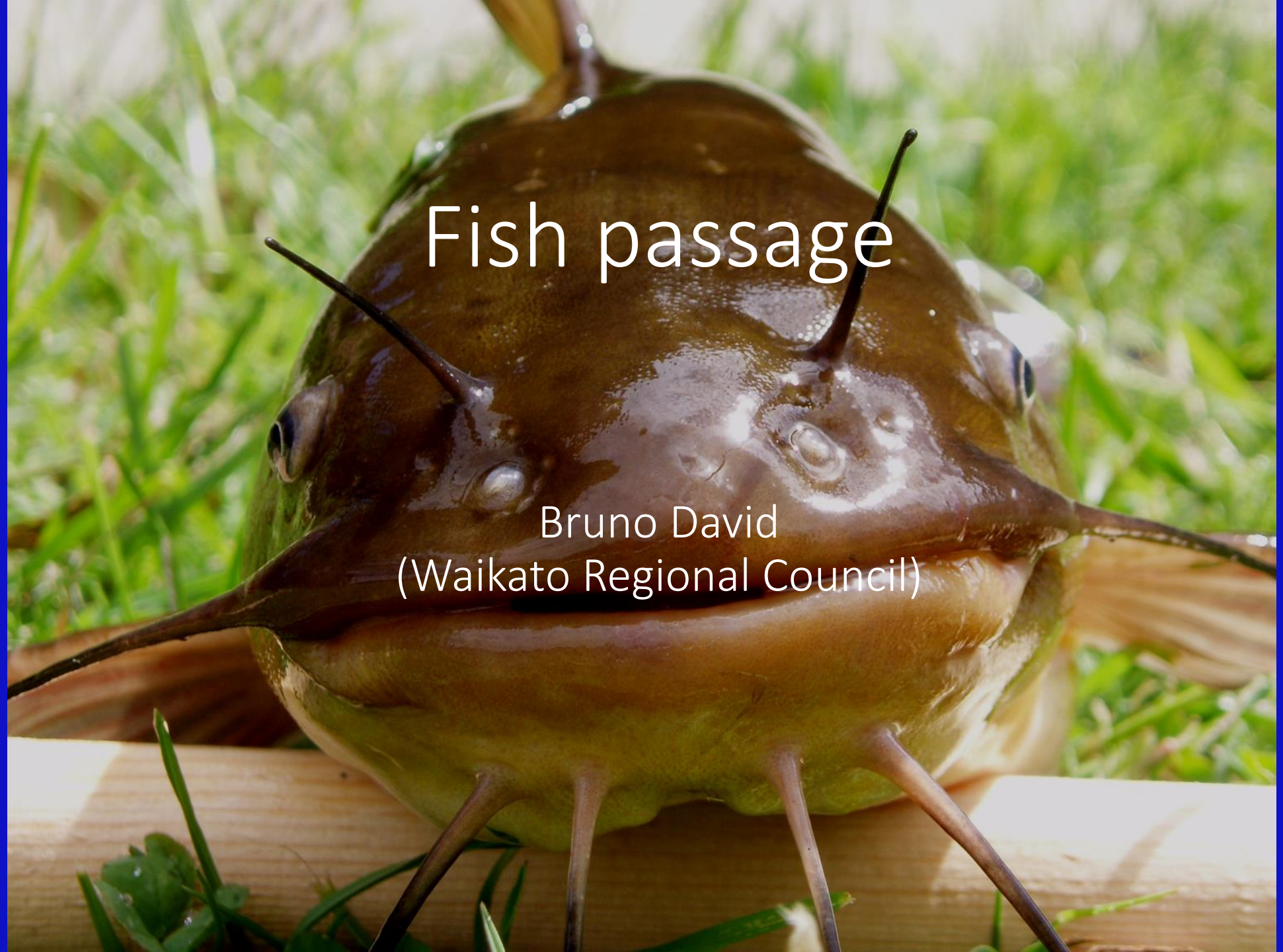
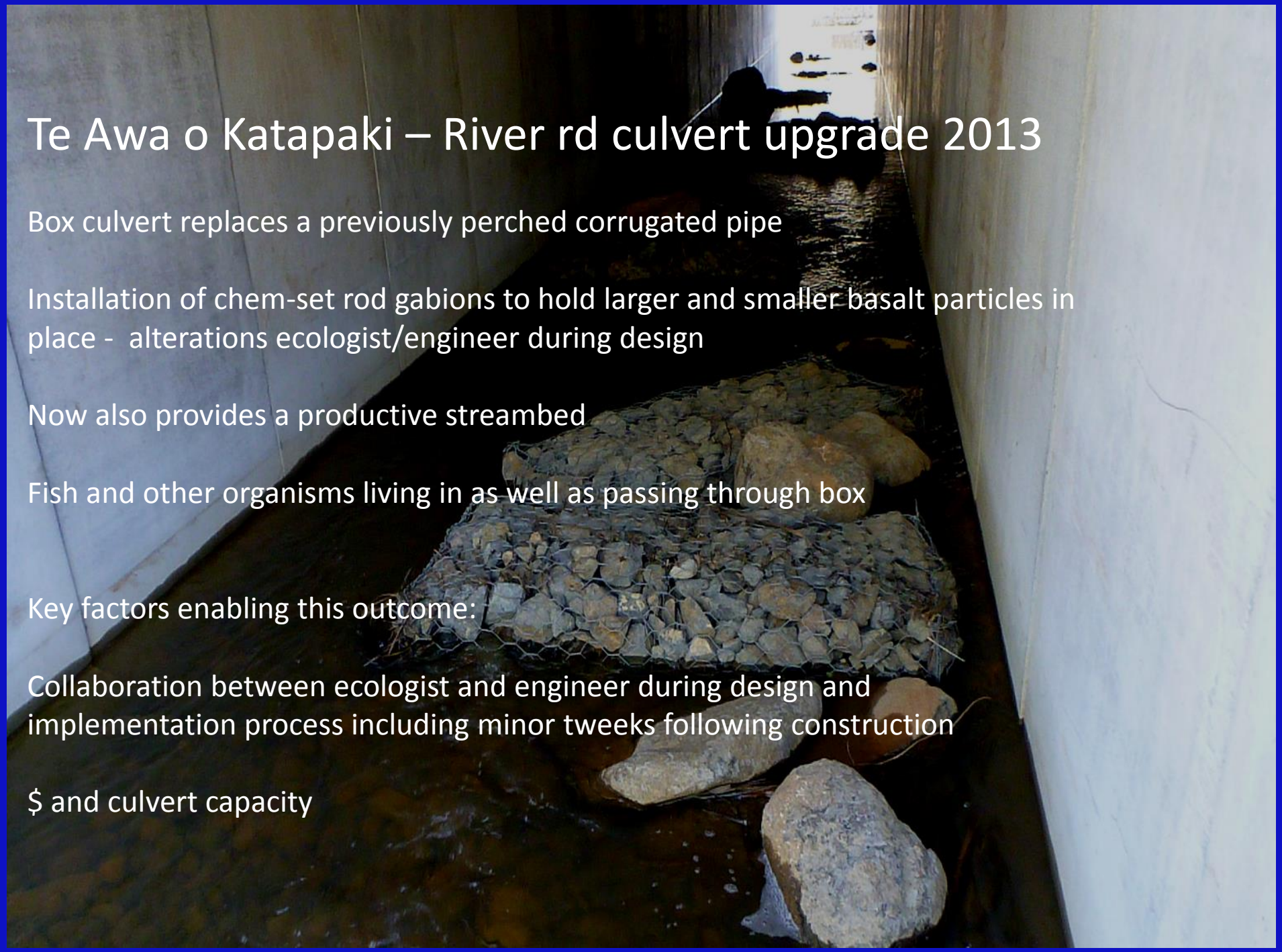


Fish passage

Bruno David
(Waikato Regional Council)

Common passage issues in Waikato

- Upstream migration barriers (e.g perched and or long culverts, v notch weirs, tide/floodgates)
- Downstream barriers (e.g pumpstations/major hydro dams)
- Enabling native fish passage while limiting invasive fish passage
- Incremental replacement of river network with pipes (reduced passage and bed productivity, higher erosion etc)



Te Awa o Katapaki – River rd culvert upgrade 2013

Box culvert replaces a previously perched corrugated pipe

Installation of chem-set rod gabions to hold larger and smaller basalt particles in place - alterations ecologist/engineer during design

Now also provides a productive streambed

Fish and other organisms living in as well as passing through box

Key factors enabling this outcome:

Collaboration between ecologist and engineer during design and implementation process including minor tweeks following construction

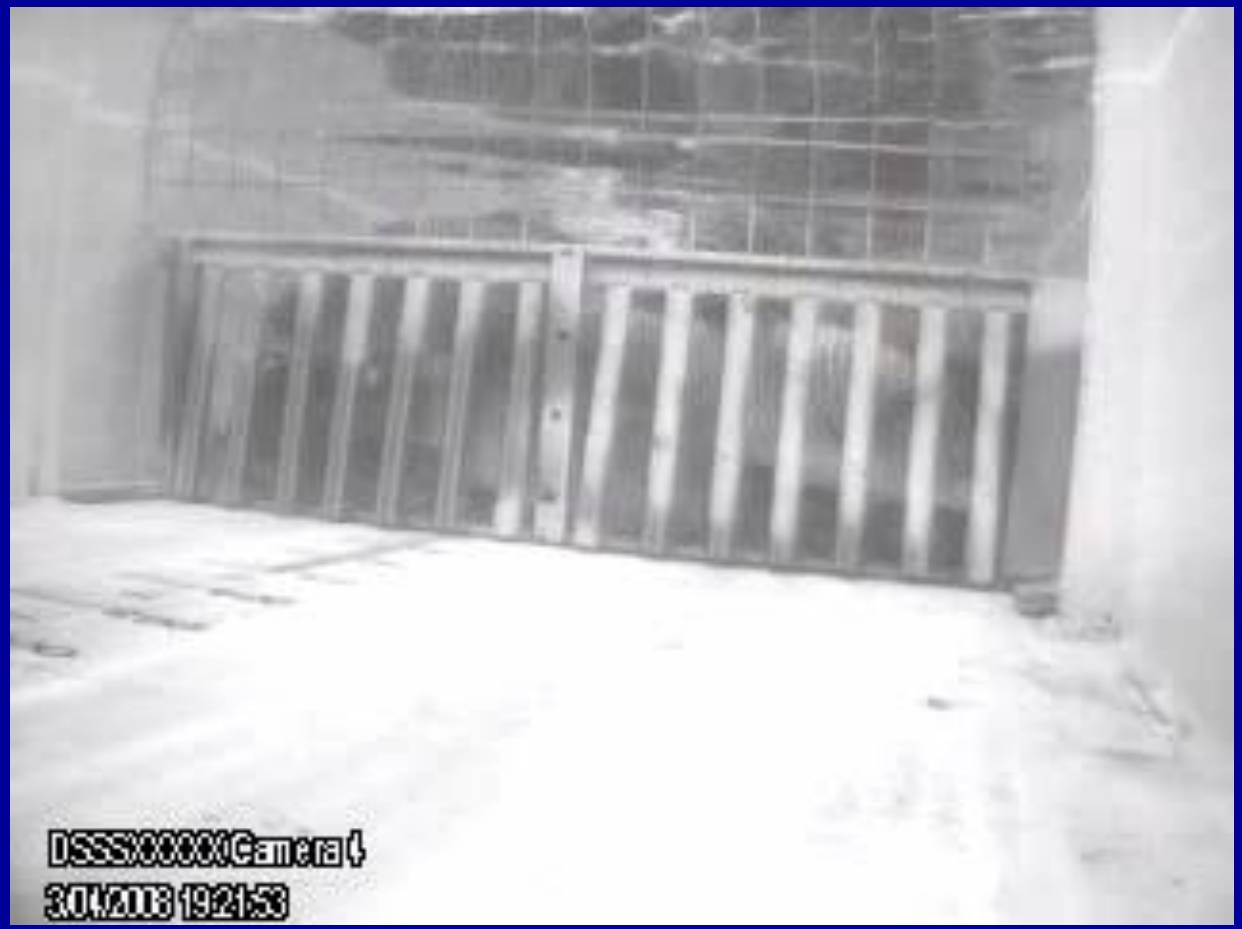
$ and culvert capacity

Masters student projects – Lake Waikare fish pass

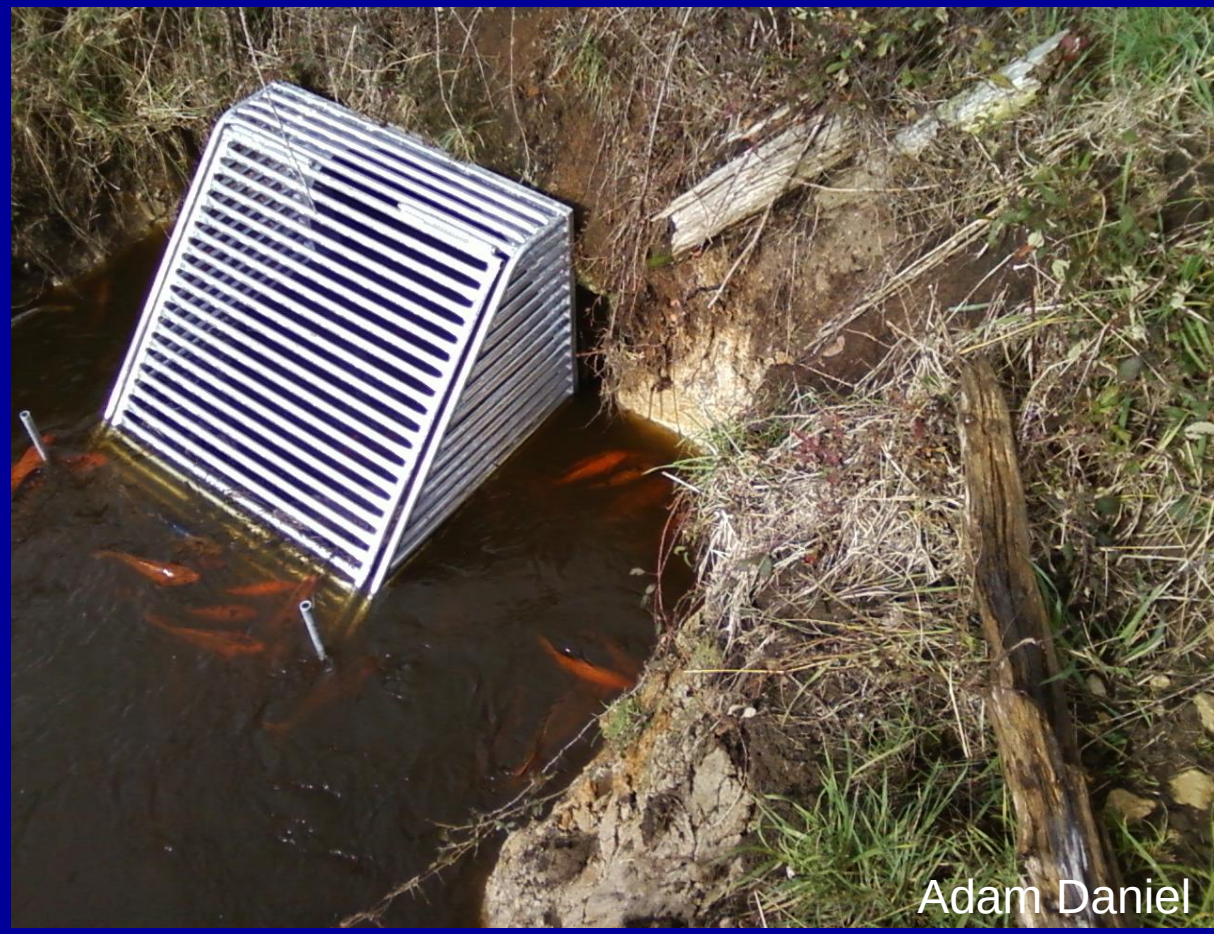
- Iain McKinnon (invasive fish) – measured + digested (+otolith samples)
- Holly Molesworth (native fish) – measured and released (+ select otolith samples)
- Identify key migration periods throughout year and r/ship to various env variables (flow,temp etc).
- Inform/optimise fish pass consent + info on key recruitment areas
- Monitoring movement upstream (through trap) and downstream (out of lake)

One way system for excluding/trapping invasive fish

Push trap footage – courtesy SARDI



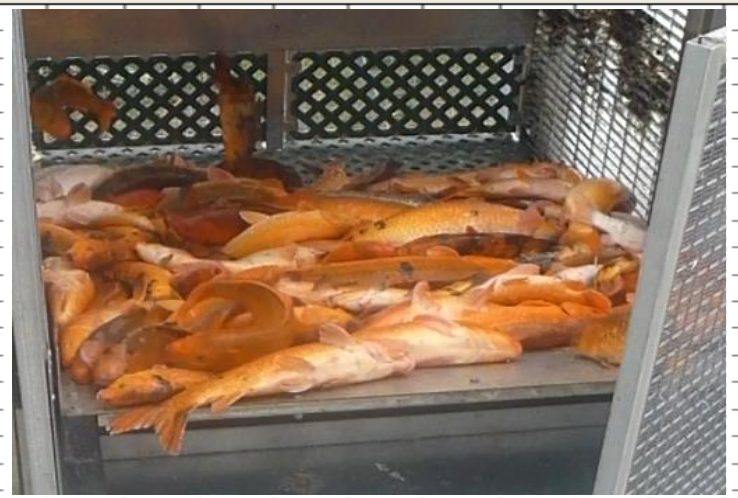
Lake ohinewai – exclusion



Automated carp/catfish gate – Lake Waikare

Carp/catfish counter - bars spaced to let native species through but count carp 300mm+

Txt message sent to arrange invasive fish removal from trap



General passage issues

- Still paucity of knowledge regarding effectiveness of different passage options, particularly for supporting upstream fish communities
- Setting appropriate mitigation and monitoring targets/conditions – some standardisation of effort and methods to ensure robust assessment?
- How to ensure long-term performance of structure for passage – e.g 5 yr assessment (esp for permitted structures?)
- Is monitoring some passage through structure itself enough (density dependence?) or should persistence of upstream fish communities be the focus of monitoring?
- How to involve engineers early in process/pathway for information transfer prior to consents being lodged – seems to be individual/relationship based

Issues cont..

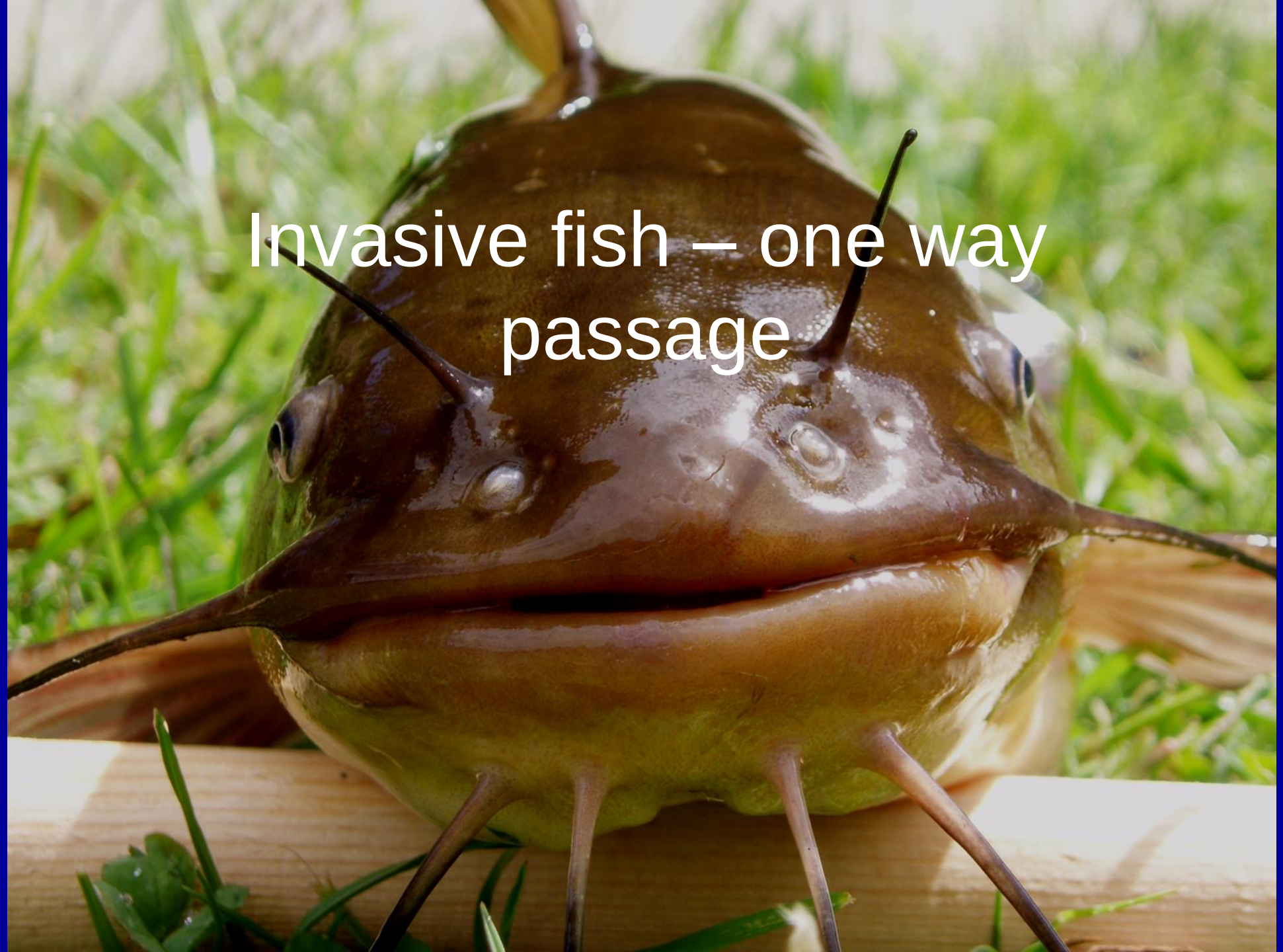
- How to replace or mitigate for lost productive streambed – max permitted culvert length otherwise exponential mitigation offset
- Is semi connectivity ok? E.g providing passage for upstream migrating juves only ?
- What about adult movement through river network in both directions? Mangauika e.g. – flood displacement and adult bottlenecking below structures
- Collaboration between engineers, ecologists, river geomorphologists prior/during/after works is rare but should not be
- How can incentives be used to encourage more favourable/recommended passage designs (e.g archway culverts/bridges) – Rangiriri/RONS e.g

Other recent work in Waikato

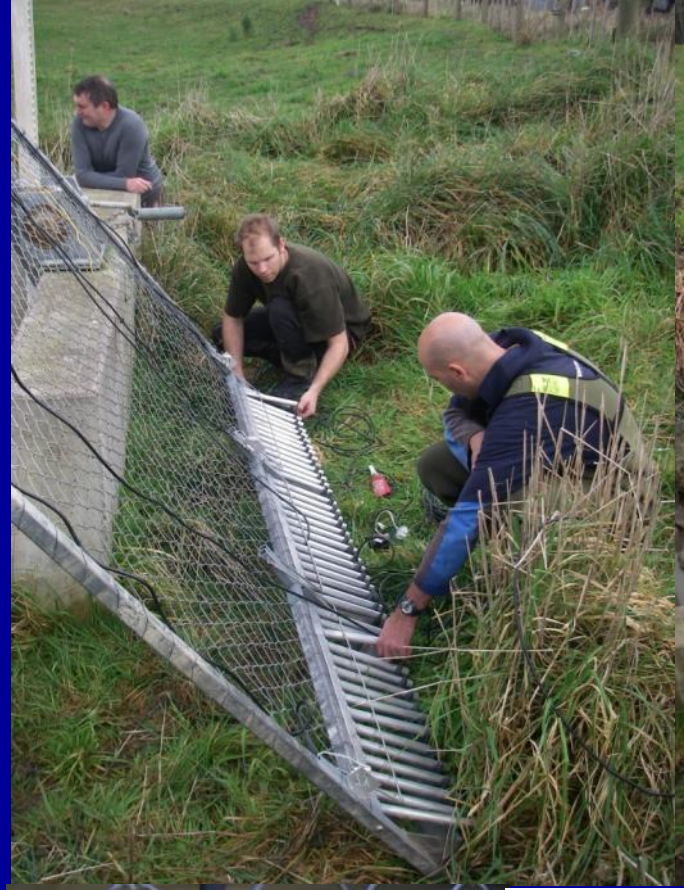
- Holly (masters) also undertaking pre-monitoring work above floodplain pump-stations (standardised fyke netting protocol) – possibly retrofit and test efficacy of recent graduated electric barriers to sites where mortality known.

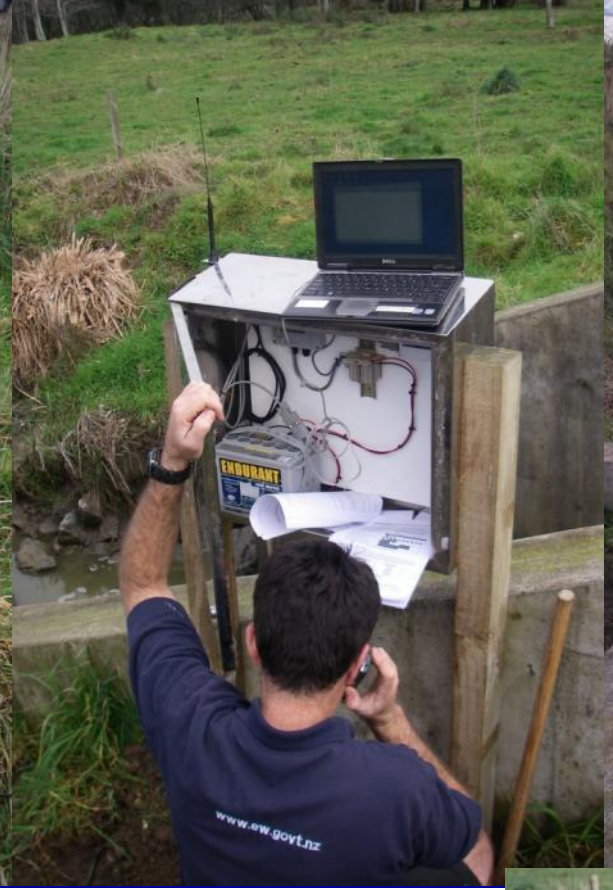
- Establishing priority sites for passage remediation within urban Hamilton and a pre post control monitoring programme to evaluate performance (HCC,T&T,WRC, NIWA)

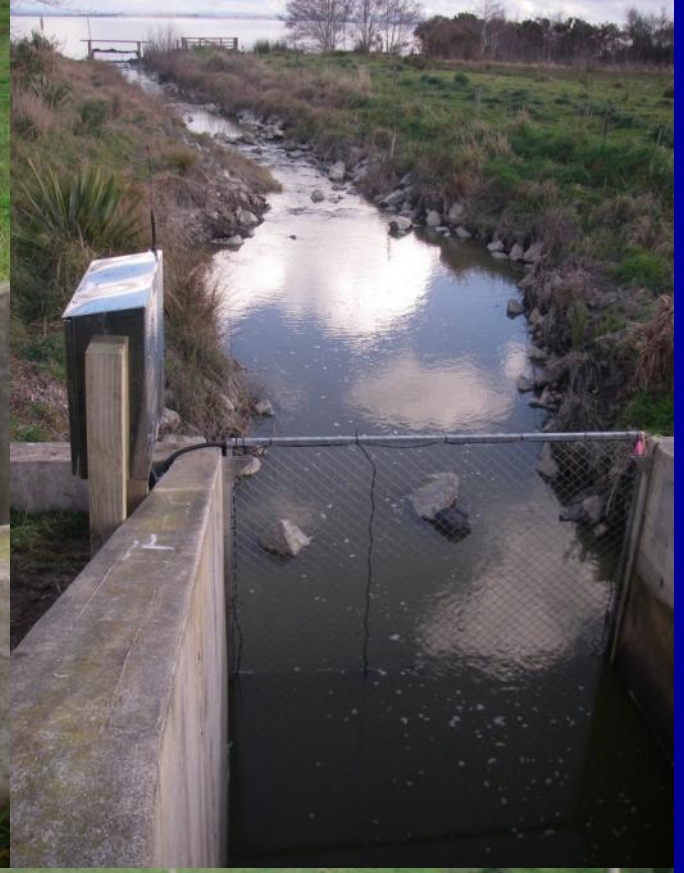
- Compliance with permitted activity rules – 60% non compliance for fish passage for culverts in catchments under 100 ha

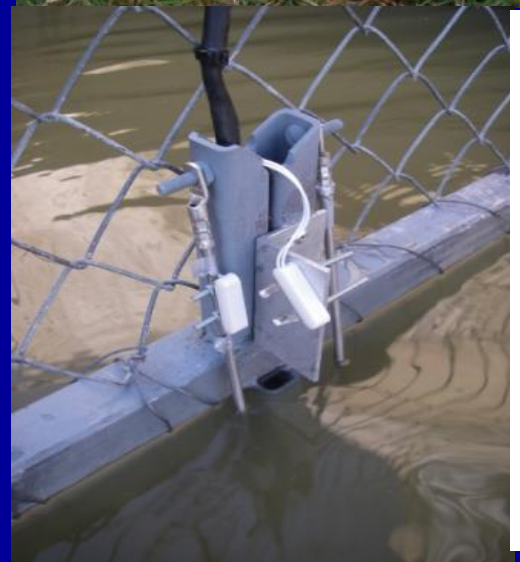


Invasive fish – one way passage









Koi Carp Counting Experiment in Progress

Please leave all fish in this stream section

If you do remove Koi Carp please record numbers and lengths in the notebook

Please contact Dave Byers on 0800 800 401 for more details

Waikato
REGIONAL COUNCIL