Case Study: Coral Avenue, Mullumbimby

Adapted from NSW Department of Primary Industries (2005) *Reducing the impact of road crossings on aquatic habitat in coastal waterways – Northern Rivers, NSW.* Report to the Northern Rivers Catchment Management Authority. NSW Department of Primary Industries, Wollongbar, NSW.

Coral Avenue crossing, which traverses the Brunswick River near Mullumbimby, was characterised by a piped causeway 19 m in length and 8 m wide with two low-flow pipes. The outlets of both low-flow pipes were raised above the bed of the waterway by approximately 800 mm, which prohibited fish from migrating upstream during low-flow conditions. During moderate to high flow events, excessive water velocity through the pipes further restricted fish passage until the structure drowned out. Prioritisation of road crossing barriers in the Northern Rivers CMA highlighted Coral Avenue as the top priority waterway structure for remediation due to the following factors:

- The Brunswick River is a moderately sized coastal waterway that supports a diverse range of native fish species including key commercial and recreational species such as the freshwater mullet (*Myxus petardi*) and Australian Bass (*Macquaria novemaculeata*);
- The causeway is located within the upper reaches of the Brunswick River estuary, thus preventing the movement of fish between estuarine and freshwater environments;
- The crossing is the most downstream barrier to fish passage on the Brunswick River. Although numerous obstructions are located upstream, remediation of Coral Avenue would open up 25 km of available habitat;
- Coral Avenue marks the upper boundaries of the Cape Byron Marine Park, an aquatic protected area established to conserve habitat and biodiversity. Appropriate management of the upper tidal reaches of the Brunswick River is a key element to protecting and enhancing the unique features of the Marine Park; and
- Instream and riparian habitat condition is considered above average within the vicinity of the Coral Avenue crossing.

Proposed remediation actions

The crossing is owned by Byron Shire Council and provides the primary access point across the Brunswick River for 19 private landholders. In addition to fish passage considerations, Council and the surrounding community were interested in seeing the safety and reliability of the crossing improved relative to flood inundation.

Numerous remediation options were discussed for the site among the various stakeholders (NSW DPI, Byron Shire Council, DNR, and the Northern Rivers CMA). However, in order to address fish passage concerns as well as to improve the safety and reliability of the crossing, the accepted design was the insertion of a prefabricated, single-span Doolan Deck bridge followed by the removal of the existing causeway barrier.

Remediation Works

On-ground works began in April 2005 with the removal of the dilapidated timber bridge located immediately upstream of the crossing, followed by works to prepare the road for realignment (e.g. tree lopping, adjustment of power lines). The Doolan Deck Bridge was to be positioned approximately 5 m upstream of the causeway, thus effectively maintaining vehicle access throughout the proposed works over the existing causeway. Footings for the new bridge were constructed during a three-week period in August, with the insertion of the single span bridge occurring a week later (**Plate a-b**). Two cranes were used to lift the prefabricated bridge deck into place, with works being completed over a four hour session. Following the construction of road approaches for the bridge which provided vehicle access across the waterway, the existing causeway barrier was removed.

Prior to removing the piped causeway, instream sediment control consisting of a floating silt boom was installed across the full width of the downstream channel. The causeway barrier was removed over a two-day period using an excavator fitted with a rock-hammer (**Plate c-d**). Spoil from the causeway was transported to the Council tip, with sediment fences being erected on the disturbed banks to limit bank erosion and sedimentation into the waterway. Road approaches either side of the crossing were sealed via bitumen, with rock scour protection inserted around the structure to assist in bank stability (**Plate e-f**). On-ground works were completed in 10 weeks, with revegetation of disturbed banks to occur the following Autumn (2006).

Project funding

Funding was largely provided by Byron Council, with assistance coming from the Northern Rivers CMA, Cape Byron Marine Park Authority and the Freshwater Recreational Fishing Trust. Additionally, NSW DPI provided a financial contribution to the proposed works on Coral Avenue through the Natural Heritage Trust funded project NRRH603.

a)

b)

c)

d)

e)

f)

Benefits associated with remediation
The main outcomes of the project at Coral Avenue were:

- Improved stream connectivity for fish species such as the freshwater mullet (*Myxus petardi*) and Australian Bass (*Macquaria novemaculeata*);
- Improved safety and reliability of the crossing for local residents relative to flood inundation (**Plate g-h**). Nineteen properties benefit from the proposed works; and
- Reduced liability to Byron Shire Council resulting from vehicle and recreational accidents.

g)

h)