

Agricultural runoff

Given the economic importance of intensive farming, how do indigenous rangers mitigate the impacts of agricultural runoff on river water quality



Far North Queensland is a major tropical region covering around 380,000 km², with river systems that connect directly to the Great Barrier Reef catchment. Agriculture is a key part of Queensland's economy, with an estimated gross value of production of approximately \$28.74 billion in 2025/26. It also supports regional employment and local economies. Far North Queensland is particularly important for agriculture, producing around 95% of Australia's bananas.

Since intensive farming is essential to food production and the regional economy, stopping agriculture is not a realistic solution. Instead, the focus is on reducing its environmental impacts. **Agricultural runoff** can carry sediment, nutrients, herbicides and other chemicals into rivers, affecting freshwater flora and fauna. As this water flows downstream, these impacts can extend to coastal and marine ecosystems, including those of the Great Barrier Reef.





Research Partner: Mamu Ranger Coordinator, Matt Gillis, holds bachelor's and master's degrees in Environmental Science and has over 20 years of experience in ranger activities. Gillis provided first-hand insight into the role of Indigenous Rangers in protecting waterways.

MITIGATION THROUGH RIPARIAN BUFFERS

The Mamu Rangers restore riparian buffers, strips of native vegetation along rivers and creeks. These buffers slow runoff, trap sediment, filter nutrients, reduce pesticide transport and stabilise riverbanks, improving water quality before it reaches the Great Barrier Reef.

Their work follows the Mamu Country Plan and Traditional Owners' knowledge. Elders share knowledge from their family connections to Country and land-management experience. The Rangers combine this Indigenous ecological knowledge with scientific techniques. They grow native trees through Project Gungamburr at Innisfail State College and source others from local nurseries and Landcare groups.

For the first two years, young trees need regular maintenance, especially during wet periods when weeds grow rapidly. Rangers water, mow, brush-cut and hand-pull vines, while also using targeted herbicides such as glyphosate and haloxyfop to control weeds without damaging trees. Sites are generally checked monthly during wet periods. This approach combines Indigenous knowledge, scientific methods and selected products to establish healthy riparian vegetation and reduce agricultural runoff into waterways.



WHAT'S A MAMU RANGER?

According to the Queensland government Mamu Rangers are an Indigenous land and sea management group in Queensland, Australia. They are traditional custodians of the Mamu Nation who look after their ancestral country (which spans the Wet Tropics World Heritage Area and Wooroonooran National Park) by blending traditional ecological knowledge with modern conservation.