CASE STUDY – BRINGING BACK THE FISH: NORTHERN RIVERS

NSW Department of Primary Industries is working with Catchment Management Authorities, landholders, volunteers, fishing groups and local councils to **Bring Back the Fish** to our rivers, creeks, lagoons and wetlands.

What needs to happen? Firstly, fish need to be able to move up and down our waterways and between freshwater and the ocean. Secondly, fish need suitable habitat: different habitat for different needs (feeding, breeding) at different times of the year.

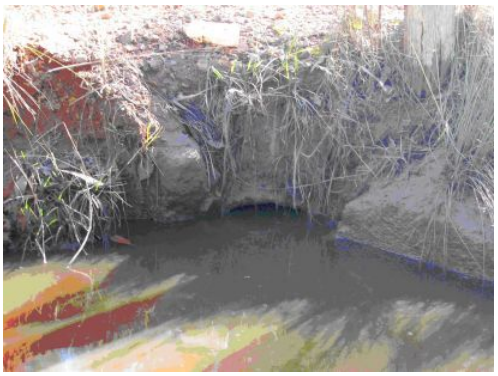
Across New South Wales, barriers to fish passage are being modified or removed to enable fish to move more freely up- and downstream. Habitat is being rehabilitated or even created in areas where it has been completely destroyed.

Each of these case studies provides an example of a project designed to **Bring Back the Fish** in your region.

KUNGALA ROAD, DUNDOO CREEK TRIBUTARY, GRAFTON

[An extract from: NSW DPI (2006) *Reducing the impact of road crossing on aquatic habitat in coastal waterways – Northern Rivers, NSW*, Report to the New South Wales Environmental Trust, NSW DPI, Wollongbar, NSW]

Unsealed Kungala Road at waterway crossing site.



Heavily silted pipe culvert, downstream view.

Description and setting

The pipe culverts at Kungala Road cross an unnamed tributary of Dundoo Creek, a tributary of the Orara River in the Clarence Valley Shire local government area. The crossing consisted of an 8.3 m by 0.35 m pipe that was blocked with sediment, thus effectively forming a weir preventing the movement of water and instream fauna beneath the road.

Prioritisation of road crossing barriers in the Upper North Coast subregion highlighted the crossing on Kungala Road as a medium priority due to the following factors:

- Dundoo Creek is a perennial flowing tributary of the Orara River within the middle reaches of the Clarence Catchment;
- Riparian and instream condition within Dundoo Creek and surrounding subcatchments is considered fair to good;

- Stream connectivity is considered good beneath the crossing, with few barriers to migrating fish; and
- The crossing restricts fish access to 1.7 km of upstream habitat throughout the year except during flooding when the structure drowns out.

Proposed remediation actions

The crossing is owned by Clarence Valley Shire Council and is used by upwards of 250 vehicles per day. Due to the inability of water to pass beneath the crossing, Clarence Valley Shire Council approached DPI (Fisheries, Conservation and Aquaculture) with a proposal to remove the existing pipe culvert and replace with a large box culvert that contained a low-flow channel. Bed level surveys were consulted to determine the invert of the middle cell to ensure that water maintained a depth of 300 mm through the structure.

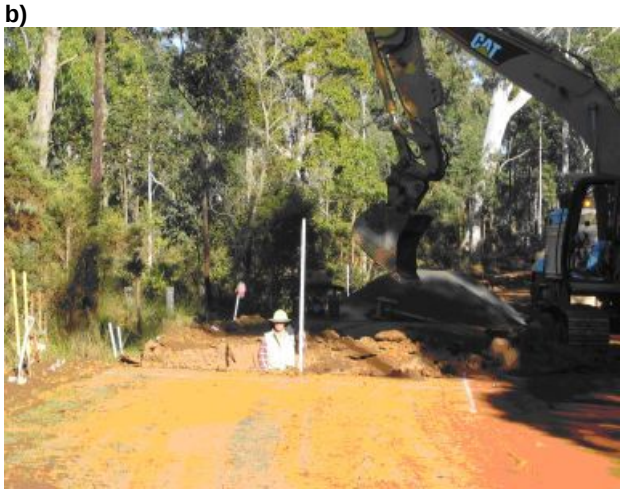
Remediation works

Designs and permits for the crossing were approved by DPI (Fisheries, Conservation and Aquaculture) in June 2004, with construction commencing shortly thereafter. Prior to the start of on-ground works, instream sediment control consisting of a hay bales wrapped in geotextile fabric were installed across the full width of the downstream channel to prevent the downstream movement of mobilised sediment. However, on-ground works were conducted during a period of prolonged drought, during which no water was flowing or pooling beneath the structure.

An excavator was used to remove the piped crossing to a level below the natural bed of the tributary (Plates a & b), which enabled a low flow channel to be constructed at a predetermined level based upon longitudinal surveys of the surrounding reach (Plates c & d). Pre-cast box culverts which incorporated the low flow channel were placed within the channel created and set in concrete (Plates e & f). Rock protection was inserted on the downstream side of the crossing, with the approach roads sealed 50m on either side of the crossing to reduce sediment input from the road surface. Total construction time was less than one week.

a)

b)



c)

d)

e)

f)

Benefits associated with remediation

The primary outcomes of the Kungala Road project were:

- Improved stream connectivity for native fish species (Plate g-h);
- Reinstatement of a natural flow regime to the unnamed tributary along with reduced sediment inputs associated with the sealing of road approaches; and
- Improved safety and reliability of the crossing for approximately 250 vehicles which traverse the crossing daily.

g)

h)