



## What can you do if you intend to build or renovate?

Consider the following **voluntary actions** if you are building or renovating in a flood-prone area:

- Locate your building on higher ground;
- Raise your building platform or floor levels, or build to two storeys;
- Flood-proof your building;
- Use reinforced materials to strengthen buildings against fast water flow and erosion; and
- Always speak to your local council before you start building.

For more information, check the Yellow Pages or contact a civil defence emergency management advisor at your local council.



The aftermath. Cleaning up at Firth's yard, Lower Hutt following the October 1998 floods.



An example of a voluntary action by NZ Post in Petone. You can see by the carpark on the right hand side of the photo that the site has been raised by over 1 metre.

## Further Reading

Wellington Regional Council – The Regional Council 1997. The Waikanae Floodplain Management Plan.

Wellington Regional Council – The Regional Council 1998. The Otaki Floodplain Management Plan.

Wellington Regional Council – The Regional Council 2001. The Hutt River Floodplain Management Plan.

These Plans can be found at [www.gw.govt.nz/fp/index.htm](http://www.gw.govt.nz/fp/index.htm), your local library, or come to Greater Wellington for more information. You can also email us at [info@gw.govt.nz](mailto:info@gw.govt.nz).

## CONTACTS AND INFORMATION

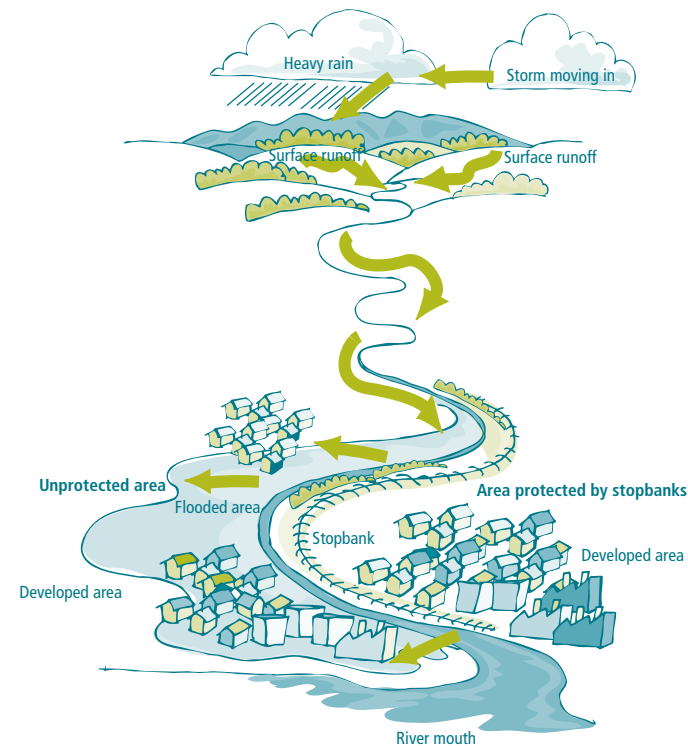
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# Flooding Hazard

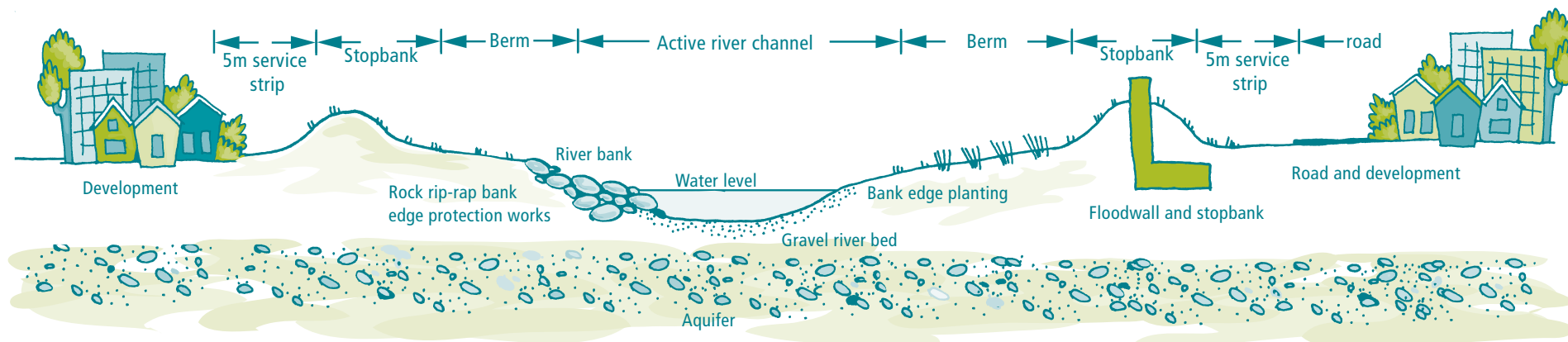
## Why do floods happen?

The Region's rivers begin their journey to the sea from steep, hilly and mountainous country. Fed by high rainfall and storms, they flow rapidly and powerfully, carrying rock and other debris. In these higher areas, much of the land is tree covered, which helps control the rate of run-off from the land into the river channel.

Nearer the sea, rivers move more slowly, depositing their load of rock, shingle and sand. These areas are called floodplains, natural features where floodwaters go when the river channel cannot cope with the amount of water. On an undeveloped floodplain, floodwaters seep into the ground, and swamps and wetlands help reduce the amount of extra water that needs to run-off downstream.



Humans cause a flood hazard when they modify and develop the landscape, both by clearing forests and building on floodplains. Along with development comes more hard surfaces such as roads and buildings. Water runs off these hard surfaces quickly, and torrential rain in urban areas can overwhelm stormwater drains. The combination of modified floodplains and heavy rain means the river cannot cope with the extra demand. Water flows onto the floodplain, and stormwater is unable to drain away.



Cross-section of a typical protected river corridor in an urban setting. The function of river corridors is to contain floodwaters.

## What's at risk in a flood?

All floods can be dangerous to people and property, from the stream that runs past your house, to a big river that has many homes and businesses built alongside it (such as the Hutt River). Fast flowing water from even smaller floods can knock people off their feet, move vehicles and damage bridges, phone and power lines, homes and other buildings.

All floodwaters carry debris (such as parts of trees or wood from structures) that can cause further damage and hurt people. This is why you should not wade through floodwaters. Remember that even deeper, slow-moving water or ponding can be equally as dangerous. A large flood could break through or overtop stopbanks on any of our major floodplains, and cover extensive areas in water.

Flooding can affect essential services such as electricity, telecommunications, water supply and sewerage for days, if not weeks. A large flood could be more destructive than we have ever experienced before and the cost of a flood on a highly developed floodplain could exceed \$1billion. Many people will be affected, causing a lot of stress and trauma. Communities are likely to be uprooted with hundreds possibly having to leave their homes. Many businesses would be out of action and schools may be forced to temporarily close.



The last of many cars is removed from the rising waters in the riversdale carpark, central Lower Hutt. (Courtesy of Rosemarie Thomas).

## What parts of the Wellington Region are exposed to flooding risk?

Most floodplains and low-lying land near the coast are prone to flooding, and much of our Region's population live in these areas. Cities and towns such as Lower Hutt, Upper Hutt, Masterton, Waikanae, Greytown, Paraparaumu, Carterton, Tawa, Otaki and even parts of inner Wellington face a risk of flooding.

The Hutt River floodplain and beyond, from Manor Park, Lower Hutt.



## How do we measure floods?

The amount of water flowing in a river is measured by a unit called a **cumec**. Cumec stands for cubic metres per second. It is a measure of how much water flows past a given point every second. A flood measuring 2500 cumecs would fill approximately 150 petrol tankers every second, or the Wellington Stadium in about 12 minutes! This idea of using cumecs to measure the volume of water helps us to determine the **size** of the flood.

The **frequency** of the flood is measured by how often a flood of a particular size is likely to happen. So, a 1 in 5, 1 in 50 or 1 in 100 year flood, for example, means that floods of certain sizes are statistically likely to happen once every 5, 50 or 100 years.

We use the term 1 in a 100 year flood to measure a very large flood. But don't be misled into thinking they can only happen **once** in a hundred years – two big floods could happen soon after each other!

## Our biggest flood

On 24 March 1880, the Region's biggest flood recorded since European settlement occurred in the Wairarapa. Its flow was larger than a 1 in 100 year event. "The thousands of miles of fencing that will be swept away, the innumerable bridges and culverts which will be displaced will entail a serious loss on the colony...The present one [flood] will be a warning to those who have been want to build their houses on low ground". (*Wairarapa Daily*, March 24, 1880).

## What should you do in a flood?

If it has been raining unusually hard or steadily over a day or two, be aware that a flood could occur and:

- Listen to a local radio station for news and advice;
- Have a family emergency plan;
- Place your valuable possessions up high, particularly if they are in low-lying garages or basements; and
- Stay indoors **unless** you are told to evacuate by the emergency services or civil defence.

## Be prepared

In a large flood you may need to look after yourself for at least three days. Keep the following survival supplies:

- Water (three litres per person per day);
- Food (canned, dried, non-perishable);
- First aid kit;
- Lighting (torch or cyalume sticks);
- Blankets and warm clothing;
- Alternative cooking method (BBQ or gas cooker);
- Battery operated radio;
- Pet supplies;
- Baby supplies; and
- Essential medications.

