A rock fishway and wide culvert at Mill Creek near Greymouth allows fish to move upstream easily. *Photo: Suze Harris, DOC*

Whitebait need a cruisy journey upstream

The young native fish caught as whitebait need to be able to reach habitat upstream so they can grow into adults. Culverts, dams, floodgates, weirs and other human-made structures in rivers and streams can make that journey impossible.

Culverts are great for water, but maybe not for fish

There are hundreds of thousands of culverts around the country. They're the easiest way to pass a stream under a road but many culverts have been designed without considering native fish.

Long, narrow culverts squeeze streams and create fast flows that can be difficult or impossible for fish to swim through. Fish that don't make it are prevented from reaching habitat upstream and some will die or be eaten. Because many New Zealand roads are built on flat land near the sea, culverts that are poorly designed or not well maintained can stop whitebait just a few hundred metres into their journey.

Better structures can open up huge areas of quality habitat

By maintaining, removing, improving and designing better structures – including culverts, weirs and floodgates – we can give fish access to hundreds of kilometres of habitat upstream to grow and reproduce. This is an important way to increase the number of fish and ensure the sustainability of the whitebait fishery.

Department of Conservation
Te Papa Atawhai

Te Kāwanatanga o Aotearoa
New Zealand Government



Left: Flapgates at Havelock in Marlborough are known to be a barrier for whitebait moving upstream. Centre: Sjaan Bowie, DOC senior technical advisor researching how well retrofitted baffles help whitebait move through this culvert on the West Coast. Right: This weir in Puketī Forest would prevent īnanga moving upstream.
Photos from left: Sarah Wilcox, Nixie Boddy, Sjaan Bowie DOC

Big, embedded culverts – at least 1.2 times the width of the stream – are much better than small ones. They allow the stream to develop a natural bed and banks inside it, so it's no harder to swim through than the rest of the waterway. Oversized culverts also handle flood flows better and will therefore last longer.

Adding fish passes and ramps are other proven ways to let fish move up and downstream past barriers. They're usually designed and built for where they're needed, and placed carefully so fish will find them.

Not all whitebait are strong swimmers

Whitebait are a mixture of young native fish, and some species are better at navigating obstacles and fast flows than others. Īnanga are the most challenged by inclines, jumps, rapids and fast flows, and so tend to live in flatter areas near the coast. Given īnanga make up about 85 percent of the whitebait catch, it's particularly important that in-stream structures allow them to move freely to breed and complete their lifecycle

Case study: fish access to Wairarapa wetland successfully restored

When Te Pouaruhe wetland was drained for agriculture in the 1940s, it became separated from Lake Ōnoke and the sea by a stopbank and two culverts. One of the culverts had a flap gate that stopped most fish getting to the wetland. In 2022 a large digger was used to remove the culverts and make breaks in the stopbank so fish could once again move freely up and downstream. Before and after surveys found huge differences in the number and range of fish species present. At one site, īnanga numbers increased from 339 to 1563 after the work was done.

Act now for the future of the fishery

Everyone can help keep the whitebait fishery sustainable for our grandkids and the next generations. Here are some simple actions that can make a real difference.

When you're out whitebaiting:

- follow the regulations and don't let your net go across more than ¼ of the waterway
- don't put rocks or barriers in the stream to reduce the width of the waterway
- don't fish within 20 m of a weir, culvert, tide gate or floodgate
- talk to other fishers about the importance of designing, installing and maintaining culverts that don't make it hard or impossible for native fish to move upstream.

Assess and report instream structures using the Fish Passage Assessment Tool. This tool has contributed to a database of more than 150,000 in-stream structures nationwide that are being prioritised and fixed by councils, landowners and other agencies across the country.

Contact us on whitebait@doc.govt.nz.
See our other factsheets and learn more about creating good habitat for whitebait on www.doc.govt.nz/helpwhitebait.
Read more about fish passage and find the Fish Passage Assessment Tool on www.doc.govt.nz/fishpassage.