



The Roper River Water Resource Assessment

CSIRO has completed, for the Australian Government, an investigation of the opportunities and risks of water resource development in the catchment of the Roper River in the Northern Territory.

The Roper River Water Resource Assessment seeks to enable informed decisions relating to resource management and sustainable regional development in the Roper catchment. Like much of northern Australia, the catchment is data poor. In this Assessment, new baseline data were collected on the soils, water, broader environment and people who live in the Roper catchment, which will enable informed regional-scale and on-country planning.

The Assessment provides an independent source of fundamental information on the feasibility, economic viability and sustainability of potential water developments in the catchment.

The Roper River catchment

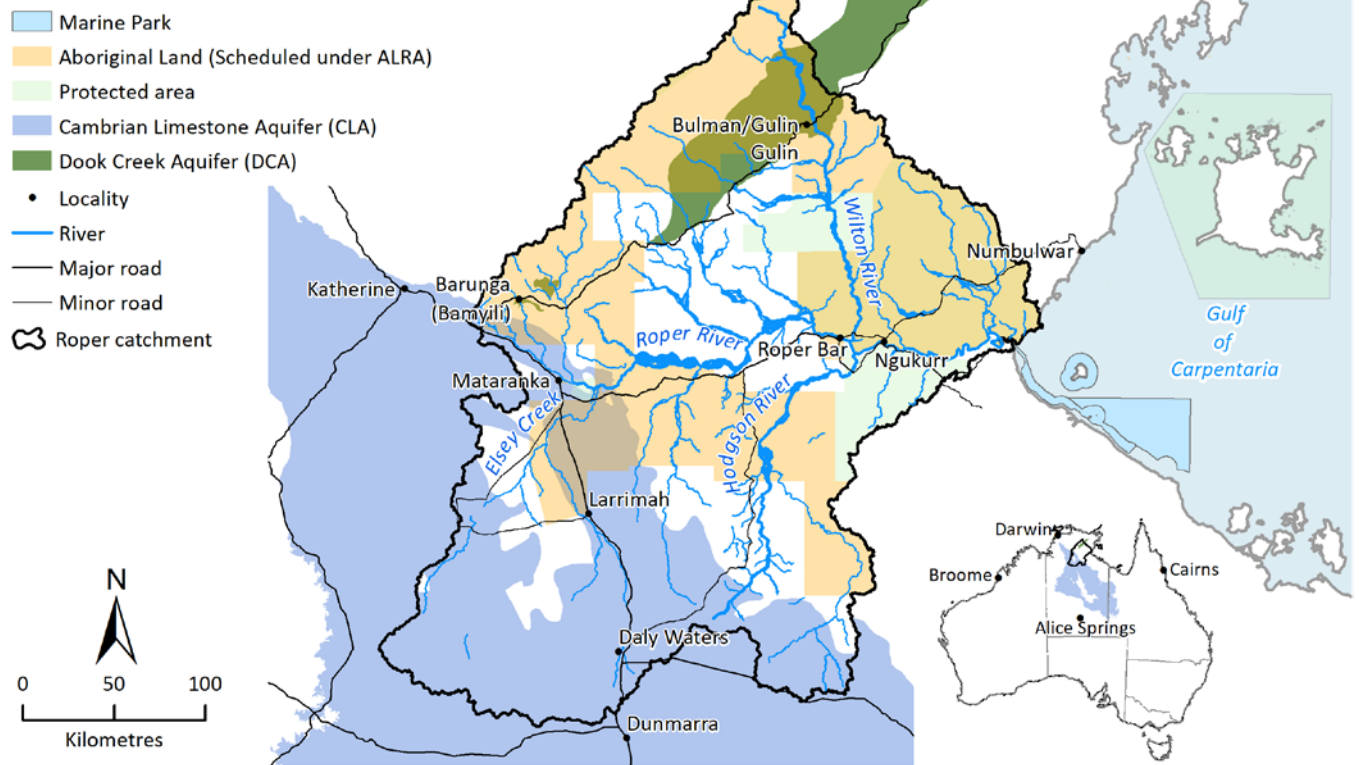
Although the Roper catchment's climate is hot and semi-arid, the Roper River has the third-largest median annual discharge (4341 GL) of any river in the Northern Territory and the fifth largest in northern Australia. The Roper River, although not pristine, has many unique characteristics and valuable ecological assets which support existing industries such as commercial and recreational fishing and extensive cattle grazing. Flowing into the Gulf of Carpentaria, the river is unique among northern Australian rivers in having extensive braiding in its mid-reaches coupled with large dry-season flows, which are derived from the regional-scale

Cambrian Limestone Aquifer (CLA). Like many parts of the Northern Territory, a large proportion of the Roper catchment is covered by Aboriginal freehold land under the *Aboriginal Land Rights (Northern Territory) Act 1976* (ALRA). Indigenous peoples have continuously occupied and managed the Roper catchment for tens of thousands of years. They retain significant and growing rights and interests in land and water resources, including crucial roles in water and development planning and as co-investors in future development.

Overview of the Roper catchment

- The Roper catchment has an area of approximately 77,400 km² and flows into the western Gulf of Carpentaria.
- Aboriginal freehold land comprises 45% of the catchment area and commercial livestock grazing 46%.
- Dryland and irrigated agriculture each comprise 0.02% of the land area, and mining occupies less than 0.01%.
- The catchment has a population of approximately 2500 people, of which about 73% are Indigenous Australians.
- There are no major urban centres.
- The river has some unique characteristics and some important ecological assets.
- Existing annual groundwater licences in the catchment total about 33 GL, and licensed surface water extractions total about 0.1 GL.

The Roper catchment



What the Assessment found

The climate of the Roper catchment is suitable for a wide range of annual and perennial horticulture and broadacre crops and forages. The regions in the catchment with the greatest potential for irrigated agriculture are the 'riverless' Sturt Plateau in the south-west of the catchment and the alluvial clay soils found on river frontages along the Roper River and its major tributaries. The opportunities and risks of development in each of these regions are starkly different.

The absence of reliable surface water on the Sturt Plateau means that water would need to be sourced from the regional-scale aquifer (CLA) that underlies much of the plateau. The magnitude of the inputs and outputs to the groundwater balance for the CLA suggest it is possible to extract between 35 and 105 GL/year depending on community and government acceptance of impacts to groundwater dependent ecosystems and existing groundwater users. This would be sufficient water to irrigate between 5,000 and 17,000 ha, potentially generating between \$150 million and \$500 million in increased annual economic activity and between 100 and 340 full-time equivalent jobs.

Along the river frontage country of the Roper River and its major tributaries, it is physically possible to irrigate up to 40,000 ha (0.5% of the catchment area) of alluvial clay

soils in 75% of years by pumping and/or diverting about 660 GL/year of water from these rivers into offstream storages such as ringtanks. This would reduce median annual streamflow by about 35% at Roper Bar and 15% at the end of the system, where the river meets the Gulf of Carpentaria. Changes in the flow regime can have profound effects on flow-dependent flora and fauna and their habitats and these changes may extend considerable distances onto the floodplain and downstream, including into the marine environment. Compared with the red loamy soils of the Sturt Plateau, the alluvial clay soils have higher water-holding capacity and are better suited to furrow irrigation. However, poor drainage, especially in the wet season, limits their use to irrigated broadacre crops and forages during the dry season. The area of the alluvial clay soils, if fully developed, could potentially generate up to \$350 million in increased economic activity annually and about 240 full-time equivalent jobs.

Irrigated agriculture and aquaculture in the Roper catchment are only likely to be financially viable when good prices for high value crops align with market advantages, which makes achieving scale challenging. Other factors influencing such development include the presence of suitable markets for the products, investment in fundamental infrastructure such as all-weather roads and bridges to access land north of the Roper River, and land tenure arrangements.

THE ROPER RIVER WATER RESOURCE ASSESSMENT WAS PREPARED BY CSIRO FOR THE NATIONAL WATER GRID



Australian Government



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