Fish passage planning and design – Scope of services

James Cook University School of Engineering and Physical Sciences provides professional services in planning and design for fish passage / aquatic fauna connectivity at small waterway structures. This includes consulting, research and development for government agencies, local authorities, NRM bodies, consultants and contractors for the scope of work and example projects outlined below.

Aquatic connectivity and impact assessment for waterways – Catchment/stream corridor scale

- reconnaissance level habitat assessment
- barrier significance and connectivity impacts
- mitigation options, effectiveness and feasibility
- prioritization for barrier mitigation

- Burdekin Dry Tropics NRM Region fish passage prioritisation – BDTNRM and Alluvium
- Toowong and Sandy Creeks connectivity impact assessment – Cubberla Witton Catchments Network

Fish passage planning and design for linear infrastructure – Road corridor scale

- waterway characterization and habitat assessment
- fish community assessment and fish movement
- classification of fish movement corridors
- fish passage provisions for priority crossings

- Tully Murray floodplain Bruce Highway Corduroy Creek to Tully – Dept of Main Roads and Maunsell
- Stuart Creek floodplain Townsville Port Access Road – Dept of Main Roads and Maunsell

Fish passage and multipurpose design for waterway structures – Site scale

- evaluation of hydraulic barriers to fish migration
- fish passage design objectives and criteria
- fish passage options and evaluation of suitability
- design and configuration of fish passage facilities

- Splitters Creek Heales Road box culvert fishway – Burnett Mary Regional Group & DPI Fisheries
- Daunia Mine New Chum Creek culvert fishway – BHP Billiton Mitsubishi Alliance and Bechtel

Field prototype and hydraulic laboratory testing and evaluation of fishways

- concept design of fishway facilities
- hydraulic laboratory testing and design evaluation
- design and construction of prototype fishways
- hydraulic & biological monitoring and evaluation

- University Creek Discovery Drive box culvert fishways – James Cook University and Qld DMR
- University Creek Solander Road pipe culvert fishways – James Cook University and Qld DMR

Design concepts, development and fabrication of fish passage devices

- design objectives and multipurpose requirements
- design and configuration of fish passage devices
- fishway suitability and performance evaluation
- fishway component design and fabrication

- Offset Baffle fishway for box culverts; Corner "Quad" baffle fishway for pipe culverts
- Block Ramp fishway for culverts and grade control; Corner "EL" baffle fishway for box culverts

Industry guidelines, peer review, practitioner training, and community collaboration

- planning and design guidelines for practitioners
- peer review of industry projects & consultancies
- specialist training for practitioners and managers
- community collaboration and demonstration sites

- Culvert Fishway Planning and Design Guidelines – JCU / Department of Transport and Main Roads
- Enoggera Creek Bennett Road box culvert fishway – Brisbane City Council and Queensland DLG

Fish migration barriers and mitigation of aquatic fauna connectivity impacts

Barriers to fish migration at road culverts, grade control and other waterway structures can severely deplete fish populations and alter fish species diversity within a catchment by obstructing migration to critical spawning or growth habitats. **James Cook University School of Engineering and Physical Sciences** designs fish passage facilities including baffled and ramp structures for installation at these sites to overcome hydraulic barriers (e.g. high velocities, water surface drop), and mitigate aquatic fauna connectivity impacts in the waterway.

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