

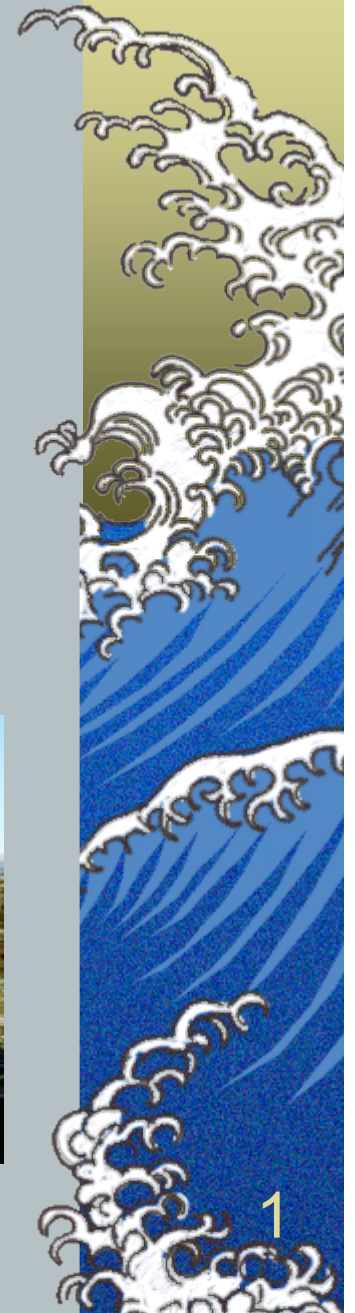
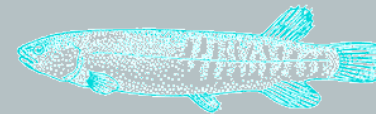
CBA

(Culvert Baffle Arrays)

Why we need them
and how they work



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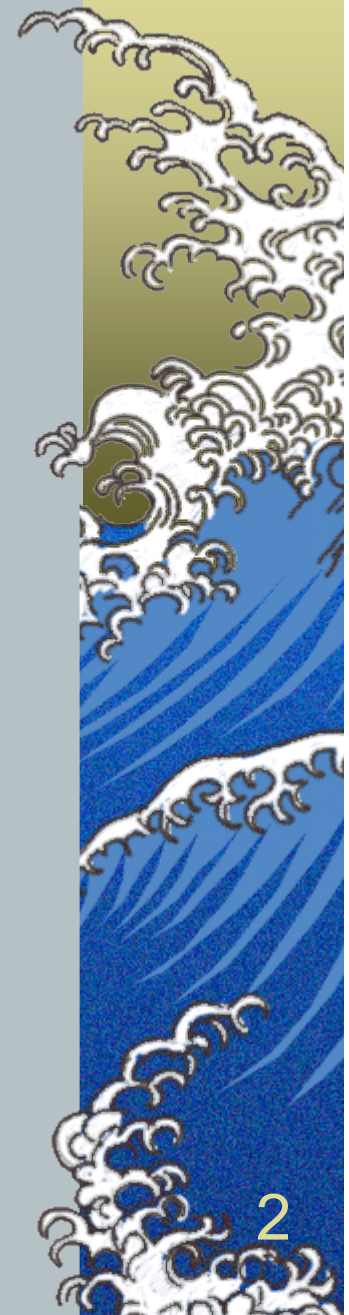


Introduction

Most fish need to migrate annually or at some time in their life cycle.

Manmade structures often impede this process.

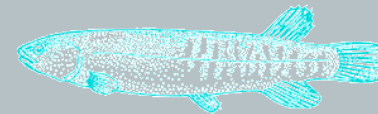
Culvert pipes can restrict the movement of fish into upstream habitats.



The Problem!



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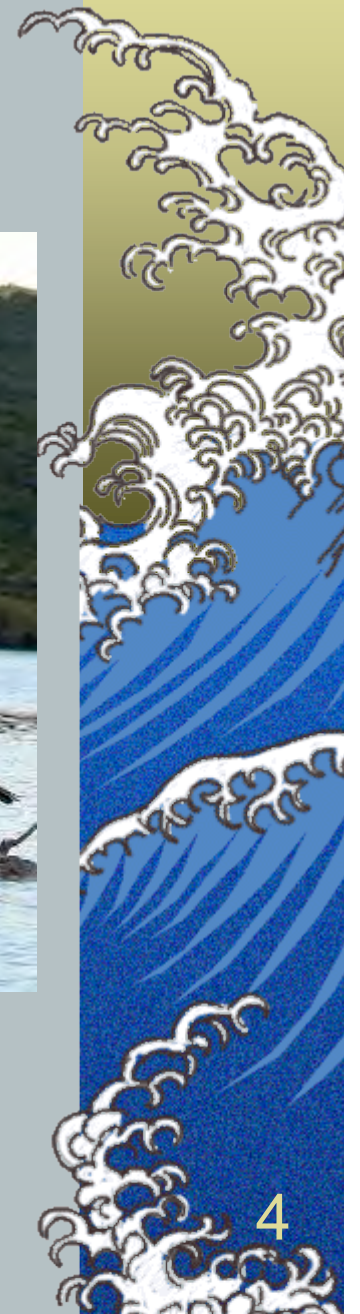
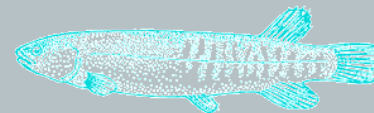
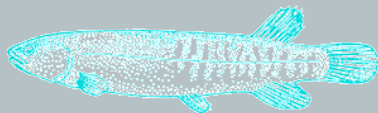
Typical Adverse Situations

Velocities too great

Depths too shallow

No opportunities to rest

Predation where fish congregate



The Solution

The CBA (Culvert Baffle Array) is a device that has been developed to address the problem.

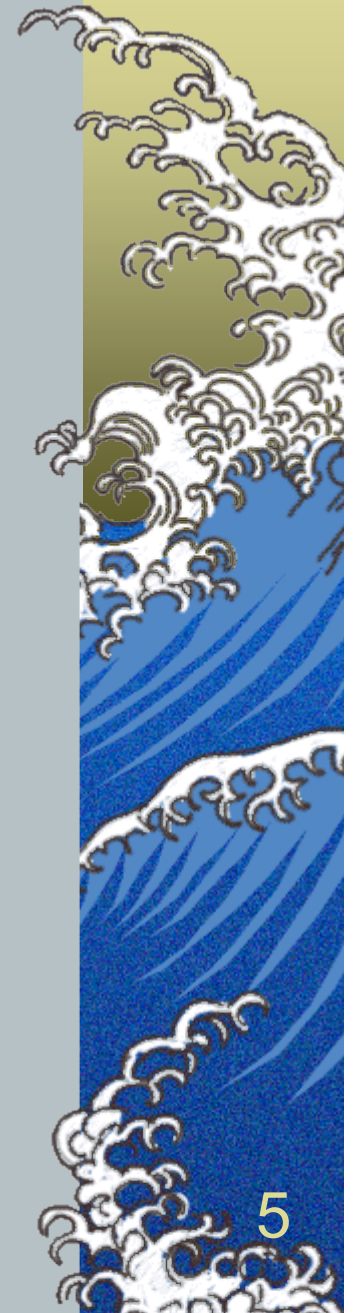
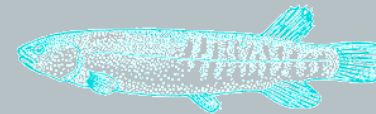
The CBA system is particularly useful with culverts with diameters of less than 1200mm and where access for workers is difficult.

The CBA can be part of new installations or retrofitted to existing structures.

Reliability, cost and ease of installation were all part of the design brief.

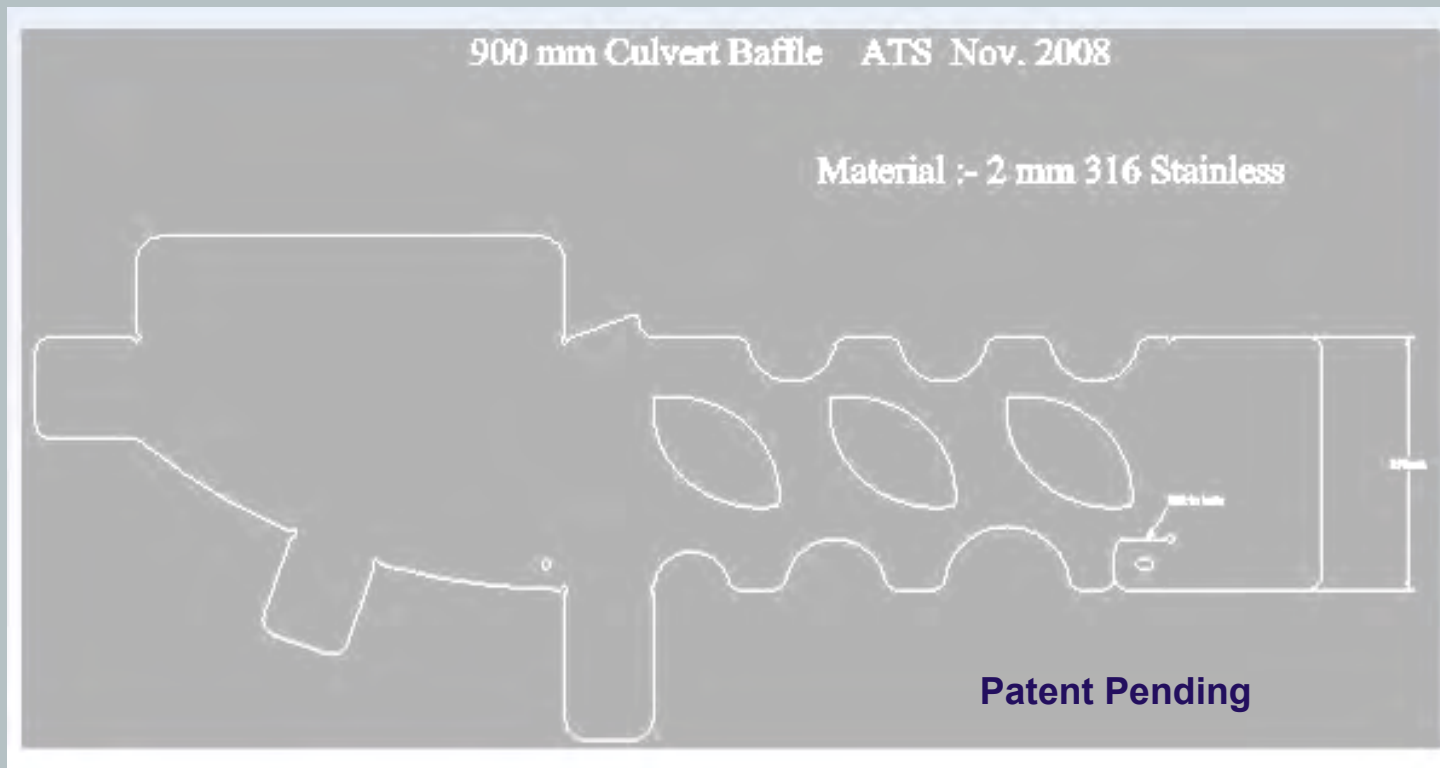


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How the CBA works...

The individual baffles are laser cut and folded from 2mm stainless steel to match the internal radius of the culvert pipe.



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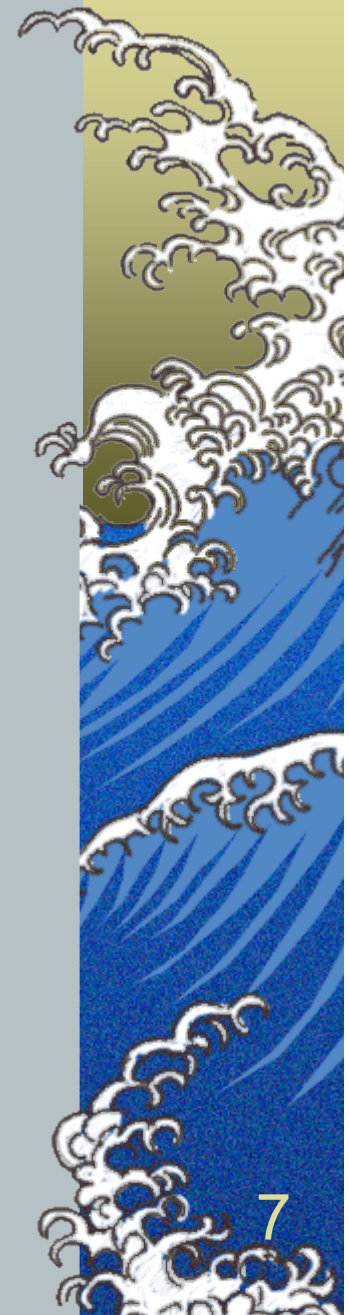
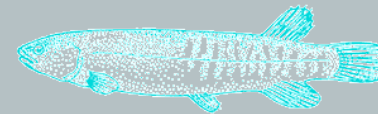
How the CBA works...



The various folds and cut-outs give fish a range of choices i.e. depth, velocity, turbulence etc



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How the CBA works...

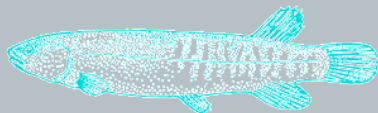
The baffles may be spaced at intervals depending on the slope and flow of the culvert

The baffles alternate left and right to create a swale effect and thereby remove some of the energy from the water

Typical Effects:

Before: $v = 1\text{m/sec}$
depth = 25mm

After: $v = 0.5\text{m/se}$
depth = 65mm



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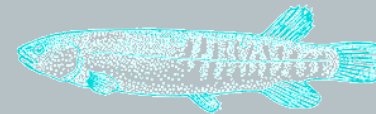


How the CBA works...

The individual baffles alternating left and right are attached to a length of stainless steel cable then passed through the culvert



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How the CBA works...

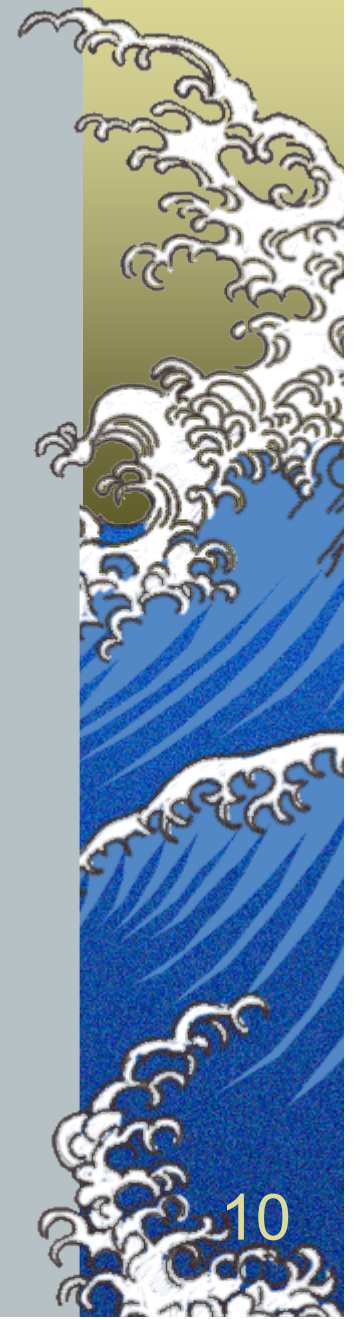
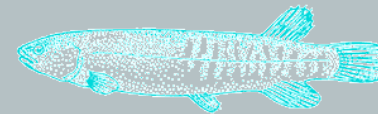
The ends of the cable are attached to the ends of the culvert pipe.



A turn-buckle is used to set the tension on the cable



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How the CBA works...

An optional “weak link” can be fitted to the top end of the cable.

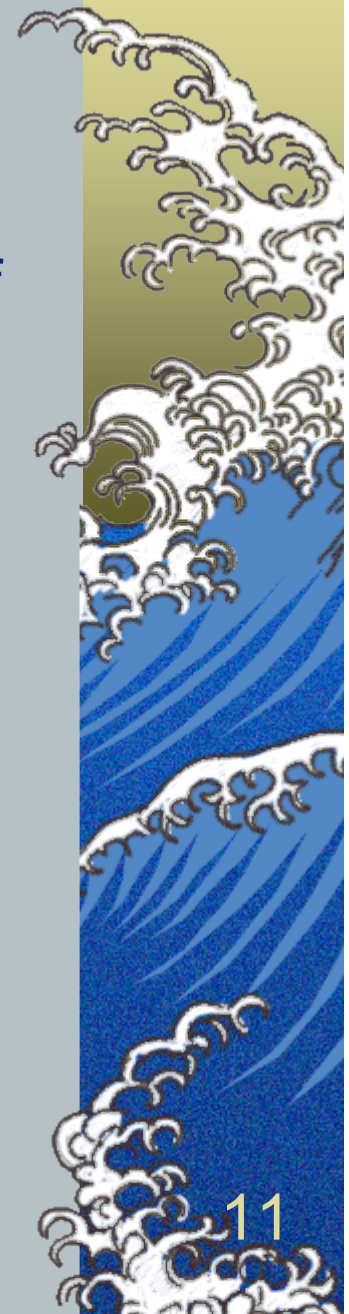
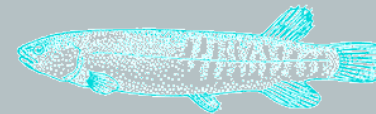
The link is designed to break if debris is caught in the CBA during extreme flood events.

The CBA will flush through the culvert pipe and be retained at the lower end for later retrieval and reinstallation.

NB: Cross sectional area of culvert reduction <2%



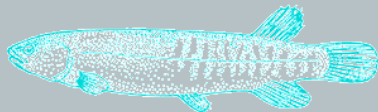
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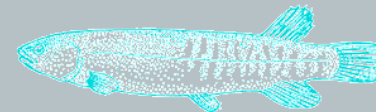
Benefits...

All Fish Species

1. **Migration** (feeding and breeding)
2. **Food-web** – better biodiversity including birds, amphibious reptiles, insects and other invertebrates
3. Can create **habitat** within the culvert pipe



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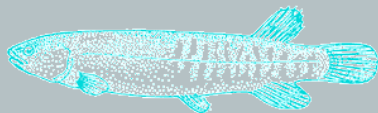


Please note that the design of the CBA is under constant review and may differ from that shown

Contact us for information on solutions for culverts greater than 1200mm

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