

Natural Hazards





Natural Hazards

Key Issues

The district is subject to a wide range of natural hazards such as; flooding, forest fire, wind, earthquakes, volcanic activity, erosions, slips and landslides. The objectives in our District Plan attempt to ensure that development is discouraged in potentially hazardous areas for example low lying areas close to major rivers. Is our District Plan achieving the anticipated environmental results?



Indicators

Pressures

- Number of resource or building consents applied for/granted within flood protection area;
- Number of buildings within flood protection area;
- Number of buildings within identified fire buffer;
- Number of dwellings built on potentially unstable land (i.e. land classed as having a degree of erosion of two or greater and/or slopes of >20 degrees); and
- Number of resource or building consent applications applied for/granted for development on potentially unstable land.



Te Aroha Flood 1985

State

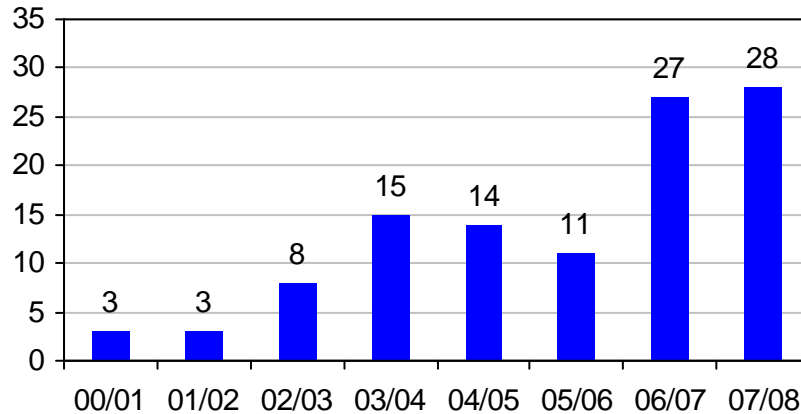
- Number and severity of flood events annually;
- Area of land subject to flooding;
- Number and area affected by rural fires annually;
- Area of vegetated and un-vegetated land classified as having a degree of erosion of two or greater;
- Area of headwater catchment in vegetation;
- Number and size of earthquakes recorded annually; and
- Annual damage (\$) to public and private property.

Response

- Area of land identified on planning maps being subject to flooding;
- Amount of Council spending on resourcing rural fire fighting emergency services;
- Area of land being identified on planning maps as being subject to land instability;
- Number of resource and building consents declined in areas identified as being subject to flooding, fire or instability;
- Council expenditure on educating community about hazards; and
- Number of fire-fighting emergencies.

Results

Number of resource consents granted within flood protection areas



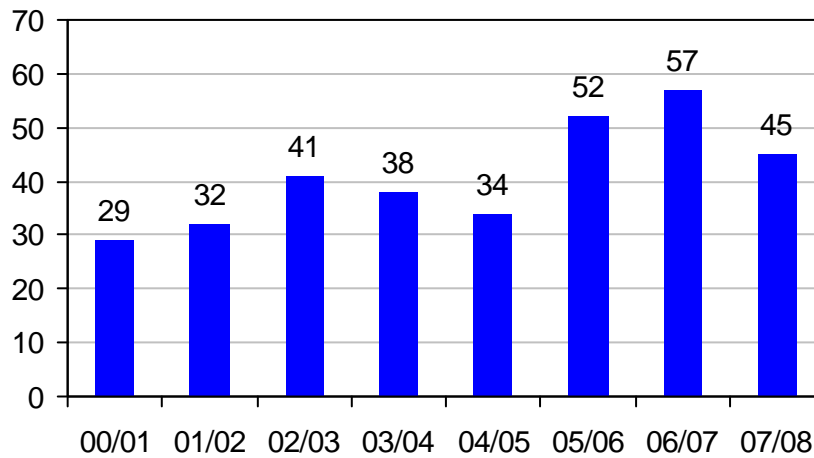
New developments in known hazard zones are potentially at high risk of being damaged by hazard events. Between 2000/01 and 2007/08, 109 resource or building consents have been applied for within the flood protection area in the district. All 109 consents were granted, subject to conditions to mitigate potential adverse effects. These consents were for activities such as building new garages, relocating dwellings, and upgrading buildings. This rise in figures is likely due to the increase in building consents overall.

There are approximately 248 buildings existing within the flood protection zone.

Between 2000/01 and 2007/08 ten resource consents were approved on land subject to fire and four building and resource consents were approved on land subject to instability. These consents were granted subject to conditions to mitigate potential adverse effects.

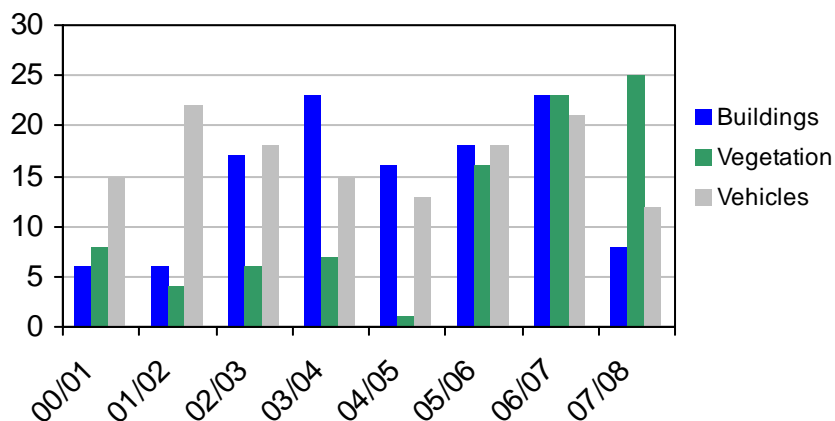
A 'flood event' is a mean annual event or higher. Whilst no flooding events have been recorded between 2003/04 and 2006/07, the district suffered three main flooding events from 2000/01 to 2002/03. In June 2002, a flood considered as a 'one-in-twenty-year-event' occurred; this 'weather bomb' caused damage to Council infrastructure estimated at a value of \$263,500. In addition to this, another \$1,467,200 worth of stormwater upgrades were recommended to be undertaken by Council following this storm. There was also a one in five year flood event on the Waitoa River in July 2002 and a one-in-five year event on the Waihou River in January 2003.

Number of rural fires



Rural fires are hazardous events that occur in the district. The number of rural fires in 2005/06 and 2006/07 was higher than in previous years, largely due to an increase in the number of vegetation fires.

A breakdown of the type of rural fires in the district is shown below



Vehicle and building fires were the most common type of fires attended between 2000/01 and 2005/06, however in 2006/07 the three types were all at similar levels, then in 2007/08 the number of vegetation was double that of buildings and vehicles.

Area affected by rural fires	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08
Area of vegetation affected (ha)	2.5	1	1.5	1.2	0.25	0.75	8*	6

*Approximately

Erosion can also be a potential problem on the steeper slopes of the district. According to data taken from the 1992 Regional Indigenous Vegetation Inventory, there is approximately 20,686 hectares of vegetated land classified as having severe erosion potential in the district.

Earthquakes occur infrequently within the district, however one was located near Walton in February 2008.

Number of Earthquakes and Magnitudes	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08
Number of Earthquakes	1	0	0	4	0	6	2	1
Magnitude of Earthquakes	2.5			3.5 3.0 2.5 2.2		3.8 3.5 3.3 3.1 3.1 3.0	3.0 2.9	2.6

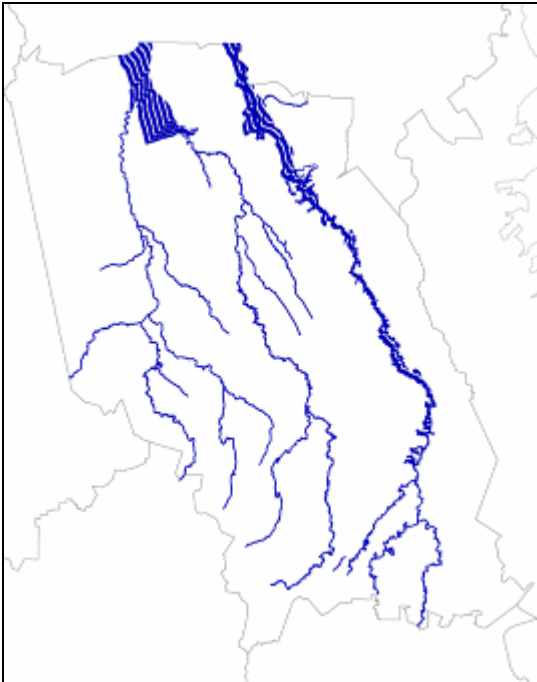
There are approximately 8091 hectares of land that has been identified by Council as being at risk of flooding.

Potentially unstable land has also been identified as a hazard within the District Planning Maps. There are approximately 11.3 hectares of this land identified in the district.

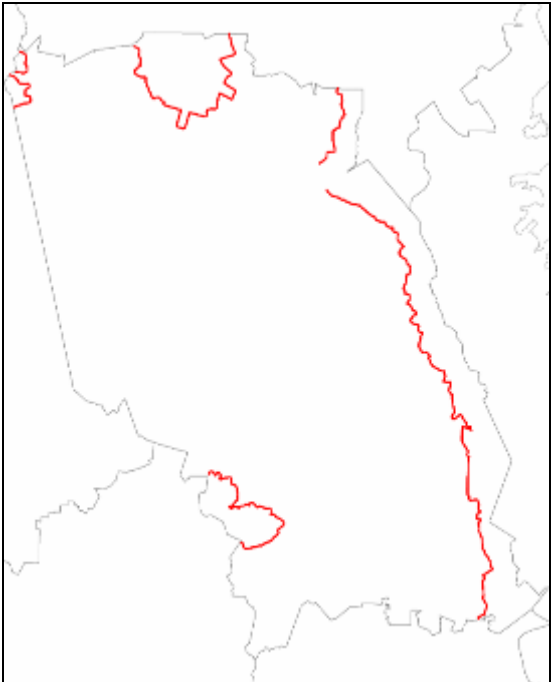
Council spending on fire fighting emergencies	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08
Amount of Council spending	\$40,435	\$30,171	\$50,200	\$43,097	\$52,000	\$68,058	\$58,214	\$99,563

No resource or building consents were declined on land subject to fire, flooding or instability from 2000/01 to 2007/08. It is noted that this will not capture those consents that were not applied for because of the rules in place in the Plan.

In 2004/05, and again in 2005/06, Council spent \$1,000 on educating the community about hazards. In 2006/07 Council carried out an evaluation of earthquake prone buildings in accordance with the Earthquake Prone Buildings Policy. In 2007/08 Council purchased an extra rural fire engine and therefore also has an increased running cost.



Flood Hazards



Fire Hazard Buffer



Land Instability (Te Aroha township)



Land Instability (Morrinsville township)

Note: these are the only instability areas noted in the district

District Plan Provisions

Section 3.2.2 Natural Hazards

Flooding:

Objective:

- To minimise the risks of flooding affecting people and property in the district.

Policies:

- To ensure that all future development does not increase the flood risk for existing buildings and activities; and
- To avoid building development below a known risk factor of 1% annual return flood levels.

Anticipate Environmental Results:

- Negligible additional runoff from new development (typical performance measure: runoff calculations pre and post development should be similar);
- Concentration of building development above a 1% flood level risk (typical performance measure: building permits check);
- Establishment of identified flooding and ponding areas within public open space;
- Increase in extent of catchment headwater vegetation cover; and
- Negligible net increase in stormwater loads generated by development in flood prone areas.

Fire hazard:

Objective:

- To minimise fire hazard for people and property in the district.

Policies:

- To avoid new dwellings being erected in high risk bush and forest areas of the district; and
- To ensure that rural fire and emergency services are adequately resourced.

Wind Hazard:

Objective:

- To minimise wind hazards for people and property in the district.

Policies:

- To avoid new dwellings being erected in known, specific design wind risk areas such as exposed ridges or sites subject to known wind tunnelling effects; and
- To manage activities so as to avoid increasing wind erosion or hazard.

Anticipated Environmental Results:

- Concentration of building development away from high fire and wind hazard areas such as bush tracts, forested hill country and exposed ridges;
- No increase in the net cost of damage to persons and property through incidence of forest fire or severe wind events; and
- No new habitable development in known high flood, wind, forest fire or land stability risk areas where mitigation cannot be readily or economically achieved.

Land Movement:**Objective:**

- To minimise hazards for people and property caused by erosion, slipping, slumping and land instability.

Policies:

- To ensure that future development does not aggravate instability or erosion problems;
- To avoid development in areas subject to high risk of land movement;
- To encourage WRC to provide incentives for bush retention and replanting of steep land and alongside erosion prone stream and river margins; and
- To encourage the retirement of high risk land to regeneration by covenant protection, public purchase and subdivision where feasible.

Anticipated Environmental Results:

- Concentration of building development away from high land movement hazard areas such as steep exposed land, soft sediments and along eroding waterway margins;
- No increase in the nett cost of damage to persons and property through incidence of land movement;
- Increase in extent of bush regeneration and planting on erosion prone land; and
- Increased awareness of the extent of earthquake and volcanic hazard affecting the district.

Earthquake hazard**Objective:**

- To minimise the risks of earthquakes affecting people and property in the district as far as practicable.

Policies:

- To take a precautionary approach to development in suspected risk areas until further information on the extent and nature of earthquake risk becomes available;
- To support initiatives aimed at designing and establishing public works and infrastructure which is more earthquake resistant; and
- To support initiatives for improved earthquake prediction and monitoring at district, regional and national levels.

Anticipated environmental results:

- Increased awareness of the extent of earthquake and volcanic hazard affecting the district.

Efficiency and Effectiveness

Are the District Plan's objectives and policies the most effective and efficient way to achieve the following anticipated environmental results?

- *Negligible additional runoff from new development (typical performance measure: runoff calculations pre and post development should be similar);*
- *Concentration of building development above a 1% flood level risk (typical performance measure: building permits check);*
- *Establishment of identified flooding and ponding areas within public open space;*
- *Increase in extent of catchment headwater vegetation cover;*
- *Negligible net increase in stormwater loads generated by development in flood prone areas;*
- *Concentration of building development away from high fire and wind hazard areas such as bush tracts, forested hill country and exposed ridges;*
- *No increase in the net cost of damage to persons and property through incidence of forest fire or severe wind events;*
- *No new habitable development in known high flood, wind, forest fire or land stability risk areas where mitigation cannot be readily or economically achieved;*
- *Concentration of building development away from high land movement hazard areas such as steep exposed land, soft sediments and along eroding waterway margins;*
- *No increase in the nett cost of damage to persons and property through incidence of land movement;*
- *Increase in extent of bush regeneration and planting on erosion prone land;*
- *Increased awareness of the extent of earthquake and volcanic hazard affecting the district;*
and
- *Increased awareness of the extent of earthquake and volcanic hazard affecting the district.*

The Matamata-Piako District is subject to a wide range of natural hazards. For areas with known or suspected hazards, the most effective control technique available involves the retention of Council discretion in order to control activities that occur in known hazards areas. The RMA obliges Council to address the cause and effects of natural hazards and avoid, remedy or mitigate the hazards.

There are approximately 8091ha of land in the district that has been identified by Council as being at risk of flooding. Between 2000/01 and 2007/08 there have been three major recorded flood events, two in 2002 and one in 2003.

The objective '*to minimise the risk of flooding affecting people and property in the district*' is technically not being met as it is difficult to 'minimise' without extremely strong rules restricting or prohibiting further development on land subject to flooding. However, the number of buildings located within the flood zone depicted on the District Plan is seen to be relatively low as there are (as at July 2008) only 248 buildings. It is noted that the majority of these buildings are not dwellings.

New developments in known flood hazard zones are potentially at risk of being damaged by hazard events. Policies regarding flooding seek to avoid additional hazards by directing development away from known flood hazard areas. The efficiency and effectiveness of policies *'to ensure that all future development does not increase the flood risk for existing buildings and activities'* and *'to avoid building development below a known risk factor of 1% annual return flood levels'* is measured by the number of resource consents granted within flood protection areas. This number has been increasing reasonably steadily between 2000/01 and 2007/08, this is generally in line with the increase of the overall number of building consents applied for. There were three in 2000/01 and 28 in 2007/08. Overall this number, although increasing it is considered to be relatively minor in terms of the overall amount of land in the district, 182,500ha and the amount of land recognised as a flood hazard, 8091ha. All 109 consents which have been granted between 2000/01 and 2007/08 have been subject to conditions to mitigate potential adverse effects. Some of these conditions imposed through subdivision include raising the land level especially near major rivers, where this has been done however it has not been reflected in the Plan, therefore these areas are still classed as flood hazard areas which may need to be looked at in the future.

Other external measures that affect flood management:

- Council's creation of water channels through the town of Te Aroha;
- Application of the Building Act (2004) s.71-74; and
- On-going works by the Regional Council in maintaining and upgrading flood protection structures within the Waihou Catchment along the Waihou River have also contributed to a reduction in flood hazard risk.

The forested areas of the Kaimai Ranges and western foothills represent both a valuable resource and a potential fire threat to the residents of Matamata-Piako. The rules and methods included in the Plan are intended to protect the forest resource from accidental fires caused by human activity and to provide a safety factor for homes and public buildings near forest areas should a fire occur. A fire hazard buffer has been drawn around those areas which are identified as "high risk areas". The line has been drawn a standard distance of 200m from the area to be protected.

The objective *'to minimise fire hazard for people and property in the district'* is effectively achieved by the fire hazard buffer guiding development to lower risk areas. Forest fire is a natural phenomena with the potential hazard greatly exacerbated by human settlement patterns and activities. In particular, it is likely that fire hazard would significantly increase if intensified development is permitted in forested hill country areas, particularly the Kaimai Range.

The policy *'to avoid new dwellings being erected in high risk bush and forest areas of the district'* is technically not being achieved as the term 'to avoid' implies that there should be no new dwellings at all, perhaps a better term maybe 'to minimise' development. Between 2000/01 and 2007/08 there have been ten resource consents granted within this fire hazard buffer and only five of these were for dwellings. This number is considered to be reasonably small and is therefore effectively controlling development and buildings to relatively small numbers.

The policy *'to ensure that rural fire and emergency services are adequately resourced'* is effectively achieved through Council contributing money towards emergency fire fighting. It is however, acknowledged that this does not arise through particular rules in the Plan. Council's financial contribution to fire fighting emergencies increased between 2000/01 and 2007/08. In 2007/08 Council spent almost \$100,000, which included purchasing an extra rural fire engine along with the additional ongoing running costs associated with new equipment. This does not show whether it is 'adequately' resourced however funding is provided by Council to contribute towards ensuring that rural fire and emergency services are adequately resourced.

The number of rural fires generally increased between 2000/01 and 2007/08. The main type of rural fire has varied over these years; vehicle and building fires were the most common type of fire attended between 2000/01 and 2005/06 with reasonably few vegetation fires in comparison. However the number of vegetation fires has increased markedly, with the three recorded types of fire having similar levels in 2006/07, and in 2007/08 the number of vegetation fires was double that of buildings and vehicles. The area of vegetation affected has increased markedly, from 2.5ha in 2000/01 to approximately 8ha in 2006/07 and 6ha in 2007/08.

Wind hazard is a particular problem in areas adjacent to the Kaimai Ranges and in known wind tunnelling areas. Wind zones can be identified, with building standards and locations controlled according to the predicted level of risk. Due to Matamata-Piako's topographical features and particular weather phenomena, the district has a large amount of land in high, very high or specific design wind zones. Wind zones are based on accepted national standards and provide the simplest technique for defining the relative degree of hazard for different geographical areas. Land defined as being in high or greater wind zones cover 45% of our district. 54.6% of the district is classified as being located within the medium wind zone with only 4% being classed as low. This small area of wind zone identified as low, is predominantly over the towns of Matamata and Morrinsville.

The Building Act 2004 contains a range of provisions appropriate for wind hazard management in the district. To avoid confusion it is considered that the best approach is to use the provisions for wind hazard management and mitigation provisions of the Building Act 2004 rather than directing development through methods in the District Plan. This avoids duplication and ensures that the Council is not heavy handed in its approach.

We are not able to ascertain whether the AER *'Concentration of building development away from high fire and wind hazard areas such as bush tracts, forested hill country and exposed ridges'* is being effectively achieved in terms of concentrating building development away from wind hazard areas as this is guided by the Building Act 2004, not the District Plan. Concentrating building development away from fire hazard areas is being effectively achieved due to the minimal development in these areas with only ten resource consents granted between 2000/01 and 2007/08. Given that a resource consent is required to build within the fire hazard areas identified in the District Plan this may also encourage people to select building platforms outside this hazard area.

Hazards from slips, landslides and erosion are important concerns in the hill country of the district, particularly on the steep slopes of Mt Te Aroha and along the Kaimai Range. There are approximately 11.3ha of potentially unstable land in the district.

The most effective management technique available is to minimise development in high risk areas. Between 2000/01 and 2007/08 there have been four resource consents approved on land identified as being subject to instability. These four consents were all for dwellings, however this number is considered to be relatively minor over the time period. The objective *‘to minimise hazards for people and property caused by erosion, slipping, slumping and land instability’* and the policies *‘to ensure that future development does not aggravate instability or erosion problems’* and *‘to avoid development in areas subject to high risk of land movement’* are being effectively achieved due to the low number of consents applied for on instable land.

Earthquake hazards from several parts of the central North Island need to be considered. These are natural phenomena but research is not sufficiently advanced to permit detailed land use management and planning controls to be implemented to mitigate against the risk of an earthquake or volcanic event. Accordingly, it is appropriate that Council adopts a precautionary approach to development in suspected risk areas near fault lines or on unconsolidated ground until further work to quantify the extent of hazard is completed. Council should also support the various agency initiatives taking place to gain a better understanding of the hazard in this regard. Although not part of the District Plan, the Building Act 2004 requires Council to adopt a policy on earthquake prone, dangerous and insanitary buildings. Council’s policy was adopted in 2006 and it classifies buildings within the district into risk categories. It requires owners of high, moderate or low risk buildings in a moderate earthquake, to undertake engineering assessments. If the assessment deems the building to be earthquake prone then Council will require strengthening or demolition of the building.

Overall the objectives and policies are working relatively well to achieve the AERs when considering alternatives. If we had strong rules completely restricting development in any known hazard zones this could prevent all development including accessory buildings such as barns, which may be appropriate in some locations. If we were to do nothing, for example not identify known hazard zones which guides development, then people’s lives and property could be at risk. The resource consent process is an efficient way of achieving the AERs with the ability to place consent conditions on resource consents to avoid, remedy or mitigate effects. It is acknowledged that it is not solely the District Plan that contributes to guiding development. Changing people’s perceptions of hazards as well as requirements to be able to get house and contents insurance also contribute to guiding development away from hazardous areas.

Summary

Anticipated Environmental Results Natural Hazards	Achieved? ☺ - Achieving → - Progress towards achievement ☹ - Not achieving ? - Not monitored
Negligible additional runoff from new development	?
Concentration of building development above a 1% flood level risk	☺
Establishment of identified flooding and ponding areas within public open space	?
Increase in extent of catchment headwater vegetation cover	?
Negligible net increase in stormwater loads generated by development in flood prone areas	?
Concentration of building development away from high fire and wind hazard areas such as bush tracts, forested hill country and exposed ridges	☺
No increase in the net cost of damage to persons and property through incidence of forest fire or severe wind events	?
No new habitable development in known high flood, wind, forest fire or land stability risk areas where mitigation cannot be readily or economically achieved	→
Concentration of building development away from high land movement hazard areas such as steep exposed land, soft sediments and along eroding waterway margins	→
No increase in the nett cost of damage to persons and property through incidence of land movement	?
Increase in extent of bush regeneration and planting on erosion prone land	?
Increased awareness of the extent of earthquake and volcanic hazard affecting the district	?