PART TWO: BACKGROUND

Research into the heritage, ecological, landscape, cultural and recreational attributes of the Heathcote River/Ōpawaho reveal opportunities which will help to guide the use and management of the river corridor.

BACKGROUND
CONSULTATION

Over the past 15 to 20 years the Council has consulted with the Community along the Heathcote River/Ōpawaho on many different projects, e.g. planting, tree removal, landscape enhancements, bridges and bank works.

During communication with the residents, many wider issues were identified both through these consultations or through direct contact with the Council. With the number of matters to manage and address, it was recognised that a Masterplan was needed to enable consistency, future planning and so that budgeting could be undertaken.

In 2005 public consultation was carried out asking the question:

"What would you like the Heathcote River/Ōpawaho and its surroundings to look like in 10, 20, or 50 years' time?"

This question was posed in public information leaflets, four public workshops and visits to local schools by Council staff.

In total 87 public submissions were received, 6 being from schools, and the public meetings were well attended. The main areas of concern/interest identified during the consultation included:

- A desire for a healthy river ecosystem.
- Improved recreation facilities.
- Slower, quieter roads adjacent to the river corridor.
- A plan for Hunter Terrace.
- Interpretation facilities.
- A balance of planting (between exotic and native).
- Flooding issues addressed.
- Improved river maintenance.
- Improved walkways/cycleways.

Consultation with Tūāhuriri Runanga and Rāpaki Runanga has subsequently been undertaken, which identified the following key issues in relation to the management of the Heathcote River/Ōpawaho:

- Erosion of the mauri of the river due to the decline in its physical health.
- Use of the river to dispose stormwater and sediment run-off and other pollutants.
- Loss of healthy and accessible mahinga kai and ability to sustainably harvest freshwater fisheries and other resources.
- Disruption of natural ecosystems and loss of habitat and native plants and animals.
- Lack of recognition of sites of significance to tangata whenua near the river and acknowledgement of Ngāi Tahu history and use of the river and surrounds.

The goals developed following consultation are:

- The Heathcote River / Ōpawaho 's natural and cultural heritage is to be protected and celebrated.
- The development of the mid section of the Heathcote River / Ōpawaho should focus on methods that can assist in improving the overall health of the river.
- A unique linear river park is created for Christchurch.
- The river corridor offers a diversity of experiences to be enjoyed by a wide range of people.

Consultation with all stakeholders will continue throughout the implementation of this Masterplan.

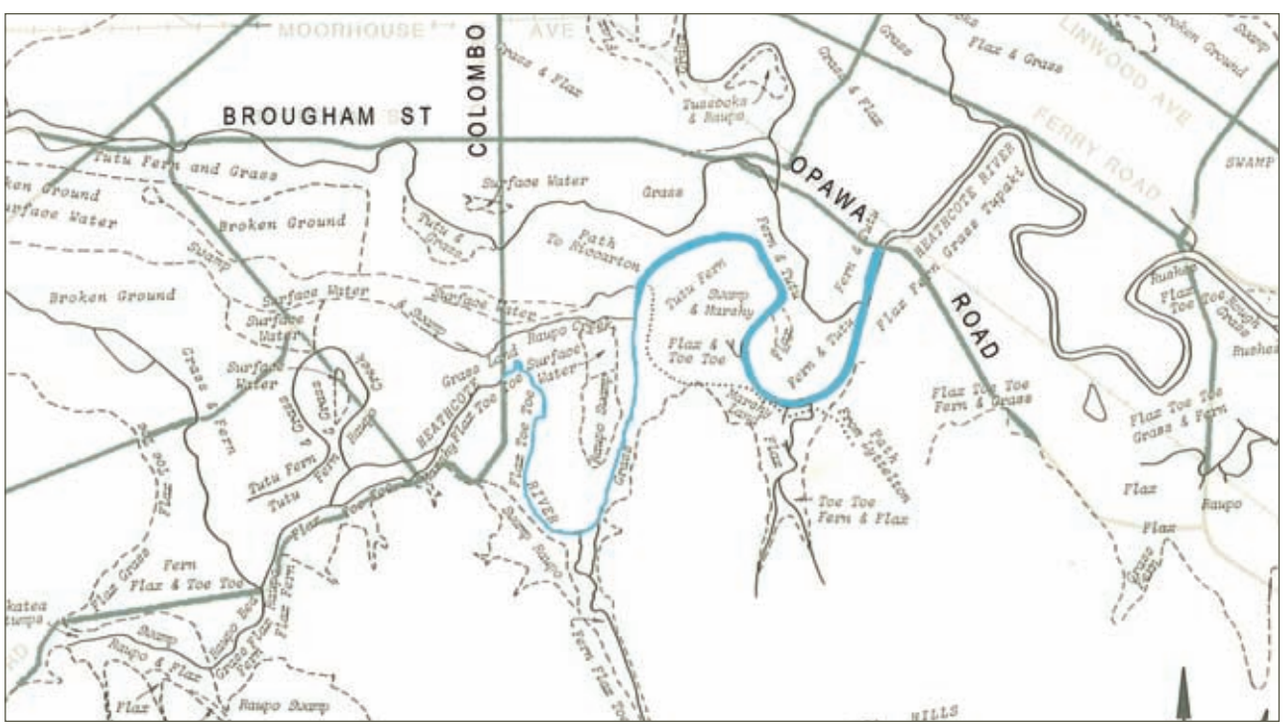
Community consultation with local residents.

BACKGROUND
PRE-EUROPEAN SETTLEMENT

The stretch of the Heathcote River/Ōpawaho covered by this Plan, historically meandered through extensive wetlands prior to urbanisation. The historic 'Black Maps' from the mid 1800s indicate that the habitat that the river passed through was abundant in harakeke (flax), toe toe, raupo, tutu and ferns and was dotted with ti kouka (cabbage tree).

The river corridor was low-lying and very wet. Even higher ground was prone to flooding when the Waimakariri River rose and flowed across the plains. The banks of the river were dense with vegetation in many places, as early survey maps indicate (see below). Over many centuries of using the river as a food source and transport corridor, the iwi of Waitaha, Ngāti Mamoe and Ngāi Tahu fostered a close relationship with this resource. The swamp forest around the river provided gathering grounds for water fowl and forest birds, including pukeko, weka and tui. Traps were regularly set for inanga (whitebait), pātiki (flounder), and tuna (eel).

The original name of this river, Ō-pa-waho means 'The Place of the Outward Pā,' or 'The Outpost' and refers to this pā being an outpost (waho) of Kaiapoi. The Ōpawaho once flowed through extensive swampland, and the pā was built in a convenient higher spot just downstream of the present Opawa Road Bridge. It was a resting place for Ngāi Tahu travelling between Kaiapoi and Horomaka (Banks Peninsula). The surrounding area was an important mahinga kai, a source of plentiful food, especially tuere (blind eel) and kanakana (lamprey).



Original waterways, swamps and vegetation cover of the Christchurch area in 1856 with an overlay of current roads within the Heathcote River/Ōpawaho project area.

BACKGROUND

NGĀI TAHU ASSOCIATION WITH THE HEATHCOTE RIVER/ŌPAWAHO

Ngāi Tahu is the iwi or tangata whenua with traditional associations in the Christchurch area. Within Ngāi Tahu, the rūnanga (sub-tribal groups) of Ngāi Tūāhuriri and Rāpaki (Te Hapū o Ngāti Wheke) have manawhenua (territorial rights) over, and are kaitiaki (guardians) for, the Heathcote River / Ōpawaho.

Like the Avon River / Ōtakaro, the Heathcote River / Ōpawaho, was highly valued as mahinga kai (a food and resource gathering area) by Ngāi Tahu. However, European settlement changed the way tangata whenua used and saw the river. The combined effects of drainage and urban development, untreated stormwater and other pollutants, loss of original vegetation cover, and colonisation by new species, changed its ecology and habitats, and reduced its mauri (life force), as well as its value as mahinga kai.

In 2007 a cultural health assessment of the Heathcote River / Ōpawaho was undertaken (as part of a wider study on the Avon River / Ōtakaro and Avon-Heathcote Estuary / Ihutai)[2] . This showed the river to be in poor cultural health and no mahinga kai sites of suitable quality for use. Despite this, Ngāi Tahu seek that the river's wellbeing be improved and restored, and their relationship to it, enhanced and revitilised.

Protecting and restoring areas of native vegetation that once grew there, planting riparian margins to recreate habitat and filter runoff, and reducing sediment and contaminants entering the river are some of the ways that Ngāi Tahu sees the ecological health and mauri of the river being returned. Identifying and telling stories about places of historic and cultural importance in the area also reinforces and acknowledges the Ngāi Tahu connections to this important waterway.

2 State of the Takiwā Te Āhutanga o Te Ihutai: Cultural Health Assessment of the Avon - Heathcote Estuary and its catchment, C Pauling et al 2007.

Native restoration planting along the Heathcote River/Ōpawaho.

BACKGROUND
FOLLOWING EUROPEAN SETTLEMENT

Due to its close proximity to the loess covered Port Hills, the Heathcote River/Ōpawaho is a silty river (especially following heavy rainfall events or snow melt) which physically and visually differentiates it from the similarly meandering Avon River/Ōtakaro to the north. Development of the hill suburbs has released a large amount of silt into the river over many decades.

The Heathcote River/Ōpawaho is generally narrower than the Avon River/Ōtakaro, probably because the Avon River/Ōtakaro historically carried a larger proportion of the Waimakariri floods. It has generally been perceived as less attractive than the Avon River/Ōtakaro, since its banks have been more affected by industry and urbanisation, particularly through its lower reaches. Industrial waste was discharged into the lower reaches for many years fouling the water, the banks and bed, and little regard was taken of its ecology, early history and importance to Māori.

Even today the river functions more as an urban drain than a natural waterway, performing a necessary physical role to the detriment of its natural and aesthetic values. Following initial land clearance and draining, the stretch of river covered in this plan saw the establishment of dairying operations in Beckenham and St Martins. Over time and through the onset of more intensive built development, the open lands on the flanks of the river became used for market gardening purposes.

Some industry was located in the area, most notably the Brightlings Brick and Tile Works on Centaurus Road using the loess from the deep west facing Port Hills slopes. The production of bricks was very important to the growing settlement of Christchurch, as local timber became less available. Materials were taken into the centre of the Christchurch by way of a ford river crossing near present-day Malcolm Avenue.

As Christchurch grew, the suburbs of Beckenham, St Martins and Opawa were early to establish along the banks of the river. The river corridor, created by a combination of road reserves and crown-owned river bed, became flanked by parks, schools and private residences.



Heathcote River/Ōpawaho early 20th century, courtesy Canterbury Museum.

BACKGROUND
TREES

Earlier this decade Council commenced asset management planning for the Heathcote River/Ōpawaho, including extensive tree planting. The condition of the trees that line this section of the Heathcote River/Ōpawaho, in particular the willows *Salix* spp. were assessed through arboricultural surveys which looked at tree health and anticipated life span, and public safety.

Many trees were assessed to be in a declining condition, either due to disease or structural defect. Many have succumbed to storm damage or have been removed due to their susceptibility to failure. As a result an immediate programme of maintenance and monitoring has been instigated. This has led to a substantial change in the arboreal landscape due to the removal of a number of declining trees, from small under-story to declining canopy.

Given the anticipated changes to the river and road infrastructure in the future, it is envisaged that some additional areas of open space can be created, thus enhancing planting opportunities. Specifically, some of the riverbank is limited at present and will not adequately support large trees, as they are too narrow and restrict the potential selection of replacement tree species. This applies to the replanting of trees such as willows in some areas.

The existing range of species include willow , poplar *Populus* spp., birch *Betula* spp., alder *Alnus* spp., and ash *Fraxinus* spp. These trees are the most significant either in number or size and create the essential character of the exotic riverbank landscape. Other species include *Prunus* spp., Maple *Acer* spp., and *Liquidamber styraciflua* as feature trees with some beech *Fagus* spp., elm *Ulmus* spp., lime *Tilia* spp., hornbeam *Carpinus* spp., and London plane *Platanus Xacerifolia* amongst the species developing as individual canopy trees.

With the decline and removal of many willows, the dominant canopy has been altered. This could be seen as a succession process. However, without supplementary planting, it appears that one species which is regenerating and has the potential to become the next dominant canopy is Tree of Heaven *Ailanthus altissima*. This tree exhibits weed characteristics and may need to be controlled to allow for other trees to succeed.

Whilst *Cordyline australis, Plagianthus* sp., *Hoheria* spp., *Pittosporum* spp., and *Kowhai* sp. are the current dominant native trees and feature in the sub canopy, there is potential to introduce native canopy trees e.g. beech *Nothofagus* spp. and Podocarp in some sites.

The rationale to replanting the riverbank depends upon the assessment of what is currently growing well, what is likely or desirable to grow and the site conditions and space in which the tree can grow. Hence , the proposed replacement tree list has been devised on this premise and as a guideline to future planting (see Appendix A). Priority of planting is outlined in the key goals (Community use and Enjoyment).

BACKGROUND
ROADING

The project area includes a total of approximately 9 km of local roads on both sides of the Heathcote River/Ōpawaho. As defined by the City Plan, local roads function almost entirely as neighbourhood access ways and are not intended as through routes for motor vehicles. Over the past 10 years, major roading projects have included Aynsley Terrace Living Streets, Fifield Terrace slow road and the closure of Hunter Terrace at Colombo Street (completed as to legality but not yet physically implemented).

The key issues associated with the existing road network in this area include the following:

- There is currently a greater width of road corridor than is necessary to carry local traffic (up to 15m).
- Road edges are less than 2m from the edge of river banks in places.
- 'Asphalt creep' into existing riverbanks from regular repairs to edge-break because there is no kerbed edges.
- A lack of road edge definition resulting in riverbanks being used as informal car parks.
- Informal car parking creating compaction of soil and drainage issues resulting in long term problems for riverbank trees.
- The lack of formed footpaths limit year round recreational usage.

The Masterplan for the linear park along this section of the river is based on the notion that as the roads adjacent to the river are local only, creating minimum width carriageways and single file sections in places will allow the river bank itself to be widened. This would result in increased opportunities for river corridor enhancement
works including:

- Reducing the impact of vehicle through traffic.
- Increased opportunities for future large tree planting reflective of the scale and numbers currently present.
- Formed paths and cycleways and strengthening of the existing cycle network.
- The expansion of existing parks.
- Re-grading riverbanks to allow river edges to be planted, enhance in-stream habitat values and allow safer access to the water's edge.
- Detaining and treating stormwater runoff from roads and improving the potential for managing stormwater on riverbanks.

"The serpentine course that the Heathcote River/Ōpawaho takes through the southern suburbs of Christchurch lends itself to the creation of a linear river park."

BACKGROUND

LANDSCAPE CHARACTER AND RECREATION VALUES

The Heathcote River/Ōpawaho has been described as one of the three most significant natural features contributing to Christchurch's unique landscape character, with the others being the vPort Hills and the Avon River/Ōtakaro. It is a major contributor to the amenity of the immediate residential environment as well as a recreational resource and a valuable hydrological and ecological system.

Past landscape character assessments have found that the stretch of the Heathcote River/Ōpawaho from Colombo Street to Opawa Road has significant landscape value, based on landscape variables such as the presence of large trees species, the degree of enclosure from trees or landform, bank width and slope, public and private access, pedestrian links and cycle ways, visibility of the river from houses and the road, alignment and configuration of river and adjacent land use. Those stretches of the river most valued by the public are those that display a dominant tree framework of large canopy trees and a wide, gently sloping grassed bank that is suitable for walking and recreation.

The existing landscape character around the new South Christchurch Library is predominantly an expanse of open grass and large canopy trees. The removal of the old Hunter Terrace and the adjacent pipe yards provides an opportunity to enhance this existing character and will connect this space to the river.

The existing weeping willows are also an essential part of the Heathcote River/Ōpawaho scene, much valued by the community. Tree removals and replacements offer the opportunity to preserve and enhance this character. The Heathcote River/Ōpawaho is also valued for the recreation opportunities it presents, particularly river walks and water play. Recent leisure studies have identified walking as the main casual recreation activity. Consultation has shown a public need for more picnic areas, seating and children's play areas as well as better access to the water by way of paths, bridges and canoe landings.

The serpentine course that the Heathcote River/ Ōpawaho takes through these southern suburbs of Christchurch lends itself to the creation of a linear river park, accommodating weeping willows and other large trees species where possible, areas of grassy banks, cycle and walking paths, seats, tables and picnic areas, views of the water and access to the water.

The Heathcote River/Ōpawaho: large canopy trees and wide gently sloping grassed banks.

BACKGROUND
ECOLOGY

The hydrological character of this stretch of the Heathcote River/Ōpawaho changes noticeably over its length. Near Colombo Street, the river has a few shallow, fast flowing sections, or riffles, on a gravel stream bed, interspersed with sections of sluggish flow.

Downstream the river becomes more uniform, deeper and slower-flowing, with a predominantly muddy substrate. This character has implications for the ecological health of aquatic flora and fauna that inhabit the river. Ecological studies completed on the Heathcote River/Ōpawaho have identified that the healthiest river habitat for fish and invertebrates is found in narrower, faster flowing sections of water with bank plantings that create overhangs, refuges and food sources for in-stream life. Aquatic macrophytes (plants growing in or near water that are either emergent, submergent, or floating), however, prefer an open canopy.

FISH AND INVERTEBRATES

Invertebrates are key indicators for assessing stream health. Studies of the Heathcote River/Ōpawaho have found that overall the invertebrate community (of about 20 species identified within the reach) is of low diversity, and typical of a fully urbanised river.

Some areas along the reach have a relatively healthy diversity of fish species. In 2004 a fish survey recorded 8 species of fish present in this stretch of the river, including:

- common bully *Gobiomorphus cotidianus*
- shortfin eel *Anguilla australis*
- longfin eel *Anguilla dieffenbachia*
- bluegill bully *Gobiomorphus hubbsi*
- yellow eye mullet *Aldrichetta forsteri*
- upland bully *Gobiomorphus breviceps*;
- inanga *Galaxias maculatus*.

In addition, a 1989 survey recorded low numbers of common smelt *Retropinna retropinna*, black flounder *Rhombosolea retiaria* and yellowbelly flounder *Rhombosolea leporina* - a total of eleven fish species in all.

However, spawning habitat of brown trout *Salmo trutta*, especially in the upper reaches of the Heathcote River/ Ōpawaho was observed to be declining. Brown Trout is considered an indicator species of a healthy river as they require abundant invertebrates for food and clean substrate for spawning.

"The greatest diversity of fish were found along the banks of the river that were overhung with flaxes."

Fish communities are sensitive to riverbank attributes. As many banks are steep and susceptible to slumping, selected areas of the riverbank important for aquatic ecology could be enhanced. Methods of enhancement could include reducing bank angles, terracing, building crib walls, varying the thickness of bank vegetation and the planting of marginal or semi aquatic vegetation along the channel margin close to the waterline. This planting would create additional in-stream habitat for fish, invertebrates and amphibians. This is especially important along reaches with an absence of large trees.

Methods within the natural heritage section (refer to Part 3 - Key Goals) of this document address the significant ways in which habitat could be created, enhanced or preserved for specific species along this stretch of the river.

Ecological studies and native vegetation on the Heathcote River/Ōpawaho.

BACKGROUND
ECOLOGY

OPPORTUNITIES FOR BIRDLIFE

Up to 43 bird species have been observed within the Heathcote River/Ōpawaho corridor. This includes the seasonal movement of bush birds from various forest Port Hills remnants and a variety of waterbirds. The waterbird population is dominated by the introduced mallard *Anas platyrhynchos* with a peak autumn population exceeding 1000 birds. Native waterfowl are represented by the New Zealand scaup *Aythya novaeseelandiae*, the paradise shelduck *Tadorna variegata* and Australasian shoveler *Anas rhynchotis*. A small number of feral geese and domestic ducks also live on the river, having either been released or escaped from captivity.

Fish-eating birds include the New Zealand kingfisher *Halcyon sancta*, pied cormorant *Phalacrocorax varius*, white-faced heron *Egretta novaehollandiae* and occasional royal spoonbill *Platalea regia*. Three species of gull are found on the river, mainly downstream of Waltham Road.

Native birds found within the riparian vegetation include the bellbird *Anthornis melanura*, fantail *Rhipidura fulginosa*, grey warbler *Gerygone igata*, silvereye *Zosterops lateralis* and very occasionally the kereru *Hemiphaga novaeseelandiae* and shining cuckoo *Chrysococcyx lucidas*. Welcome swallows *Hirundo tahitica neoxena* nest under many bridges and culverts.

Common introduced birds recorded within this habitat include:

- blackbird *Turdus merula*
- song thrush *Turdus philomelos*
- dunnock *Prunella modularis*
- redpoll *Carduelis flammea*
- chaffinch *Fringilla coelebs*
- greenfinch *Carduelis chloris*
- goldfinch *Carduelis carduelis*
- starling *Sturnus vulgaris*
- house sparrow *Passer domesticus*
- Australian magpie *Gymnorhina tibicen*.

Due to the sparse tree cover in certain sections along the Heathcote River/Ōpawaho it does not at present work well as a corridor for birds.

However, possible core bush bird habitat is present on both public and private land within the catchment and includes 11 sites that could be further developed.

"Up to 43 bird species have been observed within the Heathcote River/Ōpawaho corridor. This includes the seasonal movement of bush birds from various forest Port Hills remnants and a variety of water birds"

BACKGROUND
ECOLOGY

VEGETATION

In pre-settlement times, the Heathcote River/Ōpawaho meandered through a predominantly wetland forest, flaxland and sedgeland. Little remains of the forests, once dominated by New Zealand's tallest native tree, the kahikatea *Dacrycarpus dacrydioides*. Riccarton Bush is our only reminder of what these swamp forests would have been like. Some exposed stumps just downstream from Opawa Road are the only remaining sign of these great trees on the Heathcote River/Ōpawaho.

Early photos show that by the time of European settlement, the river had a tall margin of flax *Phormium tenax* and pukio/tussock sedge *Carex secta*, often with a swampy floodplain behind. The early settlers established their own trees on the riverbanks, favouring willows (especially weeping willow *Salix babylonica*), alders, poplars, elms and birches.

Very little remains of the original instream or riparian margin vegetation, these having been mostly replaced by exotics. The acquatic macrophytes have been mostly replaced by curly pondweed *Potamogeton crispus*, but there are still some stretches where native aquatics such as floating pondweed *P. cheesemanii* and millefoil *Myriophyllum propinquum* remain.

The riparian zone has however, had its remnants of original native species supplemented by plantings undertaken by Christchurch City Council, and some of these species have spread by themselves. The present riparian vegetation therefore comprises a combination of exotic plantings (mostly of large specimen trees) and native species, along with a variety of exotic weeds that must be constantly managed to ensure they do not dominate.

These weeds have especially thrived in open areas, especially around restoration plantings, and include reed canary grass *Phalaris arundinacea*, reed sweet grass *Glyceria maxima*, yellow flag *Iris pseudacorus* and giant sedge *Carex pendula* which even tolerates shade.

These plants have occupied the ideal habitat that occurs at the land to water interface. Although such riparian weeds are not declared 'pest plants', they detract from amenity and ecological values of the river margin.

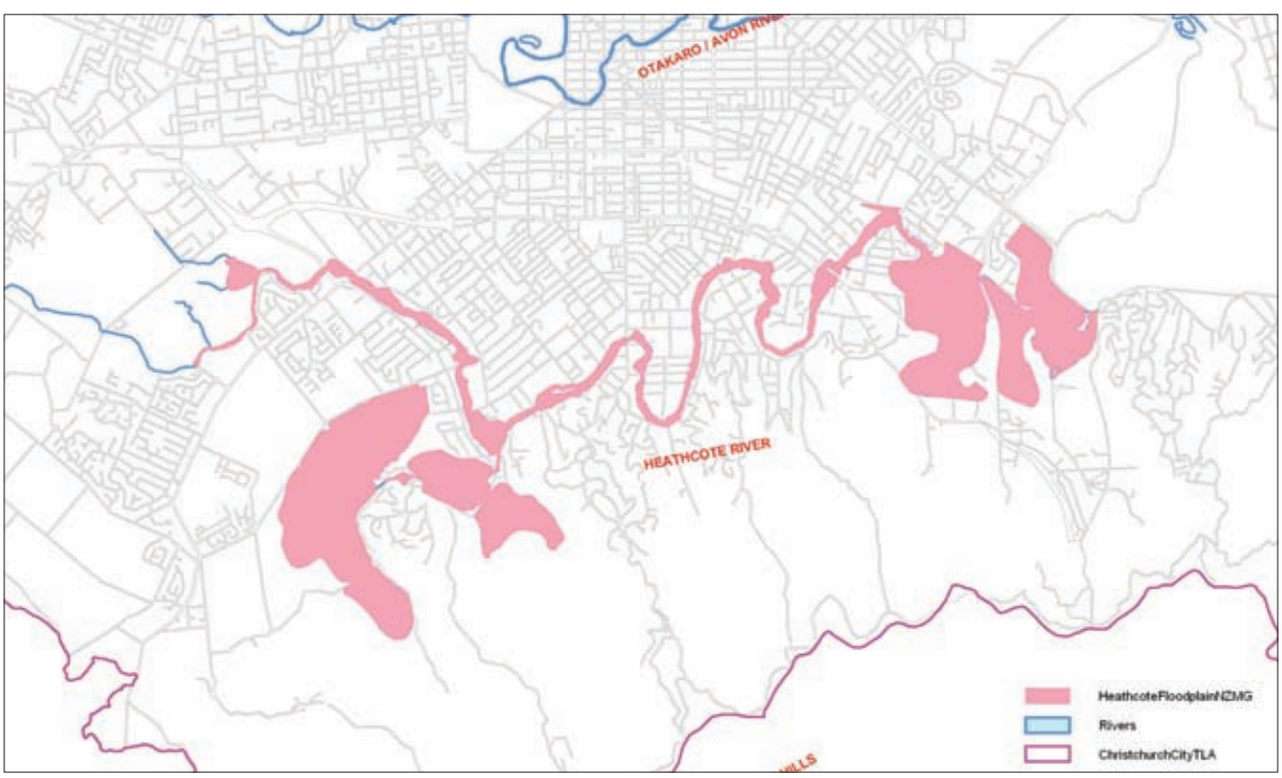
Recent native planting on the Heathcote River/Ōpawaho.

BACKGROUND
FLOODING AND BANK STABILISATION

Urban development along the Heathcote River/Ōpawaho has placed many houses within the river's floodable zone. Despite mitigation measures such as river dredging and straightening, a proportion of these houses have been affected during flood events. Development has reduced the catchment's ability to absorb water and store rainfall, perhaps increasing the frequency of flooding if not the size of major events.

Historical flood mitigation measures have included the Woolston Cut and widening and deepening of the Heathcote River/Ōpawaho channel. However in recent times the Council has adopted a more environmentally sensitive planning approach in preference to the more damaging option of channel widening. The Heathcote River/Ōpawaho Floodplain Management Strategy 1998, aims to mitigate the effects of flood damage by various means including creating stormwater detention areas in green corridors and establishing waterway setbacks along river banks.

The methods suggested for stabilising river banks to restore in-stream habitat include reducing bank angles, planting, terracing, building crib walls, forming gravel supports to unstable banks and varying the thickness of bank vegetation through planting and management regimes.



Heathcote River/Ōpawaho Flood Plain, CCC.

BACKGROUND

WATER QUALITY AND SEDIMENTATION

Excessive sediment runoff remains a key issue within the Heathcote River/Ōpawaho catchment. Fine sediment fills the spaces in stream bed gravels, coats aquatic plants and smothers immobile or slow moving in-stream life as it settles. The outcome is a reduction in the abundance and diversity of invertebrates and fish.

Sediment runoff is generated both from pastoral areas, where animals entering unfenced waterways collapse the banks; and from urban areas where construction activity and exposed soil surfaces release large amounts of sediment. The Cashmere Stream and most hill waterways will also release sediment during rainfall.

Urban contaminants such as heavy metals from road and roof runoff, litter, deliberate spillages of oils, paints and cleaners, and herbicides become trapped in fine sediments and negatively affect in-stream life.

For the river's health to improve significantly there will need to be a major reduction in sediment and contaminant inputs, and this will require a major increase in investigations, monitoring, surveillance and controls city-wide. Activities on the required scale are outside the scope of this Plan.

Improvements to water quality are most likely to come about through rules in Environment Canterbury's Natural Resources Regional Plan. For example, new subdivisions have been required since 2004 to install forms of sediment containment, and there are more controls on construction activities. The Christchurch City Council's proposed Surface Water Strategy may result in increased water quality monitoring and reduction of contaminants at source.