

Environmental water needs for the Mitchell River

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Northern Australia
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National Environmental Science Programme

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This research is supporting water planning and floodplain management in the Mitchell River catchment through increasing our understanding of the links between river flows, flooding and ecosystem assets such as fish and fisheries.

What's new?

- We've made three field trips to the Mitchell River:
 1. In February 2018 we met with Kowanyama Aboriginal Land and Natural Resource Management Office rangers about the upcoming field work
 2. During our April–May 2018 field trip we met with the Kowanyama Council of Elders and the Kowanyama Aboriginal Land & Natural Resource Management Office (KALNRMO) rangers, to collect data to map primary production and connectivity. We also spent time with students from Kowanyama State School's Junior Ranger Program. The students were introduced to scientific concepts and shown how knowledge gained from scientific research might complement traditional knowledge to help manage country
 3. The June 2018 field trip focused on the floodplain to collect habitat and ecological community composition data to complement similar field work completed over two field trips in 2017 in other parts of the catchment.
- We've been collecting samples to analyse the quality of different food sources within the Mitchell River food web. Some samples will be analysed for bulk stable isotopes to answer the question of who in the ecological food web is eating what and where. Others will be analysed for fatty acids concentrations to quantify which species are eating high quality food and how the food is being used e.g. for growth, reproduction or to ride out the dry season.
- Using laser ablation (this shows the chemical composition of bone structures), we analysed barramundi otoliths (ear bones) from the Qld Department of Agriculture & Fisheries library to understand where fish spend different stages of their lives. We also analysed over 300 otoliths collected from the Mitchell River during 2018 to understand how different fish species move around the river and floodplains and therefore the 'connectivity' of the broader catchment.

- We generated metrics for catch/effort, year-class strength and catch-at-age for the fish catch from the Mitchell River. The metrics are now ready for analysis against the Northern Australia Water Resource Assessment (NAWRA) modelled end-of-system flow models.
- Connectivity models for Mitchell River floodplain are in development based on CSIRO floodplain inundation data. We will use these models in our final report on the implications of development on Mitchell River's floodplain ecosystems.

What's next?

- We'll use the fish otolith movement data to develop the final models of how fish move through the catchment.
- We will also use this data to complement the analyses of food webs in the Mitchell River.
- A wet season field trip to the floodplain is planned for between January and March 2019 to collect samples for further food quality analyses.
- We hope to work with the Kowanyama State School and KALNRMO rangers to develop an educational resource for students.
- We'll report on the potential implications of development on floodplain ecosystems in the Mitchell River.



The Mitchell River's floodplain wetlands provide critical food and habitat, photo NERP Northern Hub.



Electrofishing helps us gather data about fish populations and growth in the river, photo Doug Ward.

Project summary

This research will improve our understanding of the critical flow needs to sustain freshwater ecosystems in the Mitchell River catchment. In particular, the project aims to predict the impacts of future development on important ecosystem linkages between the river and its floodplain wetlands, and to better understand other potential risks associated with changes to flow regimes. This information is vital to help inform decision-makers about water allocation that both enables agricultural development and protects environmental assets.



This project focuses on the Mitchell River catchment.



Rocky riffle on the Mitchell River, photo Peter Negus.

Further information

Contact project leaders, Stuart Bunn at s.bunn@griffith.edu.au or Ben Stewart-Koster at b.stewart-koster@griffith.edu.au

The project page can be found on the [Hub website](#), along with the [project start-up factsheet](#).

This project is due for completion in September 2020.



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