

Caring for Urban Streams – Guide 5: Stream life

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This guide forms part of a larger series of documents under the banner "Caring for Urban Streams". To get an overall understanding of the issues related to stream management it is recommended that people read through the complete set of guides, and as a starting point look at the Quick Reference Guide.

If you have any questions about this information sheet please contact Auckland Council on 09 301 0101

Healthy streams not only support a wide variety of native freshwater and terrestrial wildlife, they also support the ecosystems of our marine environments. A large proportion of marine fish species live in both environments during different periods of their lifecycles.

There is a strong connection between the life in the stream and the life on the land, as insects exist in the streams as eggs and larvae but live out of the water when they emerge as adults. Birds, insects and fish life feed on these insects, and birds and flying insects pollinate plants in areas around the stream.

This guide describes how to improve biodiversity in urban streams.

STREAM SOLUTIONS

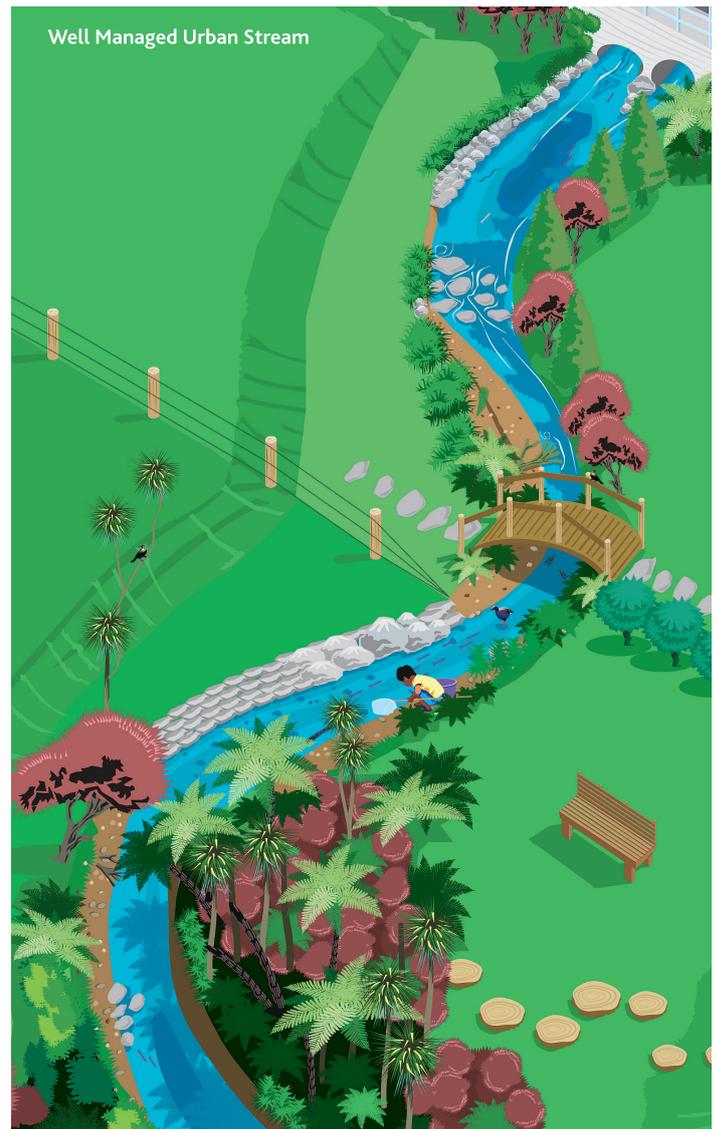
Plants and animals migrate using wildlife corridors such as streams and planted areas, so even short sections of good riparian planting and healthy stream bed and banks will improve ecology by connecting places to live, feed and breed.

Plant banks and edges. What is planted around and alongside the stream (the riparian zone)?

- Aim for variety – different heights and shapes, deciduous and evergreen, climbers, ground covers, mosses, ferns, hanging plants and native flowering plants to attract birds and insects.
- Shade the stream with tall trees as well as hanging bank side planting – this reduces water temperatures, shelters stream animals, and reduces algae growth.
- Encourage native mosses and liverworts (bryophytes).
- Plant the stream edge with plants such as Carex sedges, giant umbrella sedge and native toe toe – these feed and shelter native fish, and provide spawning sites.
- Plant water loving plants – some plant species grow well partially or completely submerged in the water. These connect the edge of the water to the stream bed, offer pathways, and help filter pollutants.

Connect. Does stream side planting connect with plants on banks and surrounding areas?

- Link planting along stream banks, across flood plain areas, to surrounding gardens and slopes.
- Plant varieties that do not block flows in overflow and flood areas – grasses, sedges and rushes lay flat so water flows freely, and water flows easily around trees with narrow trunks, such as cabbage trees.



Remove pests and weeds. Are these stopping local animal and plant life from flourishing?

- Remove invasive weeds, starting with the most widespread weeds first.
- Control animal pests by carefully trapping or using bait stations, making sure that poisons do not end up into the water or kill native species.
- Carefully replace weeds with native plants – however, make sure you do not remove important habitat for native fish and other water creatures that may already live there.



Feed animal life. What can animal life feed on in the area?

- Select plants on which native birds and insects feed – seasonal nectar, pollen and fruit bearing plants.
- Plant stream bed and banks to support a variety of insect life. Some water insects emerge as adult flying insects, feeding and breeding in areas around the stream. These insects in turn are food for birds and other stream life, and pollinate plants. Water insects feed on leaf litter, water plants, algae, and smaller organisms, and are food for fish and other water life.
- Understand the cycles – insects and birds help pollinate plants that feed other birds and insects that carry seed to new areas to grow – it is all connected.

Create habitat. What makes the stream more suitable for biodiversity?

- Large woody debris placed into the stream will promote retention of finer woody debris, the formation of meanders, and creation of shallow areas and deeper pools
- Tree stumps can be inserted upside-down into the stream bank, such that roots create overhangs in the stream
- Build artificial riffles between stream bends or add gravel to

already developing natural riffles

Stream bed and banks biodiversity. Material on the bed and banks of the stream provides food and shelter for water life.

- Natural debris. Twigs, leaves and other natural dead plant materials shelter, feed and shade animal life. Do not remove this debris unless it is causing flooding.
- Water plants. Some grow in and under the water and others in waterlogged soil. These plants offer shade, food, shelter and breeding sites for water life.
- Stream bed materials. Whilst some insects prefer to live in muddy areas, a greater diversity live in the faster flowing gravel and sandy patches in a stream, where the water is better oxygenated, there are spaces to hide, and available food (mosses, algae, tiny animals). Although some fish species seek out these faster-flowing areas, deeper slow flowing pools are preferred habitats for adult eels and some fish species. A variety of habitats is ideal.
- Logs and rocks. Large logs and boulders in the stream form deeper pools, anchor water plants, trap leaf litter and form riffles. Logs should be angled diagonally down stream to avoid blocking flows in heavy rainfall and should be anchored on at both ends by burial or pinning to bank.

Maintenance and monitoring checklist

Proper maintenance and monitoring ensures that the improved habitat is kept clear of weeds and helps you understand how the habitat is improving and where work may still need to be done.

Maintain

- Maintain your riparian planting and include a long term weed management plan.
- Pay specific attention to emergent and hydrophilic plants, as well as submerged and floating water plants.
- Re-anchor or reinstate large woody debris if this is dislodged or washed downstream in a large storm event.
- Remediate any bank slumping and undercutting.
- Maintain any infrastructure necessary for fish passage.

Monitor

- Record what you see (birds, plants, fish, insects in and around the stream) – a wide variety of stream life, especially sensitive insect and fish species, shows the stream is well shaded, has food and shelter, and has good water quality.
- Take photos of stream and surrounds – especially before and after planting and weed and pest control.
- Look for weeds and pests, and maintain bait stations.
- Check after heavy rain for erosion on stream banks and bed, and movement of in-stream structures (logs, rocks, gravel areas, plants) – these are shelter for stream life.



Links/Further Information

Further information on stream biodiversity can be obtained by entering the following search terms on internet search engines:

- Auckland Council
- Macroinvertebrates
- Waicare
- Freshwater fish
- NIWA
- Wildlife and your backyard
- Monitoring and assessment freshwater
- Stream Ecological Valuation
- Riparian Management

There are more guides available in this series.

The complete set includes the following:

- Caring for Urban Streams Quick Reference Guide
- Guide 1: Flooding
- Guide 2: Erosion
- Guide 3: Stream water quality
- Guide 4: Stream side planting
- Guide 5: Stream life
- Guide 6: Fish passage



The activities described in this document include some activities that are minor and easy to do, but may also involve significant construction activity such as the use of machinery, moving large volumes of material and extensive changes to the shape and character of a stream. Such activities are likely to require resource consents. Professional advice should always be sought before commencing any work. If in doubt, please contact the Auckland Council stormwater team.

Remember, private landowners are responsible for maintaining the streams passing through or adjacent to their property and for ensuring that any work is done in a legal and safe manner.

For access to this information sheet and to find the other information sheets, search for "Caring for Urban Streams" at www.aucklandcouncil.govt.nz

Important Notice: © Auckland Council 2013. This fact sheet is an information guide only and is not technical or compliance advice. Its recommendations may not be complete or appropriate for all situations, and the person doing/arranging the work remains solely responsible for making their own assessments and doing the work properly, safely and in compliance with all laws and regulations.