

Evolving with change in natural disaster recovery programs in North East Victoria

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Key points

- Increasing frequency and intensity of natural disasters in North East Victoria is placing sustained pressure on waterway ecosystems and communities.
- Declining availability of core disaster recovery funding is driving a shift from traditional state-led models to integrated approaches incorporating species conservation and habitat restoration.
- Recent recovery programs prioritise riparian habitat reinstatement and high-value ecological outcomes, supported by strong community partnerships.
- Collaborative initiatives, such as large-scale revegetation with community groups, demonstrate the effectiveness of leveraging shared resources and local engagement.
- A transition toward system-scale assessment and prioritisation is enabling more strategic, resilient, and long-term waterway management outcomes.

Abstract

North East Victoria has experienced a series of significant natural disasters over the past 20 years, placing increasing pressure on waterway ecosystems and the communities connected to them. The North East Catchment Management Authority (CMA) has delivered multiple recovery programs in response; however, securing core disaster recovery funding is becoming progressively more challenging. This has prompted a shift in the CMA's approach to align with available funding from traditional, state led recovery models to programs that more directly target species conservation and habitat restoration.

Recent programs have emphasised the ecological needs of species inhabiting impacted waterways, with particular focus on riparian management and the reinstatement of high-value habitat. Community engagement has also emerged as a critical driver of success. Strong partnerships, such as the collaboration with the Australian Trout Foundation to plant 40,000 native trees and shrubs for Macquarie Perch habitat, demonstrate the effectiveness of collaborative restoration efforts.

A further evolution in practice has been the transition from site-specific interventions to system-scale assessment and prioritisation, enabling more strategic and enduring waterway health outcomes. This has been in alignment with the increase in available technology allowing geomorphological assessment of reaches and the reduction in funding requiring the CMA to make investment prioritisation decisions.

Key learnings highlight the need for NRM organisations to broaden recovery programs to include system scale approaches, accessing complementary funding including targeting specific species, harness the mobilisation power of community groups, and invest in community knowledge to strengthen participation and long-term stewardship.

Keywords

Natural Disaster Recovery, Waterway Management, Funding frameworks, Adaptive Management, Riparian Ecosystems, Community Resilience

Introduction

Natural disasters are an enduring feature of the North East Victorian landscape, and are likely to remain so under future climatic conditions. Floods, bushfires, and severe storm events continue to place significant pressure on waterway ecosystems and the communities that depend on them. While the occurrence of these events is not new, what is changing is the way in which recovery programs are designed, funded and delivered. This paper focuses on this evolution, particularly in relation to shifts in recovery approaches and the funding mechanisms that underpin them.

Over the past two decades, the institutional and policy landscape governing natural disaster recovery in Victoria has undergone considerable transformation. Despite multiple restructures and iterations, the Victorian Government's environmental agency, now the Department of Energy, Environment and Climate Action (DEECA) has remained the primary investor in waterway recovery programs, with funding via delivery partners such as Catchment Management Authorities (CMAs). At the national level, funding frameworks have also evolved, most notably with the transition from the Natural Disaster Relief and Recovery Arrangements (NDRRA) to the Disaster Recovery Funding Arrangements (DRFA) in 2018. These changes have influenced both the scale and the structure of recovery funding, introducing new constraints as well as opportunities for program delivery.

Despite these institutional and funding changes, one constant remains: the ongoing need for recovery following natural disasters. Communities continue to experience the impacts of these events and require support to restore environmental assets, rebuild resilience, and re-establish connections to their local waterways. In this context, recovery programs are not only ecological interventions but also social processes that contribute to community wellbeing and long-term stewardship.

This paper examines how the North East Catchment Management Authority (CMA) has responded to these changing conditions, adapting our approach to disaster recovery in the face of evolving funding arrangements and increasing environmental pressures. It highlights the ways in which recovery programs have shifted towards more integrated, adaptive, and collaborative models, and considers the implications of these changes for future waterway management in disaster-prone landscapes.

Recovery in the past

Historically, disaster recovery programs within the North East CMA were characterised by relatively substantial and accessible funding. This level of investment allowed the CMA to address numerous sites impacted by localised erosion and declining waterway health without the need for stringent prioritisation frameworks. Interventions were typically delivered at a site scale, with a strong emphasis on stabilisation works, with rock-based armoring being the predominant method used for erosion control.

CMA's also operated with a higher degree of flexibility in program design and delivery, including autonomy over resourcing and implementation approaches. As a result, recovery efforts largely reflected more traditional models, focused on immediate remediation and risk reduction rather than integrated, system-scale or ecologically driven outcomes. This approach also built community expectations About the CMA being able to deliver works post disaster.

- 2003 – Landscape scale bushfires
- 1996-2010 – Millennium Drought
- 2006-2007 – Great Divide Fires
- 2009 – Black Saturday (Beechworth Fire)
- 2010–2012 – Prolonged, region-wide flooding events
- 2016 – Region-wide flooding
- 2017–2019 – Extended drought period
- 2018 – Flash flooding in the Ovens catchment
- 2020 – Upper Murray bushfires
- 2022 – Major flood events throughout the catchment
- 2024 – Summer storms and associated flooding
- 2026 – Upper Murray bushfires

Figure 1 Recent Timeline of natural disasters in North East Victoria

Figure 1 outlines the recent natural disasters experienced in North East Victoria. The CMA often manages concurrent disaster recovery programs sometimes in the same area.

Changing approaches to natural disaster recovery

By 2026, the funding submission process for post-disaster recovery has become increasingly complex, with funding often insufficient to fully address river health impacts. Additionally, there are significant delays, frequently several months, between disaster events and the disbursement of funding. These constraints have driven a shift in Catchment Management Authority (CMA) approaches, moving away from traditional, state-led recovery models toward strategies that more explicitly integrate species conservation and habitat restoration. There have also been wide reaching impacts, partially on community expectations and frustrations about perceived inaction and lack of willingness by the CMA to address impacts from disasters.

While funding limitations present clear challenges, they have also created opportunities to critically reassess the necessity and timing of intervention in waterway systems. Reduced pressure to rapidly implement works immediately following disasters has enabled more comprehensive, system-scale assessments. These include geomorphological investigations that examine the drivers of change within waterway systems, forecast potential trajectories under both intervention and non-intervention scenarios, and emphasise the importance of ongoing site protection through measures such as revegetation.

A key example is the Geomorphological Assessment of Nariel and Corryong Creeks. Nariel and Corryong Creek both experienced severe impacts following the 2019–2020 bushfires, which burned approximately 98% of the forested catchment area to varying degrees. These fires are considered among the most extensive in the catchment since European settlement (Streamology, 2020).

The assessment provided a detailed understanding of the underlying geomorphology, the impacts of both the fires and subsequent rainfall events, and the most likely trajectory of key sites. It also identified priority areas for investment to address river health outcomes. Importantly, the findings enabled CMA staff to design targeted recovery works focused on sites where intervention would yield the greatest ecological benefit. This approach recognised that, despite visual degradation at some locations, not all sites posed significant long-term risks to river health.

Furthermore, the assessment facilitated more transparent and informed engagement with affected landholders. By clearly articulating the rationale behind prioritisation decisions, CMA staff were better

able to explain why certain areas were selected for intervention while others were not. Figure 2 shows the type of information used to drive decision processes for intervention.

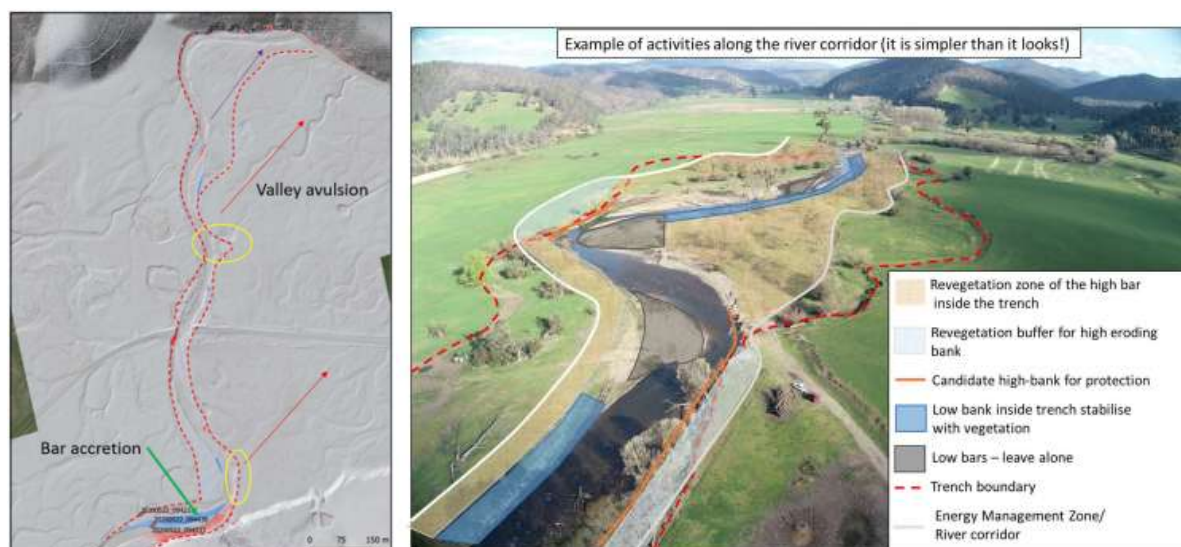


Figure 2 Images from Nariel Creek Geomorphic Assessment: Examples of potential valley avulsions and treatment options (Streamology, 2020)

The image on the left in Figure 2 shows the potential flow paths of the waterway if site works are not undertaken (red arrows), allowing the CMA to prioritise works to avoid the waterway from breaking out of its current course. Investment decisions consider critical public infrastructure (ie. roads) as well as waterway health outcomes

The image on the right provides the location of a trench boundary in which the waterway is likely to continue to move within, as well as recommendations for bank protection and revegetation.

Macquarie Perch and Platypus – key recovery species

Natural disaster recovery programs implemented by the North East CMA have increasingly transitioned from a primary focus on general waterway condition to specific riparian and aquatic habitat outcomes for species. This shift has been driven by the relative availability of funding for threatened species recovery, alongside a decline in funding for traditional natural disaster response programs.

An example of this is a series of flood events affecting Omeo, located at the upper extent of the North East CMA catchment. The region experienced six flood events between late 2021 and early 2022, varying in magnitude. The most severe event occurred on 5 January 2022, during which peak water levels exceeded those recorded in the 2012 floods by approximately 120 mm at Livingstone Creek Park. These events resulted in substantial geomorphic alteration, with sections of Livingstone Creek transitioning from a relatively confined channel (typically up to 4 m wide with defined deep pools) to a widened, shallow, gravel-dominated system characterised by multiple flow paths (Streamology, 2022).



Figure 3 Location of Omeo floods within the North East CMA Boundary



Figure 4 Livingstone Creek January 2022. Pre floods this site was a narrow deep system

Post-event assessments identified that the scale of intervention required to restore river health far exceeded available funding. Concurrently, the Victorian Government launched the Nature Fund Program, aimed at supporting high-impact initiatives aligned with the objectives of Biodiversity 2037, the Government's plan to stop the decline of native plants and animals and improve the state's natural environment (Victorian Government, n.d).

Within this context, Macquarie Perch (*Macquaria australasica*), listed as endangered and present within Livingstone Creek, became a focal species for recovery efforts. A project proposal was developed that integrated species conservation with river restoration objectives. Proposed works included large-scale habitat rehabilitation measures including bank stabilisation, stock exclusion

fencing, and revegetation, alongside the reintroduction of Macquarie Perch fingerlings. Notably, with the exception of translocation activities, these interventions align closely with those typically implemented under conventional flood recovery programs, but were reframed to prioritise habitat suitability for the target species.

The funding application was successful, securing \$962,000 to deliver the project. Implementation included the installation of 20 in-stream habitat structures across approximately 6 km within a 15 km reach of Livingstone Creek, aimed at enhancing habitat complexity and providing refugia for native fish species.

The project was delivered in partnership with the Arthur Rylah Institute for Environmental Research (ARI) and the Victorian Fisheries Authority (VFA) under the “Cracking the Code” program. ARI contributed to broodstock collection and population monitoring through electrofishing surveys, while VFA undertook captive breeding of Macquarie Perch fingerlings for release at strategic locations across Victoria.

This approach is not isolated. The North East CMA has similarly leveraged threatened species funding mechanisms to achieve dual outcomes of ecosystem and species recovery in other contexts. For example, following the 2019–2020 bushfires and subsequent flooding, a comparable strategy was employed to restore platypus habitat in Cudgewa Creek in the Upper Murray region. These examples demonstrate the increasing alignment of disaster recovery and biodiversity conservation objectives in response to evolving funding landscapes.



Figure 5 Pre (L) (2023) and post (R) (April 2026) image of Habitat work for Macquarie Perch on Livingstone Creek, Omeo



Figure 6 In-stream habitat including timber structures and boulders in Livingstone Creek, Omeo

Partnerships

The transition in funding models has facilitated the development of extensive, multi-sector partnerships, enabling a more coordinated and integrated approach to natural disaster recovery. These partnerships have been instrumental in aligning diverse objectives toward a shared outcome, the protection and restoration of healthy riparian ecosystems. Importantly, they have also enabled the pooling of financial, technical, and on-ground resources, thereby increasing the scale and effectiveness of recovery interventions in a constrained funding environment.

Recent natural disaster recovery programs delivered by the North East CMA have involved collaboration with a broad range of stakeholders, including government agencies, research institutions, non-government organisations, Traditional Owner groups, community organisations, and industry representatives. Key partners have included Greening Australia, the Victorian Fisheries Authority, the Australian Trout Foundation, Outward Bound, Nallawilli Bunjil (Jaithmathang TABOO), Konnermar Bullar Jaithmatang (KBJ), the Arthur Rylah Institute for Environmental Research, Parks Victoria, the Upper Murray Landcare Network, Friends of the Mitta Mitta, Benambra–Dinner Plain–Omeo Landcare, the Omeo Angling Club, Bairnsdale Fly Fishers Club, Towong Shire Council, and Gateway Health.

While this list is not exhaustive, it illustrates the breadth and diversity of organisations contributing to recovery efforts. Each partner brings specific expertise, capacity, and community connections, ranging from technical ecological knowledge and species management to community engagement, cultural stewardship, and on-ground implementation. The involvement of Traditional Owner organisations is particularly significant, allowing CMA staff to develop a greater understanding of Traditional Owner group's connection to Country and integrating cultural knowledge into recovery planning and delivery.

These partnerships represent a critical enabler of contemporary recovery models. By fostering shared ownership, leveraging complementary strengths, and facilitating resource-sharing, they enhance both the efficiency and effectiveness of interventions. This collaborative approach not only strengthens ecological outcomes but also builds social capital and resilience within affected communities, reinforcing the long-term sustainability of recovery initiatives.

Conclusions

Natural disaster recovery programs are undergoing significant transformation, shaped by evolving funding models, increasing climate variability, and growing expectations for integrated environmental outcomes. The experience of the North East Catchment Management Authority (CMA) demonstrates that, while funding constraints and administrative complexities present clear challenges, they also create opportunities to rethink and refine recovery approaches. By leveraging alternative funding pathways and aligning recovery actions with broader biodiversity and threatened species objectives, the CMA has been able to deliver more targeted, strategic, and effective interventions.

Despite these changes, one constant remains: the ongoing and increasing need for recovery programs. Communities and ecosystems across the region have been exposed to multiple, compounding disturbance events over extended periods, including fire, flood, and drought. Under current and projected climatic conditions, the frequency and intensity of such events are expected to continue, placing sustained pressure on both natural systems and the communities that depend on them.

In this context, the role of agencies is not only to respond, but to adapt. This requires continued innovation in program design, stronger cross-sector partnerships, and a willingness to embrace integrated approaches that deliver multiple co-benefits. By doing so, recovery programs can move beyond reactive responses toward more resilient, forward-looking models that support both ecosystem health and community wellbeing in an increasingly uncertain future.

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