Land Restoration and Water Stewardship with the Swan Brook Community of Practice

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- Catchment- and landscape-scale approaches to land restoration are needed to halt biodiversity loss and support rural climate change resilience.
- Proactive landholders and community members need the support of fresh strategies and funding models that resource their stewardship of healthy landscapes and waterways.
- Capacity-building programs that support 'Communities of Practice' can nurture the social linkages and local skillsets needed to progress landscape-scale projects.

Abstract

Many Australian farmers are seeking to improve water cycling, infiltration and storage on their properties. Enterprise sustainability is a key objective, but so too is the regeneration of habitat, biodiversity and waterway health. The not-for-profit Mulloon Institute is one of the few organisations land managers can reach out to for skills-building and guidance with nature-based solutions to land degradation. The Institute employs and promotes a range of landscape rehydration strategies that repair broken hydrological connections and optimise water cycling to improve landscape function and resilience. It has grappled with how to most effectively support farming communities, with the challenge having two key dimensions. One: the most effective way to rebuild landscape function is to tackle problems using catchment-management approaches that work at a landscape-scale, however such projects face major funding and regulatory hurdles. And two: landscape transformation is a social challenge more than a technical one, requiring methods that nurture peer exchange and multi-stakeholder collaboration.

To support grassroots adaptation, the Institute has designed a capacity-building program that revolves around Communities of Practice. It incorporates bootcamps, GIS tools, one-on-one mentoring and experiential learning through demonstration projects. In this paper we share "the journey so far" of a dynamic Community of Practice: Swan Brook in the Northern Tablelands of NSW. We present this as a case study of a scalable, adaptable model that could be replicated elsewhere by governments and others to support motivated communities seeking to achieve landscape-scale restoration and build resilience to climate change.

Keywords

"Communities of Practice", landscape-scale restoration, hydrology, nature-based solutions, landscape rehydration, catchment management, farmers, climate resilience.

Introduction

> "I want to have a biodiverse, sustainable and profitable property, with hydrated and carbon-rich soils, where waterways are stable, with slow-moving flows and no active erosion" - *Mathew Gardner*, *Swan Brook landowner and mentorship participant, Nov 2023.*

An increasing number of Australian farmers are seeking to repair dysfunctional water processes to regenerate their properties, both for enterprise sustainability and to support habitat, biodiversity and waterway health. A key obstacle they face relates to property boundaries. Actively eroding drainage lines, for example, often snake across several properties. The amount of groundcover maintained on one landowner's property can dramatically impact how water moves across the surface of their own land, and their neighbour's land. It can also impact the volume, speed and quality of water that enters our creeks and rivers. Thus, improving landscape function and healing broken hydrological connections is best tackled through landscape-scale strategies that consider the array of stresses that are at play (Norman et al. 2022, Tongway & Ludwig 2011, WaterNSW 2020). Landscape-scale strategies are not only being sought by land managers, but by biodiversity experts and others engaged in

conservation. Several recent government reports and reviews have advocated for more integrated approaches, including the *Independent Review of the Biodiversity Conservation Act (NSW)* which highlights the urgent need for legislative reform to support initiatives that have a 'landscape-level focus' and promote 'landscape connectivity' (Henry et al, 2023, see also Cresswell et al. 2021, Eco Logical Australia 2023).

Progressing such initiatives in rural communities remains incredibly challenging due to constraints on funding, capacity, the siloed nature of government agency responsibilities and the social complexity of working across property boundaries (Bates & Mulloon Institute, 2023). This paper shares a story of aspiration, impasse and adaptation in the context of a landscape-scale project in the Northern Tablelands of NSW. The dedicated stakeholders in this story include GWYMAC Landcare, staff at Northern Tablelands Local Land Services, land restoration practitioners at the Mulloon Institute, and landholders in the Swan Brook Catchment. With funding and maladaptive environmental regulation being major barriers to progress, these stakeholders have nevertheless found practical and innovative ways to advance their project. There are valuable lessons to be drawn from their 'journey so far'. The ones we highlight in this paper include: the need for well-designed funding models that support grassroots community capacity, peer networks and 'learning by doing', and the importance of inclusive communication of scientific and technical information that enable shared understanding of landscape resilience co-benefits.

The Swan Brook Project

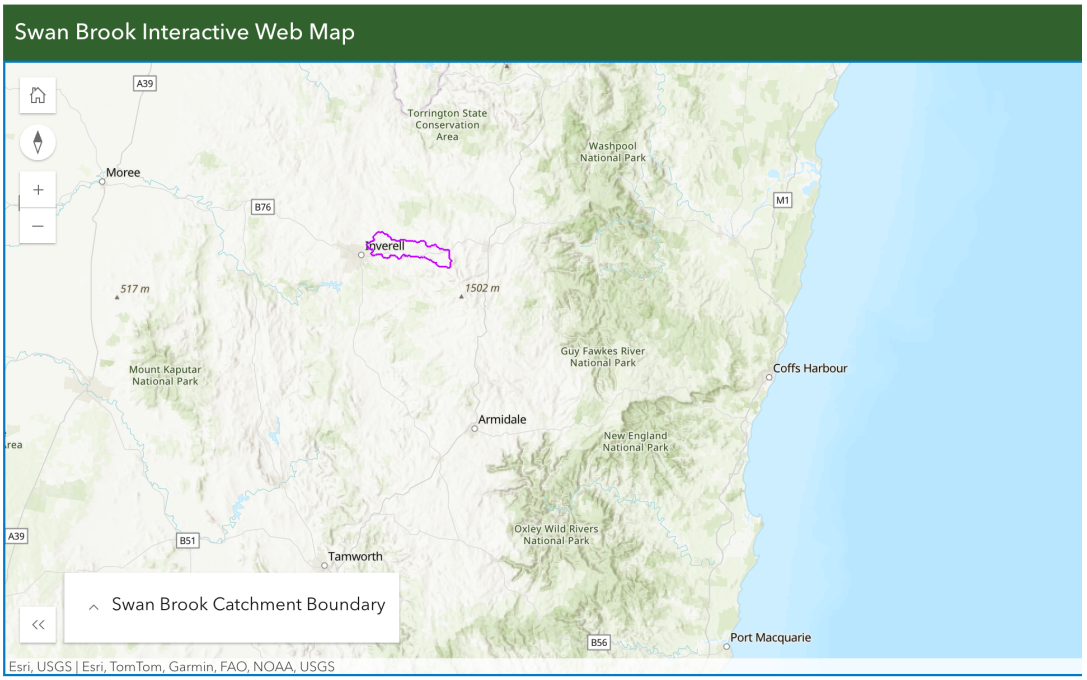

Figure 1: Location of Swan Brook Catchment. See www.catchmenttwin.org/sbinteractive-map

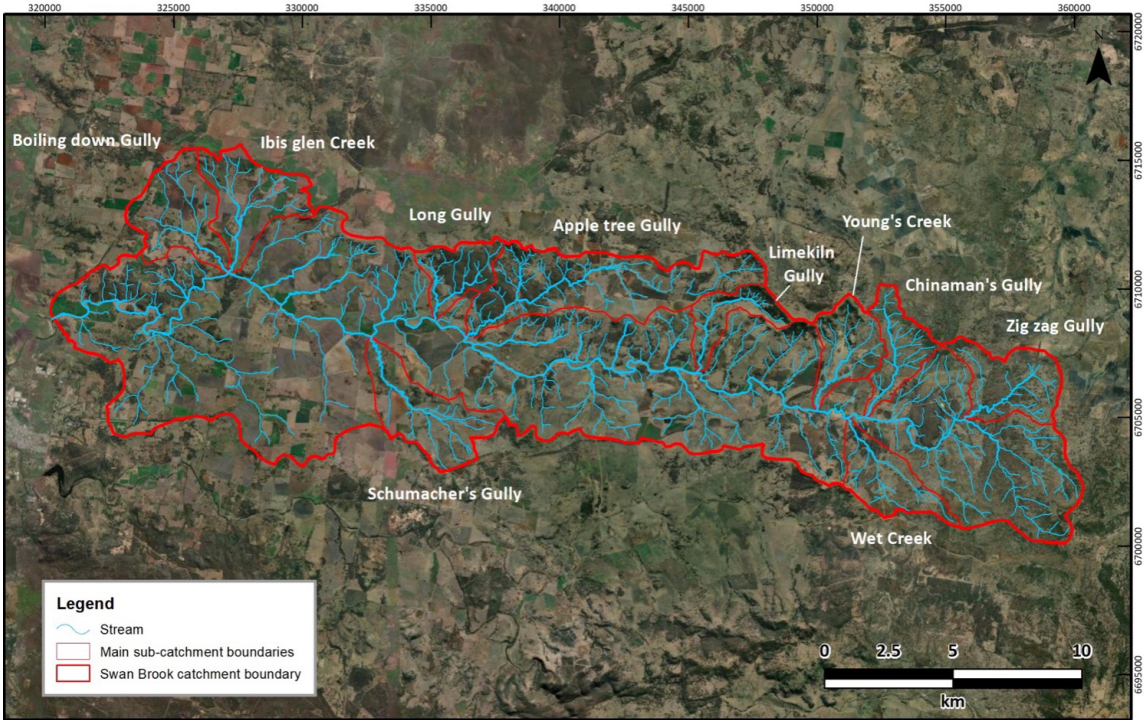

Figure 2: Catchment map (Hazell & Irish, 2021).

The Swan Brook catchment is located between Inverell and Glen Innes in the NSW Northern Tablelands and takes in the localities of Swan Vale, Woodstock and Swanbrook (see Figures 1 & 2). The headwaters of the catchment are on the western slopes of White Rock Mountain (20 km south-west of Glen Innes) and Swan Brook enters the Macintyre River around 5 km north of Inverell. The catchment covers an area of approximately 30,000 hectares (ha). The channel of Swan Brook has become incised, most likely occurring soon after livestock were introduced into the catchment in the 1830's. The valley floor was probably grazed bare during drought and then the creek channel scoured by subsequent high flows. Alluvial mining for sapphires in some parts of Swan Brook is also likely to have caused significant stream bed and bank destabilisation. Many landholders in the catchment would like to see the condition of Swan Brook improved (Hazell & Irish, 2021).

Inspired by the success of the catchment-scale landscape rehydration project at Mulloon Creek (the Mulloon Rehydration Initiative), landholders in the Swan Brook area reached out to the not-for-profit organisation the Mulloon Institute (TMI, 2021, Peel et al 2022). Staff from the Institute delivered a landscape rehydration workshop in 2021, and a hopeful dialogue about a potential landscape-scale project ensued between representatives from GWYMAC Inc, Swan Vale Landcare, Northern Tablelands Local Land Services (NT LLS) and the Institute. With philanthropic support from the Levins Family Foundation and funding from NT LLS, the Institute produced an extensive Scoping Report that was shared with the community. This Report detailed the catchment context and condition (climate, landform, geomorphology, soils, vegetation, social history and so on). It identified landscape rehydration possibilities, including both farm management solutions and natural infrastructure, and included a substantial concept design for a sequence of in-stream structures within Swan Brook. Some of the content of this paper draws from this Scoping Report (Hazell & Irish, 2021).

In 2021/2022, the Institute worked hard to progress this catchment-scale project, seeking grants and nurturing partnerships. The major project costs relate not to on-ground implementation, but the need for detailed designs and most significantly, the regulatory approvals processes for the in-stream structures. NSW does not yet have a regulatory and planning environment to facilitate environmental restoration (treating applications by restoration practitioners as if they were being submitted by developers), though there are promising indication of change (DPE 2023, Bates & Mulloon Institute, 2023, ACCEL 2023, Carmody 2024). These funding and

regulatory obstacles prevented the project from progressing until 2023, when the Institute secured a grant to deliver a capacity-building project revolving around 'Communities of Practice' through the Federal Government's Future Drought Fund (Department of Agriculture, Fisheries & Forestry).

Figures 3 & 4: Landscape Rehydration Bootcamp, Inverell 2024.

The 'Communities of Practice Project' (also known as CoPP) implements a learning pathway around low-risk natural infrastructure and farm system solutions to achieve drought resilience with five communities around Australia. It builds on strong evidence that Communities of Practice are powerful leverage points for practice change in sustainable agriculture (Cross & Ampt, 2017). Three key goals inform the program. First: the desire to foster peer-to-peer learning and skills-acquisition at the grassroots community level. Second, the desire to support land managers to put newly acquired knowledge into practice in their own context through a one-on-one mentorship process (thus addressing a widely acknowledged gap in the agriculture sector). And third, to provide a pathway for NRM Professionals and 'catchment champions' (Landcare leaders for instance) to advance their capabilities as facilitators of local Communities of Practice. Swan Brook is one of the five participating communities. As Andrew Walsh from NT LLS reflects, there was strong interest in this capacity-building opportunity:

> "the region has seen extreme weather events in quick succession over the last couple of years and [this] has landholders thinking how best to protect their investment from these devastating events. It has also been extremely valuable that 10% of the catchment area is already under solid rehydration and sustainable agricultural practices." This has allowed landholders to observe and compare landscapes and learn from neighbours."

In September 2023, the Mulloon Institute delivered a Landscape Rehydration field day and two-day bootcamp that was attended by 30 landholders (figures 3 and 4). This bootcamp included a range of mapping, modelling and in-field activities that focus on the relationship between water processes and landscape function/ dysfunction. It established the framework for participants to prioritise, scope and plan restoration projects attuned to their farming enterprise context. A purpose-designed, ARC-GIS interactive map of the catchment incorporating several attendee properties was developed and shared (Mulloon Institute, 2024a). Subsequently, participants were invited to submit an Expression of Interest to take part in a six-month mentorship program. In November 2023, the Institute hosted a four-day "Professionals Intensive" for 28 participants from around Australia. This event explored biophysical, technical and social dimensions of hydrology-focused landscape repair projects, as well as methods by which professionals could nurture communities of practice in their region. Two members of GWYMAC Landcare, and two staff members of NT Local Land Services attended this event.

An emerging "Community of Practice"

At the time of writing, the mentorship program had been in progress for 6 months. Nine properties and land managers are participating (several of whom have land that abuts the Swan Brook River itself), attesting to the impact of the Bootcamp and the drive to gain new skills. Like the quotation that began this paper, the following statements were made by participants during the EOI phase, describing what they want to achieve for their property:

> "It would be great to see my property effectively use 100% of rainfall to rehydrate pastures and waterways for increased drought resilience and water security and to enhance the aesthetic value of the landscape." (*Mick Mather, vision statement, Nov 2023).*

> "Slow the flow. Many areas with intermittent water paths incur great gushes of water in rain. These rain events are erosive to soils, trees, fences. Since we introduced timed grazing and have improved ground coverage there is little runoff from our own country. But the water remains fierce and destructive. If we could learn how to disrupt the energy of the water, disperse some of the flow, we would be happy people." (*Emma Ratajczyk & Joe Latham, vision statement, Nov 23*).

These landholders have been scoping, planning and designing their projects with one-on-one support from a Mulloon Institute landscape planner (including site visits, phone calls and online meetings).

In May 2024, one of these projects was selected to be staged collaboratively as a community 'Boots on Ground Day' (Mulloon Institute, 2024b). To help stabilise a drainage line that is vulnerable to erosion, participants constructed a log sill ramp and pin weir, strategically placed coir rolls, transplanted Cumbungi in the ponds, and learnt how to retrofit old soil banks to reinstate overland flow (Figures 5 and 6). This project day was documented by *Soils for Life*, who will produce a video and online case study to extend impact and inspire others.

Figures 5 & 6: Community of Practice action during 'Boots on Ground' day, May 2024

GWYMAC Landcare coordinator Byron Norman played a key organisational role in the event, putting into practice the principles and methods that were explored at the Mulloon Professionals Intensive. As he observed:

> "Practical events like this create a positive atmosphere that connects people and inspires them to act. It's not just about managing water on the land, it's about paying attention, observing what can be done to help the environment, and how they can support their neighbours." (Byron Norman, pers comm., 9 June 2024).

The event proved to be highly energising for this emerging Community of Practice. In addition to coming together to learn new skills and share knowledge, it was an opportunity for participants to support each other. In the words of another participant:

> "It was so valuable to have some information, some 'doing' and lots of time to genuinely build relationships and meet new people." (Rachel Lawrence, event feedback, May 29, 2024).

GWYMAC Landcare is now planning to lead additional 'boots on ground' events and skills workshops in response to the community's interest in adopting these practices to restore landscape function.

Six months into the mentoring program, the majority of participants are finalising their project plans, and two land managers are ready to implement their designs in the coming weeks. The individual projects vary from re-instating wetlands in drained gullies using brush, rock and earth, to small-scale rock weirs designed to slow flows and catch eroded sediment before it enters Swan Brook.

Concluding reflections and implications

Australian governments and communities are looking to accelerate landscape-scale restoration attuned to hydrology, to achieve biodiversity gains, foster drought resilience and manage for natural disaster risk in agricultural landscapes. However, proactive landholders and grassroots networks currently lack government agency support, and have few opportunities to gain and test new skills. As Andrew Walsh notes: 'In the past, government agencies were able to set up Demonstration Farms and Champion Farmers, but as replacement agencies were dramatically reduced in size then these fell off the radar. This is where the CoPP has stepped in and filled a critical void.' The Community of Practice Project described in this paper has enabled a stalled,

catchment-scale restoration project in Swan Brook to progress via a mosaic of smaller, lower-cost projects. The array of elements - mentoring, workshops and collaborative action - is building skills and confidence among landholders. These elements are also deepening supportive relationships between landholders, NRM professionals, 'catchment champions' and local businesses such as earthworks contractors who are now more informed about landscape rehydration principles and practices. As Walsh has also observed:

> "The challenge for the program has been to keep the information and learning engaging without being too technical and scientific. It's a really hard balance for scientists and educators to find and I believe the program is evolving nicely along this path with a great mix of indoor and outdoor learning activities, some of which are very innovative yet simple."

In light of the need across Australia for those who have a stake in land restoration to pool resources and interlink strategies, the authors regard the approach described in this paper as a model worth pursuing more widely. This model allows for flexibility and scalability, it rewards and empowers local initiative, and it enables a mix of people - not just landholders - to participate and collaborate. The outcomes so far have been rewarding and motivating for those involved, and the authors hope that these generative steps will ultimately lead to the delivery of the larger envisaged project.

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