Fishway and turtle passage

The Coordinator-General has completed his evaluation report for the Traveston Crossing Dam Stage 1. This information sheet has been prepared as a brief summary and guide only. It is not a complete re-statement of the report. For the full report, visit www.dip.qld.gov.au. For further information about the project visit www.qldwi.com.au.

Passage for aquatic animals—fishway and turtle passage

In general, fish, turtles and other aquatic species need to travel up and down a river system in order to breed/spawn and feed. It's also important to allow genetic interchange between populations which may be located in different parts of a river system.

How far animals move in a river system depends on the specific needs of each species. Some water-dwelling species may only have a small range for their entire life, while others may move large distances at different stages of their lives.

To ensure the dam wall does not become a barrier that limits movement of species in the Mary River, the Coordinator-General has required a fishway and turtle bypass system to be built. This will allow aquatic animals to move from one side of the dam wall to the other[i]. The proponent has committed to developing this system.

Measures to avoid a barrier effect

In the project's environmental impact statement (EIS) and supplementary EIS, the proponent committed to a complex and robust plan for avoiding a 'barrier effect' from the dam wall. The multi-tiered approach includes:

- installing an effective fishway
- developing and implementing a rigorous monitoring program for lungfish and Mary River cod and an adaptive response program if identified outcomes are not being met
- 'catch and carry' for lungfish and cod as a back-up method of allowing movement, only if absolutely necessary
- conservation stocking for lungfish and Mary River cod as a back-up method if necessary to support the species' presence in the Mary River
- installing an effective turtle bypass, specifically designed to allow turtles to move past the dam wall
- developing and implementing a rigorous monitoring program for turtles and an adaptive response program where identified outcomes are not being met
- 'catch and carry' for Mary River turtles as a back-up method of allowing movement, if necessary
- collecting and incubating turtle eggs and releasing hatchlings as a back-up method if necessary, to support the species in the Mary River.

Fishway technology

Fishways are engineered and constructed to allow fish to move past the dam wall. Fishway technology is now significantly advanced—fishway design is regarded as a predictable science and an innovative approach to protecting fish in their natural habitat, and no longer regarded as an inconsistent experiment.[ii]

The multi-tiered approach does not rely only upon the fishway being effective. It also requires other actions to be implemented as secondary or 'insurance' actions for threatened and endangered species.

The proponent indicated in the project's environment impact statement that they would consider making improvements for fish passage at another waterway barrier in the catchment. This would act as an offset measure to improve the connectivity of water habitat for fish and other animals in the Mary River.

Performance specifications

The Coordinator-General has considered the proponent's fishway and turtle bypass approach and the requirements for species within the Mary River. He has set stringent performance specifications on how these bypass systems will be designed and operated.

For example, fish passage in both directions across the dam wall must be maintained whenever water is released from the dam (in accordance with dam operating rules to satisfy the Coordinator-General's imposed conditions for flow performance indicators)[iii].

The Coordinator-General has also established a set of transparent rules for when fish passage is not required at the dam. These include:

- an initial commissioning period of 60 days
- 15 days per calendar year for breakdown/maintenance activities
- during flood events (to protect the bypass systems).

The Coordinator-General also requires the proponent to conduct pre-construction trials for both the fishway and turtle bypass systems. These trials will inform the best possible designs for the bypass systems.

In addition, the Coordinator-General requires one additional fishway and one additional turtle bypass be provided at another waterway barrier within the Mary River system.

The Coordinator-General's imposed flow performance indicators have been developed to ensure that when water is released from the dam, in accordance with the dam operating rules, native fish species are supported in moving across the dam wall. This will apply for both large bodied (e.g. Mary River cod, lungfish) and small-bodied (e.g. gudgeon) fish.

For example, the mandatory flow performance indicators have been developed to ensure that when water is released from the dam, a sufficient depth is maintained below the dam to enable small fish to move freely at least 97 per cent of the time.

The rules for operation of the dam must be designed to meet the Coordinator-General's imposed flow performance indicators. These flow performance indicators are outlined in Condition 8, Schedule C, Appendix 1 of the Coordinator-General's Evaluation Report.

Other conditions as set by the Coordinator-General will support improved connectivity of water habitat for aquatic species in and around the dam. For example, the proponent is required to:

- improve the regularity of downstream flows in low-flow months (condition 8)
- improve water quality (condition 9)
- restore and protect new water-side habitat areas and reintroduce 'snag' habitat in key locations of benefit to endangered and vulnerable species (conditions 4 and 5 of schedule C)—this will make the project area more attractive to native species and aid the movement of native fish and turtle species through the area and beyond
- support research (and, where relevant, implement the outcomes) to improve the effectiveness of measures being taken to reduce impact of the project, such as the fishways and turtle bypass measures (condition 11).

[i] Conditions 22 and 23 of Schedule C Appendix 1 and Schedule A Appendix 1 (Operational works that is constructing or raising waterway barrier works

[ii] Howland, Jackson and Mallen-Cooper (2008), Fishway Effectiveness for High Dams

[iii] Condition 8 Schedule C Appendix 1

Department of **Infrastructure and Planning**
PO Box 15009 City East Qld 4002 Australia
tel +61 7 3227 8548
fax +61 7 3224 4683
info@dip.qld.gov.au

www.dip.qld.gov.au