

Flooding in the Pinehaven Catchment

Pinehaven Stream

The Pinehaven Stream flows through the heart of the Pinehaven and Silverstream communities. The beauty of the stream and the wooded valley has long attracted people to the area, and it provides an ecological link from the hills to the valley floor before flowing underground to where it meets Hulls Creek, and eventually the Hutt River. However, flooding in the catchment means that the stream has been both an asset and a challenge for the community.



Flooding in the Pinehaven Catchment during the 1976 storm

Pinehaven Catchment – A History of Flooding

The Pinehaven Catchment's most severe flooding event in living memory occurred in December 1976 when a severe storm, thought to be in excess of a 1-in-100 year return period/1% Annual Exceedance Probability (AEP) rainfall event, occurred over much of the Wellington Region. This storm caused widespread damage through the Catchment, with many homes and businesses flooded.

Since 1976, flooding has occurred many times, included significant events in 2004, 2005 and 2009, when streets and properties alongside the stream were flooded. Observations of recent floods and flood modelling undertaken for the development of this Floodplain Management Plan have identified the areas in the Pinehaven Catchment with the highest flood risk, these are shown in flood hazard map below

How we measure floods

The amount of water flowing in a river is measured by a unit called a cumec (cubic metre per second), which is a measure of how much water flows past a given point every second.

The frequency of the flood is measured by how often a flood of a particular size is likely to happen such as a 1-in-5, 1-in-50 or 1-in-100 year return period flood event. A 1-in-100 year return period flood event has a 1% chance of being equalled or exceeded in any year (1%AEP). On average, one of these events will occur every 100 years based on past records.

But don't be misled into thinking that a 100 year return period flood can only happen once in a hundred years – two big floods could happen soon after each other!



Flooding in the Pinehaven Catchment during the 1976 storm

What Contributes to Flooding in the Pinehaven Catchment?

Rain and Climate Change

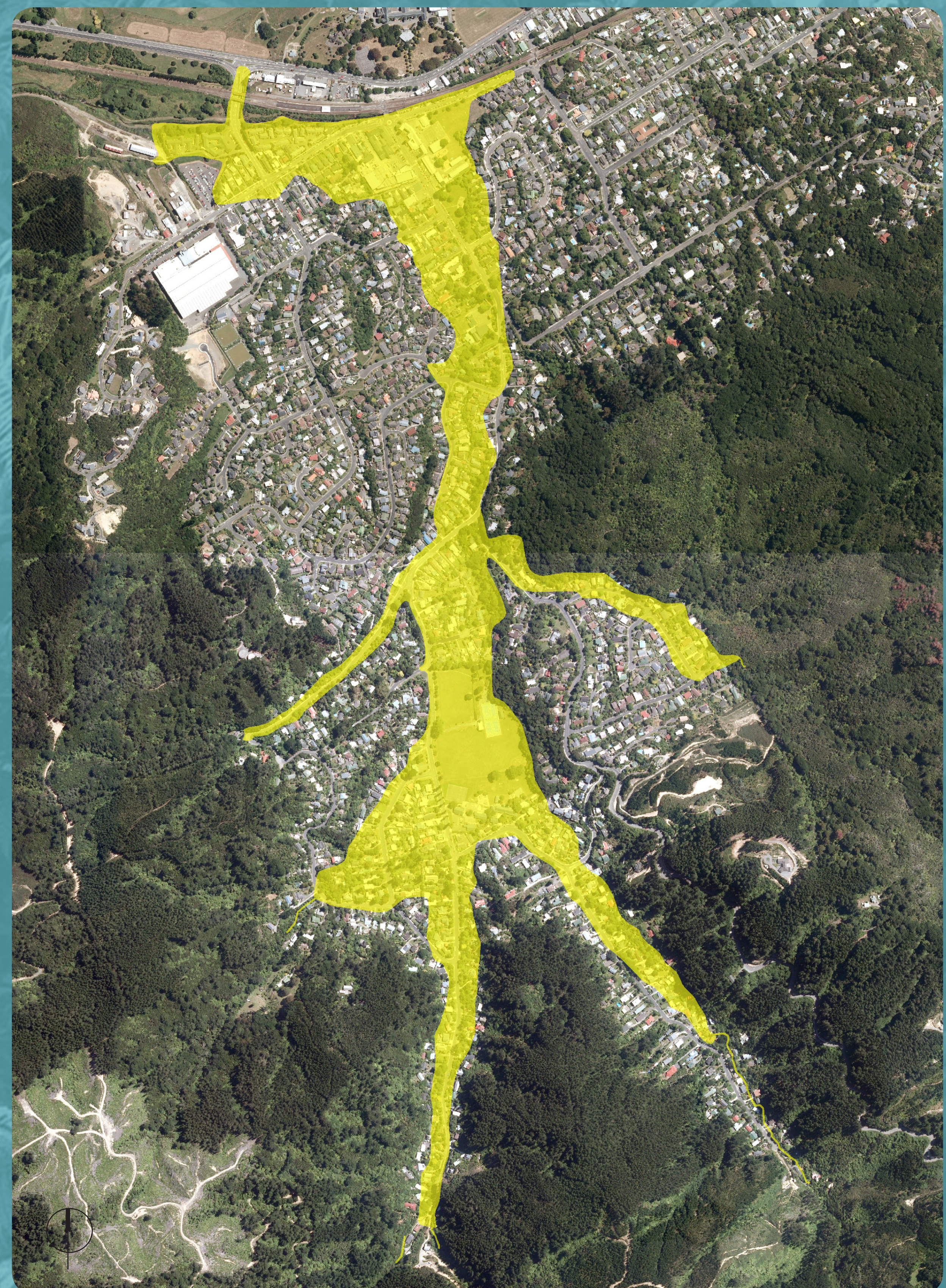
Even regular rain events in the catchment can cause flooding. Flood modelling has shown that much of the Pinehaven Stream channel can currently accommodate less than a 1-in-5 year return period flood/20%AEP rain event. The storms which lead to these flood events are predicted to become more frequent and have a greater intensity of rainfall.

Development

Development in Pinehaven and Silverstream can increase the rainfall runoff into Pinehaven Stream from hard surfaces. Past development has meant some homes were built in areas of old stream channels or on sections which are part of the floodplain. Bridges and culverts also limit the capacity of the stream channel and can aggravate flooding.

Forestry

Pine forests dominate a large part of the Pinehaven Catchment. When forests are harvested, the debris can cause blockages in the stream and increase the extent of flooding (this happened in 1976). This issue will need to be managed again as forests are harvested.



Identified Flood Hazard Zone for 1-in-100 year return period/1% AEP Event

A Floodplain Management Plan for the Pinehaven Catchment

Greater Wellington Regional Council and the Upper Hutt City Council have developed a draft Floodplain Management Plan for the Pinehaven Catchment

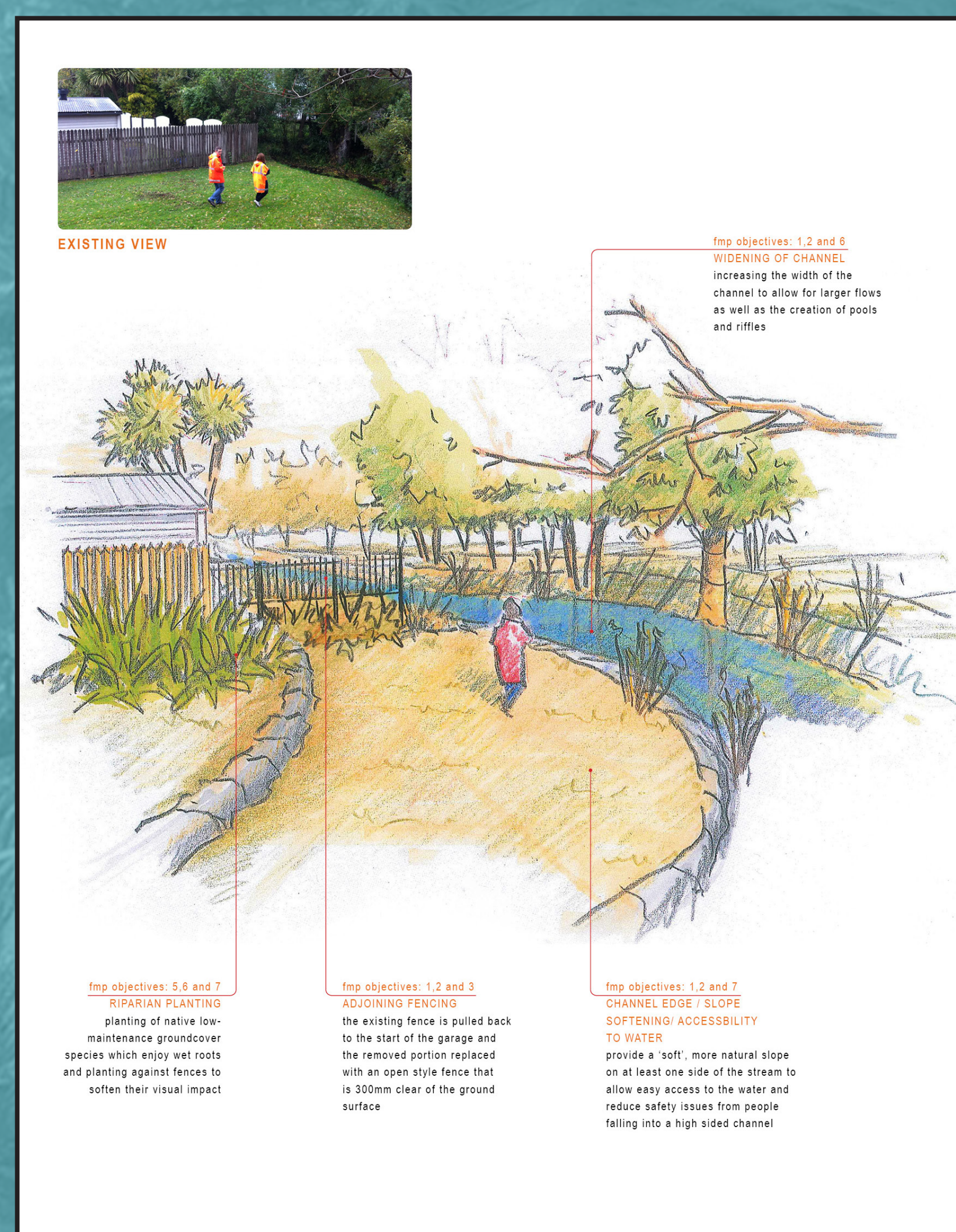
Objectives of the plan are to:

- Reduce the risk injury or harm from fast or deep flowing water
- Ensure use and development of land is compatible with reducing flood risk
- Protect house floor levels in the catchment from a 1-in-100 year level flood and provide capacity in the stream channel for a 1-in-25 year flood
- Inform and empower communities to take appropriate action about flood risk
- Contribute to economic wellbeing and resilience through flood risk management
- Recognise the relationship of tangata whenua with the stream
- Enhance the ecological values of the stream and maintain recreational opportunities

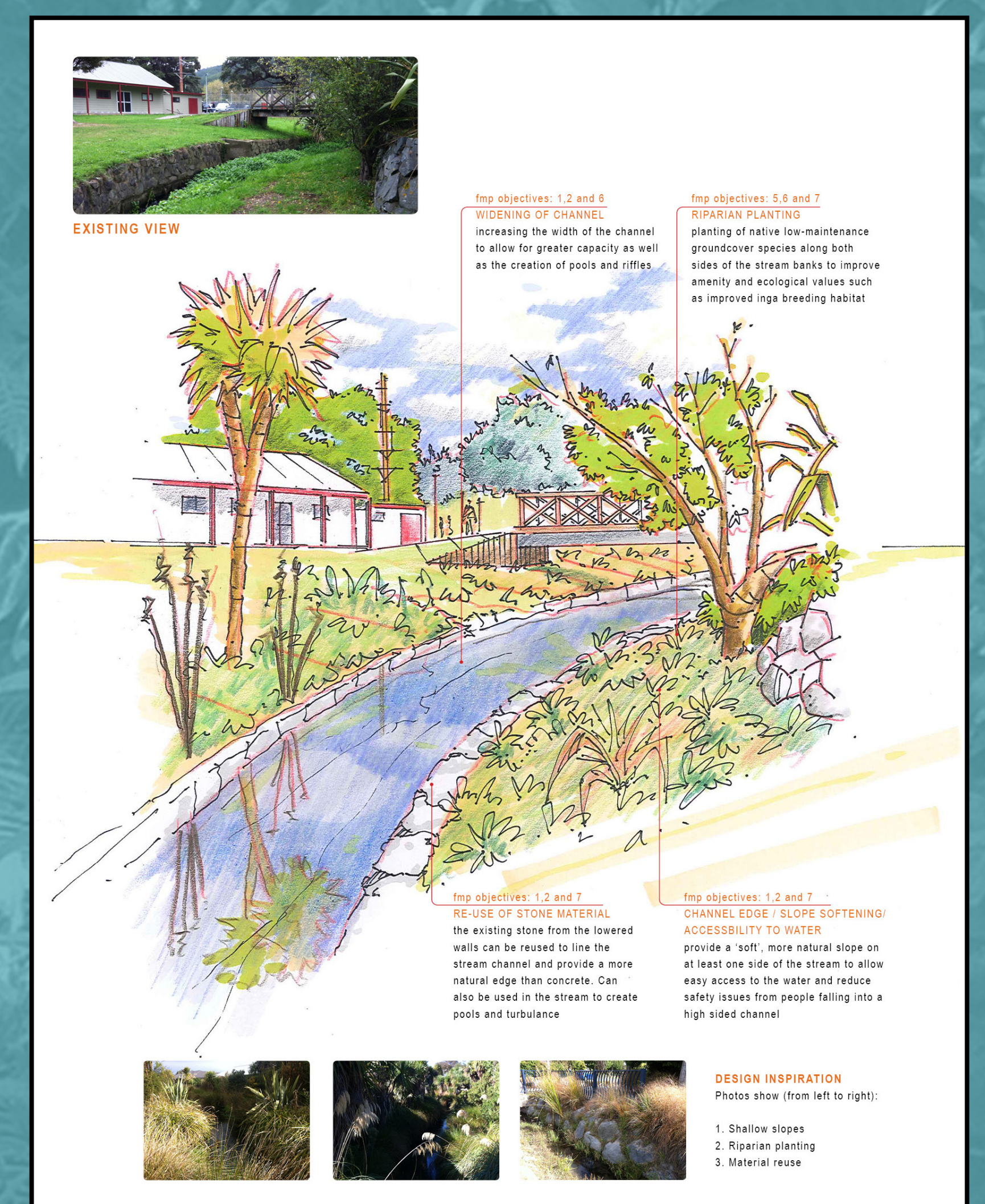
Examples of how the objectives can be realised are below



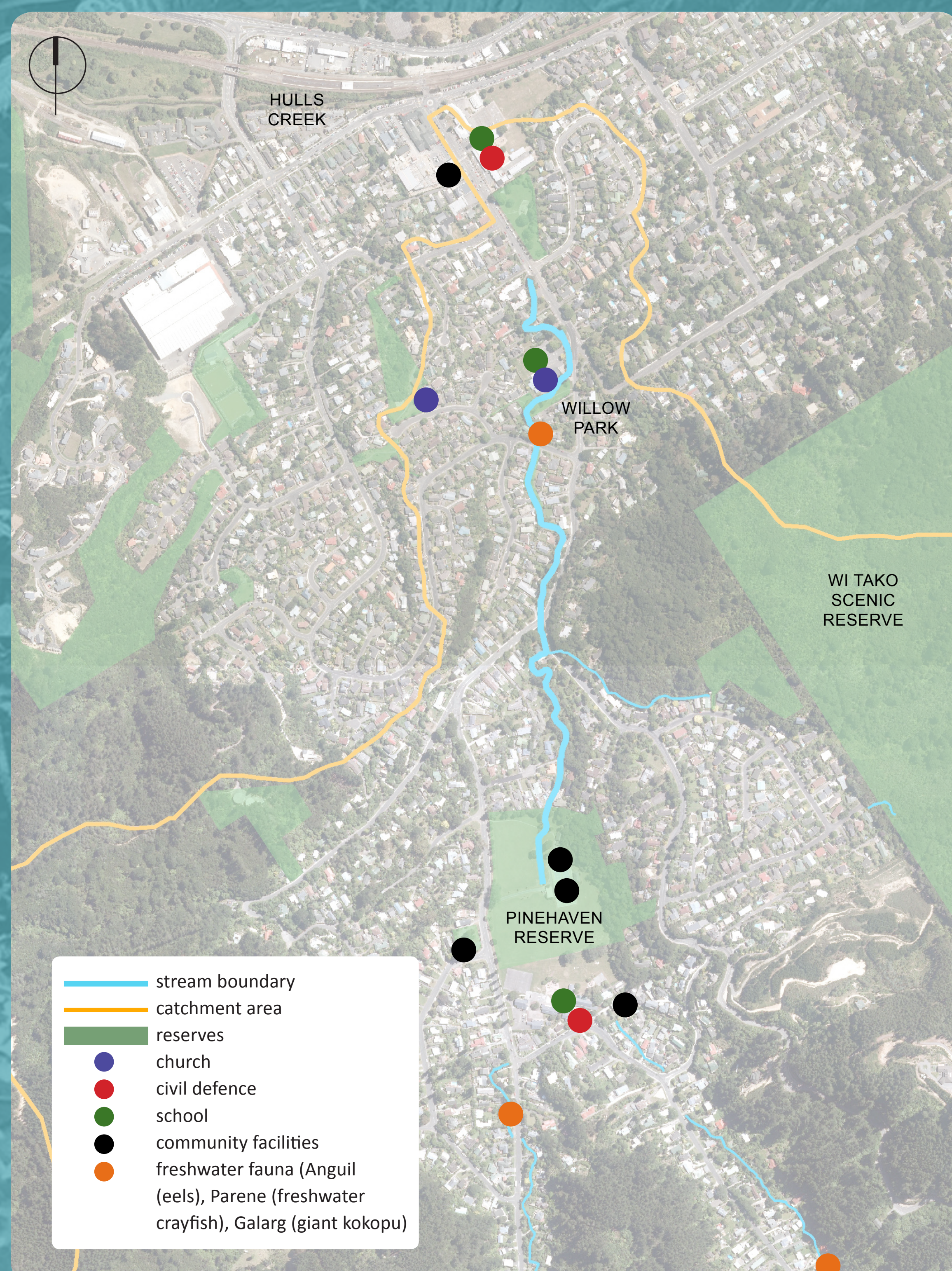
Possible enhancements Willow Park (entrance)



Possible enhancements Willow Park (top end)



Possible enhancements Pinehaven Reserve



Examples of features of the Pinehaven catchment considered in developing the FMP

Floodplain Management Plan vision:
A prosperous and safe community that proactively manages the risk of flooding in the Pinehaven Catchment

Developing the Floodplain Management Plan offers an opportunity to manage flood risk while enhancing the other values associated with the stream. Possible methods to achieve the Floodplain Management Plan's vision have been considered over a number of years. Options have included:

Structural methods

Physical works in the stream channel to increase capacity, reduce blockages and manage the paths where flood flows cross the floodplains.

Non-structural methods

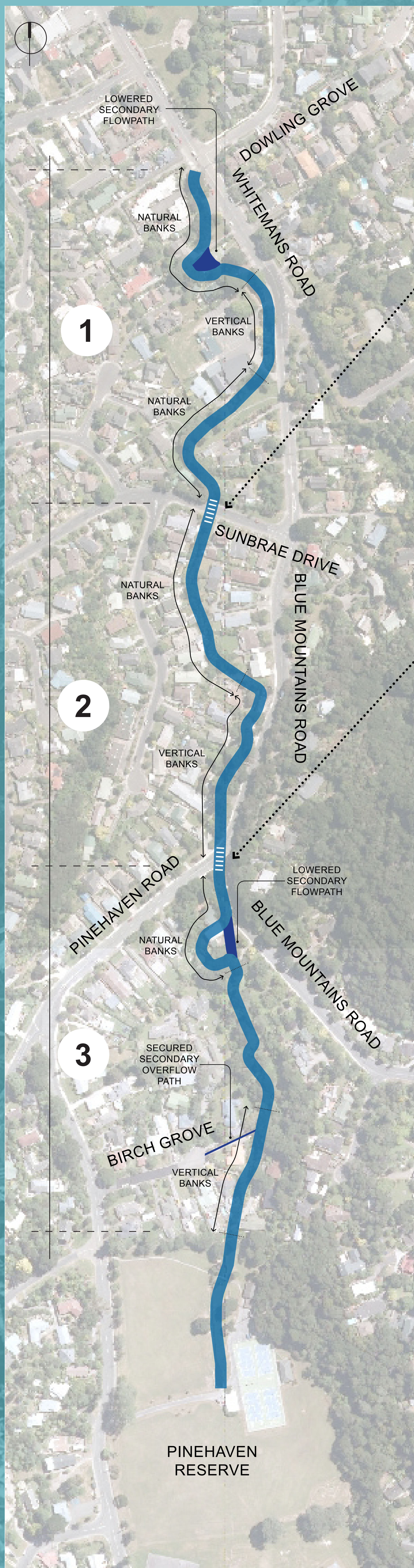
Planning controls for development, community preparedness and emergency procedures.

River management methods

Day-to-day maintenance of the stream to avoid blockages, maintain capacity and minimise erosion.

These options have been considered in the context of the physical, community, tangata whenua, ecological and recreational features that make up the Pinehaven Catchment.

FMP Recommendations – Structural Methods



Location of structural methods

Reach 1

Sunbrae Drive to Whitemans Road

- Stream widening; natural stream bed with vertical banks in some constrained locations and natural banks in others
- Native planting around the stream
- New bridge at Sunbrae Drive to increase stream capacity
- Replacement of some bridges that provide primary access to properties and removal of some secondary bridges



Possible bridge enhancements at Sunbrae Drive

Reach 2

Pinehaven Road to Sunbrae Drive

- Stream widening; natural stream bed with vertical banks in some places and natural banks in others
- Native planting around the stream
- New bridge at Pinehaven Road (near Blue Mountains Road intersection) to increase stream capacity
- Replacement of some bridges that provide primary access to properties and removal of some secondary bridges
- Debris traps to reduce blockages and securing of overflow paths



Example of stream enhancements where vertical walls are required

Reach 3

Pinehaven Reserve to Pinehaven Road

- Stream widening, natural stream bed with vertical banks in some constrained locations and natural banks on others
- Protection of stream banks from erosion
- Creation of overland flow paths to direct stormwater into the stream
- Opportunities for plantings around the stream in Pinehaven Reserve



Birch Grove - Possible stream/ bridge upgrade

Reach 4

Upper Catchment Areas

- Upgrade of some stream structures such as pipe inlets at Chichester Drive and Pinehaven Community Hall
- Secure overland flow paths to direct stormwater into the stream
- Advice and direction for owners of structures over the stream to help enhance the capacity of the channel



Example of possible bridge replacement

For more detail on the structural methods recommended, see Section 6 of the draft Floodplain Management Plan.

Recommendations – Non-Structural

Planning Controls

- A plan change will be developed for the Upper Hutt District Plan. This plan change would introduce objectives, policies and rules that address flood hazard. These will include policies that reference the Floodplain Management Plan and rules that restrict development or control bridge crossings in flood hazard areas
- Where development is aggravating flood risk, we may also consider options for Council to manage land along the stream, or remove vulnerable structures from the flood plain
- Along the length of the stream, but particularly in the upper catchment, on roads such as Pinehaven Road, there are many private driveways and pedestrian crossings over the stream. It is proposed in the first instance, to encourage owners to upgrade problem structures. If necessary, it is possible for local government to use enforcement options under the RMA to remove or upgrade structures

Education and Design Advice

- We will provide advice to owners of structures that may be restricting flood flows in the stream on how to upgrade these structures

Emergency Management

- The Floodplain Management Plan provides advice on preparing for and responding to a flood. The plan also links to the emergency management framework run by Greater Wellington Regional Council, Upper Hutt City Council and Civil Defence



Pinehaven Reserve - Opportunities for stream enhancement



Examples of stream bank planting



Willow Park - Opportunities for stream enhancement

Three groups have important roles to play in achieving the objectives of the draft Floodplain Management Plan

Community

Involvement in providing information and local knowledge for the plan. Maintenance of private structures in the floodplain. Building emergency awareness and preparedness and enhancing the stream corridor.

Upper Hutt City Council

Controlling land use through the district plan. Funding, building and maintaining stormwater networks. Emergency management.

Greater Wellington Regional Council

Environmental controls through the regional plans. River and ecosystem management and flood mitigation.



Where to from here?

We are holding a public submissions panel on the Floodplain Management Plan at the end of 2014. Individual or group submissions from the community are welcome. Further details on how to submit can be found by contacting Greater Wellington Regional Council – info@gw.govt.nz

When we have considered the submissions on the Floodplain Management Plan, we will progress the structural methods and develop the designs in more detail. The first step towards structural works is applications for resource consents. Funding is currently allocated for structural works to begin from 2015/2016 onwards. In addition to the structural works, we will also progress work on a plan change to the Upper Hutt District Plan and will work with the community to build awareness of the flood issue and to manage private structures in the flood plain.