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GISERA | Gas Industry Social and Environmental Research Alliance

Breeding response of focal threatened species to a resource pulse in the Cooper Basin

CSIRO researchers are taking advantage of recent major flooding in the Cooper Basin to capture information on important breeding sites of significant bird species.

Key points

- The aquatic systems of the Cooper Basin support a diversity of flora and fauna, including many threatened species.
- In April 2024, CSIRO established a project to identify drought refuges of focal threatened species in the area.
- However, significant rain events and flooding in 2025 have transformed the environment, and a project focused on drought refuges is no longer possible.
- Researchers have revised the project to instead focus on the habitat of a subset of the focal species during periods of high productivity – in particular, bird breeding habitat.
- This is a unique and exciting opportunity that will combine desktop and field-based approaches to capture data that can only be collected during rare, large-scale floods.

This project, conducted through CSIRO's Gas Industry Social and Environmental Research Alliance (GISERA), was initially established to identify key drought refuge areas for terrestrial species in the Cooper Basin.

Pastoralists, traditional owners, conservationists and the broader community all have a strong interest in protecting the environmental values of the Cooper Basin.

Recent major flooding in the region, the effects of which are expected to last for up to 18–24 months, has required researchers to pivot and instead focus on the breeding response of focal bird species in this changed environment.

The Cooper Basin

The Cooper Basin covers about 130,000 square km and incorporates parts of Queensland, South Australia, and New South Wales.

The basin is highly prospective for the development of unconventional gas resources, and in 2017, the Cooper Basin was announced as the first region selected for assessment under the Geological and Bioregional Assessment Program.

The user panel for this program noted the positive economic and social contributions of the petroleum and gas industry, but also agreed that careful management would be required to protect the region's unique environmental and cultural values.



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The map displays the Cooper Creek region, highlighting water depth (mm) and model areas. The legend indicates water depth ranges from >5.0 mm (dark blue) to 0-0.05 mm (light blue). Model areas are color-coded: Model area 1 (yellow), Model area 2 (orange), and Floodplain (red). Infrastructure includes stream gauges (triangles), railways (black lines), watercourses (blue lines), roads (red lines), lakes (light blue), and the Cooper GBA region (green outline). The map also shows state boundaries (SA, NSW, QLD) and an inset map of Australia.

A unique opportunity

Ecological productivity in the region is strongly tied to episodic flooding, which initiates short-lived but intense 'boom' periods that are not predictable over time.

In response to these changed environmental conditions, CSIRO researchers have revised an existing GISERA project to focus on the habitat and breeding activity of a subset of focal species – specifically, the grey grasswren, letter-winged kite, plains wanderer and yellow chat.

Revised project aims

The revised project has three primary aims, all focused on understanding the ecological dynamics of focal bird species during a period of exceptional resource availability in the Cooper Basin.

ONE: Identify and characterise important breeding sites for a subset of the original focal species list. An initial shortlist of 36 candidate species was refined to six focal species: four birds (grey grasswren, letter-winged kite, plains wanderer and yellow chat) and two small mammals (kowari and kultarr).

Given the timing of the study, the two mammal species have been excluded from the revised project. Their populations typically respond to flooding with a time lag of up to nine months, which falls outside the current research window.

TWO: Assess the presence and impact of threatening processes during the breeding season. Key threats include feral predators such as cats and foxes, invasive herbivores such as pigs, goats and horses, high cattle stocking rates, and the spread of invasive plants. Understanding these pressures during boom conditions is essential for future conservation planning.

THREE: Examine habitat condition during flooding, with a focus on grey grasswren habitat in lignum swamps – areas likely to show the most pronounced boom–bust contrast.

Research results will contribute to improved understanding and management of threatened species habitat under both boom and bust scenarios, strengthening long-term conservation planning for the Cooper Basin.

More information

Learn about other GISERA research in Queensland

Find out about GISERA's other biodiversity research



GISERA is a collaboration between CSIRO, Commonwealth and state governments and industry established to undertake publicly-reported independent research. The purpose of GISERA is to provide quality assured scientific research and information to communities living in gas development regions focusing on social and environmental topics including: groundwater and surface water, greenhouse gas emissions, biodiversity, land management, the marine environment, and socio-economic impacts. The governance structure for GISERA is designed to provide for and protect research independence and transparency of research.