RCS GOULBURN BROKEN REGIONAL CATCHMENT STRATEGY RENEWAL PROJECT

GOULBURN BROKEN CATCHMENT MANAGEMENT AUTHORITY

RESILIENT LANDSCAPES, THRIVING COMMUNITIES

How adopting a resilience approach can support people and the environment.

WHAT IS RESILIENCE?

Resilience is the capacity of a system (people and the environment) 'to absorb a shock or setback and to flourish in spite of it, maybe even because of it' (Outback, Apr/May 2017). It does not mean "bouncing back" or ploughing through and doing what we have always done. It is the capacity to cope with change and continue to evolve in positive ways.

Applying resilience in practice requires an understanding of how the resilience of any system is changing over time, what is causing that change and where and how to intervene to influence its future direction.

CONNECTED SYSTEMS OF PEOPLE AND NATURE

A resilience approach focuses on the connections between people and nature; how these connections change; and allows us to consider at what point this could completely transform our social and ecological systems. Consistent systems of people and nature are called social-ecological systems and exist at a range of connected scales, from farm to local area to whole-of-catchment scale.

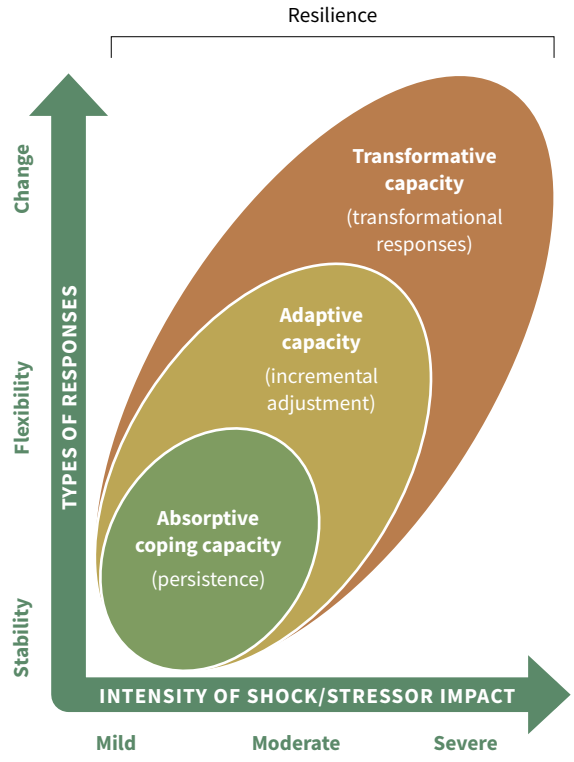
Increasing the resilience of our social-ecological systems, increases the capacity of the system to sustain human well-being in the face of disturbance and change by buffering shocks (e.g. fire), and adapting and transforming in response to change (e.g. climate change). The resilience approach recognises the importance of identifying the drivers of change and planning how to adapt to the risks and opportunities these changes present.

RESPONDING TO CHANGE

How a system, or the components of a system, respond to change varies depending on the system's capacity to:

- **Persist:** Capacity to stay essentially the same in the face of change. Persistence assumes that things will at some point return to "normal".
- **Adapt:** Capacity to deliberately adapt to change. Adaptation assumes that change will endure but that the same overall system can continue.
- **Adapt while preparing to transform:** Capacity to deliberately adapt to change, whilst preparing to fundamentally transform the overall system in response to change.
- **Transform:** Capacity to fundamentally transform in response to change. Transformation is a product of deliberate, significant change in response to enduring change.

Not one of the above responses are better than the other, we need all of them. To be resilient, systems need to be able to shape and respond to known and anticipated changes, while maintaining capacity to cope with unknown and unexpected future change.



Adapted from Cornelius et al. (2018)

BUILDING RESILIENCE

The following principles describe the characteristics of systems that demonstrate resilience. They must underpin any interventions taken to build resilience within a system.

1. **Develop a 'complexity' view of the world**
   Understanding the interactions between social, economic and environmental factors.
2. **Plan for change**
   Develop governance approaches that embrace change helps to prepare for, respond to and learn from change.
3. **Foster cohesion, self-organisation and local responsibility**
   Cohesive communities that have the internal capacity to find solutions, rather than relying on external support, are better able to respond to disturbance and capitalise on opportunities.
4. **Design for flexibility**
   Designing for flexibility up front allows for easy future adaptation when required.
5. **Manage connectivity**
   Maintaining and strengthening connectivity to allow flows between parts of a system (e.g. knowledge, resources, etc).
6. **Value, retain and build diversity and redundancy**
   This principle provides options & potential for different responses under stress. Diversity comes in many forms including diversity of people, cultures, practices, land uses etc. Having redundancy or back-ups that can perform similar roles in a system reduces the likelihood of failure and aids recovery.
7. **Focus on slow variables, leverage points and tipping points**
   This principle is about building 'system' awareness and focussing efforts where they can be most useful.
8. **Learn for change**
   A 'learning-by-doing' and forward-focused learning approach that can drive adaptation and transformation. This is more useful than relying on hindsight and past experience when dealing with high uncertainty and change.



CASE STUDY

BUILDING THE RESILIENCE OF VICTORIA'S HARDEST WORKING RIVER

The Goulburn River – the state's most popular inland fishing destination, a heritage river, Victoria's longest river – is also a hard-working river. The majority of the flows captured in Eildon Dam in the river's upper catchment are diverted via downstream weirs, channels and dams for agriculture.

This river regulation has had significant long-term effects on river flows, the Goulburn River's health and the plants and wildlife it supports. Native fish numbers are about 10-20% of pre-European settlement levels. Instream vegetation has all but disappeared and bankside vegetation, which is critical to stabilising river banks, has been left more vulnerable to droughts and floods.

To help build the resilience of the lower Goulburn River (downstream of Goulburn Weir), the Goulburn Broken CMA has worked with partner agencies to deliver water for the environment at key times to (among other things) target bank vegetation. Water for the environment is usually delivered in late autumn/early winter and spring. Autumn/winter environmental flows help spread seed and sediment along the banks, while spring flows encourage these seeds to germinate and bank-stablising plants to grow and spread. Bank vegetation also provides valuable shelter and food for native fish and other wildlife such as water bugs, platypus and turtles.

A Commonwealth Environmental Water Office-funded monitoring program shows that well-timed environmental flows have made a difference: as well as an increase in the overall coverage of bank vegetation, there have been significant golden and perch spawning events and anglers report less carp and more threatened native fish species such as Murray cod, trout cod and golden perch.

Some of this good work has recently been compromised by two years of record high transfers of water from the Goulburn River to the Murray River in summer [known as Inter Valley Transfers (IVT)]. The high summer water transfers are to meet growing downstream agricultural demand and were initially delivered at a constant rate of 2000ML–3000ML/day. Ideally in summer flows in the lower Goulburn River should fluctuate and be less than 1000ML/day to allow the banks to dry out and give seeds and plants a chance to grow and spread.

Monitoring shows two years of high summer IVT flows contributed to bank erosion as they "drowned" young vegetation on the lower banks that started germinating in spring. The record IVT deliveries and long periods of constant high flows over summer mean that it's more important than ever to maintain deliveries of water for the environment each year in winter and spring. If these environmental flows had not been delivered during the cooler months in recent years the lower Goulburn River's banks, native fish and water bug populations would be in worse condition and even less resilient to high summer flows.

As resilience also involves looking at different ways to deal with change and challenges Goulburn Broken CMA worked with the river operators during summer 2019/20 to deliver the IVT flows as a series of pulses or at least vary the delivery rate to minimise bank damage. In response to Goulburn Broken CMA concerns and community lobbying about ongoing bank damage from high IVT, the Victorian Government also put in place an interim operating regime limiting the amount of water that can be delivered between December and April along the lower Goulburn River.

Monitoring will continue to understand the impact of delivering IVT in summer. This will help environmental water managers and river operators understand the river's "tipping points" and what opportunities there are to mitigate the impact of these higher flows if they continue.



CASE STUDY

COMMUNITY DRIVES THE VISION FOR THE BOGIES AND BEYOND

The community of the Strathbogie Ranges in Victoria were seeing some big changes to the landscape around them. As a community that 'makes things happen' they felt confident about dealing with change however they were far less confident that continuing to do what they had always done was the best or only way forward.

With funding from the Victorian Government's Our Country Our Community program, a series of four community workshops were organised to help make sense of what they were seeing and to develop a plan for the future. Ads went out across the community for people to express their interest in being involved and over 25 people from all walks of life came forward.

All the workshops were well attended with the initial workshop gathering the breadth of views on what people loved about the Bogies. The group identified the region's natural environment, diverse landscape, community spirit, diverse agricultural production and clean air and water as being greatly valued by the community. This was important as identifying 'what we love' not only supported the development of a vision but was also the key theme to flow through the rest of the workshops. A timeline was developed that described the key social, economic and environmental events that made the Bogies what it is today and highlighted that the community lives with complexity, is connected to external drivers of change and that unexpected events inevitably have and will occur.

'What we love' was then used to identify the 'critical attributes' of the Bogies that interact to determine the current and future state of the the Bogies. Following on from this, potential thresholds for each attribute were identified and climate change scenarios were used to consider a range of adaptation pathways to achieve their aspirations for the future. This allowed the community to have the difficult discussion around potential transformation of some of the values they love and identify what were the "no-regrets" pathways.

The focus of the workshops was to build the capability of the community so they could take charge of their future. The project gave them the tools to make sense of what is happening but more importantly gave them the confidence to take action and make the changes needed. The workshops were not the end, with the community following through with active working groups to address concerns around water supply and security and investigating the cause of dieback in the region's eucalypts; increased awareness of the new patterns and complexities of change taking place around them; instigating action; and ensuring they influenced future funding proposals.

RESILIENCE APPROACH TO CATCHMENT MANAGEMENT

The Goulburn Broken Regional Catchment Strategy (RCS) is developed using a resilience approach. The Goulburn Broken RCS guides actions to improve and protect the Catchment's natural resources (water, land and biodiversity). Looking after these precious natural resources underpins the social, cultural and economic wellbeing of the diverse communities that make up the Goulburn Broken Catchment.

The Goulburn Broken CMA leads development of the Goulburn Broken RCS, which involves extensive enagagement with organisations, groups and individuals that contribute to the Catchment's natural resource management. Your ownership of the Goulburn Broken RCS is critical to its success. That's why we're keen to work with you to ensure the strategy reflects your priorities and aspirations for the environment and your role in looking after it. To find out more head to www.gbcma.vic.gov.au.

Resources and further information

- Wayfinder – A Resilience guide for navigating towards sustainable futures | www.wayfinder.earth
- The Goulburn Murray Irrigation District Resilience Master Plan project | www.rmcg.com.au/case_study/regional-resilience-goulburn-murray-irrigation-district
- Australian Resilience Centre | www.ausresilience.com.au