

Freshwater fish community – Brisbane Creek catchments

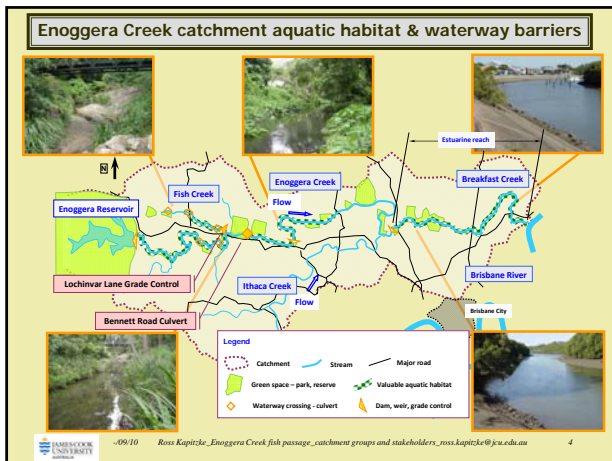
Native freshwater species

- Brisbane creek catchments – 18 species
 - ..eels (2), spangled perch, sea mullet, catfish
 - ..gudgeon (7), rainbowfish, smelt, blue eye
 - ..glass perch (2), goby, hardyhead (2)
- Moggill Creek – 17 species
- Cubberla Creek – 6 species
- Toowong / Sandy Creeks – 5 species
- Enoggera Creek – 9 species
- Bulimba Creek – 13 species

Exotic species

- ..Gambusia, Platy, Swordtails, Guppy
- ..Tilapia, Carp, Goldfish

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Enoggera Creek and Fish Creek – Culvert fishway projects

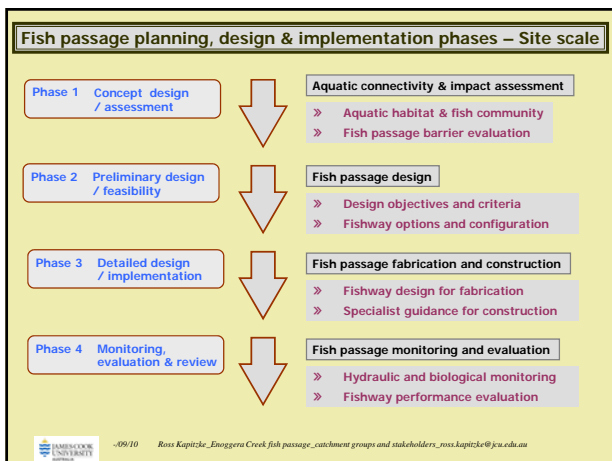
Objectives

- » Improve aquatic fauna connectivity for Enoggera Creek system
- » Establish prototype fishways for typical urban waterway structures
- » Provide fish passage demonstration sites for community and practitioners

Scope of work

- » Aquatic habitat and connectivity assessment for Enoggera Creek reaches
- » Fish migration barrier assessment and evaluation of mitigation options
- » Design, fabrication and installation of fishway facilities
- » Hydraulic and biological monitoring and evaluation of fishways

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Enoggera Creek: Bennett Road culvert fishway

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Typical hydraulic barriers at waterway crossing zones

Source: Kapitcke 2010, Culvert Fishway Planning and Design Guidelines

	Zone D	Zone C	Zone B	Zone A
High velocity	✓	✓	✓	✓
Flow depth	✓	✓	✓	✓
No shelter	✓	✓	✓	✓
Turbulence	✓	✓	✓	✓
Water drop	✓	✓	✓	✓

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Fish passage design for waterway structures – key requirements

Source: Kapitcke 2010, Culvert Fishway Planning and Design Guidelines

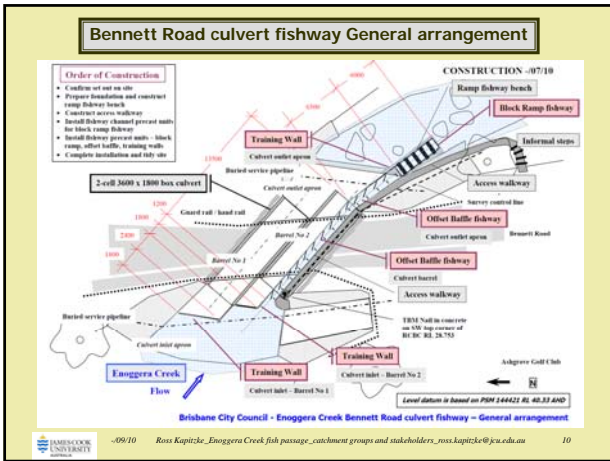
Fish passage

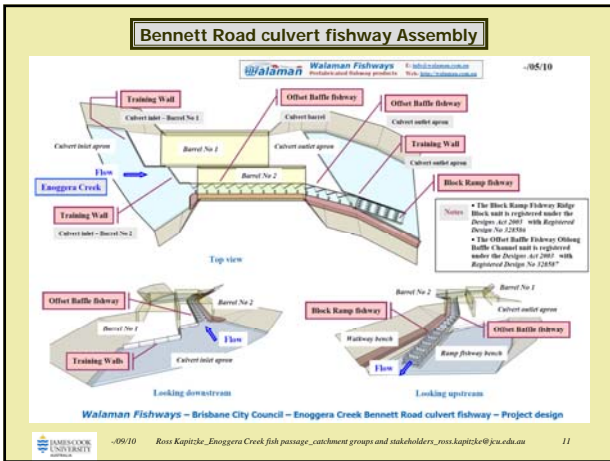
- » Provide for fish passage over range of fish migration flows in the stream
- » Provide suitable hydraulic conditions for fish – velocity, flow depth...
- » Provide flow continuity, fish pathway, attraction flows and exit conditions
- » Ensure adequate light and other suitable environmental conditions

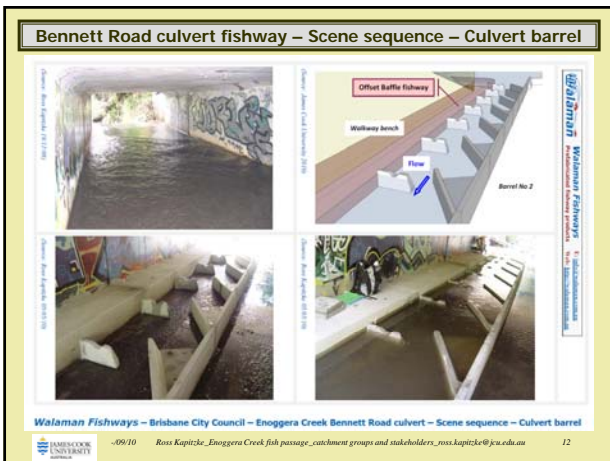
Drainage, utility, stream integrity, environmental values, amenity

- » Minimise obstruction to flow to not adversely affect flooding / drainage
- » Minimise effects of debris accumulation and sediment deposition
- » Prevent flood / erosion damage & maintain structure / waterway integrity
- » Maintain natural flow regime, geomorphic and ecological processes
- » Protect riparian and instream habitat and provide for fauna connectivity
- » Provide for monitoring, access and maintenance of fishway facility
- » Avoid public health problems, provide for safety, maintain amenity

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Bennett Road culvert fishway – Scene sequence – Culvert apron

Walamam Fishways – Brisbane City Council – Enoggera Creek Bennett Road culvert – Scene sequence – Culvert apron

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Bennett Road culvert fishway – Scene sequence – Outlet drop

Walamam Fishways – Brisbane City Council – Enoggera Creek Bennett Road culvert – Scene sequence – Outlet drop

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Fish Creek: Lochinvar Lane grade control fishway

Walamam Fishways – Brisbane City Council – Enoggera Creek Fish Creek: Lochinvar Lane grade control fishway

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Prototype fishway design, development and testing

University Creek, Townsville, north Queensland, Australia



Prototype #1 Discovery Drive offset baffle fishway



Prototype #2 Douglas Arterial Project rock ramp fishway



Prototype #3 Solander Road pipe culvert fishway



Prototype #4 Discovery Drive corner baffle fishway

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Offset baffle fishway for box culverts

Prototype #1 – Discovery Drive, University Creek

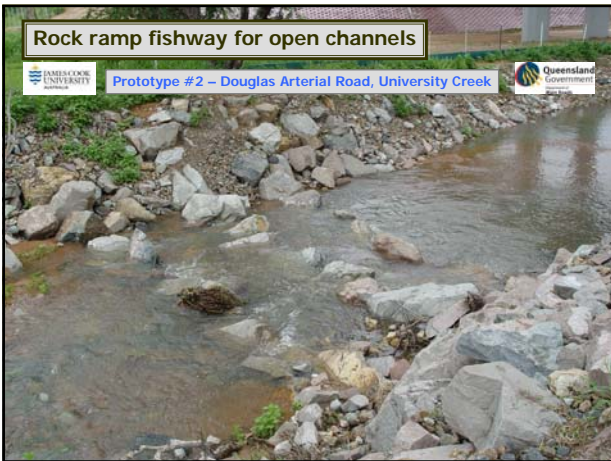


Corner "EL" baffle fishway for box culverts

Prototype #4 – Discovery Drive, University Creek





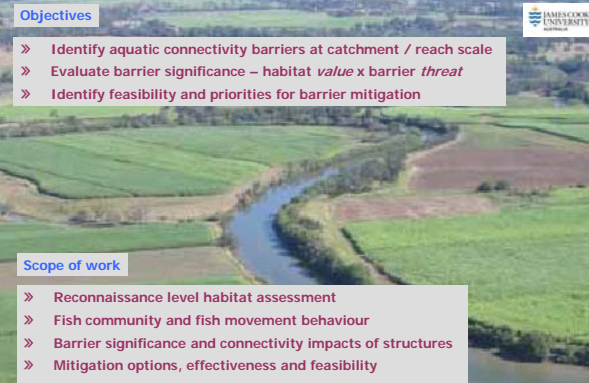




Aquatic connectivity impact assessment – Catchment / reach scale

Objectives

- » Identify aquatic connectivity barriers at catchment / reach scale
- » Evaluate barrier significance – habitat *value* x barrier *threat*
- » Identify feasibility and priorities for barrier mitigation



Scope of work

- » Reconnaissance level habitat assessment
- » Fish community and fish movement behaviour
- » Barrier significance and connectivity impacts of structures
- » Mitigation options, effectiveness and feasibility
- » Prioritisation for barrier mitigation

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Fish passage planning and design – Road corridor scale

Objectives

- » Identify fish movement corridor crossings of road corridor
- » Establish aquatic connectivity goals and design characteristics
- » Identify priority waterway crossings for fish passage (& integrated fauna)



Scope of work

- » Waterway character and fish habitat assessment
- » Fish species, fish movement behaviour and characteristics for design
- » Fish movement corridor locations and classification
- » Fish passage goals and prioritisation of corridor crossings
- » Mitigation design options for type crossings (and integrated fauna)
- » Optimising waterway crossing type and configuration

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Fish passage planning and design – Site scale

Objectives

- » Identify fish migration barriers at waterway structure
- » Establish fish passage and multipurpose design requirements
- » Define and evaluate fish passage (and integrated fauna) facility for site



Scope of work

- » Fish habitat, fish movement behaviour and characteristics for design
- » Fish passage barrier evaluation – hydraulic zones
- » Objectives, criteria and constraints for fish passage design
- » Fish passage options and evaluation for multipurpose requirements
- » Design configuration of fish passage (and integrated fauna) facility

Retrofit or new: Remediation of barriers at existing structures; Mitigation design for new structures

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