a result. This can potentially be avoided if the structure is designed and located in a

way that dissipates the wave energy rather than reflecting it to adjacent land.

Climate change will increase the risks from natural hazard events that already occur within the District, particularly as a result of:

- (a) sea level rise: exacerbating the effects of coastal erosion and inundation and river flooding in low lying areas, especially during storm surge
- (b) increased frequency and intensity of storm events: adding to the risk from floods, landslides, severe wind, storm surge, coastal erosion and inundation; and
- (c) increased frequency of drought: placing pressure on water resources and increasing the wild fire risk

There is a need to address natural hazard risks in a way that:

- **Provides certainty:** Climate change and associated coastal and flood impacts will unfold over long time frames. However rules need to be put in place now to provide certainty, both for property owners and Council, as to what will be required, and who will pay, when significant sea level rise and other impacts occur. This will ensure that properties will then be bought and sold in full knowledge of the risk and rules.
- **Plans for continuous change:** Coastal and flood management in the face of rising sea levels, more frequent rainfall and increased storm intensity raises new challenges for planning. Sea level rise will exacerbate existing erosion trends, and cause new problems of inundation and saltwater intrusion into groundwater. These changes will be ongoing, so rather than simply drawing a single hazard line on the map, planning rules need to signal clearly that hazards will change, move, and worsen over time. Rising sea levels will exacerbate existing hazards, so where there are existing coastal erosion trends, sea level rise will tend to accelerate these. Where the coastline is accreting, sea level rise will slow this accretion, and potentially reverse it as levels continue to rise.
- **Plans for an uncertain threat:** The rate and magnitude of sea level rise resulting from climate change is very uncertain. It depends on how quickly the world reduces greenhouse gas emissions, and how sensitive the climate system and ice sheets are to emissions levels. Sea levels are expected to rise by between 0.5 and 1.5 metres this century, with levels continuing to rise thereafter. The planning framework needs to provide sufficient flexibility to manage this large range, without placing undue restrictions on activities or development. Clearly a risk management approach is appropriate - even events that are unlikely may be worth planning for, if their impact is high.
- **Works with the community to find sustainable, long term solutions.** A range of tools are available to manage coastal hazards, including planting and beach renourishment, protection structures, and moving affected buildings and infrastructure away from the hazard area. At a local level, it is best to assess the risks, costs and benefits of options with the community, to arrive at sustainable solutions for the long term rather than simply providing temporary protection.

There are two significant pieces of legislation that together influence and shape regional and local government policy toward hazard management and building greater community resilience to natural hazards. They are:

- i. the Resource Management Act 1991; and
- ii. the Civil Defence Emergency Act 2002.

The Resource Management Act 1991 and Civil Defence Emergency Act 2002 require regional and local Councils to take a more integrated approach to natural hazard mitigation, with a strong focus on improving community awareness and preparedness for hazards, and using softer strategies such as better land use planning and urban design to reduce hazard risk.

These are summarised below, along with other national and regional guidance on these issues.

Resource Management Act 1991

The Resource Management Act is the principal legislation governing coastal management in New Zealand. Under the RMA framework:

- Amendments to Section 7 of the RMA made in 2004 require decisions to “*have particular regard to the effects of climate change*”. This amendment has relevance to the increasing need to plan for the effects of climate change that can exacerbate coastal hazards, particularly sea level rise.

MfE Climate Change Guidelines 2008

These guidelines recommend that Council’s use an extreme sea-level rise model that includes 1.5 metres of sea level rise for all hazard modelling (100 year worst case) and model 0.5 metre (moderate 50 year scenario)

The Ministry for the Environment’s guidance on coastal hazards and climate change states that effective regional and district plans that relate to managing coastal hazard risks, and the effects of climate change, should include rules and other methods that:

- recognise the importance of coastal set-back zones for coastal hazard areas covering a lengthy planning horizon (e.g. 100 years)
- are specific about what is not permitted in district plans in relation to new or intensified coastal development in coastal hazard areas, and/or building or upgrading coastal protection works within the coastal environment
- state a preference for risk avoidance for new development, and risk reduction for existing developed areas
- encourage early proactive action but do not lock in future generations to particular or restrictive approaches to risk management; nor reduce the range of risk-management approaches that are available at present

- place a strong emphasis on integrated planning across the mean high water springs boundary and strategically identify in the regional and district plans where certain management approaches (such as defensive, ‘hold the line’ approaches) may be appropriate and acceptable
- maintain and/or improve the natural coastal defences and buffers
- are based on a combination of coastal hazard risks, rather than treating coastal erosion, storm inundation and tsunami risk independently
- identify and allow a mix of complementary statutory and non-statutory risk-reduction activities
- facilitate ongoing research and understanding of coastal hazards, vulnerabilities and potential consequences within coastal margins, how these are changing and what is driving these changes

Based on these criteria, few local authorities in New Zealand have effective coastal hazard management policies in place. Those with the most comprehensive response tend to be in areas where the relevant Regional Council has taken a lead by implementing a Regional Coastal Plan with jurisdiction over the inland coastal environment as well as the seabed and foreshore - providing better integrated management of the coastal margin.



NZ Coastal Policy Statement (NZCPS)

The New Zealand Coastal Policy Statement (NZCPS) provides the national policy framework to manage the coastal environment. Regional Policy Statements, Regional Coastal Plans and Regional and District Plans must give effect to the NZCPS.

There is currently an operative (1994) and proposed NZCPS. The Proposed NZCPS has stronger more directive policies than the operative policy statement. It includes the following:

- proposed 100 year planning requirements for sea level rise
- use of soft engineering solutions to manage hazard risks

The recently (unofficially) released Board of Inquiry Recommended NZCPS Provisions, which are currently on the Minister of Conservation's desk, recommended managed retreat from hazard prone areas.

The government is also considering whether to introduce a National Environment Standard (NES) for sea level rise, which would specify what level of sea level rise Councils should plan for over a 100year timeframe.

Civil Defence Emergency Management Act 2002

This Act gives direction on building resilient communities through greater risk awareness and emergency response plans.

The Civil Defence Emergency Act 2002 complements this process by having a stronger focus on the three other stages of the four 'R's (Readiness, Response and Recovery), and emphasizes community preparations to survive a natural disaster once it occurs. Risk Reduction is the first and perhaps most proactive stage in the four 'R's of an emergency management strategy.

Regional planning

The Wellington Regional Policy Statement (WRPS) and Regional Coastal Plan (WRCP) are the key guiding documents.

There is currently an operative WRPS and a proposed WRPS, however the Proposed WRPS is the most important to focus on in terms of this review. The Proposed WRPS has objectives and policies relating to natural hazards which require Council to minimise the risk to people, communities, businesses and property from natural hazards by having rules in district plans to avoid subdivision and development in areas at high risk from natural hazards.

At present, the WRCP only covers the coastal marine area (i.e. the area below the high tide mark). It allows maintenance of existing structures (e.g. sea walls) in this area, but resource consent must be sought for any new structures. The review of the WRCP, which is currently in the early stages, raises the possibility of extending the plan's rules to cover the coastal area above the high tide mark, which could provide greater powers to control building in the coastal hazard zone.



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DISTRICT PLAN CONSIDERATIONS

Scope and role of a District Plan

Council has a responsibility and mandate from the Resource Management Act 1991 to avoid development in areas of known hazard risk. This means that Council is responsible for identifying natural hazard risks and restricting the use of the areas at risk.

This is becoming increasingly difficult in light of the increased risks occurring now. There are large areas of currently urban development which has become at risk of flooding or coastal erosion that was safe at the time the development occurred.

This means that in order to avoid increased natural hazard risks it is appropriate to consider how to retreat from natural hazards in areas with existing development. It is easy for the District Plan to have provisions to ensure that new development avoids natural hazard prone areas and has space to retreat to if hazard risks worsen in future but this is significantly more difficult with existing developed areas.

Differences between regional and district plans for managed retreat

Regional plans	District plans
<p>An activity cannot occur unless there is a rule specifically permitting the activity, or a resource consent is obtained.</p> <p><i>Note: This does not hold true in respect of RMA section 9(3) – restrictions on the use of land.</i></p>	<p>Activities are permitted unless there is a rule stating that the activity requires a resource consent (eg, building coastal defenses above the MHWS line is a permitted activity unless there is a rule in the plan controlling it).</p> <p>The exception to this is subdivision (RMA section 11), which cannot occur unless it is allowed in the District Plan or a resource consent is obtained.</p>
Rules cannot be used to control subdivision.	Rules can be used to control subdivision.
Rules have potential to control both existing and new development on land. Historically, most regional councils have deferred this responsibility to the district or city councils.	<p>Rules cannot control activities occurring seaward of the MHWS position.</p> <p>Rules cannot control existing development if the scale, use and intensity remains the same.</p>
Rules have potential to control coastal defense works both in the coastal marine area and on land.	Rules can control coastal defense works on land only above MHWS.
If controls on building in a hazard area are contained within the rules, then it is not possible to rely on existing use rights.	<p>If controls on building in a hazard area are contained within the rules, then existing use rights will apply.</p> <p>Controls on building in a hazard area with existing use rights can be applied only where substantial extension or upgrade of the building is undertaken.</p>

Existing development

While District Plans have the power to control subdivision and new development, existing development has the right to remain at the same scale and intensity even if the rules have changed. This extends to generally allow reconstruction of existing buildings, or infrastructure, that have been damaged or destroyed by the sea or other natural hazards. This would obviously make it difficult to reduce the impacts of coastal and flood hazards in areas which are already extensively developed. Only Regional Councils have the ability to override “existing use rights” in regional plans.

If the Regional Council were to put rules in the Regional Coastal Plan controlling development in the coastal environment (i.e. above MHWS), it would be possible to make consistent and clear rules for both existing and new buildings. One model for this approach is Environment Canterbury’s Regional Coastal Plan, which prohibits reconstruction of a dwelling that is washed away by the sea if the remaining lot is eroded to less than a certain area. This could also be applied to flood prone areas as part of a regional plan.

Ensuring short term actions give optimal long term outcomes

There also needs to be a recognition that the sea cannot be held back indefinitely, so any short term intervention needs to fit within a framework that will provide the best outcomes in the longer term. It will be necessary to assess the risks, costs and benefits of options at a local level with local communities, to arrive at sustainable solutions for the long term.

Costs

There are potentially significant costs associated with natural hazards. There are costs associated with damage as a result of the hazard and costs associated with minimising or avoiding the hazard.

There are clearly costs for the community when it is necessary to enhance or retrofit infrastructure to deal with increased hazard risks. Examples of this are enlarging stormwater pipes to deal with increased rainfall or earthquake strengthening of public buildings. These costs can become considerable, and can raise questions of equity in relation to wider community interests if the work is only undertaken in one area but the whole District is paying for it.

The difficulty with costs is balancing the interests of affected individuals with those of the wider community. Existing coastal property owners have a legitimate interest in protecting their homes, however this needs to be balanced with the costs to the wider community, both in terms of dollars and lost amenities such as public beaches.

If land needs to be vacated as part of a managed retreat policy or rule due to increased hazards this can raise an expectation of compensation by the affected property owners. Decisions around who pays for relocation, demolition and re-establishment would need to be agreed well in advance of the rules being triggered, so there is clarity on all sides as to what process will be followed. In general, costs will need to fall on individual property owners, as fully buying out coastal property owners would simply be unaffordable for the wider community.

The need for early clarity on costs is even more critical where public assets are located at the beach, such as shoreline roads. Here, because there is currently a policy to protect these assets, there is a public expectation that properties behind the road will also be protected by the Council. However this shorefront infrastructure cannot be protected indefinitely – rising sea levels will make it increasingly difficult and expensive to maintain it over time. When considering hazard zones, it would be unreasonable to expect that any current protection works will still be in place over a 100 year timeframe, so rules for building or renovation behind these structures need to reflect this.

Where existing sea walls exist these provide “breathing space” for Council and the community to make appropriate plans to prepare for long term change, but planning rules need to reflect the temporary nature of these structures. Property owners behind existing public sea walls will need long term clarity of what the rules will be for relocation and costs when these structures can no longer be maintained.

It may become necessary to establish a fund to partially pay for the early removal or relocation of homes. This could be funded through targeted rates on coastal properties, through general rates, or by central government. This may be important as a transitional measure, but once the rules for relocation are clear then over time the need for funding will reduce because property owners will have sufficient notice.

Perception of risk

A significant issue when dealing with natural hazards is that property owners do not accept that a hazard risk affects their property. An example of this is that in spite of extensive erosion of coastal areas, many of which have been highly publicised, beachfront properties have appreciated in value much faster than properties in general. This is significant as they have also appreciated considerably faster than properties even one street back from the beach. This has occurred even when hazards are identified on the property. It is clear that hazard identification is not yet having any obvious effect on the value that the market places on beachfront property values.

It is currently unclear whether other hazard risks are also being ignored by potential property purchasers. A possible reason for this is that the likelihood of any hazard occurring in any year is very low, usually 1% or less for most mapped hazards and property purchasers are prepared to take the risk that the predicted hazard will not occur in their lifetime.



Current District Plan provisions

The District Plan has addressed some natural hazards directly by identifying hazard prone areas for floods, coastal erosion and earthquake fault rupture.

In flood prone areas, the District Plan restricts subdivision, earthworks and the location of buildings, requires setbacks from waterways and compensatory storage in ponding and flood storage areas, and retains overflow paths.

The District Plan has identified nine flood hazard categories and sets a high standard of building control or building restrictions according to their level of flood risk. These categories include risks associated with failures of flood protection structures.

The nine flood hazard categories are:

1. River corridor
2. Stream corridor
3. Overflow paths
4. Residual overflow paths
5. Ponding areas
6. Residual ponding areas
7. Flood storage areas
8. Flood erosion areas
9. Fill control areas

For all areas on the Kāpiti Coast the Council requires new developments to be hydraulically neutral (not increase stormwater runoff) to prevent any increase in the flood risk for existing properties as the result of new development. The Council also places notices on the titles of properties under the Building Act 2004 advising the owners of flood and erosion risks.

For coastal areas the District Plan currently uses setback lines to manage development on the Kāpiti Coast. The setback lines include a no build zone and a relocatable buildings zone where they are directly related to coastal hazards. Coastal setbacks are provided for natural character and amenity reasons, as well as to manage coastal hazards. The current setbacks are as follows:

- Subdivision setback with a 50m coastal esplanade reserve in the rural zone and a 20m esplanade reserve in other areas.
- Building setback 7.5m from the title boundary in Waikanae and Te Horo
- Building setback 70m from the seaward edge of the esplanade reserve in Peka Peka
- Building setback 20m in Paraparaumu, Raumati and Paekākāriki, with a further 30m relocatable zone behind this.
- Building setback 100m in the rural zone

In dealing with earthquakes and earthquake related hazards, the District Plan plays a key role in reducing the potential severity of earthquake hazards by controlling development in known hazard areas. However, earthquake hazard information is continually improving and there are many already developed areas that may lie above or near known and unknown fault traces.

To manage fire risks the District Plan sets a requirement that all residential properties in rural areas, developed since 1997, must have a water tank situated on their property so that they can be used for fire fighting purposes. Developers are also required to have water storage tanks specifically for fire fighting purposes strategically placed in any rural area development.

Gaps

There are some gaps in the planning for natural hazards on the Coast. These gaps are discussed below with some suggestions to address them.

There is no mapping to show areas prone to landslides. This is a concern as a large part of the District is steep hill country in the foothills and Tararua Ranges. There have been several occasions in recent years when roads have been closed due to land slips. Climate change projections of increased rainfall in more intensive storm events are expected to make land slips a more frequent and damage causing natural hazard for the District in the future.

The District Plan restricts or places controls on earthworks and development in steep areas (slopes greater than 28 degrees) and requires that geotechnical investigations be undertaken in these areas. In addition, provisions which prevent native vegetation removal and control the harvesting of large areas (greater than 10ha) of production forestry ensure that vegetation removal does not lead to land slippage. It has been noted that the current provisions have had limited impact on improving the risk level to existing road and rail corridors particularly in the Tararua Ranges and Paekākāriki. It is recommended that further consideration be given to mapping areas which are at significant risk of land slippage and preventing the removal of trees and shrubs in these areas. Most of the areas at risk are located in rural zones. As part of subdivision controls in these areas it is recommended that there be provisions which require planting and retirement from grazing of the steepest slopes to stabilize them.

The District Plan does not specifically address the risk of wildfire. This is a concern as a large hillside forest fire has the potential to spread to other forest blocks and trigger significant economic loss, possible loss of life and biodiversity, and potentially the quality of the District's water supply (if fires occur in water supply catchments). If a large scale wildfire occurs in steep areas this may also lead to landslips.

Forestry blocks often only become known to the Council once the trees are spotted on aerial photographs, and there is currently no capacity or opportunity for the Council to impose any additional or individualized fire prevention requirements as forests are developed as a permitted activity.

In the light of climate change projections (which include increased dry periods during the summer months) and the pressure of continued development in wildfire prone areas, there is a need for the Council to strengthen its fire prevention efforts in high risk fire zones. It is recommended that the establishment of new commercial forests or felling of existing commercial forests be moved from a permitted activity to a controlled activity in the District Plan.

It is also recommended that the District Plan make it a requirement that all rural properties in high risk fire hazard zones, and commercial forests, have access roads and tracks that are appropriately designed, built, and maintained for entry and exit of fire fighting vehicles.

Best practice in NZ: Regional Councils

Environment Canterbury has taken a proactive approach to managing coastal hazard risks. The Regional Coastal Plan for Canterbury includes erosion hazard zones for the Canterbury Region which extend inland. The rules in the Regional Plan apply to new and existing developments within these coastal hazard zones. The rules allow existing uses to continue, but place limits on the reconstruction or replacement of structures. The Regional plan restricts new development and subdivision in the hazard zones identified in the Plan.

Notably, it is the only plan in New Zealand that makes rules that override existing use rights for existing dwellings. Where an existing building is damaged or destroyed by the sea, the Plan only allows it to be reconstructed if the section size has not eroded below a certain size, meaning that development will gradually move back from the coast as erosion occurs. Without this rule, homeowners would generally have a right to reconstruct on the previous footprint.

The Canterbury Regional Plan includes two coastal hazard zones. Hazard Zone 1 contains the current active beach system and land that is at risk from coastal erosion within 50 years, while Hazard Zone 2 marks land that is at risk from coastal erosion in 50 to 100 years.

Best practice: City and District Councils

Tauranga City District Plan

An example of a District Plan which takes a proactive approach to managing coastal hazards is the proposed Tauranga City District Plan (notified October 2009), which defines a Coastal Hazard Erosion Policy Area (CHEPA), with three sub-zones corresponding to immediate risk (short term fluctuations), 50 year risk including sea level rise, and 100 year risk including sea level rise. New buildings within the 50 and 100 year zones must be relocatable, access must be maintained for relocation, and an alternative building site for relocation must be held as part of the same building title. Relocation is triggered when erosion reaches 8m from the building. This is a proactive approach to deal with new development which is all that a district plan is able to do. The benefit of having multiple hazard zones in light of climate change is to deal with the predictions of long term increases in hazard risks associated with sea level rise and increased storm intensity.

Both of these examples relate specifically to coastal hazards but a similar approach could be applied to other hazards which are projected to be affected by climate change.

Promising new ideas

Relocation of services

Rising seas will mean that coastal roads, utilities and other public infrastructure will, over time, need to be relocated away from the coast. Planning for this will need to begin soon, and there will be costs to the council, and the community, to relocate infrastructure away from coastal hazard prone areas. The services that will need to move include sewer lines, water pipes and potentially also roads. It will become necessary to make provision for alternative access and utility corridors before development intensifies further.

New subdivisions will need to be carefully laid out so that access to properties is not cut off by rising sea levels or floodwaters. In general new development needs to be set back from the coastal edge and above flood levels.

The Kāpiti Coast District Plan has requirements for relocatable buildings in coastal erosion and hazard prone areas. However these provisions are yet to be tested, and are bound to be highly contentious when the time for relocation comes. The questions around where to relocate to, and who pays, are not clearly laid out in the Plan.

While regional rules that prohibit the rebuilding of structures or sea walls will have the effect of enforcing retreat as erosion occurs, they do not provide for the proactive and orderly relocation of buildings or infrastructure that are under threat.

Earlier relocation, such as will occur with the Environment Canterbury example, would allow space for a natural dune buffer to be maintained or restored, providing better protection from storms and also maintaining the amenity value of the beach. While individual property owners have an interest in staying in their properties as long as it is safe, the interests of the wider community may be better served by slightly earlier relocation, which would allow a natural beach environment to be maintained.

District Plan rules can control new development, but not require removal of existing buildings as this can only be done with regional plans (for example see Environment Canterbury above). This could lead to a patchwork where some properties are covered and others are not, unless District Plan rules are backed up by Regional rules. At this time there is no indication that Greater Wellington is prepared to develop a regional plan which deals with coastal hazard risks in developed areas. Council will need to advocate for the Regional Council to be proactive if this issue is to be addressed.

For new developments it is possible to use covenants requiring relocation or removal and prohibiting protection works, issued through resource consent processes. This approach would ensure that buildings are removed before they are taken by the sea, preventing debris from being spread along the coastline and becoming a liability for ratepayers. It would also allow for a natural coastline to be maintained, providing amenity value to the wider community and providing the protection that a natural dune environment provides.

Recommended approach for the Kāpiti Coast

It is important for the Council to continue to work with local communities to develop a long term plan to deal with worsening natural hazard risks especially those associated with climate change.

The use of multiple hazard zones is strongly recommended as this clearly signals to the community that risk will increase over time, and gives residents plenty of time to prepare for long term changes. It also allows for uncertainties such as the wide range in sea level rise figures to be incorporated in the second or third hazard zones, without unduly impacting on immediate activities.

Coastal setback lines should be based on best practice modelling of anticipated coastal erosion, and take into account amenity and natural character issues in line with the community's wishes. Best practice would suggest:

- Using multiple zones in urban areas (at least a no build zone and a relocatable zone).
- Zones should not assume the continued presence of current protection structures such as sea walls.
- Introducing tighter requirements in the relocatable zone (specific triggers for relocation, requirements to maintain access for relocation, and potentially requiring an alternate site to be held).

Different criteria are used to define hazard zones by Councils throughout the country. Options are to consider:

- 50 year and 100 year erosion hazard zones
- 100 years based on current hazards, and 100 years with sea level rise
- Or some combination/variation on these.

Best practice suggests using a risk-based approach to sea level rise. Given the wide range of potential rise (0.5-1.5m over 100 years), planning needs to provide significant flexibility. Reasonable use of the coastal environment needs to be allowed, while still being ready if high sea level rise eventuates. This would suggest using fairly modest criteria to define the "no build" zone, but high-end figures to define the relocatable zone.

One possibility would be to have a no build zone seaward of a 50-year erosion line that assumes mid-range sea level rise, and a relocatable zone seaward of a 100-year erosion line that assumes high-end sea level rise of 1.5m.

There needs to be much clearer and stricter criteria for relocatable buildings, including a specific trigger for when relocation must occur and requirements to maintain access for relocation. Consideration could be given to requiring an alternative building site for relocation, as is proposed in Tauranga.

It would help significantly if there was (with the assistance of the Wellington Regional Council) clarity on what will happen with existing dwellings when hazard risks increase.

Managed retreat

The LTCCP proposes a multi-year community discussion on managed retreat as a possibility for the Kāpiti Coast. While the primary focus will be to address the general issues involved, the option of retreat will also need to be considered as existing coastal protection structures reach the end of their lifetimes.

To properly manage coastal hazards and sea level rise, similar rules need to apply to existing properties. Kāpiti Coast District Council can advocate to Wellington Regional Council for the Regional Plan to contain provisions that allow a consistent framework for all properties in hazard zones. This could require, for example, that existing dwellings need to be moved at the same trigger point as new dwellings.

There will need to be extensive engagement with the community at the local level to map out a pathway to adapting for climate change in the long term, including how to manage the eventual transition away from current protection works such as sea walls. Hazard zones and the development rules within each zone will need to be set to fit with, and assist this long term transition.

6 CONCLUSION

The recommended approach is to strengthen the current practice of proactively managing natural hazards. The new concepts include having a trigger point for the relocation of buildings, typically related to the seaward toe of the foredune or vegetation line in coastal areas,

or a distance from floodwaters for flood prone areas and having timeframes for relocation to be undertaken for existing developments. In terms of other hazards a proactive approach to minimising risks is recommended.

	1	2	3	4	5
Possible new concepts	Use both 50 year and 100 year hazard modelling scenarios for flood and coastal hazards including a worst case 1.5m sea level model	Prohibit the use of private sea walls on public land to hold the line in existing areas. Look at restrictions on private land also.	Allow more development density away from natural hazard prone areas to compensate for less in hazard prone areas	Prevent subdivision of hazard prone areas if the hazard is likely to worsen with climate change	Significant ecological restoration and a location to move to for coastal subdivisions
Concepts to continue and/or Strengthen	Coastal setbacks (have 2 hazard lines for the whole coast) strengthen to include climate change effects	Preventing new development, including restricting renovations in hazard prone areas.	Make it clear that relocateable buildings must be removed when a trigger is met and before disaster strikes	Strengthen provisions requiring riparian planting and esplanades	Increase flood modelling to take account of worst case flood hazards
Barriers to Remove	Enable relocation of dwellings within a site or off site (permitted if relocated due to hazard)	Make hazard mitigation across multiple properties easier	Facilitate easy relocation of infrastructure to safer locations	Ensure access to relocate is available	

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