

Rural Development Strategy

Hazards: Issues and Options

Prepared by Evan Cook, Policy Planner

Table of contents

1	Introduction.....	4
1.1	Natural Hazards in the Rural Environment	4
1.2	Management of Natural Hazards.....	4
2	Policy Framework	5
2.1	National Level.....	5
2.1.1	Resource Management Act 1991.....	5
2.1.2	New Zealand Coastal Policy Statement 2010	5
2.1.3	Civil Defence and Emergency Management Act 2002.....	7
2.1.4	The Local Government Act 2002 and the Long Term Council Community Plan.....	7
2.1.5	Building Act 2004.....	7
2.2	Regional Level.....	8
2.2.1	Regional Policy Statement.....	8
2.2.2	Ten Year Review of the RPS.....	8
2.2.3	Discussion document for the new RPS.....	8
2.2.4	Regional Plans.....	8
2.3	District Level.....	9
2.3.1	Whangarei District Plan – Natural Hazards Provisions.....	9
2.3.2	Rolling Review of the Operative District Plan	9
2.3.3	Iwi Management Plans.....	9
2.3.4	Background paper – Sustainable Futures 30/50.....	9
3	Best Practice.....	10
4	Options for Whangarei District	10
4.1	What are the Resource Management Issues?.....	10
4.2	What are the Options to Address the Issues?.....	10
5	References.....	12

1 Introduction

1.1 Natural Hazards in the Rural Environment

The Whangarei District, including its rural areas are exposed to a wide variety of natural hazards that impact on people, property, infrastructure and the wider environment. The main hazards threats result from storms generated in the north Tasman Sea or the Tropics. These unstable weather patterns generate heavy rain, thunderstorms, large waves and high winds that cause flooding, slips and coastal erosion. Droughts are also common which increase the risk of fire in commercial and indigenous forests, and can be very costly through impacts on local agricultural production.

Excluding floods and climatic events, the levels of natural hazards the Northland Region is exposed to, are relatively low. The region is one of the most geologically stable in the country and of the landslide, volcanic, seismic, tsunami, and mine subsidence hazards present, the landslide hazard is considered the most significant (and is usually triggered by heavy rain). Nevertheless it is important to acknowledge the risk from rare events like tsunami or earthquakes and have the systems in place to manage this risk. Although these types of hazards have a low probability of occurring, they can potentially have catastrophic effects. With a reliance on agriculture, horticulture and forestry Northland is also vulnerable to biological hazards. These include insect, animal and plant pests along with diseases that can be spread by animals and insects. The outbreak of new diseases is expected to be exacerbated by climate change. This paper does not deal with climate change as a hazard in itself, but it is acknowledged that in the future climate change may have an influence on the frequency and severity of hazards such as flooding, drought, and coastal erosion.

1.2 Management of Natural Hazards

The management of natural hazards is the responsibility of a number of organisations under different pieces of legislation. These are discussed further in section 2 of this report, however functions of district councils relating to natural hazard management is guided primarily by the RMA. The RMA defines the term natural hazard as:

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.

It is important to note that an extreme weather event (such as a period of extreme rainfall or a volcanic eruption) is not in itself considered a natural hazard. A natural event only becomes a hazard when it impacts human life, property or the environment. The impact or risk of a natural hazard depends on the intensity of the natural event, and the exposure of people and property to the effects of that event.

The management of natural hazards is primarily about reducing the risk of adverse effects on life and property. This can be achieved in a number of ways depending on the situation, and may range from providing information and education to landowners, regulating land use patterns in identified hazard areas, or constructing large scale engineering works like stop banks, sea walls or dams. The appropriate option in any given situation depends on the nature of the hazard, the physical nature of the area, the level of existing or proposed development, and the probability of the hazard occurring. Because of the variability of these factors, site-specific problems generally require site specific solutions, highlighting the importance of consultation with affected communities before deciding on the appropriate option.

Human activities and land use patterns can significantly increase the risk to people and property associated with hazards by increasing the occurrence or the severity of effects. Unfortunately the places people choose to live in often coincide with hazardous areas. Most of our towns and productive farmland are located on floodplains, and residential development is often located on steep hills and along coastal margins to take advantage of rural and coastal views. Locating development in these areas increases the risk of natural hazards affecting life and property. It is important for communities to decide on an acceptable level of risk, and the amount the community is willing to pay to reduce the risk to an acceptable level.

With a growing population, increasing insurance costs, and the effects of climate change likely to increase the frequency and intensity of some hazards, it makes sense to manage risk and plan for natural hazards. Good planning for potential hazards now can reduce the potential for injury, damage, or loss of life and property in the future.

2 Policy Framework

2.1 National Level

2.1.1 Resource Management Act 1991

The Resource Management Act 1991 (RMA) is the principle piece of legislation that manages the use and development of resources. The purpose of the RMA, is contained in Section 5 and states:

- 1 The purpose of this Act is to promote the sustainable management of natural and physical resources.
- 2 In this Act, sustainable management means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while:
 - a sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and
 - b safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and
 - c avoiding, remedying, or mitigating any adverse effects of activities on the environment.

The RMA sets out a number of key documents that must be prepared to achieve the purpose of the Act. This includes national policy statements, regional policy statements, and regional and district plans. Under Section 57 there must at all times, be at least one New Zealand Coastal Policy Statement (NZCPS). The latest version of the NZCPS was released in December 2010 and contains strong provisions in regard to natural hazard management in coastal areas. More specific discussion on the provisions of the new NZCPS is contained in Section 2.1.2 of this paper.

Section 31 of the Act sets out the functions of territorial authorities. One of these functions is the control of subdivision and any actual or potential effects of the use, development, or protection of land, to avoid or mitigate natural hazards. Under Section 106 a territorial authority may refuse to grant consent for a subdivision if the land may be subject to natural hazards, or if any subsequent use of the land may exacerbate the effects of natural hazards.

Regional councils are also required to control the use of land to mitigate natural hazards under Section 30 of the Act. There is no clear statutory distinction between the roles and responsibilities of the two authorities, largely because of the inter-relationship between land and water management and associated hazard threats. The RMA does, however, require that the Regional Policy Statement (RPS) determines for each part of the region, whether the regional council or the relevant district council is to be responsible for developing objectives, policies and rules relating to the control of the use of land and the particular hazards concerned. Section 35 sets out the duties of local authorities to gather information, monitor and keep records in relation to natural hazards.

Regional policy statements, regional plans, and district plans are prepared under this legislation and the provisions of these documents as they relate to natural hazard management in rural areas are discussed further in the sections below.

2.1.2 New Zealand Coastal Policy Statement 2010

The recently released New Zealand Coastal Policy Statement 2010 contains objectives and policies regarding the management of natural and physical resources in the coastal environment. This document is relevant to the Rural Development Strategy as rural and rural-residential land use activities often extend into the District's coastal environment. In some cases these activities may be exposed to coastal hazard risk from coastal erosion, tsunamis, and inundation.

Local authorities are required by the Act to give effect to the NZCPS through their plans and policy statements. This provision seeks to align national direction and current policies of central government with regional and district plans. The latest NZCPS shifts its emphasis toward spatial planning and a catchment management approach to planning, rather than the previous approach, based on managing the effects of activities.

The NZCPS 2010 seeks to ensure that coastal hazard risks are managed by taking into account the effects of climate change, locating new development away from areas prone to coastal hazard risks, protecting and restoring natural defences to coastal hazards, and by considering responses to manage existing development in hazard prone areas. This includes directing councils to identify areas that are subject to coastal hazard risk over a 100 year time frame.

The following policies relate to natural hazards in the coastal environment:

Policy 24 Identification of coastal hazards

- 1 Identify areas in the coastal environment that are potentially affected by coastal hazards (including tsunami), giving priority to the identification of areas at high risk of being affected. Hazard risks, over at least 100 years, are to be assessed having regard to:
 - a physical drivers and processes that cause coastal change including sea level rise
 - b short-term and long-term natural dynamic fluctuations of erosion and accretion
 - c geomorphological character
 - d the potential for inundation of the coastal environment, taking into account potential sources, inundation pathways and overland extent
 - e cumulative effects of sea level rise, storm surge and wave height under storm conditions
 - f influences that humans have had or are having on the coast
 - g the extent and permanence of built development; and
 - h the effects of climate change on:
 - i matters (a) to (g) above
 - ii storm frequency, intensity and surges; and
 - iii coastal sediment dynamics.

taking into account national guidance and the best available information on the likely effects of climate change on the region or district.

Policy 25 Subdivision, use, and development in areas of coastal hazard risk

In areas potentially affected by coastal hazards over at least the next 100 years:

- a avoid increasing the risk of social, environmental and economic harm from coastal hazards
- b avoid redevelopment, or change in land use, that would increase the risk of adverse effects from coastal hazards
- c encourage redevelopment, or change in land use, where that would reduce the risk of adverse effects from coastal hazards, including managed retreat by relocation or removal of existing structures or their abandonment in extreme circumstances, and designing for relocatability or recoverability from hazard events
- d encourage the location of infrastructure away from areas of hazard risk where practicable
- e discourage hard protection structures and promote the use of alternatives to them, including natural defences; and
- f consider the potential effects of tsunami and how to avoid or mitigate them.

Policy 26 Natural defences against coastal hazards

- 1 Provide where appropriate for the protection, restoration or enhancement of natural defences that protect coastal land uses, or sites of significant biodiversity, cultural or historic heritage or geological value, from coastal hazards.
- 2 Recognise that such natural defences include beaches, estuaries, wetlands, intertidal areas, coastal vegetation, dunes and barrier islands.

Policy 27 Strategies for protecting significant existing development from coastal hazard risk

- 1 In areas of significant existing development likely to be affected by coastal hazards, the range of options for reducing coastal hazard risk that should be assessed includes:
 - a promoting and identifying long-term sustainable risk reduction approaches including the relocation or removal of existing development or structures at risk
 - b identifying the consequences of potential strategic options relative to the option of 'do-nothing'

- c recognising that hard protection structures may be the only practical means to protect existing infrastructure of national or regional importance, to sustain the potential of built physical resources to meet the reasonably foreseeable needs of future generations
 - d recognising and considering the environmental and social costs of permitting hard protection structures to protect private property; and
 - e identifying and planning for transition mechanisms and timeframes for moving to more sustainable approaches.
- 2 In evaluating options under (1):
- a focus on approaches to risk management that reduce the need for hard protection structures and similar engineering interventions
 - b take into account the nature of the coastal hazard risk and how it might change over at least a 100-year timeframe, including the expected effects of climate change; and
 - c evaluate the likely costs and benefits of any proposed coastal hazard risk reduction options.
- 3 Where hard protection structures are considered to be necessary, ensure that the form and location of any structures are designed to minimise adverse effects on the coastal environment.
- 4 Hard protection structures, where considered necessary to protect private assets, should not be located on public land if there is no significant public or environmental benefit in doing so.

2.1.3 Civil Defence and Emergency Management Act 2002

The CDEM Act is administered by the Ministry of Civil Defence and Emergency Management and provides for emergency management preparation, the development of policies, and event planning. This Act provides an overall framework that includes regulation, national strategies, and CDEM plans for each tier of government.

The CDEM Act is centred on the 'four R's' - reduction, readiness, response, recovery. RMA planning generally falls under 'reduction' which refers to actions or planning that reduces the hazard risk, whether through land use planning, building up community resilience, or undertaking engineering works. 'Readiness' refers to natural hazard event planning itself, including the various roles and functions of different sectors of society. 'Response' refers to powers and duties during a civil defence event, and 'recovery' points to post-event planning and actions that help communities recover from events. The CDEM Plan 2004 identifies flooding as the most significant natural hazard in Northland, followed by coastal storm surges and tropical cyclones (wind and rain combined).

2.1.4 The Local Government Act 2002 and the Long Term Council Community Plan

The Local Government Act sets out the purpose of local government, which is to enable democratic decision-making and action by, and on behalf of, communities; and to promote the social, economic, environmental, and cultural well-being of communities, in the present and in the future. The Act provides the general framework, obligations, restrictions and powers under which local authorities operate including the preparation of a Long Term Council Community Plan (LTCCP). During consultation for the 2009 Long Term Council Community Plan, the community identified the following community outcomes relating to natural hazards:

- our District has a robust, resilient and sustainable infrastructure able to withstand climate and economic changes
- development is achieved in a responsible and sustainable manner
- regional and district agencies work together to achieve positive environmental outcomes.

2.1.5 Building Act 2004

The Building Act 2004 regulates all buildings and structures to safeguard the health, safety, and amenity of people, facilitate efficient energy use, and to protect property from damage. In terms of natural hazards the Act is geared towards the management of risk by setting performance standards for the construction and modification of buildings. The key sections of the Building Act in relation to natural hazards include Sections 35, 37, and 71-75.

2.2 Regional Level

2.2.1 Regional Policy Statement

The Regional Policy Statement for Northland (RPS) contains objectives and policies that seek to avoid or mitigate the effects of use and development of land and water at a regional level. This document sits at a high level of the planning hierarchy and provides a broad direction for resource management that regional and district plans must give effect to. The RPS seeks to identify and monitor major hazard threats, collect and disseminate information on natural hazards to the public, limit the likely exposure of people and property to hazard risks through avoidance planning, and limit the use of hard protection works which are expected to be maintained and provided to where they are clearly the most effective option from an economic and environmental perspective.

The RPS is also the document that sets out the different functions of both NRC and WDC. The current approach has been for the Regional Council to do the science for the regionally significant natural hazards and then provide information to district councils to set the 'rules' for land-use through their District Plans, for example by identifying flood susceptible areas in the Resource Area maps, with associated rules for activities that fall within those areas.

2.2.2 Ten Year Review of the RPS

The RPS 10 Year Efficiency and Effectiveness Review identifies that there is now considerably more 'science' about hazard susceptibility, particularly regarding areas subject to flooding, coastal hazards and tsunami. This information should be implemented into Northland's RMA planning documents such as District Plans. The review recommends further discussion around the roles of the NRC and district councils in respect to natural hazard management. For instance, it may be more efficient and consistent to manage natural hazard risk at a regional level through one regional plan, instead of having different management regimes for each of the three district councils.

Another advantage of NRC determining the rules regarding natural hazards, is that unlike district councils, regional councils can make rules in regional plans for controlling land (for the purposes of avoiding or mitigating natural hazards) that are exempt from existing use right clauses under s.10 of the RMA. This makes them particularly useful in managing hazard risk in areas where development has taken place before plan rules to manage such risks could be implemented. An example of this is Environment Waikato's Proposed RPS which seeks to manage development in Coromandel's beach side communities to reduce the risk of coastal erosion.

2.2.3 Discussion document for the new RPS

NRC released a discussion document in October 2010, seeking public feedback on the expected scope of the new RPS. The document considers options to manage the effects of natural hazards, the appropriate level of regulation of land use activities, the allocation of limited council resources and the roles and responsibilities of local authorities. A draft of the new RPS is expected to be released for comments towards the end of 2011. WDC will continue to be involved in the development of the new RPS and once complete, the District Plan may need to change to ensure it gives effect to its provisions.

2.2.4 Regional Plans

Regional plans can contain land use rules only for the purposes stated in Section 30 of the Act although they can contain objectives and policies for the protection and values listed in Part II of the Act rules can only be included where they impact on regional council functions. One of the matters included in section 30 is the avoidance and mitigation of natural hazards.

The regional Water and Soil Plan contains objectives and policies that recognise the role of wetlands, riparian margins and flood plains in the management of floodwater. The plan controls structures on the beds of rivers and streams that may affect flows through rules, and discourages development on floodplains through educational methods.

The Regional Coastal Plan (RCP) manages effects of activities in the Coastal Marine Area. The RCP seeks to avoid remedy or mitigate adverse effects of coastal hazards on coastal subdivision use and development, and to avoid remedy or mitigate subdivision and development that exacerbates hazards in the coastal marine area. The policies also look to protect natural buffers to natural hazards. The management of natural hazards is an issue which involves consideration of factors above and below Mean High Water Springs. Because the RCP only contains rules for the area below mean high water springs, integrated management is required with land use controls in the Regional Water and Soil Plan and the District Plan.

2.3 District Level

2.3.1 Whangarei District Plan – Natural Hazards Provisions

The District Plan contains provisions to manage the risk of natural hazards from flooding, land instability, coastal hazards, and fire. The policies seek to avoid increasing the risk from natural hazards by avoiding subdivision and development in identified natural hazard areas. It also seeks to protect natural features that act as buffers to natural hazards such as sand dunes. The Plan identifies areas that are susceptible to flooding and coastal hazards in the Resource Area Maps. Proposed activities in these areas trigger rules in the subdivision and natural hazards sections of the plan. The rules for the Countryside and Coastal Countryside Environments set minimum floor levels to reduce the risk of flooding, and require engineering reports in identified flood susceptible areas. This section of the plan also sets a 30 metre buffer zone between residential buildings and commercial forestry to reduce fire risks.

2.3.2 Rolling Review of the Operative District Plan

The Council is required to review the entire District Plan within a ten-year period. It has resolved to achieve this through a rolling review programme which incorporates the priorities set out in Council's various business plans, asset management plans, and the Long Term Council Community Plan (LTCCP). As a result of changes to the Resource Management Act, more emphasis has been placed upon policy, therefore the rolling review will aim to focus primarily on policy formulation over the next three years.

2.3.3 Iwi Management Plans

Under Section 74(2A) of the RMA, Council must take into account any relevant planning document recognised by an iwi authority and lodged with the territorial authority, to the extent that its content has a bearing on the resource management issues of the District. At present there are three such documents, being Te Iwi O Ngatiwai Environmental Policy Document (2007), Patuharakeke Te Iwi Trust Board Environmental Plan (2007), and Ngati Hine Iwi Environmental Management Plan (2008).

Natural hazards are not noted explicitly within any of the iwi management plans lodged with Council, however many of the issues, objectives, and policies within these documents mention natural features that will influence the potential management of natural hazards such as flooding. Significantly, each IMP has significant sections on water quality and much of this is centred around rehabilitation as well as integrated approaches to catchment management.

2.3.4 Background paper – Sustainable Futures 30/50

Whangarei Growth Strategy - Sustainable Futures 30/50 was adopted by the Council in September 2010. After assessing different options for growth, a consolidated future development pattern was chosen and adopted by Council. This will guide future decision making on infrastructure and the spatial arrangement of development across the District. The District Plan will be one of the tools used to implement the growth strategy adopted through the Sustainable Futures project.

The Whangarei District Growth Strategy - Sustainable Futures 30/50 background paper on natural hazards notes that flooding is generally accepted as having the highest risk potential in both the Whangarei District and in Northland as a whole

The paper, confirms that at present, 13,523 parcels of land are located fully or partially within flood susceptible areas across the whole District. This exposure continued to increase with development patterns in the last decade. Of the 11,833 new land parcels created since 1996, 24% (2,867) are located in flood susceptible areas, and since 1995 1,259 building consents have been processed for flood susceptible lots across all Environments. This represents an increasing level of risk exposure for flooding hazards across the District.

The paper recommends that careful land use planning taking into account natural hazard risk be used to determine the future spatial arrangement of land uses in the district. It also recommends local analysis of communities during structure planning of identified growth areas with the direction of structure plans being incorporated into the District Plan provisions and resource consent processes. Also highlighted is that strong leadership in managing risks associated with natural hazards is necessary at the regional level as many local risks form similar patterns regionally. While there are existing provisions at the regional level there is still room to strengthen these to direct settlement away from natural hazards.

Should the development of the district follow a controlled, consolidated development path, it is expected to lead to a more urbanised settlement pattern concentrated in rural settlements and coastal nodes. This approach is likely to reduce risk exposure in the countryside areas as the policies will promote consolidation around existing settlement areas where hazard risks can be avoided.

3 Best Practice

Several trends in international natural hazard and flooding research are emerging and should be incorporated into the preferred planning policy. Traditional approaches to the management of natural hazards have been to ignore them, or try to design engineering solutions to protect existing investment and mitigate risk. More recently there has been a shift from hard to soft mitigation measures. The ways local authorities address flooding issues are changing by complementing structural forms of mitigation like stop banks and dams with the use of non-structural mitigation measures. These methods may include land-use planning and community education. There has also been a shift from using built solutions to natural solutions for example, from built infrastructure like dams to the use of wetlands, riparian margins and retention basins which decrease the intensity of the flooding event.

There has also been widespread adoption of a risk management approaches to manage and mitigate the risk of natural hazards. This is a technical exercise relying on expert led approaches so while the information used is accurate, it can be difficult for local communities to understand the consequences. There has also been increasing effort to incorporate community knowledge into natural hazard planning. In New Zealand the main focus has been on the incorporation of traditional (Maori) knowledge, however there is a wealth of knowledge in the rural regions which can provide accurate information on natural hazards gathered over many years, such as trends in river levels. These best practice methods are already being applied to a certain extent by NRC and WDC.

4 Options for Whangarei District

4.1 What are the Resource Management Issues?

- natural hazard events can have significant adverse effects on people, property, infrastructure, the economy and the environment
- natural climatic events such as flooding, inundation, and slips resulting from high intensity rainfall are predicted to increase in intensity and frequency over time
- development in areas subject to natural hazards continues to increase our exposure and vulnerability to natural hazard risks
- flood susceptible areas and the 50 and 100 year coastal hazard lines in the Resource Area Maps are mapped at a high level requiring site specific investigation when a development or change of land use is planned. The identified hazard zones in the District Plan need to be updated as new or more accurate information becomes available
- the roles and responsibilities between agencies for managing natural hazard risks are not clear
- activities like earthworks and vegetation clearance can exacerbate hazard problems, lead to loss of topsoil, and deposit sediment in streams rivers and estuaries. There are no methods in the District Plan to manage these activities in the Coastal Countryside and Countryside Environments at present
- development in areas of bush and near commercial forests increases fire risk
- District plans are less effective in controlling development in hazard prone areas where existing use rights apply.

4.2 What are the Options to Address the Issues?

This section contains options that may be considered in attempting to address the issues set out in the previous section. There are many ways territorial and regional councils may choose to address natural hazard risk. The following list is not exhaustive but is intended as a starting point to facilitate discussion on this topic.

- Restrict buildings on floodplains and on unstable land to reduce exposure to natural hazards. Decisions need to be made on how restrictive rules should be and what level of event we are planning for. If we were to take a cautious approach with a low level of tolerance, then the rules will be a lot more restrictive compared to a less cautious approach and a willingness to tolerate a high level of risk. The costs of avoiding hazardous areas in the first place are much lower than trying to mitigate hazard risks with engineering works later.
- The mapping of hazard areas in the District Plan could be updated and improved using new information. The coastal hazard lines have not been updated since 1999, the flood susceptible areas were last updated in 2001, and Policy 19.4.4 Sea Level Rise bases its margin of safety on predictions

from the Intergovernmental Panel on Climate Change in 1996. WDC now has access to new information regarding flood levels as a result of NRCs priority rivers program, and work done internally by Infrastructure and Services as inputs into structure plan implementation into the District Plan (Waipu, Waipu Cove, Langs Beach, and Oakura). Also NRC now has much better detailed knowledge of tsunami risk, and tsunami/coastal inundation maps. This information can be included in the Resource Area maps of the District Plan and the associated rules can be included to avoid inappropriate development in areas subject to coastal hazard risk. It may be appropriate to look at specific areas as required during structure planning exercises and feed this information into the District Plan.

- Look at options to increase the resilience of communities to hazards. This may involve promoting restoration planting along rivers and streams in the upper catchment or converting marginal land in hill country to forest. Vegetative cover and riparian planting improves water quality, reduces erosion and sedimentation and provides flood attenuation that reduces flooding in lower catchments. This will also have positive effects on rural amenity and landscape values, biodiversity and may be an opportunity to provide cycleway and walkway connections into the future.
- Engineering works to reduce flooding needs to be based on good information and specific to the area in which it is being implemented. This is not something that can be addressed under the District Plan but can be taken into account when developing structure plans and in the LTP.
- Provide identified evacuation paths for areas prone to tsunami. The management of tsunami risk is probably not best addressed by the District Plan but can be looked at in an educational role. Tsunami sirens are currently being installed in coastal areas however communities need to know what to do if a tsunami warning occurs.
- The community need to decide on what time frame we should plan for. Do we seek to plan for 1 in 100 year events, 1 in 50 year events, or 1 in 5 year events. The answer to this is site specific and highly dependant on the nature of the hazard and the amount of investment at risk.
- Include provisions in the District Plan requiring rain water tanks to collect water for fire fighting and provide backup storage in drought events.
- In circumstances where the management of both existing and new development through RMA plan rules is desired, regional and territorial authorities may need to work together on an integrated approach that uses a combination of regional and district plan provisions which can address existing use rights.
- Use the upcoming review of the RPS to clearly state the functions of the regional and district councils with regard to natural hazard management.
- The NRC has begun the Priority Rivers project, which has identified 27 catchments around Northland as priorities for flood risk planning. In the Whangarei District the rivers included are the Helena Bay, Ngunguru, Hatea, Waiharohia, Otaika, and Ruakaka Rivers. The project involves carrying out detailed surveys of the catchments of these rivers using LIDAR, to develop flood models. This model will allow flood level predictions to be made which can be used to predict the likely consequences for people and communities. The NRC is working with affected communities to prioritise and develop tailor-made plans to reduce flood risks over the next several years by amongst other things, producing flood hazard maps and flood risk reduction plans. If the results of the detailed surveys do not reflect the existing Flood Susceptible Area overlay in the District Plan Maps these overlays should be updated to show the most up to date information. Also this should be expanded to include the remaining rivers in the Whangarei District as resources allow.

5 References

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