



Environment Institute
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New Zealand



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BREAKING THE BARRIERS

INNOVATING TO IMPROVE ECOLOGICAL OUTCOMES
ON TRANSPORT AND OTHER LINEAR INFRASTRUCTURE
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IMAGE CREDIT: ROB APPLEBY, WILDSPY/GRIFFITH UNIVERSITY



WORKSHOP ABSTRACT

Forward Planning for Fish Passage

This presentation seeks to cover Engineering challenges to achieving best practice Fish Passage Treatments for Road Crossing Culverts. Although applicable to all geographical regions, the presentation seeks to cover best practice outcomes directly related to code provisions from the Queensland State Development Assessment Provision (SDAP) code requirements – Code 18 Waterway Barrier works, which is part of the Queensland Integrated Development Assessment process under the Planning Act 2016. The presentation will review required treatments and examine the Engineering and Project Management considerations from each type. Aspects include: • Water softening treatments – hydraulic capacity implications (hydraulic modelling) and anchoring of baffle implications as they relate to Designer RPEQ obligations • Hydrological Considerations – accounted for velocity softening from a velocity barrier, however, must also account for a depth barrier once stormwater flows drop away. • Fish passage treatments away from culvert – predominantly accounting for low-flow conditions from the apron to the tie-in to the natural watercourse. • Lighting effects – outlining the feasibility of options to consider to introduce light into the flow path of the culvert crossing to prevent the behavioural barrier of light-dark contrast. Takeaway messages to reinforce Forward Planning to install treatments examines the Engineering and Project Management challenges, and the resultant financial implications to install treatments in culverts, including: • Fish passage treatments in culverts are no longer able to be considered “bolt-on” treatments to traditional concrete culverts. • Introduction of Fish Passage Treatments after a traditional hydraulic design will trigger a redesign due to loss of hydraulic capacity and reduced service requirements. • Introduction of passive lighting after a standardised road alignment design will trigger a redesign. Achieving passive lighting into a culvert will have a flow on effect to a larger part of the road design. Passive lighting incorporated into a standardised road design may need products that have not been invented yet. • Introduction of electrical lighting in a predominantly wet environment will require a safety-in-design assessment and lighting system that has not specifically been designed yet. Single concluding message – Provide Fish Passage treatment requirements to the designer at the start of the design phase.

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KEY TAKEAWAYS

1. Fish Passage Treatments are no longer considered a “bolt-on” process to traditional culvert design.
2. Hydraulic and light-penetration requirements can only be introduced during design, not construction.
3. Fish Passage Treatments don’t stop at the culvert apron, they extend along the watercourse to tie into natural features.

SPEAKER BIOGRAPHY

Ben Cotton is an Environmental Engineer working in the Department of Transport and Main Roads in Queensland as an Environmental officer in North Queensland. Incorporating Fish Passage and other Fauna passage requirements on road projects has been his core business for over 15 years, working with Fisheries biologists, Environmental Engineers and Scientists, Ecologists and Civil Engineers on Road projects in Queensland. The main challenge of an Environmental Engineer working on major road projects is to translate an environmental requirement from a policy perspective into delivery on the ground. Taking lessons learned, Ben has an optimistic view that continual improvement and creative thinking, will continue to benefit Environmental outcomes now and in the future.