INFO SHEET 05

TOITŪ TE HAKAPUPU
PLEASANT RIVER CATCHMENT RESTORATION PROJECT

Fish passage assessment and improvement

Potential barriers to fish passage have been surveyed throughout Te Hakapupu / Pleasant River catchment as part of the catchment restoration project. Seven of the 20 structures assessed need replacement and/or improvement. There are a variety of ways to restore passage for fish at these sites.

Figure 1. Examples of flap gates (left image) and culverts (right image) restricting fish passage in Te Hakapupu / Pleasant River catchment. Photo credit: Matt Dale, Waterscape Solutions.

Why fish passage is important

Many of Aotearoa's fish species, such as tuna (eel) and some whitebait species, migrate between fresh and salt water as part of their life cycle. Barriers such as culverts and flap gates (**Figure 1**) can prevent this migration between their breeding, juvenile and adult habitats.

Barriers to migration affect some fish species more than others. Species such as tuna (eels, *Anguilla dieffenbachii* and *Anguilla australis*) and kōaro (*Galaxias brevipinnis*, a type of whitebait) have excellent climbing abilities and can move through or around most barriers. However, īnaka (*Galaxias maculatus*, another type of whitebait), pōrohe (*Retropinna retropinna*, smelt), and pātiki (*Rhombosolea retiarii*, black flounder) are less mobile and can be stopped by relatively small barriers. There is a real risk that barriers to passage can lead to local extinction of fish populations.

Surveying fish passage in Te Hakapupu / Pleasant River catchment

As part of the Toitū Te Hakapupu / Pleasant River Restoration Project, Kāti Huirapa Rūnaka ki Puketeraki worked with the East Otago Catchment Group and local landowners to survey fish passage barriers in the catchment and recommend actions to remove these barriers. Twenty instream structures were surveyed, of which seven need replacement or improvement. All seven are in the lower part of the catchment.

Enhancing fish passage in Te Hakapupu / Pleasant River catchment

Replacement of the seven structures is recommended; however, they may need temporary improvements while the substantial work required for full replacement is completed. Improvements could include rock ramps, spoiler baffles, and mussel spat ropes (**Figure 2**).

Further information on how fish barriers can be improved can be found at **doc.govt.nz/nature/habitats/freshwater/fish-passage-management/resources/** and **fishladdersolutions.co.nz**.

Figure 2. Fish passage enhancement including a ramp and spoiler baffles (left) and mussel spat ropes (right). Photo credit: Fish Ladder Solutions.

Fish passage improvements are already being made in the catchment, including rock ramps at the Patterson's Road ford and Brooklands Road ford (**Figure 3**).

Figure 3. Before (left) and after (right) installation of a rock ramp to improve fish passage at the Patterson's Road ford. Photo credit: Matt Dale, Waterscape Connections.

Fish passage and new river crossings

New river crossing structures should be designed to allow fish passage (**Figure 4**). Guidelines are available at **doc.govt.nz/fishpassage** and say:

- The structure should retain the natural bed of the stream if possible.
- Culverts should have at least one third of the barrel below the stream bed.
- The slope of the culvert should be the same as that of the surrounding stream.

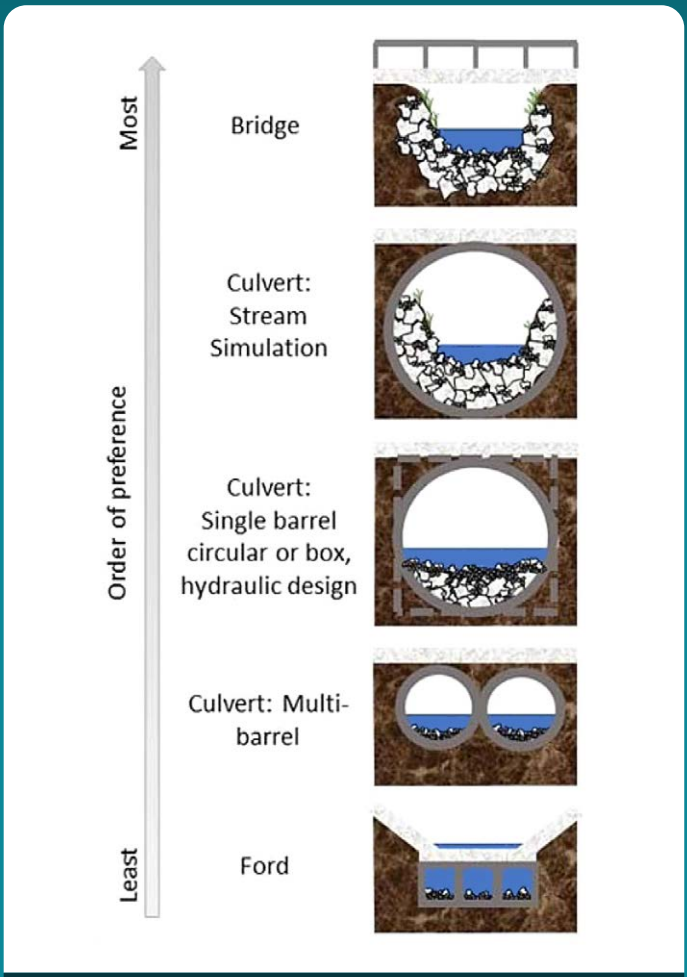

Figure 4. Order of preference for culvert replacement with regards to fish passage risk (New Zealand Fish Passage Guidelines, 2018).

A partnership project by:

Otago Regional Council

Kāti Huirapa Runaka ki Puketeraki

In collaboration with:

Ministry for the Environment Manatū Mō Te Taiao | Essential Freshwater Fund

A JOBS FOR NATURE PROJECT

East Otago Catchment Group

Find out more at www.orc.govt.nz/toitutehakapupu