# Lessons Learnt 009

Ford removal and replacement with a bridge at Wainora Stream (Kauaeranga Valley), Coromandel

February 2020

V 1.0

This case study forms part of a series that provides key information and guidance about how to potentially improve a fish passage barrier in a New Zealand waterway.

While providing fish passage is advantageous to most fish, removing or remediating a barrier can also affect fish populations by introducing invasive species to new areas.

Ford

STRUCTURE TYPE

5/5
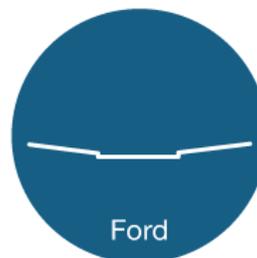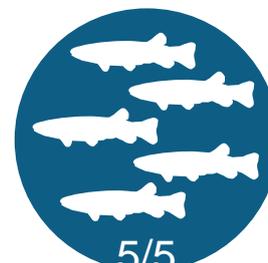
[IMPROVEMENT RATING*](IMPROVEMENT RATING)

What was the problem?

Wainora Stream is recognised as having high ecological values: it contains a diverse native fish population, and its aquatic macroinvertebrate communities indicate high water and habitat quality; a reflection of the high proportion of native forest cover in its catchment.

Previous investigations found that a roadway ford was preventing the upstream passage of some native fish. In two separate surveys, we failed to record torrentfish (*Cheimarrichthys fosteri*) and common smelt (*Retropinna retropinna*) upstream of the ford, despite both being present downstream. Other species recorded in the stream included longfin eel (*Anguilla dieffenbachii*), shortfin eel (*Anguilla australis*), Crans bully (*Gobiomorphus basalis*), common bully (*Gobiomorphus cotidianus*), redfin bully (*Gobiomorphus huttoni*), banded kōkopu (*Galaxias fasciatus*), kōaro (*Galaxias brevipinnis)*, kōura (*Paranephrops planifrons*), and rainbow trout (*Oncorhynchus mykiss*). All six culverts within the ford were perched (by up to 0.5 m) and the ford was undercut (by up to 1 m). Replacement of the ford with a bridge aimed to improve fish passage for all freshwater species, especially torrentfish and common smelt.

What was the solution?

A new single-span bridge was constructed 3 m upstream of the ford between May and June 2018, and once completed, the ford was removed. The total project costs were $535,000 (bridge $469,000), including all costs involving contractors to build the bridge, other resources and building consents. The bridge installed was pre-cast concrete construction (14.5 m span and 5.4 m width).

BEFORE

January 2018. *Photo: Tom Drinan*

AFTER

March 2019. *Photo: Tom Drinan*

Figure 1. <u>Top</u> – Roadway ford prior to removal. <u>Bottom</u> – Single-span bridge replacement.

Monitoring results

Monitoring occurred in January 2018 (prior to the works) and March 2019 (following the works). The electrofishing results demonstrated that the removal and replacement of the ford with a single-span bridge completely remediated this fish passage barrier.

Both torrentfish and common smelt were found upstream of the bridge for the first time.

Overall, the fish community is now much more comparable both upstream and downstream of where the ford used to be.

Figure 3. Torrentfish are now found upstream of where the ford used to be (March 2019. Photo: Katie Collins).

Did it work?

Yes. Torrentfish and common smelt can now successfully migrate upstream and downstream of where the ford used to be, and all other species previously found are still present in good numbers throughout. Furthermore, the removal of the ford has 'opened up' an 8-km section of streambed upstream as available habitat for other stream biota.

Lessons learnt

1. Single-span bridges represent the best practice approach to maintaining/improving fish passage at river crossings.

2. Significant down-cutting of the channel occurred following the removal of the ford, as the stream channel reassumed its natural gradient.

3. This project demonstrates how quickly improvements to fish passage can occur when barriers are removed.

For further information

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References

Lake, M.D. 2008: Fish passage assessment of road culverts on the Whangaiterenga & Wainora Streams. Internal memo (DOCDM-273541). Department of Conservation.

Lake, M.D. 2009: Assessments of fish communities affected by road culverts on the Kauaeranga Valley Road. Internal report (DOCDM-385758). Department of Conservation.

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