



**Local Land
Services**
Northern Tablelands

Northern Tablelands Investment Plan 2025

A plan for profitable agriculture and resilient landscapes



Published by the Local Land Services

Northern Tablelands Investment Plan 2025

First published July 2015

More information

Planning and Commercial Services / Northern Tablelands Local Land Services / Inverell

www.lls.nsw.gov.au/northerntablelands

Acknowledgments

See final pages of the Investment Plan for a list of contributors and acknowledgements.

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Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing July 2015. However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of Local Land Services or the user's independent adviser.

Chair's foreword

The Northern Tablelands Investment Plan 2025 brings together actions under the four pillars of Local Land Services. It represents a document that will guide investment and inform our partners of the direction of the Northern Tablelands Local Land Services over the next ten years. At its heart is working with the community to ensure we have a safe and secure agriculture industry.

As one organisation Local Land Services has an increased ability to provide services to landholders and the broader community. The Northern Tablelands Local Land Services has built on the past successes of the individual organisations to ensure a customer focus that is responsive to the needs of local people.

We continue to partner with organisations that seek to deliver similar activities. Of prime importance are partnerships with grass roots organisations driven by local people. These include Landcare, NSW Farmers and producer groups. Additionally we continue to promote a whole of government approach to the delivery of services and partnerships.

The Investment Plan 2025 is a practical and realistic guide for local investment and decision-making on sustainable agriculture supported by improvements in the condition of natural resources. Additionally, work will continue to improve the capacity of landholders to deal with natural disasters and any threats posed by disease outbreaks.

The key to successful implementation of the Investment Plan 2025 is to continue to work with the community and partners to maximise the impact of investment. As Board Chair at the Northern Tablelands Local Land Services, and from my experience in local government, I appreciate what can be achieved through the strategic involvement of all players working towards a shared goal.

The Northern Tablelands Local Land Services is a new organisation with a range of skill sets and cultures. Rather than focus on the culture of one organisation overriding another one, we will seek to build a new profile and culture within the community. While it is important to build on the successes of the past, it is also important to consider the future and

how and where we want to be - not just as an organisation but also as a region.

As a region we sit atop the Great Dividing Range and encompass the headwaters of rivers that flow east and west. These include the Gwydir, Macleay, Macintyre, Namoi, Hunter and the Border Rivers.

We have the most cattle and the fourth highest number of sheep of any region in NSW. This means that actions in our part of NSW can have flow on effects in other regions and industries. Hence we need to ensure our actions have positive impacts on industry and the environment.

Achieving a sustainable balance between production and conservation is an ambitious goal. An erratic climate and competing social, environmental and economic demands add further complexity to the task. This Plan aims to foster the resilience in our people and our landscape to tackle these challenges and ensure ongoing prosperity, without diminution of our rich biodiversity and natural landscape.

Northern Tablelands Local Land Services has offices in Armidale, Inverell, Glen Innes and Tenterfield. Our doors are always open to new ideas and input that will be beneficial to our region so drop in and talk to the staff.



Hans Hietbrink — Chair, Northern Tablelands Local Land Services

Acknowledgement of Country

The Northern Tablelands Local Land Services acknowledges the Aboriginal people residing within our region. We acknowledge the Aboriginal nations of Gomeroi (Kamilaroi), Anaiwan, Ngarabal, Banbai, Thunggutti, Bundjalung and the various Aboriginal tribes and language groups within those nations. We take this opportunity to pay our respects to Elders past, present and future of those nations.

Expressions of intent from Aboriginal members of the community

Aboriginal people welcome the relationships being forged with the communities of the Northern Tablelands Local Land Services region. They look forward to the strengthening of their relationships with community and government agencies to increase the cultural and natural resource management skills and knowledge of people in the region.

Connection to the land is of great importance to Aboriginal people, and is expressed through social, physical and spiritual lore. It is important for young Aboriginal people to get back “on Country”, to gain traditional knowledge from their Elders for looking after the land and water and helping pass knowledge onto future generations.

In implementing the Investment Plan, Aboriginal people are looking forward to sharing their knowledge as respected contributors to all aspects of land management.



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Executive summary

The Northern Tablelands Investment Plan 2025 (Investment Plan) is a non-regulatory plan that outlines the investment priorities for agriculture and natural resources within the region. This Investment Plan, when implemented, also contributes to meeting the goals in the Northern Tablelands Local Strategic Plan.

The Investment Plan updates the Catchment Action Plans (CAPs) for the Border Rivers-Gwydir, Northern Rivers, Namoi and Hunter Central Rivers regions and integrates the four pillars of Local Land Services - biosecurity, agricultural production, emergency management and natural resource management.

The Northern Tablelands Local Land Services region is situated in northern inland New South Wales (Figure 1). The region has a diverse climate, ranging from temperate to sub-tropical, with considerable differences in climate between the east and the west, and great variety in its landforms, hydrology, vegetation, and soils.

Natural resources and land use in the region reflect climatic and geographic influences. Grazing predominates across the region, with some cropping occurring in the north-west of the area. Major industries and town viability are focused around agricultural production.

Vision and goals

The integrated vision for investment in the region (see facing page) recognises that maintaining profitable agricultural production can only occur through having:

Safe and secure agriculture, sustainable productive lands, balanced hydrological systems, connected biodiverse landscapes and resilient adaptive communities.

The elements of the vision are interconnected and co-dependant, with changes within one part

of the system flowing on to all others. Regional goals contribute to the vision for the Northern Tablelands and are also interconnected.

Guiding principles

The core principles that were used to develop the Investment Plan reflect the desire to have resilient, productive communities by addressing social, economic and environmental needs:

1. Landscape and community resilience will be built through targeted action and will contribute to improved profitability.
2. Actions will contribute to maintaining market access for agricultural industries and enterprises.
3. Collaboration and partnerships are central to effective action.
4. The services and benefits from ecosystems will be promoted and protected.
5. Decisions must be responsive to climate variability.
6. Adaptive management will guide improvement and is based on best available evidence.

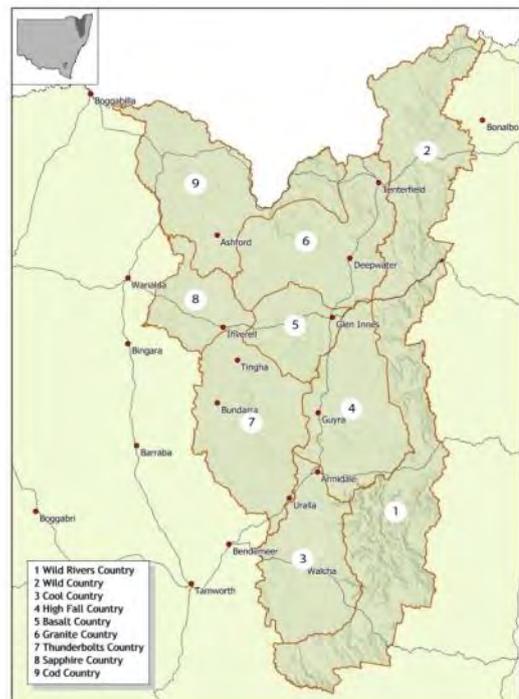


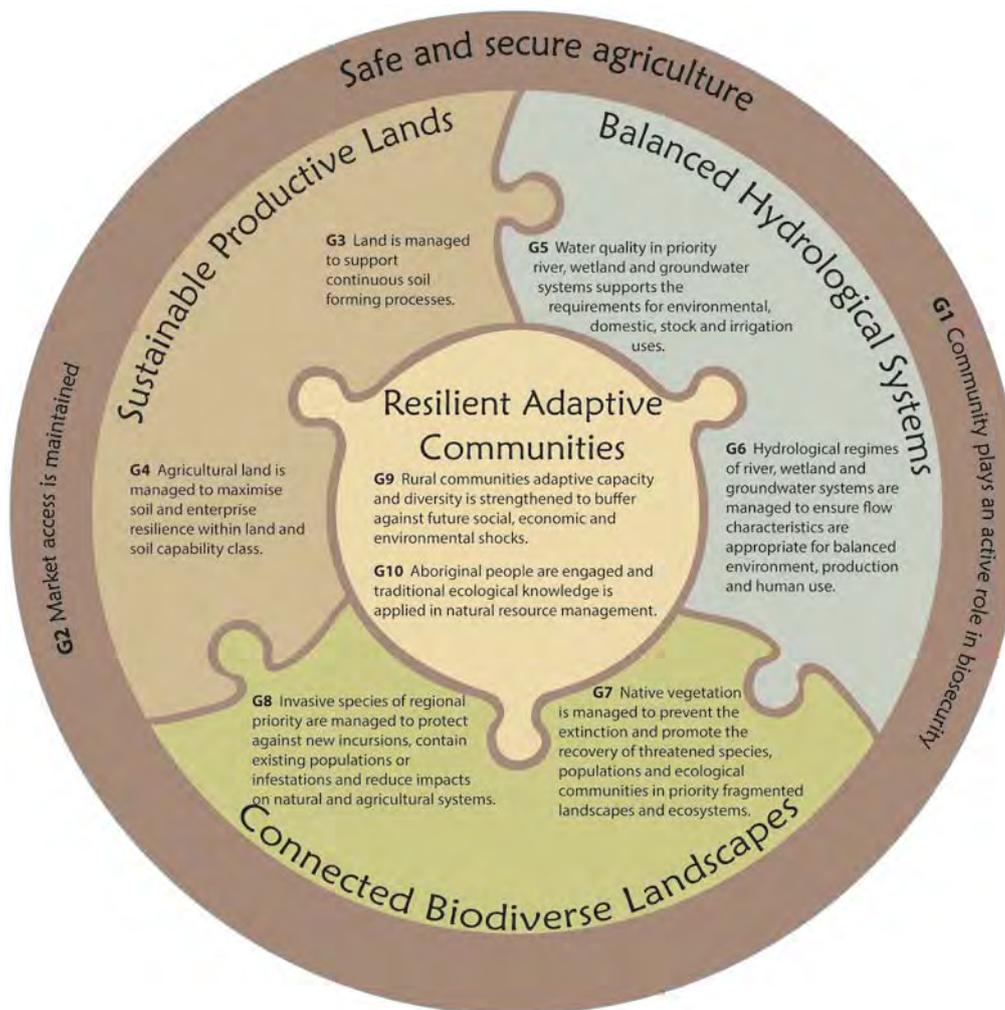
Figure 1. Northern Tablelands Local Land Services region.

Resilience thinking

The Investment Plan identifies spatially explicit areas that are high priority for actions to support profitable agriculture and to maintain, protect or improve the natural assets that provide the basis for supporting and sustaining primary production and biodiversity values within the region.

Resilience thinking is used to inform how these priorities can be addressed. Understanding and managing the landscape as an integrated system is critical to achieving the vision.

The Resilience Framework describes the critical regional scale drivers, controlling variables, and critical thresholds that are relevant at these broad scales.



System drivers

The critical system drivers for the Tablelands landscape will be the focus of the plan. Broadly, these drivers relate to pests, diseases and weeds, emergency animal disease outbreak, runoff processes, deep drainage and salinity, high intensity rainfall events, grazing management, drought, cropping practices and

land clearing. These drivers are influenced by biosecurity capabilities, groundcover, soil organic matter, rainfall use efficiency, native vegetation extent and condition, stream bed and bank stability, hydrological regime, and soil fertility.

Targets

Regional scale targets and system targets direct the action and outcomes for the ten-year life of the plan. Regional scale targets apply across the Tablelands landscape. System targets are focused on each socio-ecological landscape (SEL) and its priorities. These targets are aimed at achieving the system strategies which have been developed using the best available spatial data, community consultation, and analysis using state and transition models.

The targets provide the Northern Tablelands Local Land Services, and partners, with a blueprint for building profitable agricultural industries that are dependant on natural resources. Collaborating across and between regions is central to the delivery of the Investment Plan. For optimising outcomes, activities to deliver the plan align with a range of state and federal legislation, policies, plans and strategies. A conceptual model of collaborative governance has been developed, and this will be used to guide whole of government and whole of community implementation of the plan.

As lead agency for implementing the plan, the Northern Tablelands Local Land Services will coordinate and facilitate collaborative governance among partners and stakeholders as a way to achieve the targets and goals of the plan.

Adaptive management

The Northern Tablelands Local Land Services will use its monitoring, evaluation, reporting and improvement (MERI) program as a framework and delivery mechanism for adaptive management. Regular review of progress will feed into the adaptive management cycle, helping to identify what is working and what needs to change.

Knowledge gaps are threats to the successful implementation of the Investment Plan. During the planning process a number of gaps were identified and will need to be addressed. These will be addressed within the MERI framework.

The Northern Tablelands Investment Plan 2025 provides a collaborative and targeted strategy for ensuring profitable agriculture and a resilient resource base for future generations across the region.

Snapshot of targets

Regional Scale Targets (these apply across the Northern Tablelands region)

Northern Tablelands 1 By 2025, 4 high priority invasive weed species are targeted for intervention.

Northern Tablelands 2 By 2025 there is a 25% increase in the number of land managers participating in programs to manage vertebrate pests to reduce predation.

Northern Tablelands 3 By 2025, a 10% increase in agricultural enterprises being managed above critical thresholds for groundcover, soil organic carbon, litter, pasture biomass and native vegetation cover.

Northern Tablelands 4 By 2025, facilitate the establishment of 1 new Aboriginal community-owned, profitable, land management focused business enterprise.

Northern Tablelands 5 By 2025, biosecurity surveillance and reporting maintains market access 100% of the time.

Northern Tablelands 6 By 2025, there is a 15% increase in the number of farm businesses achieving a profitability ratio better than 0.8.

Northern Tablelands 7 By 2025, 50% of upland wetlands are managed to maintain ecological function.

Northern Tablelands 8 By 2025, improve community resilience by addressing the most limiting drivers of human or social capital.

Northern Tablelands 9 By 2025, there is a 15% increase in the capacity of landholders to manage biosecurity risks and increase profitability.

System (socio-ecological landscape) targets

SEL 1 “Wild Rivers Country”

SEL 1-1 By 2025, 10% of private land managers in the SEL are engaged in public/private land partnership projects to improve the balance between agricultural profitability and conservation.

SEL 2 “Wild Country”

SEL 2-1 By 2025, 5% of private land managers in the SEL are engaged in public/private land partnership projects to improve the balance between agricultural profitability and conservation.

SEL 3 “Cool Country”

SEL 3-1 By 2025, manage and consolidate 5% of existing native vegetation.

SEL 4 “High Fall Country”

SEL 4-1 By 2025, manage and consolidate 5% of existing native vegetation.

SEL 4-2 By 2025, riparian stability and in-stream habitat quality is improved in 20% of priority reaches (44km).

SEL 4-3 By 2025, 95% of land is used and managed within soil land capability (a 4% increase).

SEL 5 “Basalt Country”

SEL 5-1 By 2025, manage and consolidate 5% of existing native vegetation to increase extent.

SEL 5-2 By 2025, riparian stability and in-stream habitat quality is improved in 10% of priority reaches (24km).

SEL 6 “Granite Country”

SEL 6-1 By 2025, consolidate 10% of existing native vegetation to increase extent.

SEL 6-2 By 2025, riparian stability and in-stream habitat quality is improved in 30% of priority reaches (87km).

SEL 7 “Thunderbolts Country”

SEL 7-1 By 2025, manage and consolidate 3% of existing native vegetation within fragmented landscapes.

SEL 7-2 By 2025, riparian stability and in-stream habitat quality is improved in 20% of priority reaches (46km).

SEL 7-3 By 2025, 85% of land is used and managed within soil and land capability (a 4% increase).

SEL 8 “Sapphire Country”

SEL 8-1 By 2025, manage and consolidate 10% of native vegetation to increase extent (2,303 ha).

SEL 8-2 By 2025, riparian stability and in-stream habitat quality is improved in 20% of priority reaches (34km).

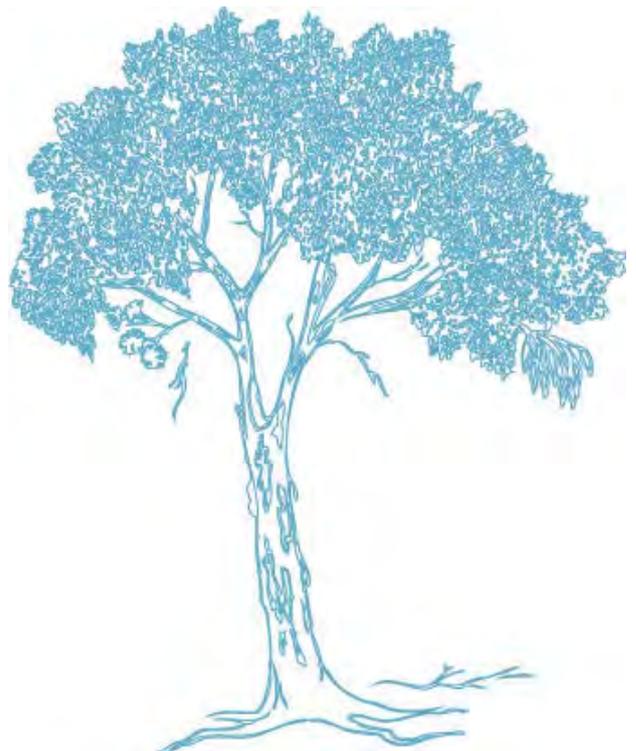
SEL 8-3 By 2025, 90% of land is used and managed within soil and land capability (a 4% increase).

SEL 9 “Cod Country”

SEL 9-1 By 2025, riparian stability and in-stream habitat quality is improved in 30% of priority reaches (90km).

SEL 9-2 By 2025, 90% of land is used and managed within soil and land capability (a 2% increase).

Introduction



Introduction

The Northern Tablelands Investment Plan 2025 (Investment Plan) is a non-regulatory plan that outlines the investment priorities for agriculture and natural resources within the region.

The Investment Plan updates the Catchment Action Plans (CAPs) for the Border Rivers-Gwydir, Northern Rivers, Namoi and Hunter Central Rivers regions and integrates the four pillars of Local Land Services - biosecurity, agricultural production, emergency management and natural resource management.

What is in the Investment Plan?

The Investment Plan represents an amalgam of existing plans and strategies, with priorities from

these plans tailored to the Northern Tablelands region (Figure 1). The region has a strong reliance on agricultural production and the natural resource base that supports this. Targets, strategies and goals within the plan are based on the priority needs of the region that will allow producers to supply commodities that are market ready and high quality and that meet the needs of a variety of markets. The role of the Northern Tablelands Local Land Services is to facilitate and mobilise both community and government action towards achieving these goals.

The Local Land Services Act 2013 requires that Local Land Services across NSW develop Local Strategic Plans. This plan will be part of the strategy to contribute to achieving the Local Strategic Plans goals and vision.

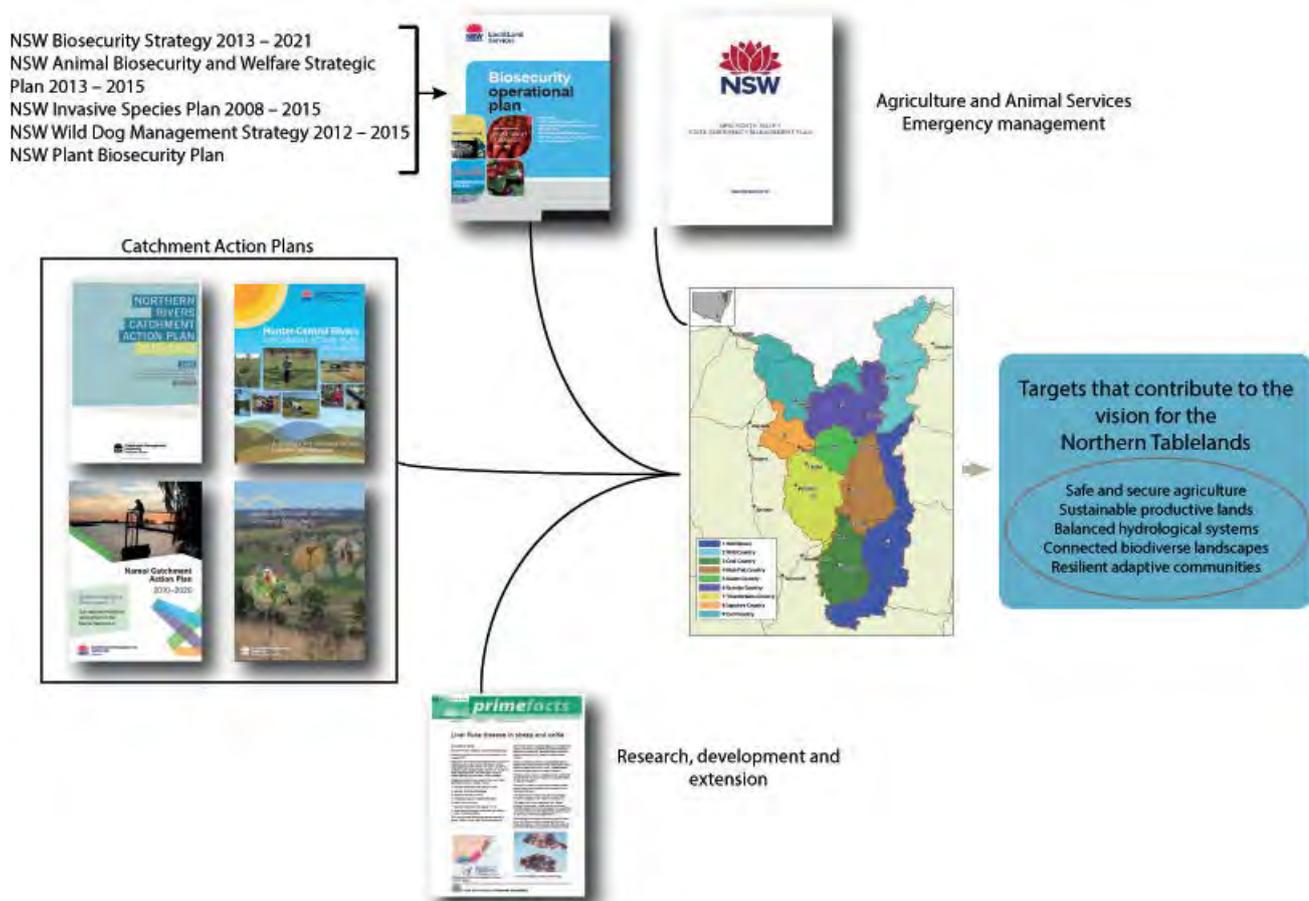


Figure 1. Integration of biosecurity, natural resource management, agriculture and emergency management plans and strategies for the Northern Tablelands Local Land Services.

Who is this plan for?

The Investment Plan will aim to achieve whole-of-government and whole-of-community involvement in its delivery and establish new levels of multi-stakeholder collaboration. The Northern Tablelands Local Land Services will play a lead role in coordinating and facilitating partnerships and collaboration to achieve the targets outlined in this plan. The investment plan also plays an important role as a contributor to meeting the goals outlined in the Northern Tablelands Local Strategic Plan (Box 1).

The Investment Plan belongs to everyone who contributes to agricultural and natural resource sustainability in the region. Working together at all levels - landholders, the community, government, and industry - have contributed

knowledge, resources, and a clear vision of what can be done to maintain profitable agricultural industries using a sustainable resource base.

The ultimate goal of the Investment Plan is to ensure the agricultural community, and the resources that underpin it, are buffered against threats and shocks, and can function productively.

Box 1. How the Northern Tablelands Investment Plan 2025 and Local Strategic Plan are connected

Where we all invest: This Investment Plan 2025 outlines the priorities for action to build a resilient, profitable and sustainable region. It guides where investment and activities should occur, by all stakeholders, to ensure that agricultural profitability is maintained and that natural resources can continue to support it. The Investment Plan is a ten year plan and will be used by the Northern Tablelands Local Land Services, and its stakeholders across the region, to implement actions where they are needed most.

The Local Strategic Plan is focused on Local Land Services business. It provides a framework for Local Land Services on how it will conduct operations in a transparent and equitable manner. The Local Strategic Plan describes how Northern Tablelands Local Land Services will deliver its legislated services and functions including leading the Investment Plan. The Local Strategic Plan has a five year term.

The Northern Tablelands in focus

The Northern Tablelands Local Land Services region (Figure 3) is situated in northern inland New South Wales and encompasses an area of approximately 40,000 square kilometres, straddling the Great Dividing Range (GDR). The total population of the region is around 72,000, concentrated in and around Armidale, Glen Innes, Inverell, Tenterfield, Guyra, Walcha and Uralla. Agricultural production is the major industry in the region.

The elevation and the presence of GDR affect and influence the climatic conditions across the Northern Tablelands region. High elevation areas such as Guyra, Armidale, Uralla, Tenterfield and Glen Innes are subject to extreme cold during the winter months. Rainfall is also influenced, with the 'eastern fall' of the GDR generally receiving higher average rainfall throughout the year. These climatic differences, and differences in terrain, are reflected in the diversity of agricultural industries and landuse within the Northern Tablelands.

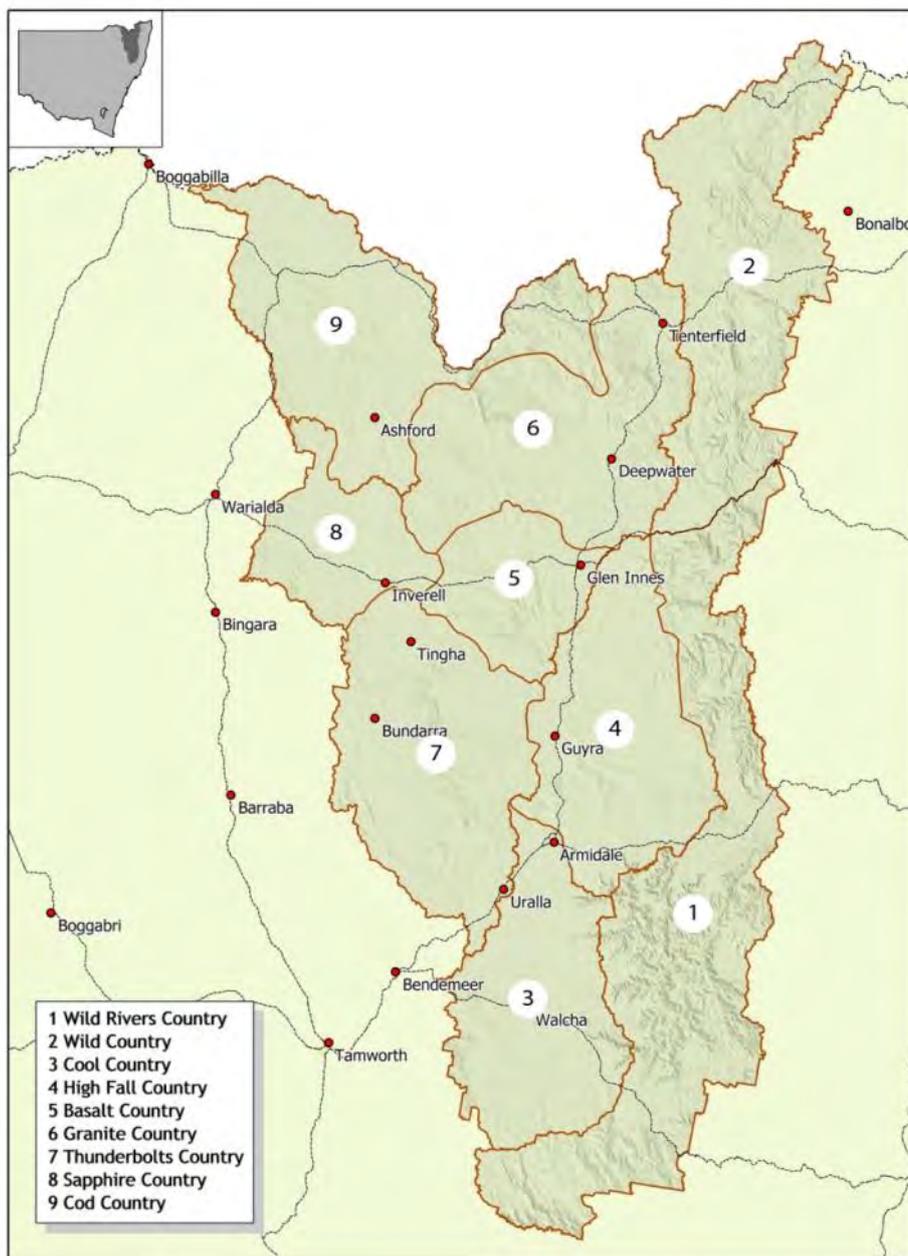


Figure 3. Northern Tablelands Local Land Services Region, showing the socio-ecological landscapes.

Sheep and cattle grazing are the main agricultural pursuits in the region, where the Northern Tablelands have a long history of fine wool production, fat prime lambs and beef cattle. The Northern Tablelands Local Land Services has the highest number of cattle of all Local Land Services regions, and the 4th highest sheep number and, overall, has the highest livestock carrying capacity. It is crucial that producers in the region have complete market access for their livestock.

Since nearly a quarter of people in the region are employed in agriculture or agribusiness, industry and town viability are focused around agricultural production.

Sheep (wool and meat), cattle, cropping, viticulture, and numerous other industries, make an enormous contribution to the economy of the Northern Tablelands. Protection of these industries through animal and plant health advisory services and biosecurity (through surveillance and reporting), sustainable natural resource management and preparedness for natural disasters, are the focus of this plan.

Engagement and participation of landholders and industry is vital in implementing and delivering the plan. A strong community is fundamental for these measures to be successful.

Aboriginal people are represented through a number of language groups across the region. Closing the gap on Aboriginal inequality and self-determination is underpinned by maintaining culture, heritage and language through connection to traditional lands. Aboriginal involvement in decision-making supports self-determination and ensures cultural traditions and sites are protected.

The Investment Plan is designed to improve or maintain the land, agricultural enterprises and the communities in the region by committing to goals and targets that are focused on building resilient landscapes and industries.

References

Australian Bureau of Statistics, National Regional Profiles for Local Government Areas

<http://www.ausstats.abs.gov.au/ausstats/nrprmaps.nsf/NEW+GmapPages/national+regional+profile?openDocument> (Accessed 4/6/14)

Working with community, industry and government

The community, government and industry have willingly provided their time and knowledge to help develop the former Catchment Action Plan, both individually and through group consultation processes across the region.

The information from these consultations was used to inform planning direction which has been integrated into this plan. The individuals and groups consulted made it clear they wanted to remain involved in the process of implementation.

Input from landholders, the community, government and industry stakeholders have been critical in developing a plan that is based on the best available knowledge and understanding about the region. Knowing what communities value is fundamental to the plan being relevant and practical to the people who will implement actions on ground.

Activities to deliver the plan will align with a range of state and federal legislation, policies, plans and strategies.

With changing conditions and new information, annual reviews of the Investment Plan will incorporate changes in addenda to the main document.

A collaborative governance model is central to the success of a whole-of-community and whole-of-government plan. This ongoing collaboration is aimed at ensuring our decisions and actions promote the social and economic wellbeing of our communities as well as protect and improve natural assets.

Collaborative Governance Model

Collaborating across the region is central to the delivery of the Investment Plan. By engaging with all sectors — public, private, non-profit, individuals and community groups — effective and lasting solutions to shared problems can go beyond what any sector could achieve on its own. Resilient, adaptive communities and productive landscapes need people to share, to

act collaboratively and to be well networked. By adopting a shared vision, people can act individually or together to make that vision a reality.

Effectively implementing the plan through working together is based on the concept of ‘collaborative governance’ (Figure 2).

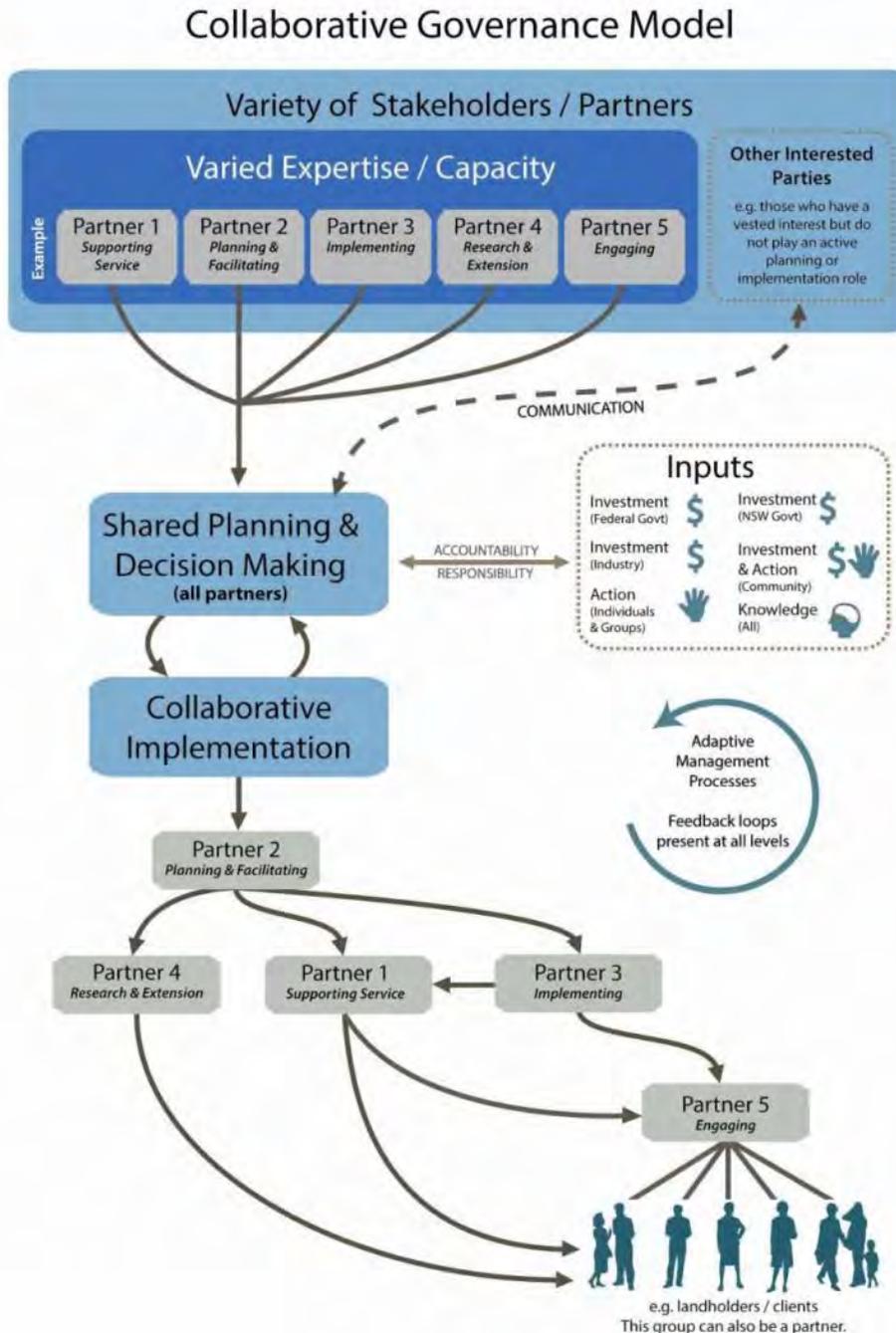


Figure 2. Collaborative governance model for implementation of the Investment Plan.

Aims of collaborative governance

Collaborative governance for implementing the Investment Plan will involve more effort from participants and it will be, in some cases, different from the past ways of working together. The aims are to:

- Achieve consensus to create lasting solutions across sectors.
- Achieve genuine commitment. By working across sectors people with a stake in an issue will be involved in authentic ways and all those involved will have a role to play in multi-stakeholder projects.
- Increase capacity to achieve results.
- Innovate through the application of diverse knowledge and expertise.
- Better coordinate investment across the region and borders, leading to multiple outcomes.
- Establish greater understanding and trust.

What does it take?

Collaborative governance will require commitment from participants and willingness to adopt an evolving model. As lead agency for implementing the Investment Plan, the Northern Tablelands Local Land Services will coordinate and facilitate collaborative governance among partners and stakeholders as a way to achieve the targets and goals of the plan.

Engagement with, and among, our partners may range from simple information sharing to complex and long term collaborative partnership agreements. The collaborative governance model provides structure to co-operatively:

1. Clarify respective roles and responsibilities.
2. Jointly invest in activities which have mutually beneficial outcomes.
3. Coordinate where, when, and how actions will be implemented.
4. Agree on common guidelines for methods and procedures in planning and operating.
5. Agree on expectations and annual project targets.

Working across borders

The Northern Tablelands Local Land Services region shares boundaries with Queensland, as well as the North Coast, North West and Hunter Local Land Services regions. The boundaries between these regions are administrative. People's daily lives and landscape functions are not constrained by lines on a map.

To effectively address biosecurity, emergency management and natural resource management issues requires a cross-border approach.

The plan emphasises continuing with existing, in-principle agreements with neighbouring regions, aligning targets, programs, investments and the sharing of information and lessons learnt.

Investing in increased cross-border programs is vital for shared targets to be met. In preparing this plan we have consulted widely with neighbouring regions and are committed to working together to align our planning. This process will involve collaborative, streamlined actions and on-ground delivery approaches, implementation of community support programs, joint priority setting and opportunities for the community to participate in planning.

Community and Landscape Vision

Across the Northern Tablelands many views are shared. As part of developing the former Border Rivers-Gwydir and Northern Rivers CAPs, people at over 20 community meetings shared their visions for the future.

The people of the region want a healthy, functioning environment that maintains and enhances social and economic wellbeing. They are committed to finding a balance between economic prosperity and environmental sustainability.

Communities value a future with cleaner and healthier waterways that delivers economic, environmental, cultural and aesthetic benefits. Communities also value environmental assets such as biodiversity and they want natural habitats across the landscape to be linked.

Economic sustainability makes vibrant and resilient communities. Agriculture is vital to the

economic sustainability of the region. As representatives of the dominant industry, agricultural land managers want to feel valued and supported. They want to be recognised for their contribution to the region's economy and for their role as custodians of key natural assets.

The vision is based on five broad elements that comprise a socio-ecological system. The elements of the vision are interconnected and co-dependant, with changes within one part of the system flowing on to all others. Figure 4 on the following page represents the interconnected nature of the vision, with resilient, adaptive communities at its core.

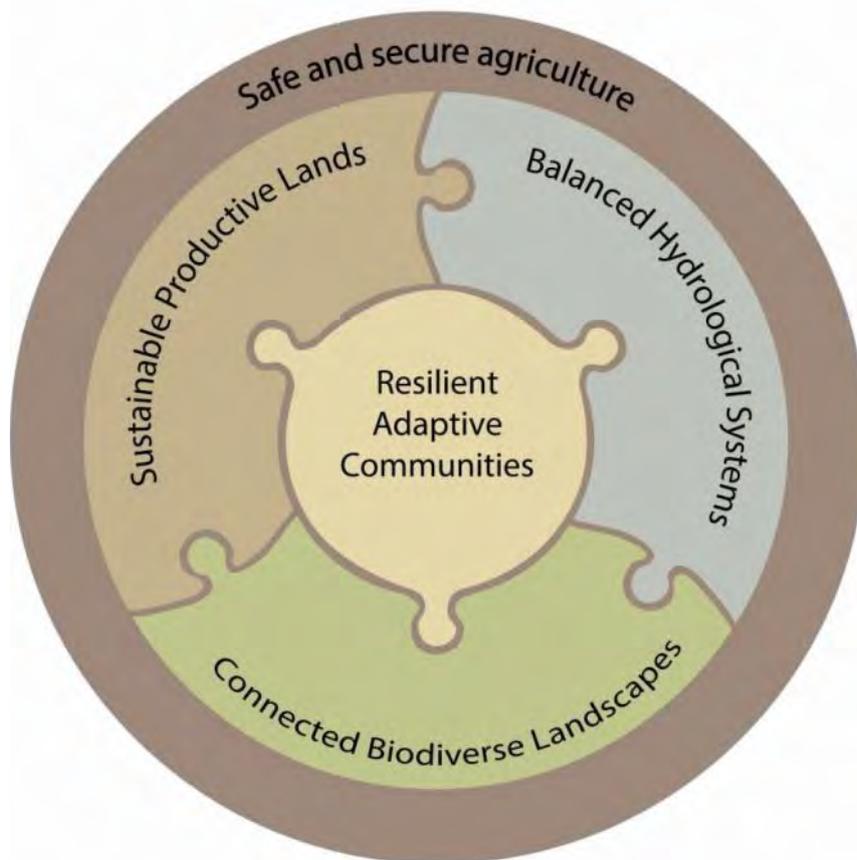
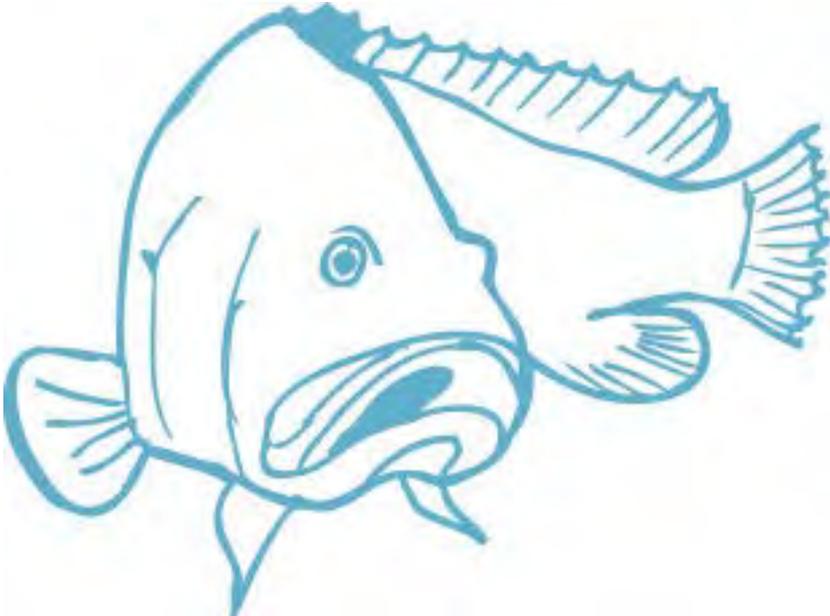


Figure 4. Interconnected vision of the Northern Tablelands Investment Plan.

Our approach to planning



Our approach to planning

The Investment Plan represents an amalgamation of four Catchment Action Plans (CAPs) and the integration of agricultural advisory services, biosecurity and emergency management. The CAPs, and this plan, use ‘Resilience Thinking’ to identify priorities for action and to develop the core, overarching principles. They are:

1. Landscape and community resilience will be built through targeted action.
2. Actions will contribute to maintaining market access and improved profitability for agricultural industries and enterprises.
3. Collaboration and partnerships are central to effective action.
4. The services and benefits from ecosystems will be promoted and protected.
5. Decisions will be responsive to climate variability.
6. Adaptive management will guide improvement and is based on best available evidence.

1. **Landscape and community resilience will be built through targeted action.** The term ‘resilience’ means the ability of the system — the landscape, production of food and fibre, the community and the economy — to absorb disturbances and still be able to maintain its basic functions and structure. We want to build resilience across the whole region to protect it against possible future shocks and disturbances such as climate events or trends, global economic events, policy and social changes, or the impacts of new technologies.

2. **Actions will contribute to maintaining market access and improved profitability:** This will be achieved through close collaboration with landholders, community and relevant stakeholders, as

well as through application of regulatory processes. Having a disease and residue free region is fundamental to maintaining and improving profitability. Integration of biosecurity, natural resource management and agricultural advisory services are integral to meeting this principle.

3. **Collaboration and partnerships are central to effective action:** Collaborating and working in partnership with different individuals, agencies and organisations, exists already. This plan continues to implement a model for collaborative governance that enables highly effective collaborative action and investment by government, community, landholders and industry partners.
4. **The services and benefits from ecosystems will be promoted and protected:** Ecosystems provide a number of services that benefit agriculture and communities such as natural pest control, fresh water, fertile soils, pollination and regulation of climate. Preserving ‘ecosystem services’ means ensuring that the underlying natural assets and functioning processes of ecosystems are maintained and enhanced.
5. **Decisions will be responsive to climate variability:** Changes in climate will impact on production systems and the health of the region’s natural assets. All Investment Plan targets must contribute to the resilience of the system to climate variability. Temperatures, evaporation, and the risk of fire, flood, and drought, are all likely to increase across the region.

These impacts will have implications for food and fibre production in the region and threaten the economic and social wellbeing of landholders and communities in the region. Being “climate ready” means setting and achieving carbon abatement targets,

and improving habitat connectivity and biodiversity. It also means increasing the resilience of soil, water and agricultural production systems to extreme climate events or trends.

6. **Adaptive management will guide improvement and is based on best available evidence:** Implementing the plan will involve continually responding in new ways to changing circumstances. ‘Learning by doing’ will enable a flexible and responsive approach, based on continuous improvement. The Northern Tablelands Local Land Services will adopt a cyclical process of planning, implementing, monitoring, evaluating, and modifying what we do. Basing the plan on evidence from both science and experience will reduce risks and create better outcomes for production, conservation and communities.

Resilience thinking

The Investment Plan uses resilience thinking to inform how the Northern Tablelands region and

the socio-ecological landscapes are functioning. Understanding and managing the landscape as an integrated system is critical to achieving the vision of the plan.

State and Transition Models (STMs)

STMs were developed as a way of assessing resilience in the Northern Tablelands region.

These models show us:

1. The characteristics of resilient versus non-resilient states.
2. The major drivers of change in these systems.
3. How to manage these drivers to maintain or improve the state of the system safely within ‘thresholds of concern’.

The models were used to inform the goals, strategies, targets and actions for the management of the landscape. A STM for the Northern Tablelands region, conceptually identifying the desired and non-desired states, is shown in Figure 5.

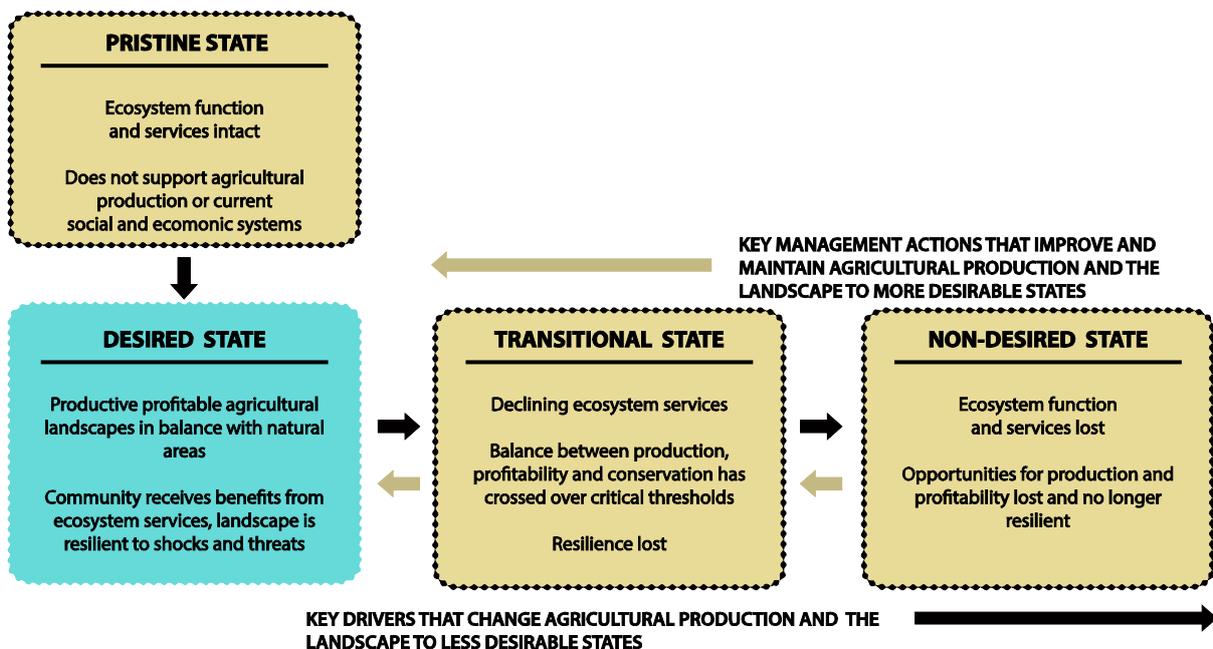


Figure 5. Conceptual state and transition model for the Northern Tablelands region.

Resilience framework

The Resilience Framework summarises regional scale system linkages. Linkages that influence agricultural production and natural resources across and within the region are listed (See table 1). The following terms and words are used to describe these relationships at a regional scale:

Critical regional scale system linkages –

External connections – Identifies the most important social and biophysical links and connections that extend beyond the borders of the Northern Tablelands administrative region.

Known thresholds – Identifies the known thresholds of concern that are the focus of the plan.

Critical system drivers – Identifies the most significant drivers of the landscape and are directly related to the level of threat to system resilience. Many other system drivers exist, but those identified are the most significant for response through the Investment Plan.

Priority controlling variables – The controlling variables are the aspects of the system that control whether or not it will move towards or away from a known threshold and where actions can be focused.

Critical thresholds – Identifies the most relevant thresholds of concern that are the focus of the system.

Table 1. Regional scale linkages, drivers, controlling variables and thresholds.

Critical regional scale system linkages	
<p>Northern Tablelands influences on other systems</p> <ul style="list-style-type: none"> • Headwaters of major river catchments (Macleay, Clarence, Gwydir, Border Rivers, Namoi, Hunter) • Murray Darling Basin river catchments • Recharge area for the Great Artesian Basin in the north west portion of the region • Clarence-Moreton basin in the north east portion 	<p>Influences to and from other systems</p> <ul style="list-style-type: none"> • Invasive species pathways • East-west and north-south road networks • Atmosphere and climate • Markets • Plant and animal diseases • Livestock selling facilities
Critical system drivers:	
<ol style="list-style-type: none"> 1. Total grazing pressure 2. Runoff processes 3. Invasive species 4. Dieback 	<ol style="list-style-type: none"> 5. Deep drainage & salinity 6. Emergency animal diseases (EADs) 7. Drought
Priority controlling variables:	
<ul style="list-style-type: none"> • Groundcover and pasture biomass • Soil organic matter • Surveillance and reporting for EADs 	<ul style="list-style-type: none"> • Rainfall use efficiency • Native vegetation extent and condition
Critical thresholds:	
<p>Known Thresholds:</p> <ul style="list-style-type: none"> • Groundcover 70% • Soil Organic Carbon 2.0% • Pasture biomass* 1,500 kg GDM/ha • Litter 2 t/ha 	<ul style="list-style-type: none"> • Native vegetation cover 30% • Wetland State 1 to 2 Transition* • Stream Condition State 1 to 2 Transition* • Profitability ratio* 0.8 total cost: total income <p>*see Glossary</p>

Community resilience

People in our region have adapted to many changes and shocks over time, including: global economic downturns, droughts, major floods, changing government policies, commodity and input prices as well as complex social changes. However, the communities of the region are complex systems that tend to have varying degrees of resilience.

Our planning process uses the concept of 'capital' as a way of working with people to maintain and build community resilience. There are five types of capital used in the plan to assess community resilience: human capital, social capital, financial capital, natural capital and physical capital.

Maintaining or improving **natural capital** is the foundation of this Investment Plan and is the base from which communities and their livelihoods are derived and is essential for resilient communities. Assessment of natural assets in the region, through the former CAPs, has informed development of socio-ecological landscapes, which integrates our understanding of communities and their reliance on natural capital for production and profitability. This assessment has also informed development of our vision and targets. For this reason natural capital is integrated across all facets of community resilience.

Climate change has the potential to impact on productive systems and the resilience of communities in the region. It is critical that our landscapes and agricultural enterprises are buffered against the projected effects of climate change.

During the community consultation process for the four CAPs that this plan encompasses, characteristics of a highly resilient community were identified by landholders and other stakeholders. This has informed the development of the vision for 'resilient adaptive

communities' and the goals and targets for the plan.

A summary of the key characteristics of highly resilient communities is as follows:

Human capital — healthy, engaged, skilled communities with:

- High levels of knowledge and understanding of the ecosystem services provided by the natural resources.
- An ability to embrace new ideas, support initiatives, innovate and transform.
- Individuals who have good leadership skills and a willingness to take on leadership roles.
- A range of leaders who are representative of the age, culture, gender and other characteristics of the communities.

Social capital — connected, inclusive, positive cultures with:

- Social networks which develop wellbeing and build relationships, and which ensure that community ownership is present, accessible and functional.
- Mutual trust between individuals groups, service providers and industry.
- Community groups that are able to respond to difficulties, transform and regenerate.

Physical capital — accessible infrastructure and resources which:

- Enable equitable access to services such as health, public transport, education and other support services. Institutional and service systems are well developed and available to communities.

Financial capital — a sufficient, enabling economy in which:

- Industry and employment is available for people within the local region.

- Diversity within industries safeguards against change, and innovation allows people to cope with a shock through the response of the community as a whole.
- Economy and industry is maintained within ecologically sustainable limits.
- Sufficient financial resources are available at an individual, group and community level to enable care of natural resources.

Adaptive resilient communities can be maintained and strengthened by working together within and across the nine SELs. Identifying ways to further strengthen communities using these four capitals, with natural capital as an overarching influence, will assist in reaching system targets.

Community resilience can also be supported by being prepared for uncommon events or shocks that may have lasting impact on everyday life. The Northern Tablelands Local Land Services is well-placed to provide advice to land managers on how to be prepared for or to prevent certain emergencies. Box 2 below provides an outline of the role that Northern Tablelands Local Land Services plays in *Prevention, Preparedness, Response and Recovery*.

Box 2. Prevention, Preparedness, Response and Recovery (PPRR)

An emergency, for the purposes of Northern Tablelands Local Land Services, encompasses animal welfare during natural disasters as well as emergency animal and plant disease outbreaks.

Our role in **prevention** includes preventing the entry of biosecurity threats into the region, through surveillance and tracking of livestock along with implementing plant biosecurity measures.

Preparedness includes activities based around developing and maintaining response capabilities, both in the community and as an organisation.

Response involves taking action to effectively contain an emergency and the operationalisation of emergency plans.

Recovery is about assisting community and industry back to normality and improving the ability to prepare for future emergencies.

Goals, targets and priority actions



Goals, targets and priority actions

A strategic framework

The Investment Plan uses a strategic framework to inform focused action in building the social, economic and environmental resilience of the region. The connection between the vision, goals, targets and priority actions provides a foundation for effective investment of resources. The strategic framework is made up of the following components.

Vision

The long term direction for the future.

Goals

The goals are unquantifiable direction that collectively supports the vision and targets. The goals are aspirational with a time frame of 20-50 years. The goals apply generally across all socio-ecological landscapes.

Targets

The targets are the core of the Investment Plan and are expressed at both the landscape and socio-ecological landscape scale. While many targets could be established to address every element of environmental and agricultural management, the targets focus on the critical issues to build resilience at the system scale, consistent with the goals. The system targets are separated in the target tables as follows:

- Regional scale targets – are targets that apply at the regional scale. There are nine regional scale targets.
- System targets – are targets that apply specifically at the SEL scale. The system

strategy describes the management intent for the SEL which is reflected in the system targets.

The targets must meet the SMART criteria. In other words they must be **S**pecific, **M**easurable, **A**chievable, **R**elevant and **T**ime bound. The targets guide all implementation actions and will be reached in a medium-term timeframe of ten years.

Priority actions

Priority actions are high level actions that will be completed by 2025. The priority actions will inform implementation level actions, but do not represent a complete list of potential actions or initiatives. Securing multiple benefits for targets and actions is a priority. Multiple benefits for agricultural profitability, landscape maintenance and improvement will be delivered through integrated and carefully designed projects and programs.

Connecting the vision to goals and targets

Social, economic and natural systems are interconnected and interdependent. The Northern Tablelands Local Land Services acknowledges this through the recognition of nine socio-ecological landscapes.

The vision, targets and priority actions also work in an interconnected way. Actions to address each target will contribute to multiple goals.

Figure 6 (following page) shows the relationship between the vision and system targets.



Vision is...

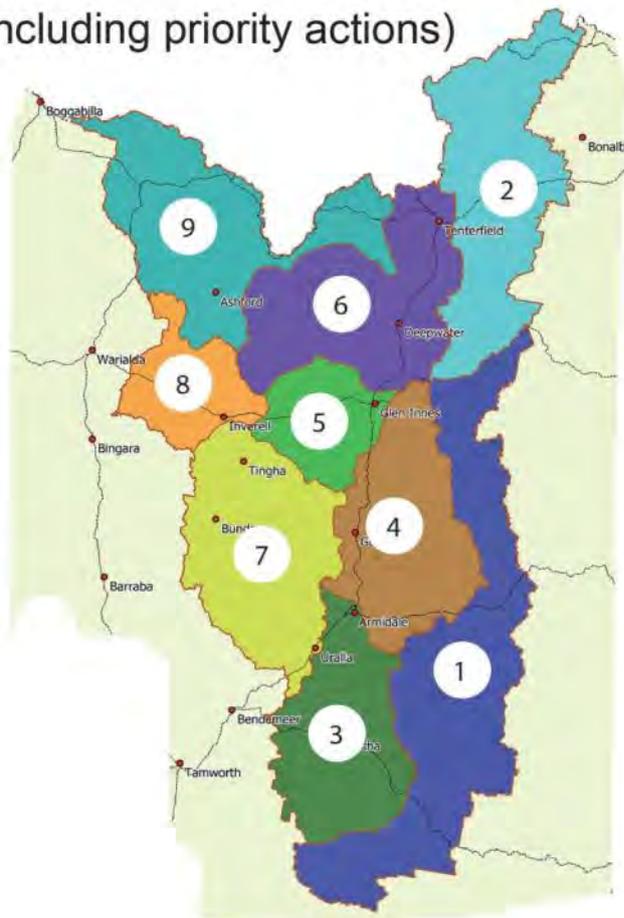
Our vision is for safe and secure agriculture, sustainable productive lands, balanced hydrological systems, connected biodiverse landscapes and resilient adaptive communities.



Goals are...

The ten goals apply generally across all socio-ecological landscapes. The goals are an unquantified direction that collectively support the vision and system targets.

Targets (including priority actions)



Socio-ecological landscapes

- 1. Wild Rivers Country
- 2. Wild Country
- 3. Cool Country
- 4. High Fall Country
- 5. Basalt Country
- 6. Granite Country
- 7. Thunderbolts Country
- 8. Sapphire Country
- 9. Cod Country

Figure 6. Interconnected vision and targets

Regional goals

The goals are directly connected to the vision. The goals apply generally across all socio-ecological landscapes. The goals are unquantified directions that collectively support the vision and system targets. Ten goals have been identified for the Northern Tablelands. The relationship of the vision and goals is outlined in Figure 7.

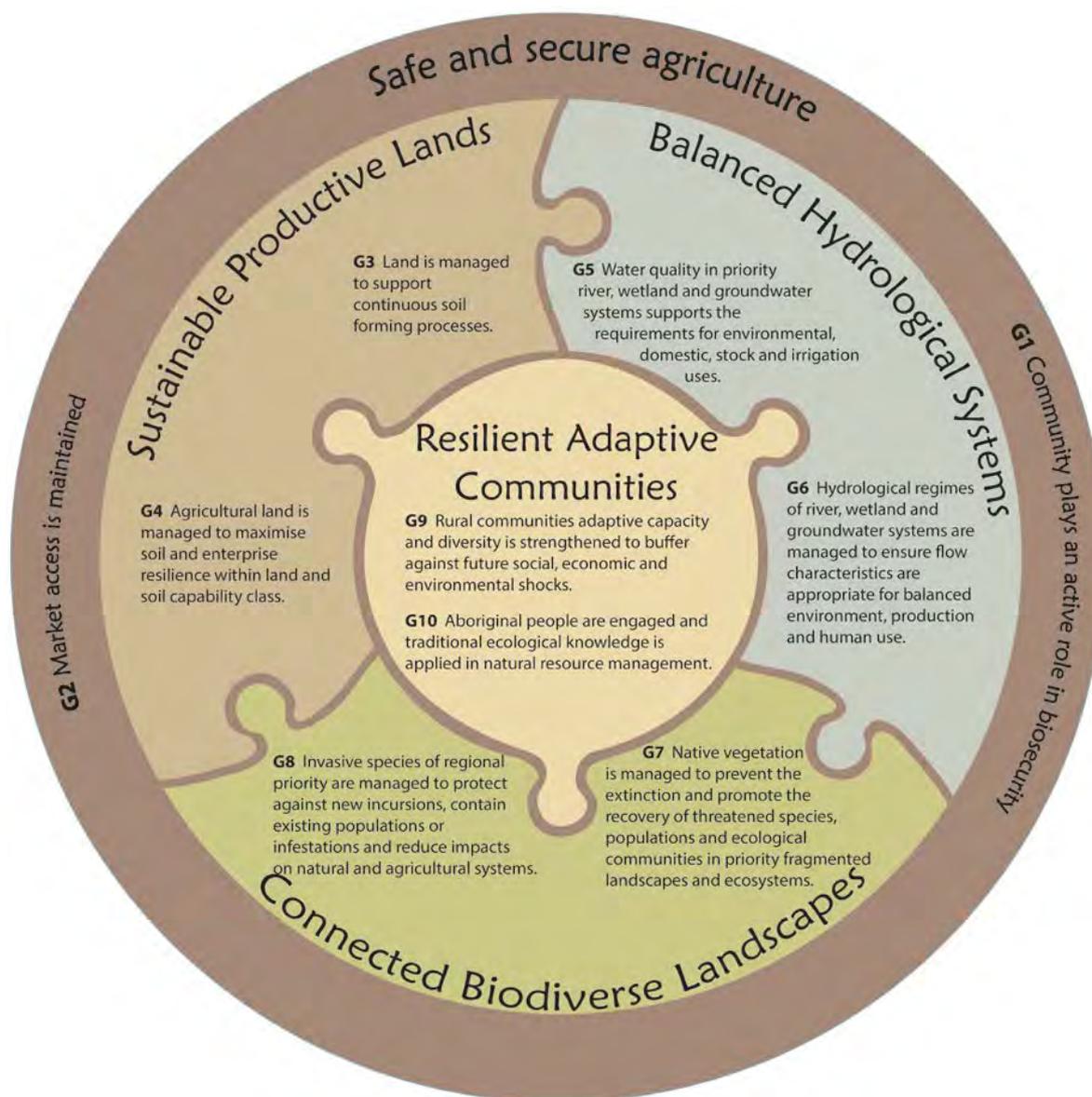


Figure 7. Vision and goals of the Northern Tablelands Investment Plan.

Target tables

The Investment Plan aims to build on the regions existing resilience and capacity. From the consultation processes and analysis of information, visions, regional goals, strategies, targets and priority actions emerged. The targets provide clear directions for implementing the plan over the next ten years. At the core of the plan are the system targets — they direct actions and outcomes for the ten-year life of the plan.

These target tables are based on input from many groups and a rigorous analysis. In particular, the targets are based on:

1. Community and stakeholder consultation – community identified visions, needs, natural

assets and existing policies and plans that were used to inform the targets within Catchment Action Plans.

2. Resilience analysis – this included the analysis and development of SELs as well as community resilience. Spatial data and literature were analysed to inform their creation.
3. State and transition models – the models, derived from scientific evidence and local knowledge, were used to inform the goals, strategies and targets for the management of natural resources for the next 10 years.

The regional scale and system targets are detailed in Target Tables 2 and 3 and relate to the SELs shown in Figure 8.

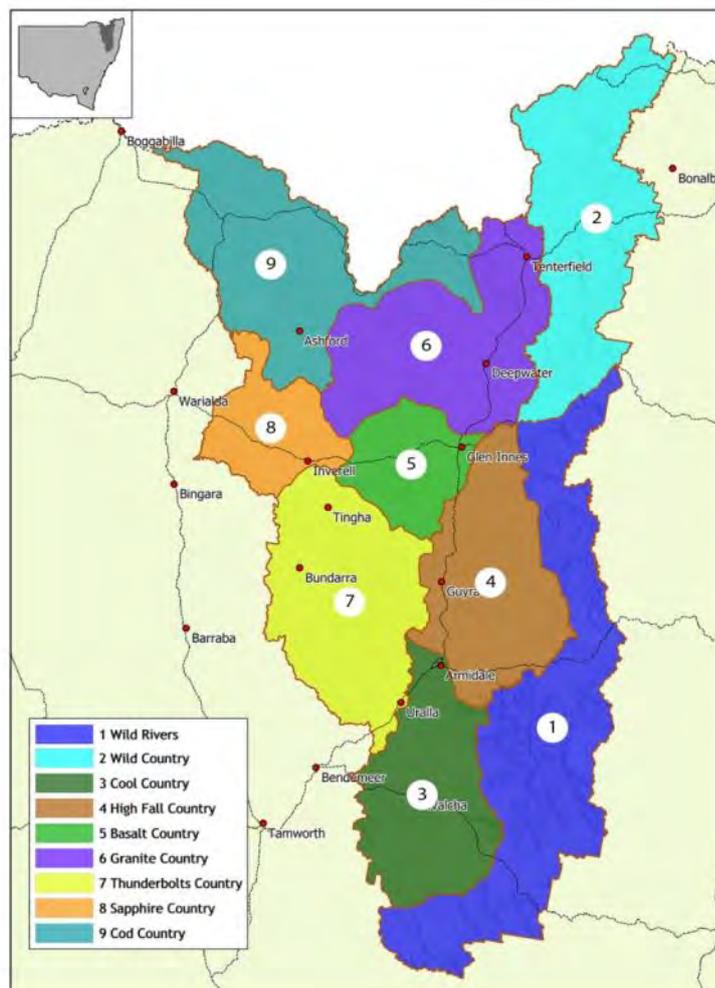


Figure 8. Socio-ecological landscapes of the Northern Tablelands region.

Table 2. Regional scale targets for the Northern Tablelands.

Regional Scale Targets (these apply across the Northern Tablelands region)	Priority actions
Northern Tablelands 1 By 2025, 8 high priority invasive weed species are targeted for intervention.	<ul style="list-style-type: none"> • Monitor weed pathways to prevent invasive species entering the region • Prioritise management of weeds that are a threat to agriculture and the environment
Northern Tablelands 2 By 2025 there is a 25% increase in the number of land managers participating in programs to manage vertebrate pests to reduce predation.	<ul style="list-style-type: none"> • Form new groups or increase membership of existing groups • Baiting programs held in priority areas for priority species
Northern Tablelands 3 By 2025, a 10% increase in agricultural enterprises being managed above critical thresholds for groundcover, soil organic carbon, litter, pasture biomass and native vegetation cover.	<ul style="list-style-type: none"> • Manage total grazing pressure • Manage threatening processes, such as weeds, feral animals, soil erosion and soil fertility decline
Northern Tablelands 4 By 2025, facilitate the establishment of 1 new Aboriginal community-owned, profitable, land management focused business enterprise.	<ul style="list-style-type: none"> • Work closely with Aboriginal people and groups through established networks (Local Aboriginal Land Councils and Local Land Services Aboriginal Reference Advisory Group)
Northern Tablelands 5 By 2025, biosecurity surveillance and reporting maintains market access 100% of the time.	<ul style="list-style-type: none"> • Increase community awareness of the benefits of tracing stock movement through Property Identification Codes (PICs) through the National Livestock Identification Scheme (NLIS) • Identify and manage threats to market access • Biosecurity information provided through farm planning services
Northern Tablelands 6 By 2025, there is a 15% increase in the number of farm businesses achieving a profitability ratio better than 0.8.	<ul style="list-style-type: none"> • Farm and sub-catchment planning that integrates agricultural and environmental factors that influence profitability
Northern Tablelands 7 By 2025, 50% of upland wetlands are managed to maintain ecological function.	<ul style="list-style-type: none"> • Manage threatening processes, such as weeds, feral animals, soil erosion and soil fertility decline
Northern Tablelands 8 By 2025, improve community resilience by addressing the most limiting drivers of human or social capital.	<ul style="list-style-type: none"> • Awareness, education and training that focuses on the needs of the community
Northern Tablelands 9 By 2025, there is a 15% increase in the capacity of landholders to manage biosecurity risks and increase profitability.	<ul style="list-style-type: none"> • Awareness, education and training to increase knowledge and capacity to report and manage biosecurity risks.

Table 3. System scale targets for the Northern Tablelands region.

System Targets 1: “Wild Rivers Country”	
	<p>System Target: SEL 1-1 by 2025, 10% of private land managers in the SEL engaged in public/private land partnership projects to improve the balance between agricultural profitability and conservation.</p>
<p>System Strategy: Maintenance of ecosystem services that contribute to functioning of productive landscapes. Partner with conservation/forest managers and land managers to manage threatening processes across public and private tenure</p>	<p>Priority actions:</p> <ul style="list-style-type: none"> • Manage total grazing pressure • Manage threatening processes, such as weeds, feral animals, soil erosion and soil fertility decline • Increase partnerships between public and private land managers that support internationally important conservation areas • Surveillance of weed and disease pathways • Fire management • Increase community awareness of weeds and feral animals • Increase community awareness of the benefits of a PIC for maintaining market access.
System Targets 2: “Wild Country”	
	<p>System Target: SEL 2-1 By 2025, 5% of private land managers in the SEL engaged in public/private land partnership projects to improve the balance between agricultural profitability and conservation.</p>
<p>System Strategy: Maintenance of ecosystem services that contribute to functioning of productive landscapes. Partner with conservation/forest managers and land managers to manage threatening processes across public and private tenure</p>	<p>Priority actions:</p> <ul style="list-style-type: none"> • Manage total grazing pressure • Manage threatening processes, such as weeds, feral animals, soil erosion and soil fertility decline • Increase partnerships between public and private land managers that support internationally important conservation areas • Surveillance of weed and disease pathways to and from adjoining regions • Increase community awareness of weeds and feral animals • Increase community awareness of the benefits of a PIC for maintaining market access.

System Targets | 3: “Cool Country”

	<p>System target: SEL 3-1 By 2025, manage and consolidate 5% of existing native vegetation.</p>
<p>System Strategy: Manage water movement through the landscape to mitigate salinity hazard and peak discharge impacts to soils and stream systems. Manage existing vegetation to increase linkages across the landscape. Manage livestock enterprises to maintain market access.</p>	<p>Priority actions:</p> <ul style="list-style-type: none"> • Ensure producers have access to the latest research and development information that is relevant to their industry • Manage total grazing pressure • Manage threatening processes, such as weeds, feral animals, soil erosion and soil fertility decline • Manage and consolidate existing vegetation to address threatening processes such as salinity • Increase community awareness of weeds and feral animals <p>Increase community awareness of the benefits of a PIC for maintaining market access.</p>

System Targets | 4: “High Fall Country”

	<p>System Targets: SEL 4-1 By 2025, manage and consolidate 5% of existing native vegetation. SEL 4-2 By 2025, riparian stability and in-stream habitat quality is improved in 20% of priority reaches (44km). SEL 4-3 By 2025, 95% of land is used and managed within soil land capability (a 4% increase).</p>
<p>System Strategy: Manage native vegetation for improved connectivity and ecosystem services. Manage the landscape for improved water quality and riparian stability. Manage livestock enterprises to maintain market access.</p>	<p>Priority Actions:</p> <ul style="list-style-type: none"> • Ensure producers have access to the latest research and development information that is relevant to their industry • Manage total grazing pressure • Manage threatening processes including weeds, feral animals, soil erosion, salinity and soil fertility decline • Improve native habitat extent for increased connectivity • Buffer streams and regenerate aquatic habitat features and riparian vegetation • Manage threatening processes to upland wetlands • Increase community awareness of weeds and feral animals • Increase community awareness of the benefits of a PIC for maintaining market access.

System Targets | 5: “Basalt Country”

	<p>System Targets:</p> <p>SEL 5-1 By 2025, manage and consolidate 5% of existing native vegetation to increase extent.</p> <p>SEL 5-2 By 2025, riparian stability and in-stream habitat quality is improved in 10% of priority reaches (24km).</p>
<p>System Strategy:</p> <p>Manage critical thresholds to reduce salinity and soil degradation hazards. Manage vegetation to improve connectivity and ecosystem services. Maintain or improve riparian stability in priority reaches. Manage the landscape for improved soil condition.</p>	<p>Priority Actions:</p> <ul style="list-style-type: none"> • Ensure producers have access to the latest research and development information that is relevant to their industry • Sustainably manage cropping systems • Manage total grazing pressure • Manage threatening processes including weeds, feral animals, soil erosion, salinity and soil fertility decline • Improve native habitat extent and heterogeneity for increased connectivity • Buffer streams and regenerate aquatic habitat features and riparian vegetation • Increase community awareness of weeds and feral animals • Increase community awareness of the benefits of a PIC for maintaining market access.

System Targets | 6: “Granite Country”

	<p>System Targets:</p> <p>SEL 6-1 By 2025, consolidate 10% of existing native vegetation to increase extent.</p> <p>SEL 6-2 By 2025, riparian stability and in-stream habitat quality is improved in 30% of priority reaches (87km).</p>
<p>System Strategy:</p> <p>Increase landholder adaptive capacity and enterprise resilience and diversification. Manage high threat weeds. Maintain or improve riparian stability in priority reaches. Manage the landscape for improved soil condition.</p>	<p>Priority Actions:</p> <ul style="list-style-type: none"> • Focus on improving or maintaining critical thresholds • Manage total grazing pressure • Maintain or improve groundcover • Sustainably manage cropping systems • Restore balance to native vegetation across the landscapes (control woody growth on upper slopes, regenerate lower slopes and floodplains) • Manage threatening processes including weeds, feral animals, soil erosion, and soil fertility decline • Manage threatening processes to wetlands • Improve community capacity and farm viability through research, education and training and access to services • Farm business planning • Stabilise, rehabilitate and protect riparian zones • Increase community awareness of weeds and feral animals • Increase community awareness of the benefits of a PIC for maintaining market access.

System Targets | 7: “Thunderbolts Country”

	<p>System Targets:</p> <p>SEL 7-1 By 2025, manage and consolidate 3% of existing native vegetation within fragmented landscapes.</p> <p>SEL 7-2 By 2025, riparian stability and in-stream habitat quality is improved in 20% of priority reaches (46km).</p> <p>SEL 7-3 By 2025, 85% of land is used and managed within soil and land capability (a 4% increase)</p>
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<p>System Strategy:</p> <p>Manage water movement through the landscape to mitigate salinity hazard and peak discharge impacts to soils and stream systems. Increase connectivity and condition of native vegetation at the landscape scale. Manage the landscape for improved soil condition.</p>	<p>Priority Actions:</p> <ul style="list-style-type: none"> • Manage total grazing pressure. • Manage threatening processes including salinity, weeds, feral animals, soil erosion and soil fertility decline • Improve native habitat extent and heterogeneity for increased connectivity. • Buffer streams and regenerate riparian vegetation • Increase community awareness of weeds and feral animals • Increase community awareness of the benefits of a PIC for maintaining market access.
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System Targets | 8: “Sapphire Country”

	<p>System Targets:</p> <p>SEL 8-1 By 2025, manage and consolidate 10% of native vegetation to increase extent.</p> <p>SEL 8-2 By 2025, riparian stability and in-stream habitat quality is improved in 20% of priority reaches (34km).</p> <p>SEL 8-3 By 2025, 90% of land is used and managed within soil and land capability (a 4% increase).</p>
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<p>System Strategy:</p> <p>Manage the landscape for improved rainfall use efficiency and within land capability. Stabilise soil landscapes and stream systems to improve water quality. Increase extent and condition of native vegetation.</p>	<p>Priority Actions:</p> <ul style="list-style-type: none"> • Focus on improving or maintaining critical thresholds <ul style="list-style-type: none"> ◦ Manage total grazing pressure ◦ Sustainably manage cropping systems to improve soil health ◦ Increase areas that maintain groundcover above 70%. • Ensure producers have access to the latest research and development information that is relevant to their industry • Manage threatening processes including salinity, weeds, feral animals, aquatic pest species, soil erosion and soil fertility decline • Improve community capacity and farm viability through research, education and training and access to services • Increase farm business diversification • Protect river systems and rehabilitate riparian and in-stream habitat • Increase community awareness of weeds and feral animals. • Increase community awareness of the benefits of a PIC for maintaining market access.
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System Targets | 9: “Cod Country”

	<p>System Targets:</p> <p>SEL 9-1 By 2025, riparian stability and in-stream habitat quality is improved in 30% of priority reaches (90km).</p> <p>SEL 9-2 By 2025, 90% of land is used and managed within soil and land capability (a 2% increase).</p>
<p>System Strategy:</p> <p>Increase landholder adaptive capacity and enterprise resilience and diversification. Manage high threat weeds including invasive native species. Manage the landscape for improved soil fertility and rainfall use efficiency.</p>	<p>Priority Actions:</p> <ul style="list-style-type: none"> • Restore balance to native vegetation across the landscape (control woody growth on upper slopes, regenerate lower slopes and floodplains) • Manage total grazing pressure • Sustainably manage cropping systems to improve soil health • Ensure producers have access to the latest research and development that is relevant to their industry • Increase areas that maintain groundcover above 70% • Manage threatening processes including weeds, feral animals, aquatic pest species, soil erosion, soil fertility decline • Improve community capacity and farm viability through research, education and training and access to services • Increase farm business diversification • Promote landholder awareness and preparedness for natural disasters. • Increase farm business planning • Protect river systems and rehabilitate riparian and in-stream habitat. • Increase community awareness of weeds and feral animals • Increase community awareness of the benefits of a PIC for maintaining market access.

Priority areas

Biosecurity

Many biosecurity priorities are guided by legislative requirements. Property Identification Codes (PICs) and compliance with the National Livestock Identification System (NLIS) are important parts of a national strategy to monitor and trace livestock movement. In the event of an animal disease outbreak the PIC becomes the key way to track and identify infected livestock.

Northern Tablelands Local Land Services region has the highest livestock carrying capacity of all Local Land Services regions, with the highest cattle numbers and the 4th highest sheep numbers (Figures 9 and 10, based on 2013 land and stock returns). The Northern Tablelands economic and social reliance on agricultural commodities means that biosecurity is a high priority. Maintaining access to local, national and international markets for livestock trading is a fundamental priority for the Northern Tablelands Local Land Services and its community.

Cropping also contributes to the local economy, including providing fodder for livestock. Surveillance by biosecurity officers, and the ability of the community to identify or control the entry of plant diseases, is an integral function of the Northern Tablelands Local Land Services.

Biophysical

Agricultural landscapes occupy around 60% of the Northern Tablelands Local Land Services region. For the long term sustainability of the region it is important that these industries continue to function. This cannot happen without the provision of clean water, healthy soil, active biodiversity and community capacity.

To maximise the effectiveness of investment in natural resource management and capacity

building, it is important to choose locations that have a high need for intervention, or that will provide the highest benefit to maintaining and improving sustainable and balanced production and conservation within the landscape.

The Investment Plan identifies spatially explicit areas that have a high priority for action to maintain, protect or improve the natural assets that provide the basis for supporting and sustaining primary production and biodiversity values within our region. The identified priority areas are extensive. It is unlikely that they can all be addressed given limited resources. They are intended to be used as a guide to assist with targeting investment.

It is important that other factors are also considered, including the capacity and willingness of land managers to invest in and undertake actions, the availability of equipment and labour, and the degree of commitment to long term management.

While these priorities have been presented individually on the following pages, the targets have been developed to address or reduce the risk in other priority target areas and assist in achieving those targets. For example, targets for consolidation or revegetation of native vegetation are also areas that have been identified as a salinity hazard risk. As a result, progress towards the vegetation targets will also ensure progress towards targets which address salinity.

Rivers and streams

Priority river and stream reaches for targeting investment in restoration/rehabilitation are presented in Figure 11. The relative need to restore or rehabilitate stream reaches is based on an analysis of the risks of hydrological and geomorphic disturbance and water extraction to in-stream values. In-stream values include all aquatic species. Investment in river reaches identified as high to very high priority for restoration/rehabilitation should improve water

quality for livestock and in-stream and riparian habitat for fish and other aquatic biota.

Biodiversity

Priority areas for native vegetation management are presented in Figure 12. The map shows areas where the greatest benefit to sustaining the persistence of biodiversity is predicted to be achieved if appropriate on-ground works are undertaken. Managing native vegetation on-farm also has benefits for livestock for shade and shelter, as well as improving rainfall use efficiency e.g. capturing and retaining rainfall.

The predicted benefits to biodiversity are based on state-scale modeling that considers the spatial distribution of native vegetation communities and their condition. The modeling assumes that native vegetation priorities will also protect and maintain populations of native fauna. Benefit categories are:

“Manage and improve” areas would benefit from active management of any remnants of native vegetation to maintain or improve their condition.

“Consolidate” areas would benefit from investment in maintaining or improving connectivity of patches of vegetation.

“Revegetate” areas that are predominately cleared and would benefit from investment in establishing additional areas of biodiverse vegetation.

The environmental value of Travelling Stock Reserves and their relative importance for connectivity is presented in Figure 13. The data is based on a compilation of surveys of the biodiversity values remaining in these unique areas, and an assessment of their significance for connecting core remnants of native vegetation within the landscape.

Integrating biodiversity benefits with rainfall use efficiency and livestock health means that addressing priorities for vegetation management can have multiple benefits.

Soils

Good soil health is the basis for profitable and sustainable agricultural enterprises. Addressing priorities that address or reduce land degradation will provide the platform for agricultural and community resilience.

Areas that are at risk of soil degradation are presented in Figure 14. The data is based on an assessment of ‘land and soil capability’ relative to existing land use. Soils in a degrading state have reduced fertility, permeability and structure, are at higher risk of erosion and scalding, and limit profitability.

Areas that are at risk of salinity outbreaks are presented in Figure 15. Rankings for salinity hazard are determined from a number of factors including salt stores, salinity outbreaks, water quality, salt loads, onsite and offsite impacts, presence of acid sulfate soils, presence of highly sodic soils, aquifer systems, ground water quality and ground water depth.

The Investment Plan incorporates an assessment of the best available spatial information. There are many natural resource management issues for which detailed spatial data is not available. The *Adaptive Management Section* (on page 47) addresses these gaps in our knowledge.

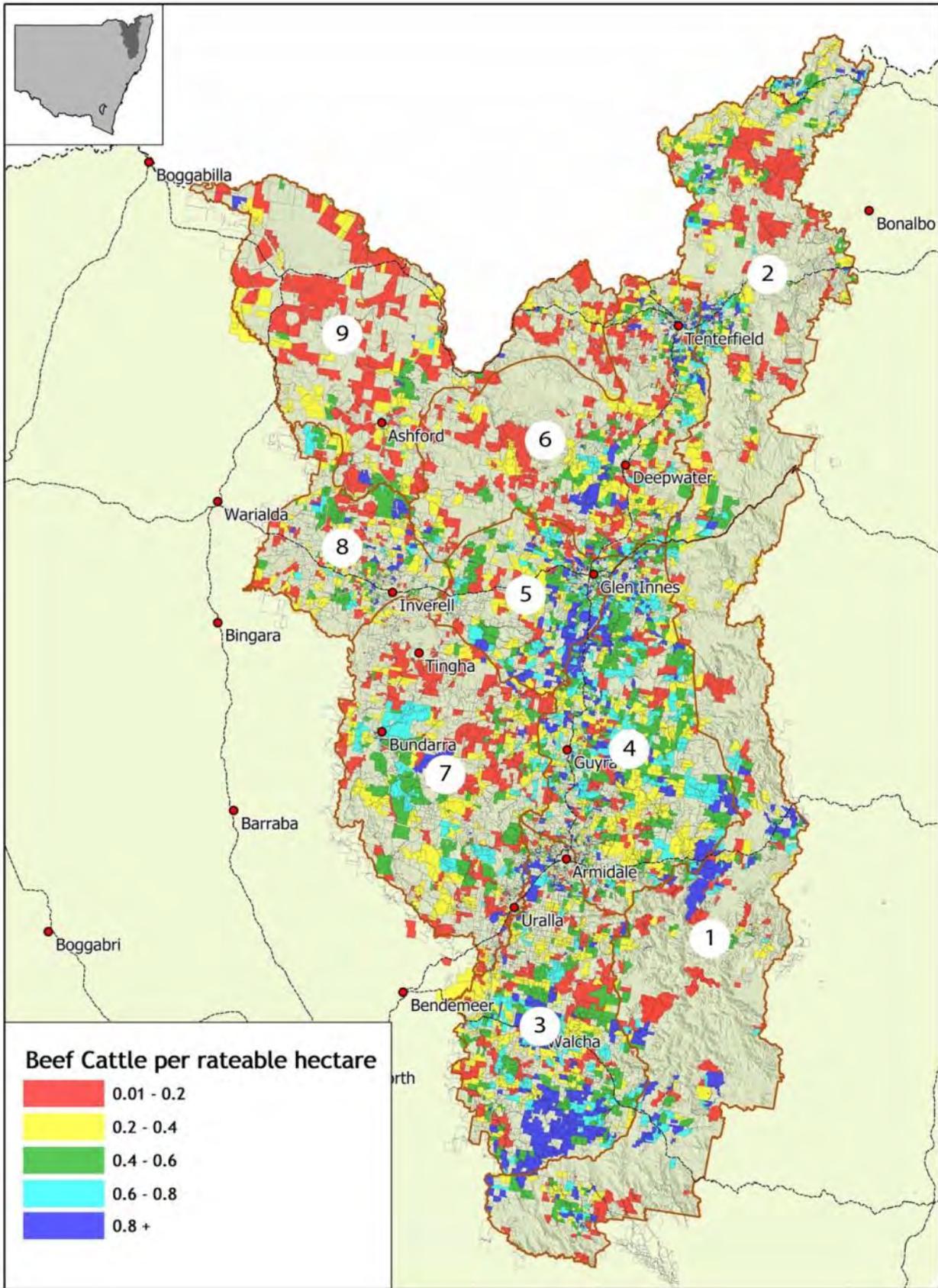


Figure 9. Beef cattle density (Data source: Financial and Rural Management System database. Numbers on the map relate to SELs, see page 23 for information)

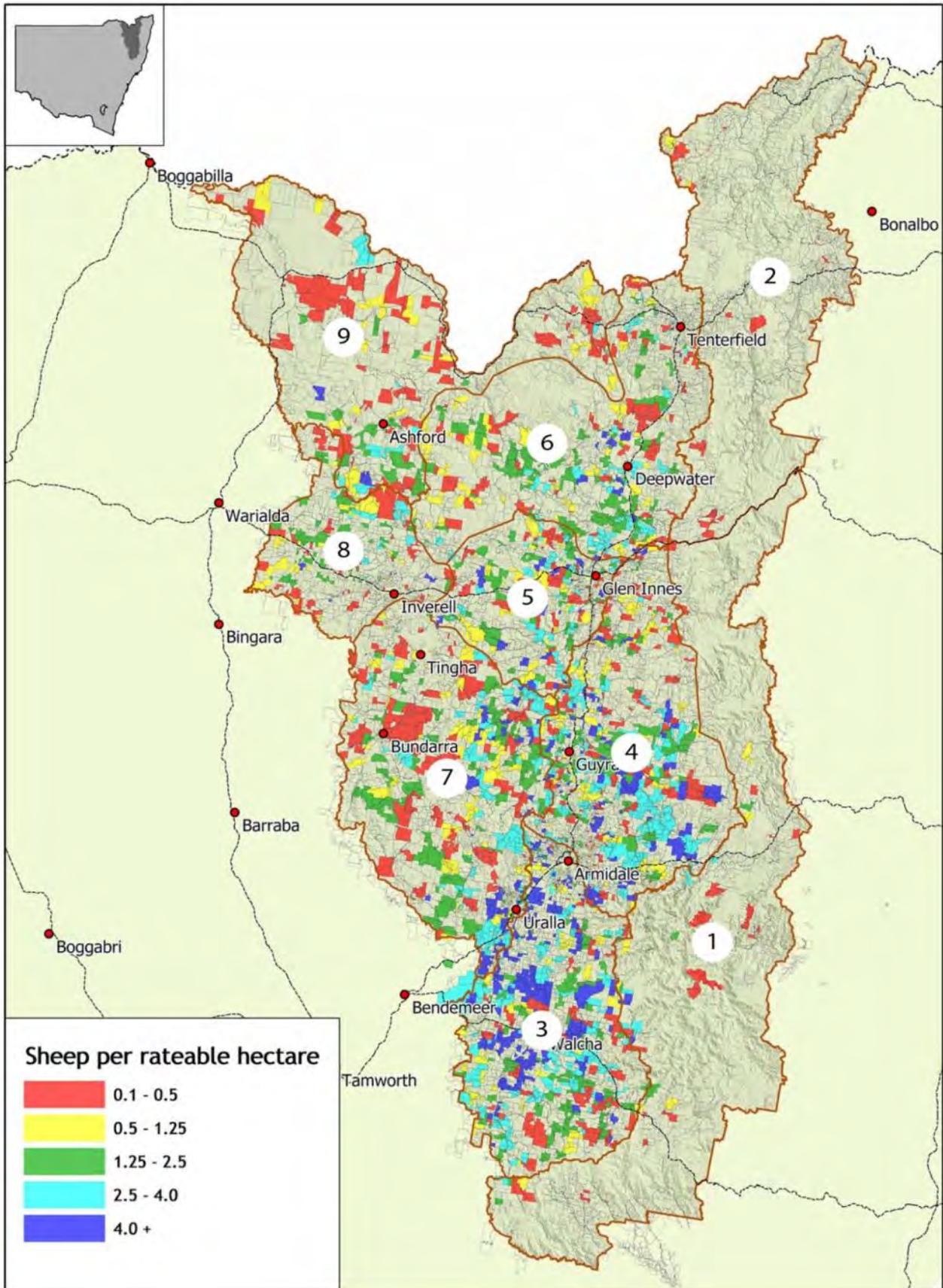


Figure 10. Sheep density (Data source: Financial and Rural Management System database. Numbers on the map relate to SELs, see page 23 for information)

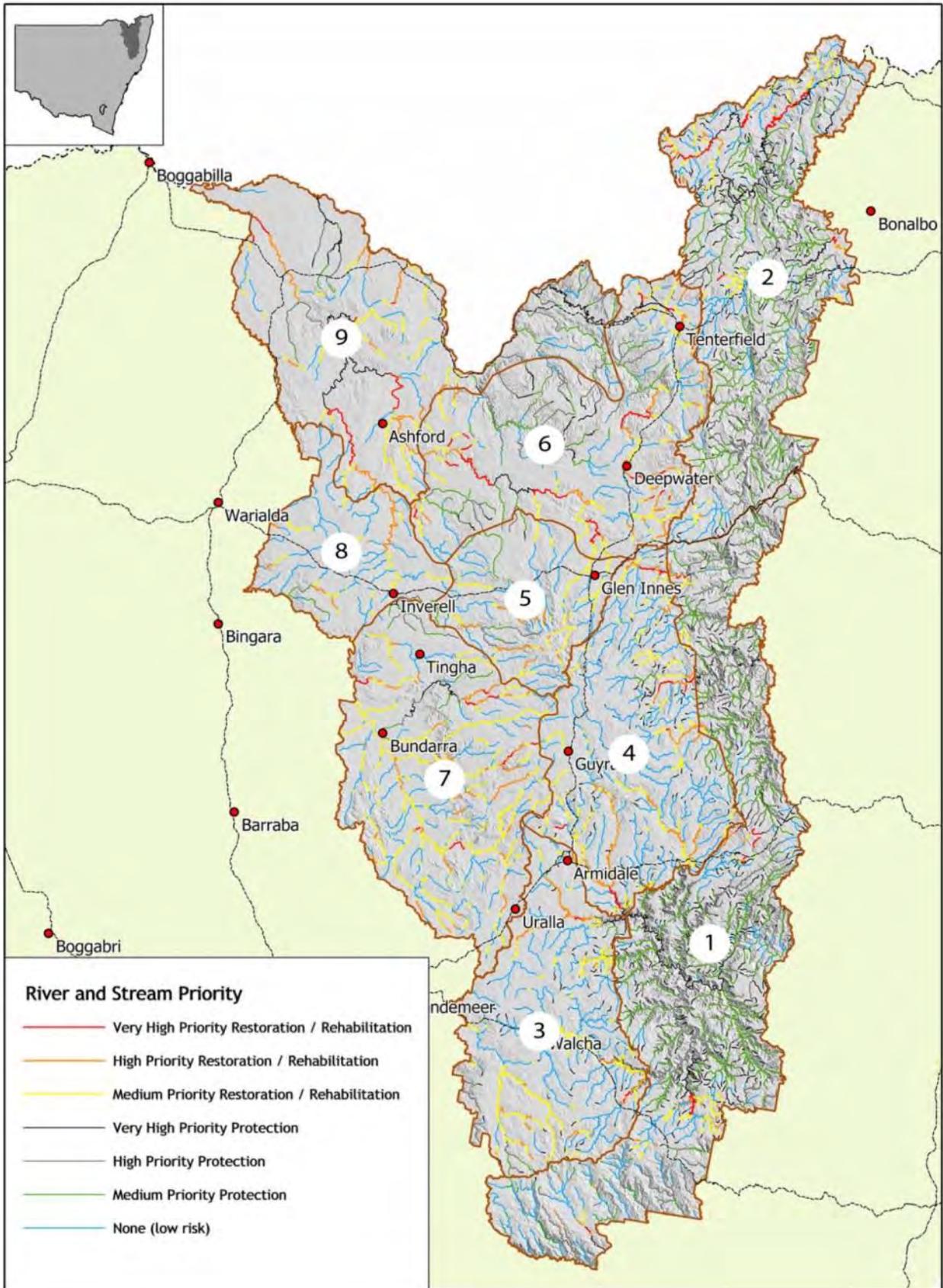


Figure 11. River and stream priority (Data source: NSW Office of Water. Numbers on the map relate to SELs, see page 23 for information).

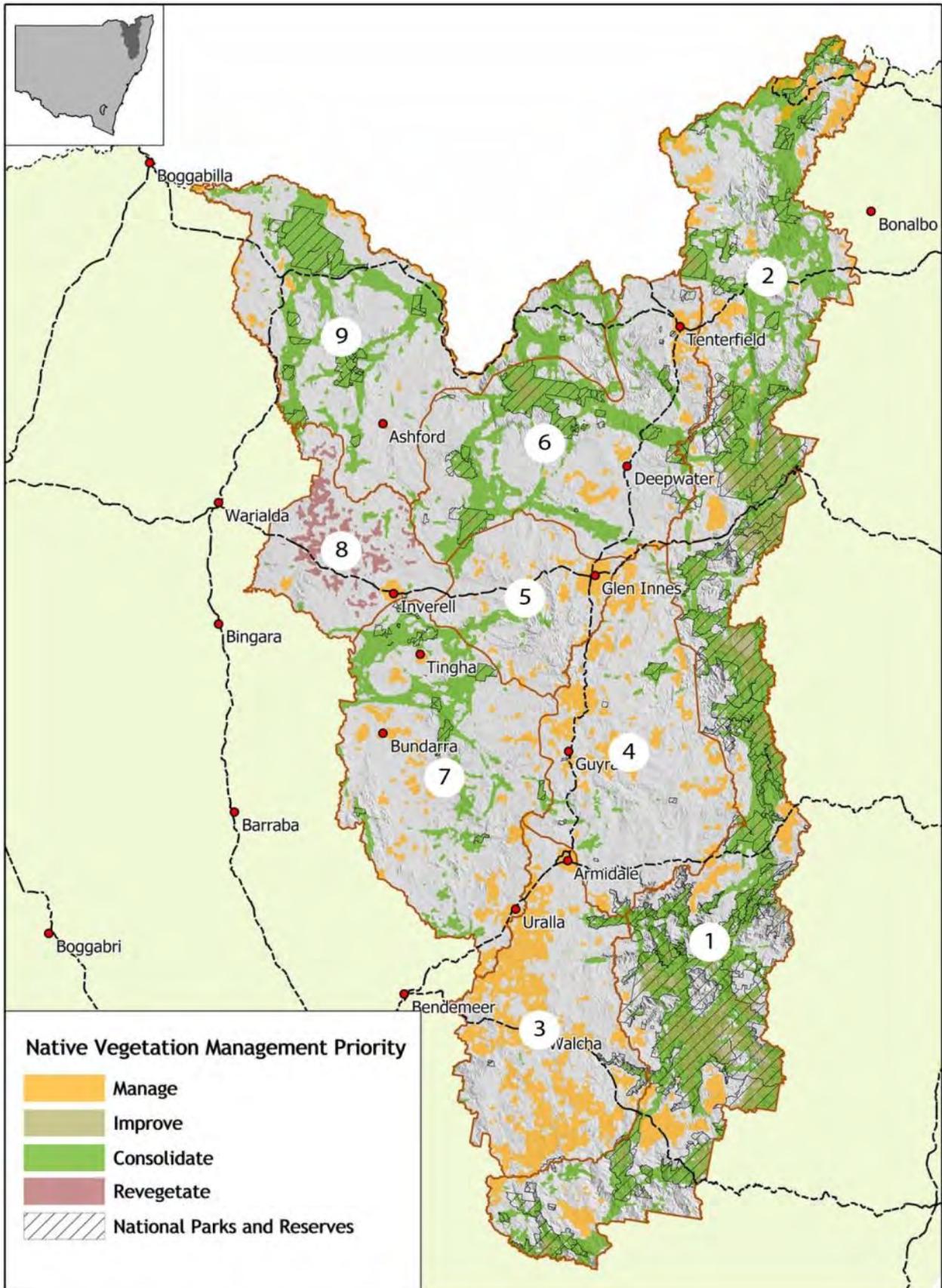


Figure 12. Native Vegetation Management priority (Data source: NSW Office of Environment and Heritage. Numbers on the map relate to SELs, see page 23 for information).

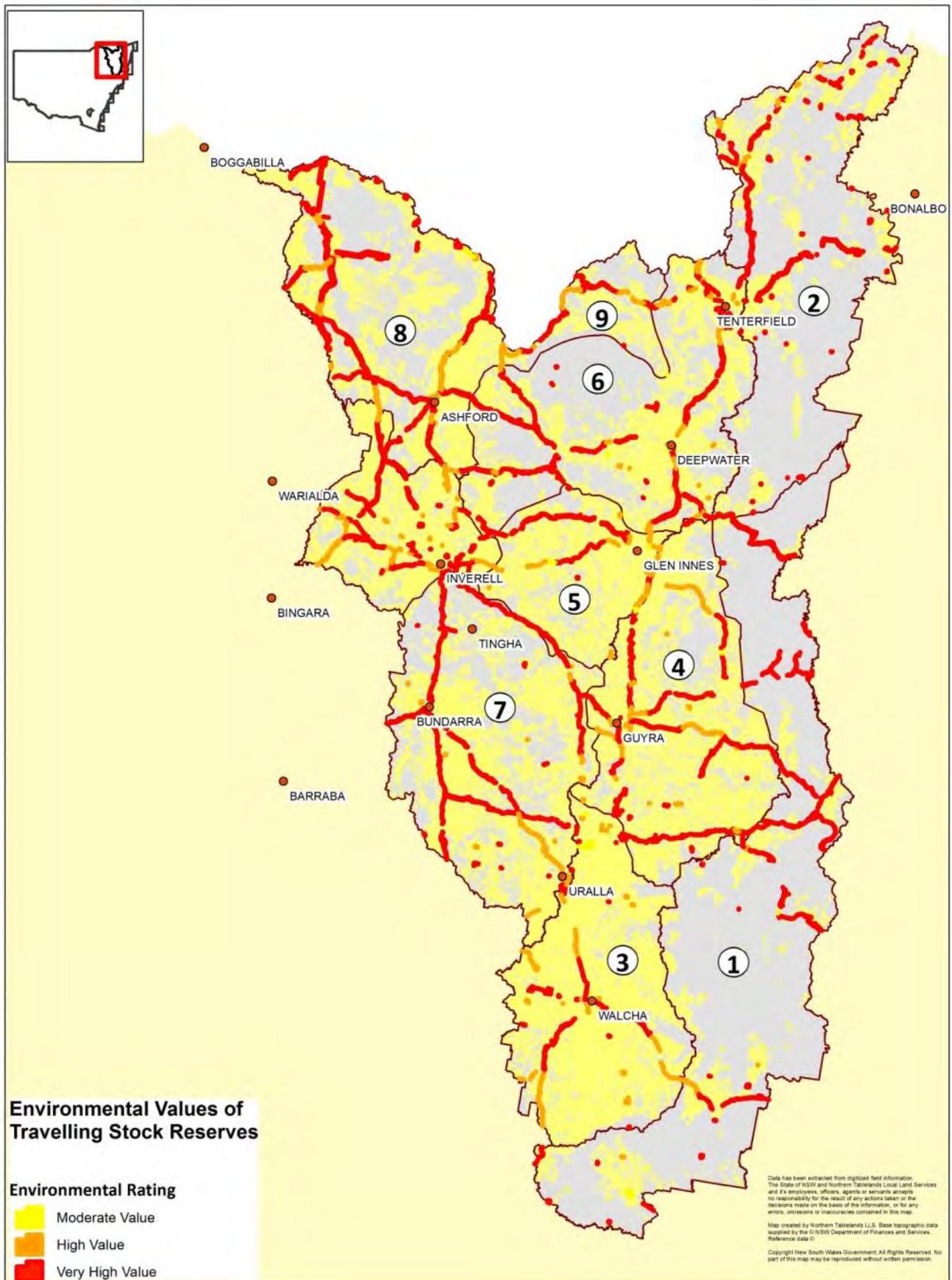


Figure 13. Travelling stock reserve connectivity and conservation priority (Data source: Northern Tablelands Local Land Services. Numbers on the map relate to SELs, see page 23 for information).

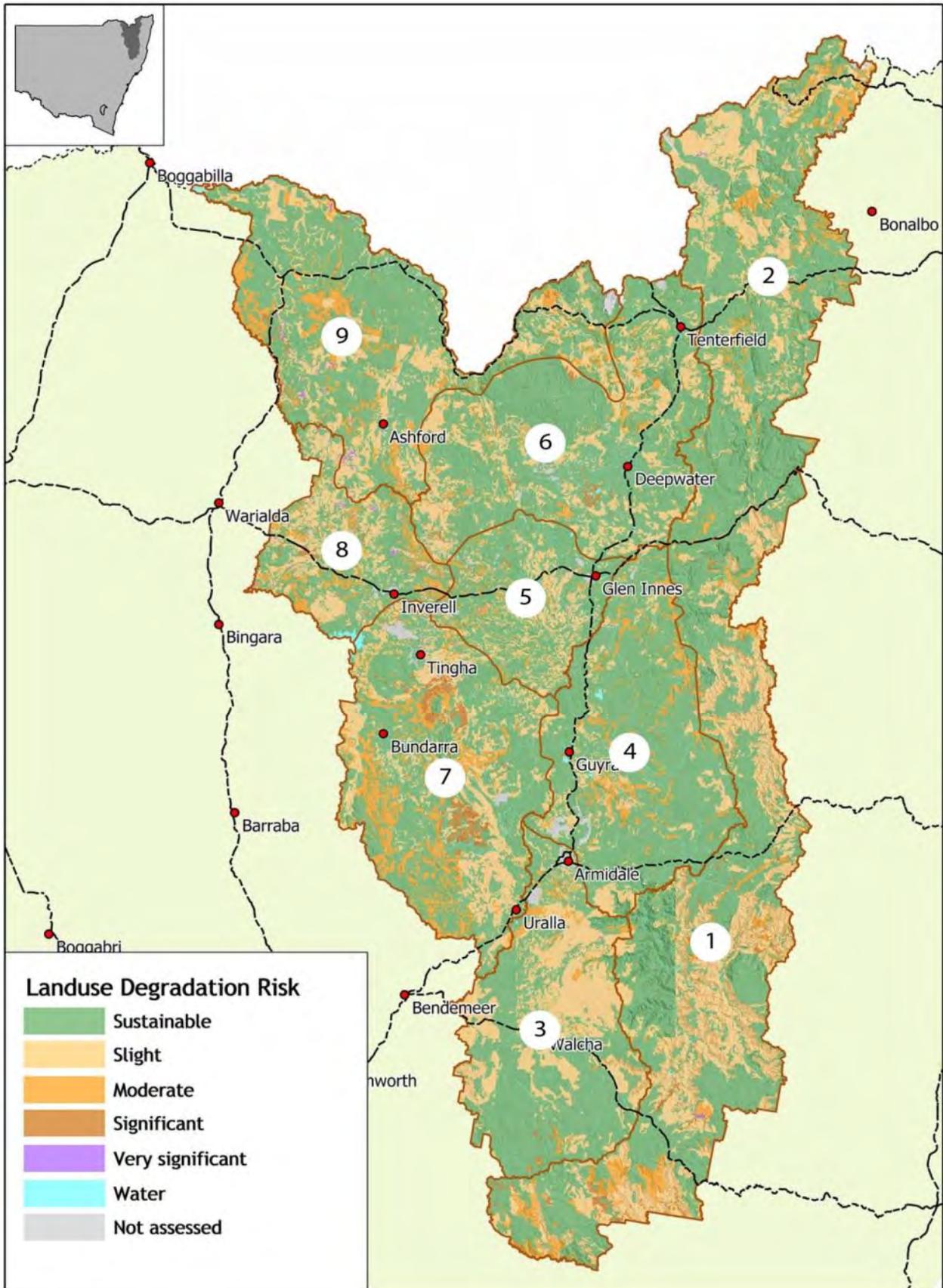


Figure 14. Land use degradation risk (Data source: NSW Office of Environment and Heritage. Numbers on the map relate to SELs, see page 23 for information).

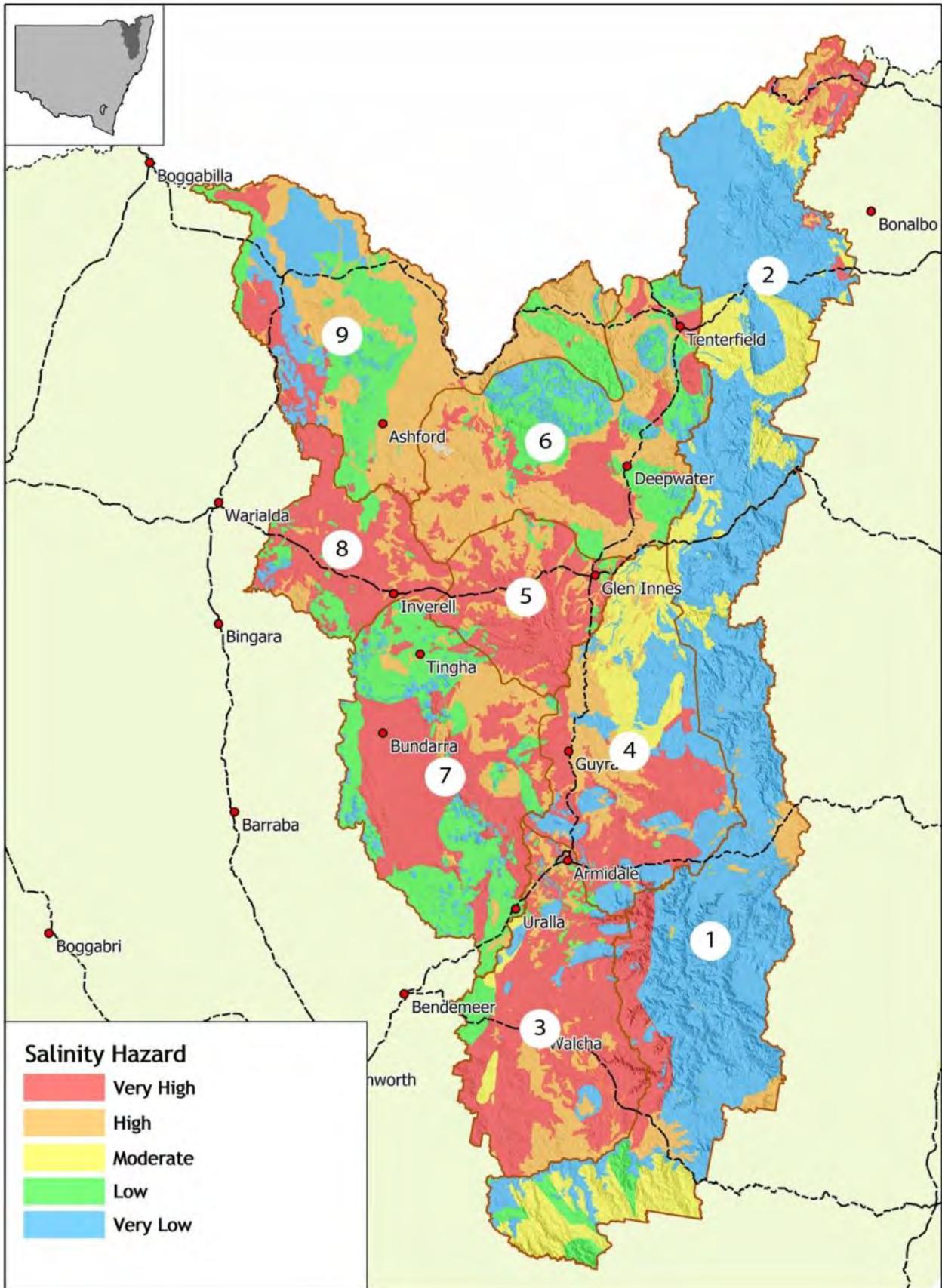


Figure 15. Salinity hazard risk (Data source: NSW Office of Environment and Heritage. Numbers on the map relate to SELs, see page 23 for information).

Implementing the investment plan



Implementation of the Investment Plan

Actions to achieve regional and system targets will have a positive flow-through to state and national targets for profitable agriculture, resilient communities and sustainable natural resources.

The Local Strategic Plan shows where the Northern Tablelands Local Land Services will focus business effort in the first five years of operation, including implementing the Investment Plan.

1. Creating resilient, adaptive communities

A whole-of-government and whole-of-community approach will be used to implement the plan. Local Land Services will work with individuals and organisations in the community, agencies, and industry for greater collaboration and mutual outcomes.

A collaborative governance model has been developed and will be implemented with partners and key stakeholders in the first five years of plan implementation.

Partnerships to develop research will be particularly important in the first five years. Research will provide relevant, local information, as well as the rigor and evidence for adaptive management and decision making.

Community engagement will underpin all approaches over the 10 year period of the Investment Plan. It will involve increasing community adaptive capacity through education and communication, and through sharing our collective knowledge and expertise.

Actions by landholders, communities, agencies and industry will be undertaken in the context of contributing towards all of the following three areas.

2. Safe, secure and modern agriculture

Maintaining a region free from emergency animal or plant diseases requires a whole-of-government and whole-of-community approach. Biosecurity is everyones responsibility and regional resilience will be enhanced through raising awareness of the importance of Property Identification Codes and the National Livestock Identification Scheme. Working with the community will be a focus to ensure that reporting of diseases and surveillance is of the highest standard. Local Land Services staff will be trained and ready to assist in natural disasters and biosecurity emergencies that affect plants and animals.

Agricultural extension officers are available for consultation and advice on all aspects of agriculture.

Innovation in agriculture will be encouraged and supported through partnerships with research institutions and industry groups.

3. Achieving sustainable productive lands

The focus will be on improving the management of productive landscapes across the region where soil and land is currently managed outside its capability, groundcover levels are below desirable thresholds, or where soil condition is under threat.

- Land managers in this situation will be assisted with farm planning.
- Soil capability mapping will be improved.
- Progress towards models for groundwater predictions under climate scenarios will be made through partnerships with other agencies.
- Managers who are committed to managing land within capability will be supported.

4. Achieving connected biodiverse landscapes

In the first five years of plan implementation, areas that offer opportunities for maximising vegetation connectivity, contribute to carbon sequestration, and offer maximum biodiversity resilience, will be identified. Over the next ten years the Northern Tablelands Local Land Services will work with landholders, the community, government and industry to increase connectivity and the presence of vegetation within fragmented landscapes. The focus will also be on reducing critical threats such as invasive species.

5. Achieving balanced hydrological systems

The focus on hydrological systems extends to rivers, wetlands, groundwater and riparian and in-stream habitats. Recognising the connection between land use and hydrological systems, actions to achieve sustainable productive lands will also contribute to achieving balanced hydrological systems.

On-ground works for in-stream and riparian habitat projects with land managers and other partners will commence in year one. The focus will be on identified priority river and stream reaches.

Education and extension will be a key activity from year one to year ten. Key partners will include the Department of Primary Industries, NSW Office of Water, Office of Environment and Heritage, Fisheries NSW, local government, landholders and industry.

Further actions

Working together in partnerships across boundaries to identify and create integrated agricultural and natural resource management solutions will be a high priority from year one onwards.

Monitoring, evaluation, reporting and improvement (MERI) activities will be integral to

all activities implemented under the plan, and all activities will be adaptively managed.

Scale and time will drive the implementation of projects. To augment implementation of the plan, initiatives will build on past projects from across the region and use lessons learnt and evidence from natural resource management projects elsewhere.

Strategy for investment

Not only will the NSW and Australian Government, through Northern Tablelands Local Land Services provide investment, but this investment will be the catalyst for investment by others to bring about the successful implementation of the plan.

Federal and state government funding, and other sources, will contribute a substantial amount towards implementing the plan. Most of this funding will be distributed across a range of contracts with farmers and other partners who will collectively exceed the Northern Tablelands Local Land Services' contribution (in funds, labour or other in-kind).

By improving coordination between agencies and organisations, and by implementing collaborative governance, funds will be leveraged further. The result will be substantial investment, both financially and in-kind, for agriculture and natural resource management across the region.

This plan provides the basis for innovative solutions at all levels. For example, through collaboration, multi-disciplinary projects could involve partners from across numerous sectors (e.g. natural resource management, health, rural financial and education). Every level of collaboration can and will be explored.

Investment in innovation will be increased. This will include climate-ready activities, collaboration and co-investment with industry bodies in projects for production and profit benefits.

Shared priorities and targets

To enable greater coordination of effort, planning for investment will be aligned with key partners, their plans, policies and strategies, particularly with local government and other government agencies. Current policies, plans, and strategies promote collaboration with other key stakeholders to help achieve shared outcomes. Aligning the plan with relevant policies, plans, and strategies has helped to inform where and how Northern Tablelands Local Land Services will work more closely with stakeholders and partners to achieve shared targets.

Opportunities for leveraging investments

Resource constraints affect all stakeholders so collaboration is an effective means to leverage funds and achieve multiple policy and plan objectives. Several opportunities for collaboration and leveraging resources have been identified, including:

1. Collaboration with partner agencies responsible for research, monitoring and / or licensing, such as NSW Department of Primary Industries, NSW Office of Water, and NSW Office of Environment and Heritage.
2. Collaboration across sectors to build social and environmental resilience and to promote community, industry and landholder understanding of the connection between land use and community resilience. Partnerships with Local Government, Local Aboriginal Land Councils, Landcare, education and health sectors will be developed to achieve common goals.
3. Collaboration with regional planning and development committees. The New England North West Strategic Land Use Plan (SRLUP) and Regional Development Australia's Northern Inland (RDANI) NSW

Regional Plan share goals similar to the Investment Plan for creating resilient SELs.

The Northern Tablelands Local Land Services is keen to ensure that within these initiatives social and economic development is based on enhanced resilience for the natural resources and processes that underpin the region's ecosystem services.

Further opportunities for leveraging resources through collaboration will be assessed and developed during implementation planning.

Roles and responsibilities

Partner organisations and stakeholders bring a range of different roles, responsibilities, and capacities to managing agriculture and natural resources and the social and economic aspects of the region.

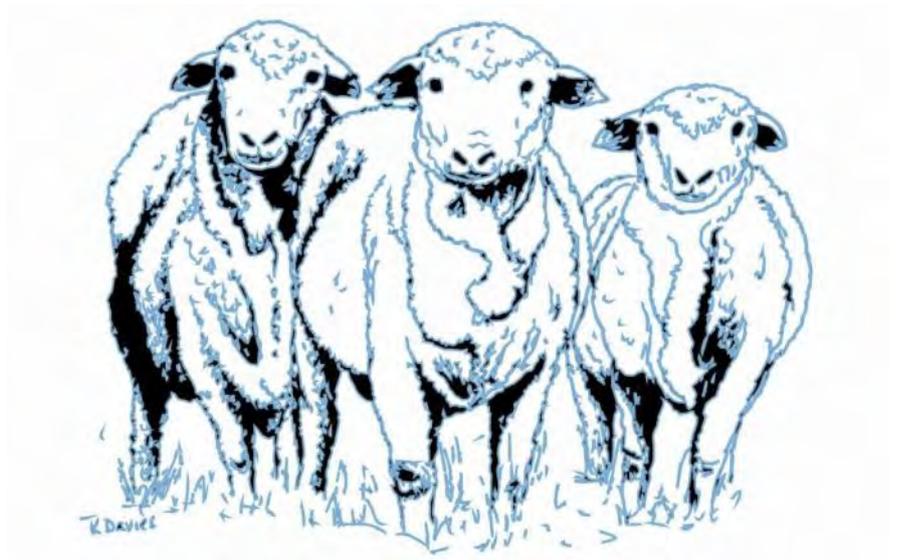
Through plan implementation, Northern Tablelands Local Land Services will collaborate with all levels of government, agencies, community and industry to reach the goals of the plan. Individuals and organisations listed in Table 4 represent a selection of partners best positioned to contribute to delivery of the plan. The table is not exhaustive and all organisations and individuals are welcome to contribute to building a resilient region.

Table 4. Link between the goals and delivery partners.

Goals	Partners to deliver against individual Goals	Partners delivering against all Goals
G1 Community plays an active role in biosecurity.	Stock selling centres, agribusiness, Department of Primary Industries and landholders.	Farmers and land managers
G2 Market access is maintained.	Stock selling centres, agribusiness, Department of Primary Industries and landholders.	Department of Primary Industries (Including NSW Office of Water, Fisheries NSW, and other divisions)
G3 Land is managed to support continuous soil forming processes.	Private agronomists, Industry groups, landholders, private agronomists and consultants.	NSW Office of Environment and Heritage, including National Parks and Wildlife Service
G4 Agricultural land is managed to maximise soil and enterprise resilience within land and soil capability class.	Agronomists, Industry groups, landholders, private agronomists and consultants.	Department of Planning and Infrastructure
G5 Water quality in priority river, wetland and groundwater systems supports the requirements for environmental, domestic, stock and irrigation uses.	Fisheries NSW, landholders, NSW Office of Water and Office of Environment and Heritage.	Australian Government Local Government
G6 Hydrological regimes of river, wetland and groundwater systems are managed to ensure flow characteristics are appropriate for balanced environment, production and human use.	Fisheries NSW, State Water, landholders, NSW Office of Water and Office of Environment and Heritage.	New England North West Landcare Network
G7 Native vegetation is managed to prevent the extinction and promote the recovery of threatened species, populations and ecological communities in priority fragmented landscapes and ecosystems.	Fisheries NSW, Greening Australia, Rural Fire Service, landholders and Office of Environment and Heritage	Research / education institutions
G8 Invasive species of regional priority are managed to protect against new incursions, contain existing populations or infestations and reduce impacts on natural and agricultural systems.	New England Weeds Authority, Northern Inland Weeds Advisory Committee, Local Government and Department of Primary Industries..	
G9 Rural communities' adaptive capacity and diversity is strengthened to buffer against future social, economic and environmental shocks.	Local Aboriginal Land Councils, Fisheries NSW Rural Financial Counselling Service, Landcare, Regional Development Australia Northern Inland.	
G10 Aboriginal people are engaged and traditional ecological knowledge is applied in natural resource management.	Local Aboriginal Land Councils, Department of Aboriginal Affairs, Fisheries NSW, Australian Government.	
Cross-border collaboration (Queensland state agencies and other NRM organisations) Neighbouring Local Land Services regions, Queensland Murray Darling Committee, Queensland Department of Environment and Resource Management, Border Rivers Food and Fibre, and others.		



Adaptive management



Adaptive management

The Northern Tablelands Local Land Services applies adaptive management as part of its monitoring, evaluation, reporting and improvement (MERI) Program. A form of adaptive management will also underpin collaborative governance.

What is adaptive management?

Adaptive management is 'learning by doing'. It is a structured, iterative process of decision making allowing uncertainty to be gradually reduced through monitoring systems and landscapes. Adaptive management offers transparency and accountability to decision-making and investment prioritisation, while providing a formal and theoretical foundation for learning and improving.

How will adaptive management be applied to the Investment Plan?

Adaptive management will be applied to all aspects of the plan. Background data,

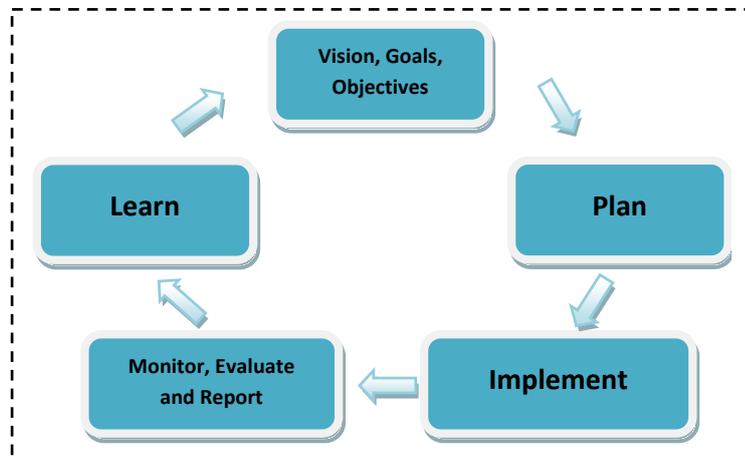


Figure 16. Adaptive management framework.

A priority of the Northern Tablelands Local Land Services will be to ensure that progress is occurring to achieve the targets. Measuring progress against targets will require a collaborative approach to monitoring, evaluation, reporting and improvement. Organisations which gather economic, social and environmental data will be identified so that data can be shared to

implementation activities, strategies, and delivery mechanisms will be reviewed on a regular basis. The reviews will deliver lessons that provide the Northern Tablelands Local Land Services with information to help improve achieving the plan's targets. Adaptive management will inform ways to:

- Learn from projects and programs.
- Evaluate how things might be done differently, either to improve management outcomes or to improve what can be learnt about the system being managed.
- Manage projects and programs in improved ways.

How will it be delivered?

The Northern Tablelands Local Land Services will use its MERI program as a framework and delivery mechanism for adaptive management. This is demonstrated in Figure 17.

measure progress. During the implementation phase, the Northern Tablelands Local Land Services will identify consistent and cost effective methods of gathering relevant data. Formal and informal agreements will facilitate this approach. Regular review of progress will inform the adaptive management cycle, helping to highlight what is working and what needs to change.

Monitoring, evaluating, reporting and improvement

The Northern Tablelands Local Land Services currently implements a MERI strategy that ensures:

- MERI is integrated into all programs and projects.
- Monitoring and evaluation is not an end point, but is a key part of adaptive management and is used in this context across the Northern Tablelands Local Land Services.
- Long-term outcomes are monitored rather than just short-term outputs.
- Multiple lines and layers of evidence are used to evaluate and inform decisions.

This strategy is regularly reviewed and will be adapted to take account of the context of the SELs. Outcomes of MERI reviews will be communicated to community and stakeholders regularly.

Knowledge gaps

A number of gaps in knowledge across the region have been identified based on a review of relevant local research, knowledge, and historical information, as well as government, technical, and scientific knowledge.

Knowledge gaps are threats to the successful implementation of the plan. Addressing knowledge gaps will be achieved through the MERI program. Under the collaborative governance model, partners and collaborators will be involved in identifying and addressing gaps, including research and monitoring programs.

Although the best available evidence was used in developing the plan, we currently have incomplete knowledge in spatial data for biophysical processes occurring within the region, these include:

- Comprehensive vegetation community mapping.
- Soil carbon storage – actual and potential modelled surfaces.
- Weed mapping records of local government areas.
- Spatial locations and extent of threatened ecological communities.

Other knowledge gaps include:

- Data for socio-economic variables and processes occurring at all scales within the region.
- Spatial data for threats occurring at all scales throughout the region.
- Interactions between biophysical, socio-economic and agricultural production systems throughout the region.
- How drivers and threats influence different parts of the natural, social, and economic systems.
- The thresholds at which irreversible change or damage occurs.
- Impacts of unforeseen events, including climate change.

As time and funds permit, the Northern Tablelands Local Land Services will work with agencies, stakeholders and other organisations to fill these gaps. As new information emerges this plan will be reviewed to ensure it reflects the latest information.

Triggers to review the plan

Ensuring the Investment Plan remains current and relevant is a priority. Table 9 identifies when the plan will be reviewed and why.

Table 9: Northern Tablelands Investment Plan review schedule.

Review trigger	Why?
Annual	Projects and programs including new information from data collected will be reviewed annually. Information that is relevant to the plan will be provided in an addendum to the plan.
Context review	<p>An extreme 'shock' to the entire Northern Tablelands system may mean targets become obsolete.</p> <p>An extreme 'shock' could be:</p> <ul style="list-style-type: none"> • A major policy change. • The Local Land Services Board identifying a significant external factor (including extreme weather events) that necessitates change. • A major threshold that is unexpectedly crossed. <p>Changes in the priorities for Local Land Services that may be specified in accordance with Section 49 of the <i>Local Land Services Act 2013</i>.</p>
Funding realignment	Changes in funding from either the state or federal government may mean that the Northern Tablelands Local Land Services is unable to invest in actions to achieve the management targets, which would require the targets to be amended.
Whole-of-government delivery	The plan is a whole-of-government document and is reliant on other agencies to deliver against the targets. If the collaborative governance approach is unsuccessful, the targets may need to be realigned.
Boundary realignment	Changes in boundaries or responsibilities for the Northern Tablelands Local Land Services could change its organisational structure. This would mean that the targets would need to be reviewed to reflect the change in governance.
New information	Any new information that would change our understanding of landscapes and systems would need to be integrated where relevant.

Process for the annual review of the plan

The plan will be reviewed annually. These annual reviews will contribute to a five and ten year review. Information gained from research, monitoring, and management will be used to evaluate the effectiveness of the plan's implementation.

The MERI strategy will provide details on how to prepare the annual review. MERI methods are responsive to new information and sensitive to change. Previous experiences will be included in future decisions, resulting in a

refinement of the monitoring process, making monitoring more targeted and efficient over time.

The annual review will address:

- Programs, projects and delivery mechanisms
- Internal business systems
- Internal and collaborative governance models
- Knowledge gaps

After each annual review, an addendum will be added to the plan that will outline new information and its significance to the region, knowledge gaps, and the rationale for changing or not changing the plan based on this new information. The addendums will be available so that all partners, project participants, and interested parties can remain informed and engaged in the plan implementation.

Acknowledgements

Thank you:

To the many communities and organisations that gave their time and knowledge in workshops and meetings during development of the former CAP. Much of this information has been retained in the Northern Tablelands Investment Plan 2025.

Aboriginal Reference Advisory Group	QLD Dept of Environment and Resource Management
Anaiwan Local Aboriginal Land Council	Regional Development Australia Northern Inland
Armidale Dumaresq Council	Northern Inland Weeds Advisory Committee
Armidale Local Aboriginal Land Council	Northern Coast Local Land Services
Ashford Local Aboriginal Land Council	New England Weeds Authority
Caring For Our Country	New South Wales Department of Planning
Centre for Rural and Remote Mental Health	New South Wales DPI
Citizen's Wildlife Corridors	New South Wales Farmers
Country Women's Association NSW	New South Wales National Parks and Wildlife
Glen Innes Local Aboriginal Land Council	New South Wales OEH
Glenrac Landcare	New South Wales Office of Water
Glen Innes Severn Council	New South Wales Rural Fire Service
Granite Borders Landcare	New South Wales State Emergency Service
Guyra Local Aboriginal Land Council	Rural Support Services Network
Guyra Shire Council	Soil Conservation Service
Gwymac Landcare	South West Inverell Landcare
Gwydir Shire Council	Southern New England Landcare
Inverell Shire Council	State Water Corporation
Land and Property Information	Tenterfield Shire Council
Land and Property Management Authority	University of New England
Livestock Health and Pest Authority	Uralla Rivercare Group
Macintyre Development Unit	Uralla Shire Council
Moombahlene Local Aboriginal Land Council	Walcha Council
Queensland Murray–Darling Committee	Western Local Land Services

Mapping acknowledgement

Arjan Wilkie, Armidale, NSW, 2350

Leith Hawkins, Northern Tablelands LLS

Photo acknowledgements

Front cover: K Coleman (Gwydir River), DPI Photo catalogue (Fox), W Miller (Sheep), A Monie (Cattle)

Page 41 – A Monie (both photos)

Page 50 – J Easey (top), A Sendall (bottom)

Artwork acknowledgements

Pages iii, 2 & 10 - Harry and Judy White

Pages 16, 36 & 42 - Kathleen Davies

Glossary

Adaptive capacity – capacity of a system (social or ecological) to respond to change.

Adaptive management – a structured process of decision-making in the face of uncertainty.

Asset – natural or cultural resources that hold value to the people of the Northern Tablelands region.

Biodiversity – the variety of life forms — plants, animals, and micro-organisms, the genes they contain and the ecosystems they form. Biodiversity is considered at various levels: genetic, species and ecosystem.

CAP – Catchment Action Plan.

Capacity building – the process by which individuals, groups, and organisations further develop their understanding and abilities within a supportive environment.

Catchment – the area determined by topographic features which rainfall will contribute to runoff at a particular point.

Climate ready – addressing carbon abatement targets, while improving habitat connectivity and biodiversity, soil, water and agricultural production systems' readiness for extreme climate events or trends.

Collaborative governance – working together in an inclusive, pro-active and adaptive manner with community, government and industry.

Community – All residents of the Northern Tablelands region.

Country (Aboriginal use) – often used by Aboriginal people to describe the land, and associations with particular parts of the region.

Drivers – external forces or conditions (for example issues, threats, policies) that cause a system to change, pushing the controlling variable towards or away from a threshold.

Ecosystem – a system that includes all living organisms (biotic factors) in an area as well as

its physical environment (abiotic factors) functioning together as a unit.

Ecosystem services – are the transformation of natural assets (soil, plants, water, animals, air and so on) into things that are of value to society (pollination, water purification, flood control etc.).

Evaluation – the analysis of information from activities that have been monitored, to determine how well and in what ways the plan is achieving results. It includes an assessment of:

Appropriateness – determining if the actions meet the objectives of the program.

Effectiveness – determining whether or not the actions are having the desired effect.

Efficiency – determining if the actions are delivered at lowest cost.

Functional area - operational and governance functional areas of Northern Tablelands Local Land Services.

GDM (Green Dry Matter) – The actively growing portion of a sward that is dried and weighed. The capacity of plants to utilise radiant energy declines rapidly as pasture mass falls below 500kg of green dry matter/ha. Having a diversity of plants with different growing seasons will enhance response to rainfall events in all seasons.

Land and Soil Capability (LSC) – a general classification that allows the capability of the land to be broadly categorised for a number of uses. The LSC provides a guide for the assessment of land capability, soil constraints and land management recommendations for use at the regional and property planning level. The Land and Soil Capability Classification shares some characteristics with the existing Rural Land Classification but extends and refines this older system to account for contemporary farming practices and the available information relating to soil properties, condition and degradation. LSC has been proposed as a basis for Natural

Resources Commission Soil Condition Monitoring.

Landholder – anyone who owns or leases land, including public and private land.

Landscape – geographic areas characterised by diverse interacting ecosystems, including terrestrial and aquatic systems, urban and agricultural environments.

Market access - the freedom to enter a market to sell goods and services. In the context of the Northern Tablelands, it is the ability to produce agricultural commodities that are of a standard that meet specific market parameters, e.g. free from disease or chemical residues.

MERI – monitoring, evaluation, reporting and improvement.

NRM – natural resource management.

Outcome – a change in natural resource condition resulting from the implementation of actions through on-ground work.

Output – the work or actions produced.

Pillars - Core operational areas of the Local Land Services - biosecurity, emergency management, agricultural advisory services, natural resource management and customer service.

Profitability ratio – The cost to income ratio identifies whether economic profit is being maximised. This ratio will only determine whether the existing management is sustainable if all costs are accounted for.

Ramsar Convention – Intergovernmental treaty (signed in Iran 1971), that provides framework for the conservation and wise use of wetland ecosystems worldwide.

Resilience – the ability of a system to withstand sudden changes and still retain the same structure and function.

Resilience analysis – the examination of how capable our communities and landscapes are in dealing with shock or disturbance, what drives

change and which management actions can address these drivers.

Socio-ecological landscape (SEL) – geographical areas of a region where a community of people depend on resources and services provided by ecosystems and where the ecosystem dynamics are influenced, to varying degrees, by people's activities.

State – the set of variable conditions which the system currently functions. For example, if a rangeland system is defined by the amount of grass, shrubs, and livestock it contains, then the state is the three-dimensional space of all possible combinations of the amount of these three variables. These conditions define the thresholds that a system must cross to enter a different state, either improved or degraded.

State 1 to 2 Transition – for wetland and stream condition, relates to characteristics described in STMs and represent the threshold between a functioning, resilient state and a non-functioning, non-resilient state.

State and Transition Model (STM) – a tool that informs how our social and biophysical systems function.

Sustainability – meeting the needs of the present without compromising the ability of future generations to meet their own needs. The likelihood that an existing system of resource use will persist indefinitely without a decline in the resource base or in the social welfare it delivers.

System – a group of interacting, interrelated or interdependent elements forming a complex whole.

Target – the level of action needed to achieve a regional goal within a specified time, being action that is specific, measurable, relevant, and time dependent.

Threshold – a break point between two 'states' of a system. Levels in underlying controlling variables of a system at which point feedbacks to the rest of the system change.



