



## River Science and Engineering

Rivers, streams and wetlands are highly sensitive and dynamic environments that provide vital life support functions to our ecosystems while also at times posing significant hazards and risks to our built environment. Tonkin & Taylor has a broad team of engineers, scientists and planners with specialist skills and wide experience in assessment and engineering of projects associated with rivers, streams and wetlands.

### Expertise

- Ecology
  - Environmental assessments of freshwater, marine and terrestrial areas including water and sediment quality
  - Resource consent applications and processing
  - Environmental monitoring for compliance with resource consent conditions
- Hydrological and hydraulic assessment
  - Hydrological and hydraulic modelling of rivers for flood and debris flow hazard assessment including effects of climate change and analysis of flood mitigation options
  - Hydrological analysis for water availability for water supply, irrigation and hydro
  - River morphology and sediment transport assessments
- Geotechnical engineering
  - Risk based stability assessments of existing stop banks and river banks
  - Site investigations and geotechnical assessment for design of river works
- River engineering
  - Flood mitigation works
  - Debris flow mitigation works
  - Sediment control works
  - Erosion control works
  - Wetland enhancement
  - Weirs and water off-takes
  - Diversion works and canals

- Culvert and bridge crossings
- Dams for water supply, water augmentation, flood detention and hydro projects.

### Experience

T&T has extensive experience in New Zealand, Asia, Africa and the Pacific.

#### Recent examples include:

- **Tauranga Taupo River Flood Mitigation Scheme** - This project involved assessment of the complex river morphology, hydraulic modelling and assessment of flood hazard, analysis of flood mitigation options including bank erosion works, stop banks, overflow spillways, resource consent applications and consultation, detailed design and construction management of the works
- **Tongariro River Flood Protection Scheme** - This project involved a similar scope to the Tauranga Taupo project with constructed works including erosion control measures, stop banks, flood walls and gravel management in the river bed
- **Piriaka Water Intake Enhancement** - Assessment and design of remedial works to the intake on the Upper Wanganui River for the Piriaka hydropower scheme
- **Mangakotukutuku Stream Diversion** - Detailed design of new stream channel with enhanced environmental characteristics to facilitate open cast mining beneath the original stream bed
- **Matata Debris Flow Remedial and Mitigation Scheme** - Detailed morphological and hydrological assessment of the Matata Debris flow event (May 2005). Analysis of options for mitigation of future flood and debris flow events. Detailed design of works including culvert upgrades, debris diversion bunds, erosion protection works, and debris containment works including a large debris flow barrier net for the Awatarariki Stream.

