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Make Australian Wetlands Wet Again:

The Large-scale Restoration of the Indigenous-managed Gayini Wetlands | Jan Kreibich

At the lower end of Australia's second longest river, the Murrumbidgee, lies a remarkable jewel, spanning 88,000 hectares on the nationally significant Lowbidgee Floodplain – the Gayini Wetlands. This natural mosaic of waterways, with lush vegetation when the river floods, creates a breathtaking spectacle of myriads of waterbirds. It stands as an oasis in this primarily dry landscape.

In this land of stark contrasts, the semi-arid climate intertwines with the rhythm of nature's floods, crafting an ecosystem of tremendous diversity. Here, one can wander through one of Australia's largest expanses of lignum shrublands (*Duma florulenta*), marvel at the towering river red gum forests (*Eucalyptus camaldulensis*) and lose oneself in the intricate black box woodlands (*E. largiflorens*). It also provides a haven for threatened native fish, such as Murray cod (*Maccullochella peelii*) and the endangered Southern bell frog (*Litoria raniformis*). It hosts extensive rookeries where waterbirds such as royal spoonbills (*Platalea regia*), glossy ibis (*Plegadis falcinellus*) and straw-necked ibis (*Threskiornis spinicollis*) breed.

Returning Nari Nari Country

For over 50,000 years, the Gayini has also been a cradle of Indigenous history. Among its trees and tranquil waters lie hidden treasures of the past: scarred trees, stone artifacts, and burial sites. It is a rich cultural landscape, connected and enduring for the Nari Nari people. The abundance of these cultural sites underscores the profound importance of Gayini, not just as a natural wonder, but as country with a long First Nations history.

Tragically, the 1840s marked a turning point, as European colonisation brought upheaval. The Nari Nari were uprooted from their ancestral lands, a loss immeasurable in its impact, severing deep-rooted connections with their Country. The fertile plains of Gayini were reshaped into agricultural lands, altering the landscape that had been nurtured for millennia.

A new chapter began a decade ago when the New South Wales and Australian Governments took a significant step: they invested $180 million to acquire the farming properties on the floodplain, aiming to restore Gayini's ecological balance. Then, in a historic moment in December 2019, the Gayini Wetlands were rightfully returned to their traditional custodians – the Nari Nari Tribal Council. However, the land that greeted the Nari Nari was a shadow of what it once was – a landscape awaiting significant healing.

An Australian pelican (*Pelecanus conspicillatus*) colony in the Gayini Wetlands. Image: Annette Ruzicka.

A River Running Dry

For millennia, the Gayini Wetlands followed the rhythm of nature's pulse. The untamed and free river frequently bestowed life with its regular but variable floods. This natural drying and wetting cycle created a dynamic 'boom-and-bust' environment, sustaining a high biodiversity in the wetlands. But today, the once bountiful floods have dwindled, stifled by the grip of human progress. Upstream, a network of twenty-six major reservoirs, like the Burrinjuck Dam and the Snowy Mountains Hydroelectric Scheme, hold the river's flow in check, diverting its waters from its freshwater ecosystems.

This transformation has cast a long shadow over Gayini. The wetlands now lie fragmented and parched. At least 80 percent of the wetland's former glory in this altered landscape has already been lost or critically damaged. The impact of this change echoes through the ecosystem: once a thriving and vibrant community, waterbirds have seen their numbers plummet alarmingly. From 1983 to 2001, their populations have nosedived by 90 percent, a stark indicator of the fragility of this ecosystem under strain.

Reviving the Pulse of Gayini

In a groundbreaking collaboration, the Nari Nari Tribal Council, The Nature Conservancy, the Murray Darling Wetlands Working Group, and the Centre for Ecosystem Science at the University of New South Wales Sydney have joined forces to breathe new life into the Gayini Wetlands. Supported by government and philanthropic funding, this ambitious initiative aims to reconnect the broken bond between the river and its floodplain, restoring this once-magnificent ecosystem.

In the context of this broader initiative, my PhD research is dedicated to diving deep into the past, unravelling the intricate ways river regulation has affected water availability to the wetlands, and peer into the future, anticipating the challenges posed by climate change. Collaborating with an interdisciplinary team of renowned ecologists, hydrologists and cultural anthropologists, my overarching goal is to contribute valuable insights to environmental flow management for the large-scale restoration of the Gayini. This approach seeks to channel water from reservoirs back into the wetlands. By doing so, the aspiration is to mimic the natural patterns of flows and floods, a rhythm long lost but still narrated by more than a century's worth of scientific data. We used this extensive data to develop models and employed satellite-based remote sensing techniques for our analyses.

Nari Nari Elders Mabel Fitzpatrick and Kerrie Parker. Image: Annette Ruzicka.

The stakes of the endeavour reach far beyond the boundaries of Gayini. Success here means more than just a revival of a single wetland; it represents a beacon of hope for ecosystems affected by similar pressures worldwide. Restoring Gayini aims to safeguard a refuge for threatened and endangered native Australian species, both flora and fauna. These wetlands can also be a buffer against climate change, with their soils capable of capturing and storing tremendous amounts of carbon. But perhaps most importantly, this restoration journey is a step towards healing, providing the Nari Nari people ownership, with our research providing insights and data to guide their stewardship of the land and water so deeply entwined with their culture and identity.

I want to express my profound gratitude to the Australian Wildlife Society for their generous support in funding portions of my PhD research. I am also particularly grateful to Mrs Brittany Mitchell and Professor Richard Kingsford for their constructive feedback on this article. Furthermore, I wish to acknowledge the Nari Nari people as the traditional custodians of the Gayini and recognise their continuing connection to land, water, culture, and community. I pay my respects to Elders past and present.

An aerial view of the Gayini Wetlands on the lower Murrumbidgee River in south-west New South Wales. Image: Annette Ruzicka.