

# Greater Sydney Natural Resource Management Plan

2023-2028

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Published by the Local Land Services  
Greater Sydney Natural Resource Management Plan 2023-2028  
First published May 2023

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Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing May 2023. 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.

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# Acknowledgement of Country

Greater Sydney Local Land Services (Greater Sydney LLS) acknowledges it operates in and delivers services throughout Country of First Nations\* people in the Greater Sydney Region. Greater Sydney LLS recognises First Nations people hold a continuous and deep connection to Country and this in turn holds significance to the broader community.

For First Nations people, Country takes in everything within the physical, cultural and spiritual landscape. It includes landforms, waters, air, trees, rocks, plants, animals, foods, medicines, minerals, the sky and sea as well as sacred places. It includes cultural practice, kinship, knowledge, ceremony, songs, stories and art, as well as spiritual beings, and people: past, present and future.

Greater Sydney LLS recognises and respects Elders and cultural knowledge holders, both past and present, while acknowledging and respecting the unique and diverse enduring cultures and histories of all First Nations people.

Greater Sydney LLS recognises that Caring for Country, the protection and promotion of First Nations cultures, heritage, land management practices and spiritual beliefs are paramount to the relationship with Country and that this benefits the whole community. By supporting self-determined futures and strengthening cultural values for First Nations people, Greater Sydney LLS can contribute towards improved relationships and resilient sustainable communities in the region.

(\*Please note: the term First Nations people and communities, honours the unique physical and spiritual relationships to Country and acknowledges the diversity of cultural, social, economic and political structures held by the distinct First Nations of this continent).



Artwork by Charmaine and Jason Mumbulla from Mumbulla Creative.

# Foreword from the Chair

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The Greater Sydney Local Land Services' (Greater Sydney LLS) Natural Resource Management Plan (NRM Plan) sets the strategic direction for investment in Natural Resource Management (NRM) services in the Greater Sydney region for the next six years. One of the primary purposes of this plan is to identify Greater Sydney LLS' priorities for NRM service delivery, and the actions and interventions needed to act on those NRM priorities.

The Greater Sydney region is one of the most biologically and geographically diverse regions in New South Wales. Few areas reflect such a high concentration of urban development directly adjacent to vast expanses of natural bushland and waterways. Greater Sydney is home to around 5.2 million residents. It is ringed to the north, south and west by more than one million hectares of reserved bushland and to east by an extensive network of waterways, estuaries and the Tasman Sea. These natural features are beautiful and striking, and give much to the distinctive character of the region. They also provide countless benefits to the region's residents by way of clean air, clean water, productive agriculture and recreation.

Perhaps unsurprisingly, many of the pressures and threats to the healthy functioning of these natural systems arise from close proximity to urbanisation and development. To address these issues, this NRM plan takes an 'assets' and 'threats' approach: NRM assets, and the threats to those assets have been identified and catalogued. This process provides a solid framework for the prioritisation of investment, and to identify appropriate management actions to mitigate threats and improve the condition of natural resources. Other sections in the plan cover measures of success, prioritisation principles, and key relationships and partnerships vital for successful NRM outcomes.

Although a stand-alone document, the NRM plan is strongly aligned to numerous other key plans and strategies and their objectives and outcomes, including the state-wide LLS NRM Framework and our own Greater Sydney Local Strategic Plan. In addition, valuable community input was provided during development, ensuring a robust plan that speaks to government, industry and community concerns and interests for identifying and implementing best-practice NRM in the Greater Sydney region.

The plan was developed by Greater Sydney LLS staff with a broad range of expertise in NRM, biosecurity, agriculture and horticulture in collaboration with staff from the Department of Climate Change, Energy, the Environment and Water and the local community including NRM practitioners and First Nations' representatives. We invite the community of Greater Sydney to continue their close engagement and join with us as we move forward to implement this NRM Plan. Our local teams are excited at the opportunity to work in partnership with you.

The Greater Sydney LLS Board commend the efforts of all involved in the development of the plan and look forward to seeing the outcomes of its implementation over the next 6 years.

**Robert Webster**

Chair, Greater Sydney Local Land Services



# Purpose of the Plan

The purpose of this Plan is to provide a clear direction for the delivery of natural resource management (NRM) services in the Greater Sydney LLS region. It will allow customers, stakeholders, and the community of Greater Sydney to see an overview of:

- Greater Sydney LLS priorities for NRM service delivery and investment in the region
- The broad actions and interventions needed to act on identified NRM priorities
- Measures of success
- Prioritisation principles
- Relationships and partnerships needed to achieve successful outcomes, and
- Stakeholder aspirations for natural resource management.

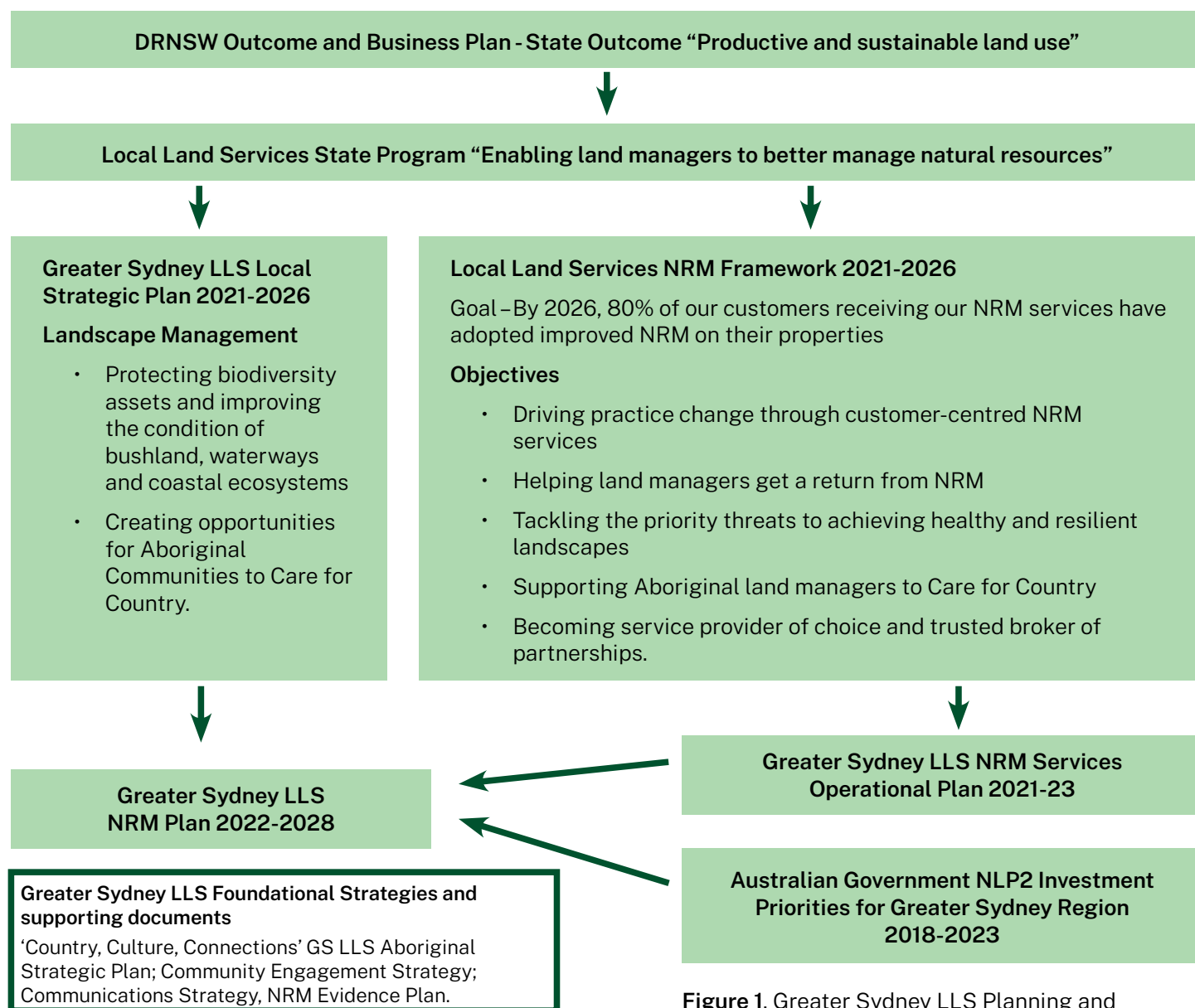
## The LLS NRM Planning and implementation framework

Although the Greater Sydney LLS NRM Plan has been developed as a stand-alone document, it is informed by a number of other key plans and strategies and there is a strong alignment of their various objectives and outcomes (see Figure 1). Related plans and strategies include:

- The Greater Sydney LLS Local Strategic Plan (2021–2026)
- Local Land Services Natural Resource Management Framework (2021–2026)
- Australian Government’s National Landcare Program (2018–2023)
- GS LLS ‘Country, Culture, Connections’ Aboriginal Engagement Strategy (2022–2026).

### GS LLS Local Strategic Plan (2021–2026)

The Greater Sydney LLS Local Strategic Plan provides a local context to the delivery of Local Land Services (LLS) core services (emergency management, primary production, biosecurity and landscape management). Although the Plan is underpinned by the concept of cross-collaboration between our different functional areas, the landscape management pillar of the Plan covers the key NRM priorities specific to the Greater Sydney region and the priority programs Greater Sydney LLS.



**Figure 1.** Greater Sydney LLS Planning and Implementation framework.

## Local Land Services Natural Resource Management Framework (2021–2026)

The Local Land Services Natural Resource Management Framework (2021–2026) (NRM Framework) sits at a state level and sets out the strategic focus and direction for Local Land Services NRM services for 2021 to 2026. It captures the unique role and value of LLS in the NRM Landscape and our value as a service provider for delivery.

The framework outlines key priorities to improve service delivery and better respond to a range of identified challenges and opportunities for NRM. Priorities in the NRM Framework are set out in 5 Objectives and their associated Key Results and Initiatives. These objectives being:

1. To drive widespread NRM practice adoption by understanding and addressing our customers' social and behavioural drivers
2. To help our customers realise returns from adoption of improved NRM practices
3. To take action on the top threats to the health and resilience of NSW landscapes and catchments
4. To champion opportunities for Aboriginal people and communities to care for Country and enhance contemporary land management practices
5. To be the NRM service provider of choice and a trusted broker of NRM partnerships.



# Australian Government's National Landcare Program (2018–2023)

Regional Land Partnerships involves a \$450 million investment over 5 years delivering national priorities at a regional and local level. Funding is being delivered nationally to 54 management units, including Greater Sydney LLS, to support projects contributing to 4 environment and 2 sustainable agriculture outcomes.

Greater Sydney LLS is the Management Unit Service provider for the NRM region of Greater Sydney and is implementing a suite of priority projects for the Australian Government under its Regional Land Partnerships program.

Under the Core Services Agreement for Regional Land Partnerships with the Australian Government (Schedule 2, 3.2(b)(iii) (A, B, C)) it is a requirement that the Management Unit Service Provider has an up-to-date NRM plan. This includes a requirement that:

Within 36 months of the Commencement Date (unless the Department agrees in writing to an alternative timeframe), to ensure that the Natural Resource Management Plan(s) meets the requirements of clause 3.2(c) of the Statement of Work, either:

- a. revise the relevant existing Natural Resource Management Plans or material; or
- b. develop a new Natural Resource Management Plan for the Management Unit; and
- c. submit the revised or new Natural Resource Management Plan to the Department.

## 'Country, Culture, Connections' GS LLS Aboriginal Engagement Strategy (2022–2026)

Greater Sydney LLS and its Greater Sydney Aboriginal Advisory Group alongside First Nations communities, seek through the life of this strategy and beyond, to support the ongoing journey of empowerment across generations of First Nations peoples in Caring for Country, and the deepening and continuation of culture, supported by real and lasting connections to Country.

'Country, Culture, Connections' recognises the diverse and layered Country in Greater Sydney and identifies actions that support key regional outcomes while responding to State-wide Local Land Services Aboriginal Engagement Strategy objectives.

# NRM investment context for Greater Sydney

Local Land Services has 2 main funding programs to implement NRM activity and is highly dependent on external funding:

1. NLP2–NRM activities are dictated by the Australian Government with commitments and strategies agreed in Contracts and MERI plans
2. NRM Services Program–NRM activities are funded directly from NSW Treasury for the implementation of a two-year program (2021-2023) with 3 key objectives:
  - Increase the adoption of improved NRM practices by landholders and communities
  - Increase the area of land where improved practices are being implemented
  - Increase the number of land managers implementing improved practices as a result of practice change.



# The Greater Sydney Local Land Services Region

The Greater Sydney LLS region covers approximately 2,300,000 ha and sits within the Sydney Basin bioregion, a distinctive geographic area in south-eastern Australia comprising relatively uniform climate, geology, landforms and flora and fauna (see Figure 2 for map of GS LLS region, including NRM sub regions). The region is one of contrasts, featuring extensive areas of natural bushland directly surrounding the most urbanised area in Australia.

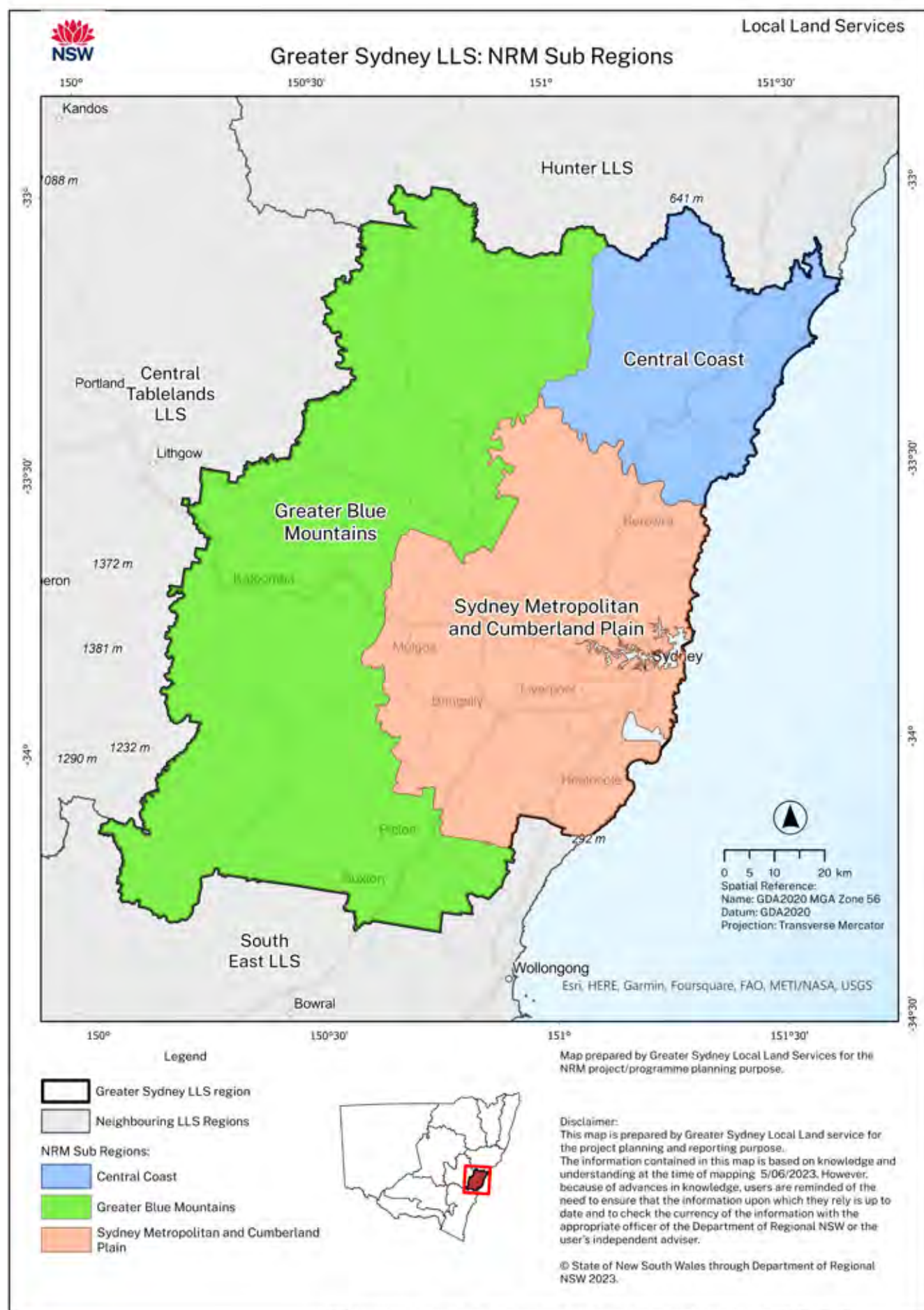
The Greater Sydney region contains an extraordinary diversity of native plant species. Over 2 thousand species of plant are found within dozens of distinct vegetation communities occupying every ecological niche from mangroves and saltmarsh to tall open forest and rainforest.

Similarly, the Greater Sydney region also displays a particularly rich faunal biodiversity with over 70 species of mammals, 350 species of birds, 95 species of reptiles and amphibians, and countless thousands of invertebrate species.

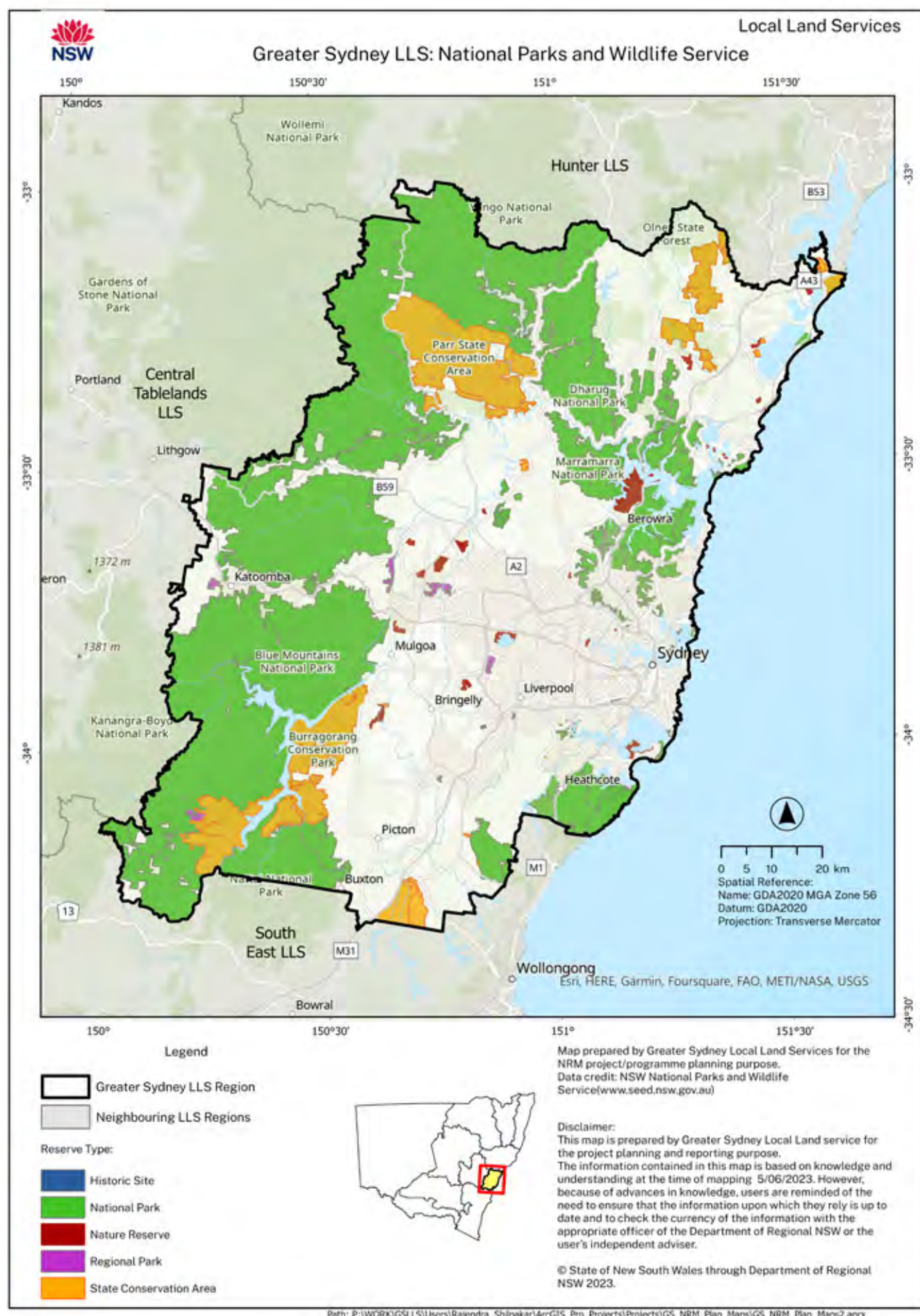
In the Greater Sydney region, the majority of bushland (57% of the total Greater Sydney LLS area) is formally protected as parks, reserves or water catchment areas. There are 96 state reserves in the Greater Sydney LLS region, 8 of which together form the 1 million hectare Greater Blue Mountains World Heritage Area (GBMWH) (see Figure 3 for map of bushland areas under conservation management through government ownership and regulation).







**Figure 2.** Map of the Greater Sydney LLS region, including NRM sub regions.



**Figure 3.** Greater Sydney LLS: Bushland areas under conservation management.



# First Nations communities in the Greater Sydney LLS region

The First Nations community in the Greater Sydney region is complex and layered, containing the largest population of First Nations people in NSW if not Australia. This includes local First Nations people from within the region (Traditional Owners) who hold a deep cultural responsibility and obligation to care for their Country, interwoven through lore, law, customs and practices, inherited over countless generations.

Along with the First Nations people from Country, the community in Greater Sydney consists of individuals and families who have historically or recently moved into the area. These First Nations communities are culturally diverse, with many community members continuing to hold cultural, social and kinship connections to communities and Country in other regions within NSW and Australia.

The Greater Sydney LLS region includes 6 Local Aboriginal Land Councils (LALCs), constituted under the *NSW Aboriginal Land Rights Act 1983* (ARLA). As of 2021, the LALCs across the region hold a significant amount of land claimed and regulated through the ARLA. The ARLA recognises the spiritual, social, cultural and economic importance of land to Aboriginal peoples of NSW. In many instances the membership of LALCs, reflect the diverse and layered landscape of First Nations communities in the region.

Within the region there is also a growing recognition of Traditional Ownership, addressed in part through the *Commonwealth Native Title Act 1993*, and instruments such as Indigenous Land Use Agreements, along with the development of alternative types of agreements between land and water management bodies with First Nations People from Country.

These aspects of formal recognition further provide opportunities to deliver Caring for Country approaches and apply Traditional Land Management knowledge and practice within NRM outcomes in support of public and private land holders.

Due to this multi-layered landscape, NRM outcomes within the Greater Sydney LLS region will be guided by Aboriginal Officers in the first instance, with collaboration from the Greater Sydney LLS Aboriginal Advisory Group (AAG) and involvement of broader First Nations communities to realise meaningful opportunities.

## Greater Sydney NRM Sub Regions

For operational purposes Greater Sydney LLS has identified 3 distinct sub-regions, based on landscape and land use being the Blue Mountains, Sydney Metropolitan and Cumberland Plain, and the Central Coast. A regional setting for each sub-region is provided below.

### The Blue Mountains

The Blue Mountains region is characterised by sandstone uplifted and incised by a network of streams and rivers over tens of millions of years. The upwarped sandstone bedrock rises steeply off the Cumberland Plain to around 150 m above sea level at Lapstone and Kurrajong, increasing in elevation to around 1000 m at Mt Victoria, 40 km to the west. The plateau and steep valley slopes are mantled by a continuous cover of forest and woodland. Within sheltered slopes and gullies and on basalt capped peaks such as Mt Banks and Mt Wilson, rainforest vegetation communities have established featuring species such as Coachwood and Sassafras growing above a rich understorey of ferns and mosses.

Most of the population of the Blue Mountains live within a narrow corridor of towns and villages running westwards from Emu Plains along the Great Western Highway, or in scattered villages along (or accessed from) Bells Line of Road north of the Grose Valley. The Blue Mountains City Council region has a population of around 80,000. Tourism is vital to the region's economy however areas around Bilpin and the Shipley Plateau support various small-scale agricultural activities focussing on apples and other cool-climate fruit.



## Sydney Metropolitan and Cumberland Plain

Sydney is a thriving, cosmopolitan metropolis with a population of around 4.8 million people. Metropolitan Sydney is highly urbanised comprising 33 Local Government Areas, with a combined area of around 160,000 ha, or 13% of the total Greater Sydney LLS region. The city of Sydney is also an important gateway for the flow of goods and people from a multitude of domestic and international locations. This factor exposes the Greater Sydney LLS region to high levels of biosecurity risk, particularly the potential for new incursions of invasive species.

Metropolitan Sydney has numerous National Parks and bushland reserves located wholly within an urban landscape. Sydney Harbour National Park comprises nearly 400 ha of foreshore and bushland only a few kilometres from the CBD. Other urban-impounded National Parks such as Lane Cove, Garrigal or Kamay Botany Bay provide significant habitat for native flora and fauna, amenity benefits, and recreation opportunities for the city's population. Two of the most significant bushland reserves within the region also define the city's southern and northern urban extent, the Royal National Park in the south, and Ku-ring-gai Chase National Park to the north. Both parks are similar in size and geography at around 15,000 ha each and feature extensive coastal sandstone landscapes. Another key reserve within the Metropolitan region is Towra Point Ramsar site, comprising 600 ha of coastal bushland and wetlands, located in Sutherland Shire on the southern shore of Botany Bay. The site is internationally recognised under the Ramsar convention as a critical breeding area for many threatened migratory and non-migratory bird species and other native fauna.

The area north from Windsor, south to Picton and eastwards to inner metropolitan Sydney lies the Cumberland Plain and primarily features a landscape of low rolling hills and broad open valleys. The relatively gentle topography has seen substantial suburban development over many decades however significant areas of peri-urban and agricultural land remain. Agricultural development and urbanisation have resulted in extensive losses to native vegetation on the Cumberland Plain and any vegetation communities are listed as rare or threatened, occupying a fragment of their former range. Cumberland Plain Woodland, once commonplace and contiguous throughout the region has been reduced to 6% of its former extent and now exists as scattered remnants and isolated patches in an urban and agricultural landscape.

The Cumberland Plain is the most important area for agriculture in the Greater Sydney region with enterprises such as poultry, eggs, mushrooms, cut flowers and vegetables.

The northernmost areas of the Cumberland Plain where it adjoins the Hornsby Plateau has uplifted resulting in a hilly landscape at higher elevation relative to the lowlands to the South and East. This part of the Sydney Basin has become known as 'The Hills' district. The higher elevation leads to marginally higher (orographic) rainfall than other non-coastal areas of Sydney and a slightly cooler climate. The Hills district primarily comprises a mix of suburban development, peri-urban and rural land with environmental conditions favouring the production of stone fruit and citrus. In the north, the productive agricultural soils of The Hills district give way to poorer soils developed from Hawkesbury sandstone with the landscape becoming increasingly dissected by the creeks and streams draining into the Hawkesbury River.

## The Central Coast

The Central Coast lies north of Sydney from the Hawkesbury Estuary north to Lake Munmorah. A key feature of the Central Coast are the numerous waterways and coastal lagoons, the largest 2 being Brisbane Water and Tuggerah Lakes. The coastline features estuaries, rugged sandstone cliffs and sandy beaches. The region is also noted for its extensive areas of bushland with around 70% (120,000 ha) of the Central Coast Local Government Area comprising national parks, reserves, state forests, or water catchment areas.

The Central Coast is home to around 330,000 people with the majority living on the coastal lowlands or adjoining hillsides in the eastern part of the region with Gosford and Wyong the 2 major urban centres. The Central Coast has a mixed economy with significant output from the construction, retail, healthcare, manufacturing and agricultural sectors. The main agricultural industries include poultry, cut flowers, turf, vegetables and fruit with production centred on Somersby Plateau. Small scale grazing enterprises are also a feature along the narrow coastal valleys such as Yarramalong, Jilliby and Dooralong.

A map showing variation in landuse across the Greater Sydney regions is provided in Figure 4.

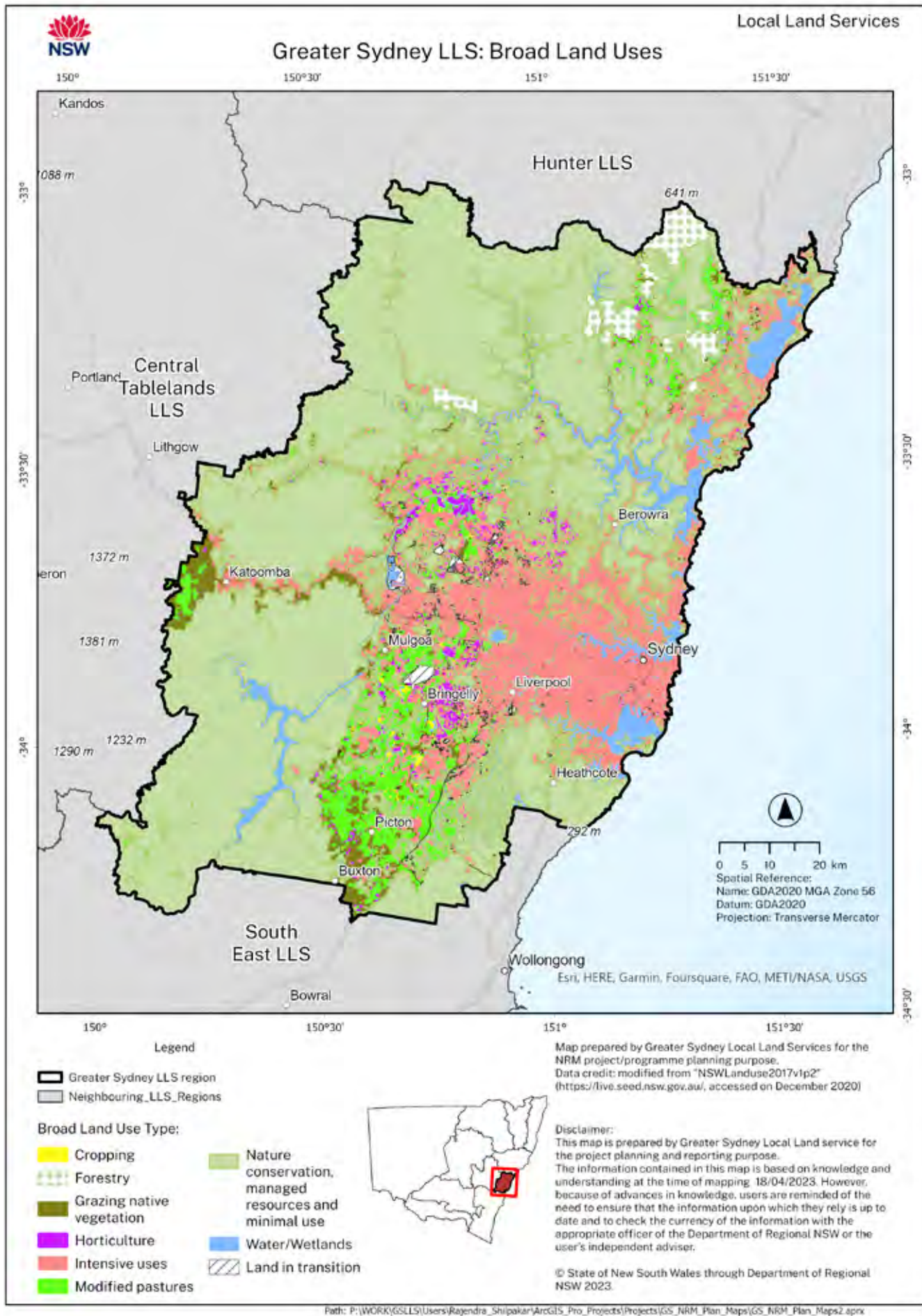


Figure 4. Map of broad landuse across the Greater Sydney region.



## Caring for Country through Natural Resource Management

Since time immemorial the First Nations people from the area now known as Greater Sydney have held a deep and continuous relationship to their Country. The diverse landscapes within Country in the region, encompassed abundant natural resources, providing the First Nations peoples with a vibrant and productive physical and spiritual existence for millennia, allowing countless generations to grow up healthy, strong and connected to Country. Over time beyond counting, First Nations people have cared for, protected and nurtured their Country, and the myriad of plants and animals, elements, stories and ceremonies which are interwoven within it. Everything was managed and balanced by First Nations people to ensure that Country was plentiful, harmonious, healthy and viable for themselves and subsequent generations.

Central to this was Caring for Country, the reciprocal relationship embodied in First Nations culture and beliefs, ensuring Country, the physical and spiritual features within, as well as all interdependent beings, remained healthy and balanced through sustainable approaches. The features and beings within Country, be it land, water, fire, wildlife, vegetation, places, natural features and even seasons were respected and cared for with a deep dignity and abiding respect, following enduring traditions and practices. Through intricate ecological knowledge and practice, First Nations people view this responsibility through an interconnected web of kinship, physically and spiritually binding people and Country.

The arrival of European colonists into the Greater Sydney region and the subsequent building of farms, settlements, roads, and industry, changed Country and dispossessed First Nations people. This colonisation led to many decades of unhealthy and unbalanced Country. The clearing of native vegetation, planting of exotic species, impacts on aquatic bodies and waterways as well as the incursion of invasive plants and animals, all have adversely impacted Country.

The Greater Sydney LLS NRM Plan aims to rehabilitate and redress the adverse impacts brought about by European colonisation through ecological landscape management approaches. This plan seeks the involvement of First Nations people, with their guidance, Caring for Country values and Traditional Ecological Knowledge contributing towards restoring health to Country. The plan further seeks to bring back balance to Country in the region, identifying and addressing threats while protecting and promoting the diversity of ecosystems, through improving broader landscape management.

As many First Nations peoples believe: 'Healthy Country, Healthy People.'



# Assets and threats analysis

The NRM Plan follows a model that identifies the region's key NRM assets, the threats to these assets, and the relevant management actions required to protect and enhance these assets.

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## Assets

Assets are defined as: elements within the Greater Sydney region that are a component of, or provide support to, healthy and resilient ecosystems and landscapes. Importantly, assets also provide critical services to human populations. These services include:

- Clean air
- Clean water
- Natural resources
- Nutrient processing and cycling
- Amenity and recreational opportunities
- Cultural and spiritual benefits.

Assets can be physical (e.g., a bushland reserve) or social (e.g., a community group that undertakes bush regeneration at the reserve). Assets exist both within existing frameworks (e.g., EPBC listed species and communities) and outside those frameworks (e.g., clean swimmable rivers).

Assets have been identified through an analysis of listed Matters of National Environmental Significance (MNES) under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) specific to the Greater Sydney region and an analysis at a local level identifying region-wide assets and assets specific to each of the 3 sub-regions. For clarity and a logical representation of assets and threats appropriate to both method and scale, Greater Sydney LLS NRM assets are presented in 3 distinct formats:

- Listed MNES specific to the Greater Sydney region
- Regional scale assets – categorised as physical or social assets with further sub-categorisation
- Local and sub-regional scale assets – categorised by location, listing or social characteristics.

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## Threats

Any factor that has the potential to degrade or compromise the functioning of an asset is defined as a threat. Threats can arise from physical disturbance and/or social or management related factors. Threats have been identified from existing plans and strategies such as Recovery Plans and Conservation Advice (MNES analysis) and through the application of local knowledge and expertise (local analysis).

In the Greater Sydney region, there are a broad range of threats to the functioning of healthy and resilient landscapes. Threats vary widely in degree of impact and scale. Some threats are specific to a location, species, ecological community or social/cultural feature. Others have a wide-ranging impact on the functioning of both physical and social assets.

The Greater Sydney Region is unique in terms of having some of the largest areas of natural bushland in the state in very close proximity or directly adjoining the largest concentration of urban development in NSW. This factor alone, either directly or indirectly, accounts for many of the most significant threats to natural systems in the region.



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# Matters of National Environmental Significance Analysis

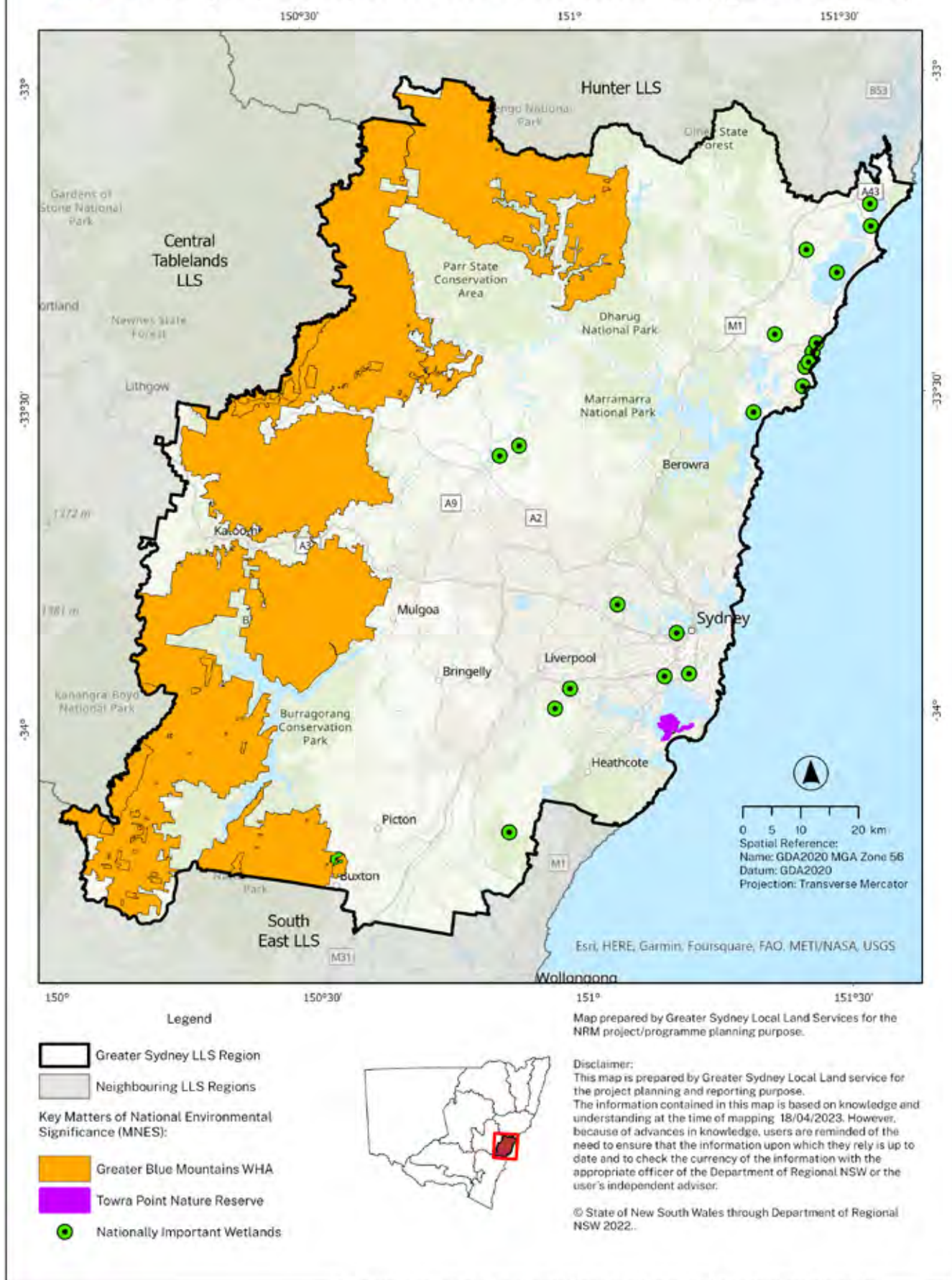
MNES are matters listed under the Australian Government's EPBC Act that are considered of environmental importance at the national level. MNES include matters such as World Heritage Areas, threatened plants, animals and communities, and migratory species. Maps showing key Matters of National Environmental Significance in the Greater Sydney region are provided in Figures 5 and 6 below.

An MNES analysis was undertaken to identify assets under the EPBC Act found within the Greater Sydney region. Threats to those assets and actions to mitigate threats have been identified within existing Recovery Plans and strategies.

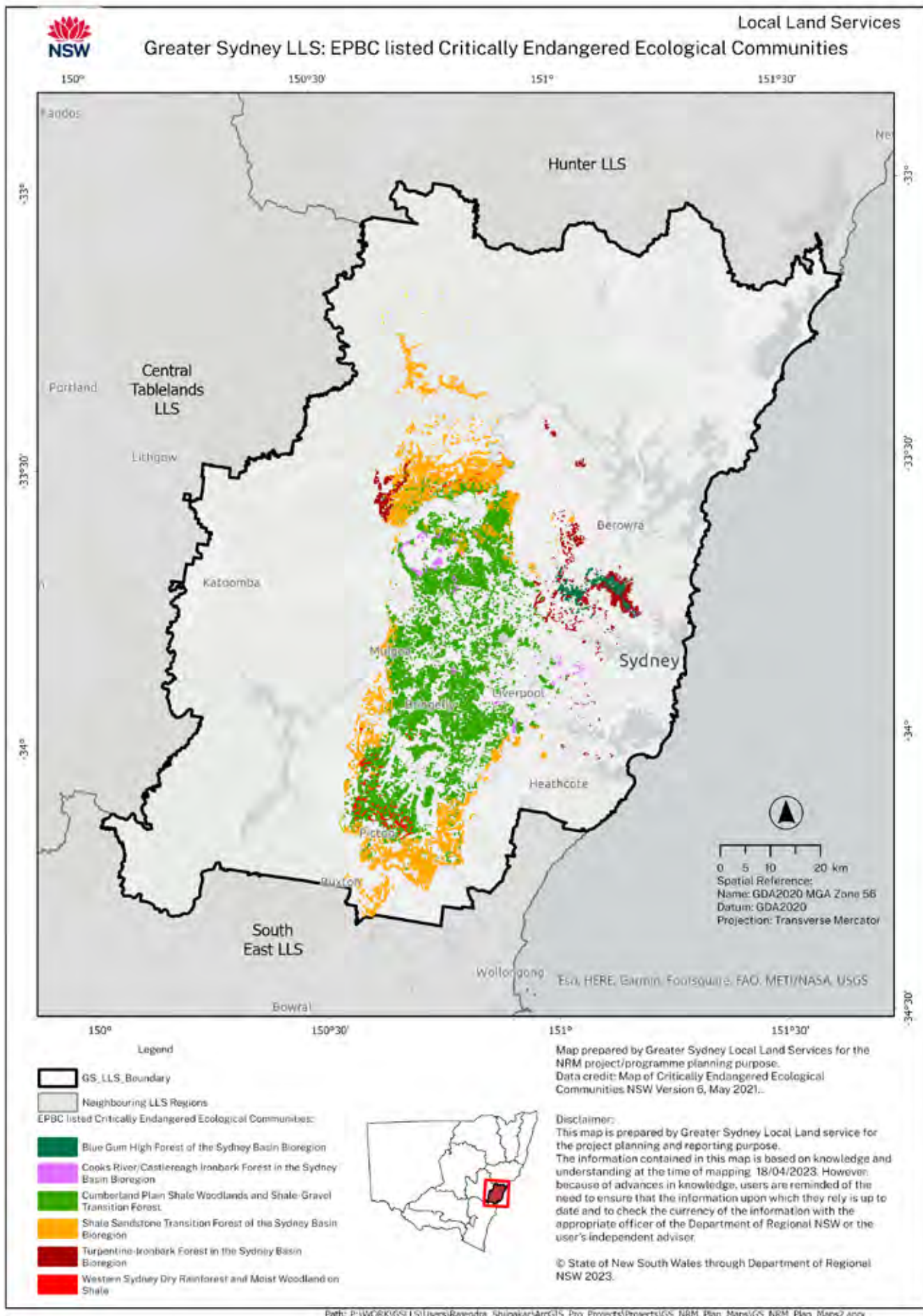
A protected matters search for the Greater Sydney Management Unit identified 344 MNES relevant to natural resource management. Table 1 provides a summary (<https://pmst.awe.gov.au/>). Detailed lists for all MNES species, communities, protected places and nationally important wetlands are provided in Appendix 1.







**Figure 5.** Map showing key MNES (world heritage properties and wetlands of international importance) in the Greater Sydney region.



**Figure 6.** Map showing some of the key MNES (nationally listed critically endangered ecological communities) in the Greater Sydney region.

**Table 1.** MNES: Greater Sydney Management Unit.

Protected matter	Listing
World Heritage Sites (1)	<ul style="list-style-type: none"> <li>Greater Blue Mountains Area</li> </ul>
Wetlands of International Significance (1)	<ul style="list-style-type: none"> <li>Towra Point Ramsar Site</li> </ul>
Nationally Important Wetlands (21)	<ul style="list-style-type: none"> <li>Cockrone Lagoon</li> <li>Terrigal Lagoon</li> <li>Eve St. Marsh, Arncliffe</li> <li>Wyong Racecourse Swamp</li> <li>Liverpool Military Training Area</li> <li>Colongra Swamp</li> <li>Tuggerah Lake</li> <li>Wamberal Lagoon</li> <li>Avoca Lagoon</li> <li>Voyager Point</li> <li>Budgewoi Lake Sand Mass</li> <li>Brisbane Water Estuary</li> <li>Thirlmere Lakes</li> <li>Towra Point Estuarine Wetlands</li> <li>Newington Wetlands</li> <li>Pitt Town Lagoon</li> <li>O'Hares Creek Catchment</li> <li>Longneck Lagoon</li> <li>Blue Mountains Sedge Swamps</li> <li>Botany Wetlands</li> <li>Bicentennial Park</li> </ul>
State Reserves (96) *	* See Appendix 1 for complete list
Threatened Species (196) *	<ul style="list-style-type: none"> <li>Mammals: 14</li> <li>Birds: 40</li> <li>Fish: 9</li> <li>Sharks: 5</li> <li>Reptiles: 9</li> <li>Amphibians: 8</li> <li>Invertebrates: 3</li> <li>Plants: 108</li> </ul> <p>*See Appendix 1 for complete list</p>



Protected matter	Listing
Threatened Ecological Communities (22)	<ul style="list-style-type: none"> <li>• Elderslie Banksia Scrub Forest in the Sydney Basin Bioregion</li> <li>• Shale Sandstone Transition Forest of the Sydney Basin Bioregion</li> <li>• Blue Gum High Forest of the Sydney Basin Bioregion</li> <li>• White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland</li> <li>• Central Hunter Valley eucalypt forest and woodland</li> <li>• Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest</li> <li>• Cooks River/Castlereagh Ironbark Forest of the Sydney Basin Bioregion</li> <li>• Western Sydney Dry Rainforest and Moist Woodland on Shale</li> <li>• Turpentine-Ironbark Forest of the Sydney Basin Bioregion</li> <li>• Illawarra-Shoalhaven Subtropical Rainforest of the Sydney Basin Bioregion</li> <li>• Littoral Rainforest and Coastal Vine Thickets of Eastern Australia</li> <li>• Natural Temperate Grassland of the South Eastern Highlands</li> <li>• River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria</li> <li>• Southern Highlands Shale Forest and Woodland in the Sydney Basin Bioregion</li> <li>• Coastal Swamp Oak (<i>Casuarina glauca</i>) Forest of New South Wales and South East Queensland ecological community</li> <li>• Eastern Suburbs Banksia Scrub of the Sydney Region</li> <li>• Castlereagh Scribbly Gum and Agnes Banks Woodlands of the Sydney Basin Bioregion</li> <li>• Temperate Highland Peat Swamps on Sandstone</li> <li>• <i>Posidonia australis</i> seagrass meadows of the Manning-Hawkesbury ecoregion</li> <li>• Coastal Upland Swamps in the Sydney Basin Bioregion</li> <li>• Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion</li> <li>• Subtropical and Temperate Coastal Saltmarsh</li> </ul>
National Heritage Places (Natural)	<ul style="list-style-type: none"> <li>• Ku-ring-gai Chase National Park</li> <li>• Lion, Long and Spectacle Island Nature Reserves</li> <li>• Royal National Park and Garawarra State Conservation Area</li> <li>• Greater Blue Mountains Area</li> </ul>

# Other MNES Priorities – Natural Disaster Recovery

## Bushfires

Greater Sydney LLS is contracted to deliver a bushfire recovery program funded by the Australian Government to mitigate threats in bushfire affected GBMWH. Priority areas for investment both within or adjacent to GBMWH include threatened ecological communities (TEC), threatened species, priority terrestrial and riparian areas, and Traditional Ecological Knowledge. By June 30, 2022, the following actions will be implemented:

- Strategic weed control and regeneration (45 ha) on bushfire affected priority riparian and terrestrial sites.
- Protection and enhancement of TEC's habitat values and threatened species habitat (48 ha, 4 TEC's, 6 threatened species).
- Strategic ground-based pest animal control program (787 ha, 4 TEC's) to assist in the recovery of TEC's and threatened species and their habitat.
- Protection or remediation of priority riparian areas (4 ha, 1 TEC) through the implementation of soil conservation works and riparian vegetation enhancement.
- In consultation with local Aboriginal communities, the project will identify relevant sites and key actions, to implement Traditional Ecological Knowledge and manage significant habitats protecting the GBMWH outstanding universal values (biodiversity and Aboriginal Cultural Heritage) and enhancing local TECs and habitat for threatened species (2 on-ground works projects).

## Floods

During the period 2020–2022, the Greater Sydney region has been impacted by 3 significant flood events, the most recent being in July 2022. Initial impacts to MNES have been identified by the Australian Government but full assessment of the scale and nature of these impacts is yet to happen. Greater Sydney LLS will be involved in further assessing impacts and identifying opportunities for management action to help the recovery of impacted MNES.

## Local Analysis of Assets and Threats

A local analysis of assets and threats was also undertaken to ensure assets of community value outside of MNES were also identified. This analysis was undertaken by Greater Sydney LLS staff bringing together expertise in natural resource management, biosecurity and sustainable agriculture. An internal workshop involving the input of 19 staff identified important regional and sub-regional assets and threats, management actions, relevant stakeholders, prioritisation principles and evidence. Overall, this exercise demonstrated strong correlation between MNES and locally identified assets and threats however sufficient points of difference emerged providing a clear illustration of the value in utilising this approach alongside MNES analysis.

Figure 7 provides a summary of the strengths of the MNES analysis and local analysis of assets and threats and the benefits and synergies that arise from undertaking and integrating both approaches.

At a region-wide scale, local analysis has placed assets into 2 broad categories or themes: natural assets, and human and social assets. Natural assets have been further categorised as: Terrestrial, Riparian, and Estuary and Marine. Human and social assets have been further categorised as human capital, social capital and cultural heritage. Human capital refers to skills, knowledge, technical capacity, management and processes. Social Capital refers to interrelationships between individuals and groups resulting in positive outcomes. See Table 2 for listed region-wide assets. At a region-wide scale threats have been placed into one of six categories (modified from Salafsky et al., 2007): Development, invasive species, pollution, disturbance and systems modification, weather and climate change related impacts, and social and management related. Refer to Table 3 for listed region-wide threats. At a sub-region scale physical and social assets have been listed and are linked directly to the specific threats to those assets. Assets and threats at a sub-regional level are provided in Appendix 2.

<p><b>Matters of National Environmental Significance analysis (strengths)</b></p> <ul style="list-style-type: none"> <li>• High level region-wide analysis capturing all matters listed under the <i>EPBC Act 1999</i></li> <li>• Assets directly linked to known threats and actions through Recovery Plans, Conservation Advice and related plans</li> <li>• High level prioritisation inherent in threat level</li> <li>• High level knowledge gaps identified from existing evidence</li> </ul>	<p><b>Local analysis of assets and threats (strengths)</b></p> <ul style="list-style-type: none"> <li>• Identifies social factors as assets emphasising importance for achieving successful NRM outcomes and visibility for investment</li> <li>• Identifies importance of linkages including spatial patterns in the landscape such as corridors and connectivity</li> <li>• Identified non-listed physical environmental assets enabling investment to prevent decline from non-threatened to threatened status.</li> <li>• Identifies local priorities</li> </ul>
<p><b>Benefits of integrating MNES and local analysis of assets and threats (synergies)</b></p> <ul style="list-style-type: none"> <li>• Assets have been identified at multiple levels and at a range of scales reducing the likelihood of gaps.</li> <li>• More likely to meet a broad range of investor requirements</li> <li>• Full range of evidence and custodians of evidence becomes visible</li> <li>• Knowledge gaps become visible</li> <li>• Efficient identification of stakeholders</li> <li>• Increased confidence in investment with priorities that are consistent at multiple scales</li> </ul>	

**Figure 7.** MNES and local analysis of assets and threats; summary of strengths and synergies.



**Table 2.** Greater Sydney LLS regional scale NRM assets (local analysis).

Type	Assets
<b>Natural assets</b>	
<b>Terrestrial</b>	<ul style="list-style-type: none"> <li>• Biodiverse bushland areas</li> <li>• Threatened ecological communities (TECs)</li> <li>• Threatened species and populations</li> <li>• Biologically connected systems</li> <li>• Fertile, agriculturally productive landscapes</li> <li>• Green space within an urban landscape</li> </ul>
<b>Riparian</b>	<ul style="list-style-type: none"> <li>• Wild Rivers –Grose, Colo, Macdonald</li> <li>• Drinking water catchments</li> <li>• Regionally significant wetlands</li> <li>• Hanging swamps</li> <li>• Riparian zones</li> <li>• Clean swimmable rivers</li> </ul>
<b>Estuary and Marine</b>	<ul style="list-style-type: none"> <li>• Sydney Harbour</li> <li>• Hawkesbury Estuary, Brisbane Water, Pittwater</li> <li>• Botany Bay and Georges River</li> <li>• Coastal Fisheries</li> <li>• Coastal lagoon systems and regionally significant wetlands</li> <li>• Towra Point Ramsar site</li> </ul>
<b>Human and social assets</b>	
<b>Human Capital</b>	<ul style="list-style-type: none"> <li>• Knowledge and expertise</li> <li>• Information: Plans, strategies, reports, maps</li> <li>• Monitoring programs</li> <li>• Extension resources</li> <li>• Workshops, field days and extension services</li> <li>• Critical support infrastructure for NRM (e.g., seed banks and community nurseries)</li> </ul>
<b>Social Capital</b>	<ul style="list-style-type: none"> <li>• Landcare and bushcare groups</li> <li>• Landcare and bushcare volunteer coordinators and networks</li> <li>• Pro-active community groups and networks</li> <li>• Small farmer networks</li> <li>• Landholder champions</li> <li>• First Nations community networks</li> <li>• Professional and non-professional groups</li> </ul>
<b>Cultural Heritage</b>	<ul style="list-style-type: none"> <li>• Tangible and intangible First Nations Cultural Heritage values</li> <li>• Sites of cultural significance</li> <li>• Sites of archaeological importance</li> </ul>

**Table 3.** Greater Sydney LLS regional scale NRM threats (local analysis)

Type	Threat
<b>Development</b>	<ul style="list-style-type: none"> <li>• Urban and rural-residential development</li> <li>• Habitat loss and/or fragmentation</li> <li>• Loss of biological connectivity</li> <li>• Loss of productive agricultural land</li> </ul>
<b>Invasive Species</b>	<ul style="list-style-type: none"> <li>• Foxes</li> <li>• Wild dogs</li> <li>• Feral and domestic cats</li> <li>• Deer</li> <li>• Feral pigs</li> <li>• Weeds</li> <li>• Myrtle rust</li> <li>• New incursions of invasive species</li> </ul>
<b>Pollution</b>	<ul style="list-style-type: none"> <li>• Nutrient inputs from urban and agricultural practices</li> <li>• Litter</li> <li>• Urban run-off and stormwater impacts</li> <li>• Marine debris</li> </ul>
<b>Disturbance and Systems Modification</b>	<ul style="list-style-type: none"> <li>• Vehicle strike on native fauna</li> <li>• Recreational land-use pressures</li> <li>• Inappropriate or lack of fire regimes in contemporary land management practices</li> <li>• Altered hydrological regimes</li> <li>• Barriers to fish passage</li> <li>• Accelerated soil and riverbank erosion</li> <li>• Cumulative impacts of farm dams on water supply</li> </ul>
<b>Weather and Climate Change Related Impacts</b>	<ul style="list-style-type: none"> <li>• Floods</li> <li>• Bushfires</li> <li>• Drought</li> <li>• Sea-level rise – impacts on ecosystems</li> <li>• Urban heat-island effects</li> <li>• Range shifts in flora and fauna distribution</li> <li>• Response to broader cyclic weather patterns</li> </ul>
<b>Social and Management Related</b>	<ul style="list-style-type: none"> <li>• Poor communication and knowledge</li> <li>• Legislative framework</li> <li>• Competing interests</li> <li>• Variable and unreliable funding</li> <li>• Very large population with many small landholdings</li> </ul>



# Greater Sydney LLS NRM plan investment priorities

Prioritising investment in NRM activities is a complex process involving decision making at multiple levels. At the highest level, priorities are often set or at least strongly guided by investor preferences. In other cases, prioritisation occurs at a local level whereby community interest or local knowledge and expertise has a guiding influence. There are also numerous examples where priorities are set through a collaborative approach involving a range of stakeholders including funding bodies, industry experts and the local community.

Effective prioritisation of investment in NRM at an organisational level requires a comprehensive understanding of complex physical and social systems and their interrelationships across varying temporal and spatial scales. Sound prioritisation processes also need to incorporate decision-making frameworks that are transparent and evidence based to ensure decision making is consistent and scientifically and socially defensible. This is particularly important for the ranking of investment priorities and in circumstances where opportunity exceeds capacity or demand exceeds supply. Effective MERI and review processes are necessary to track progress, but also to ensure prioritisation processes can adapt and evolve, incorporating new information or changing circumstances.

For this NRM Plan a series of NRM priorities have been identified that provide a solid framework for NRM investment in the Greater Sydney region. The priorities have been selected to reflect the full range of NRM assets identified as part of the MNES process and those identified at a region and sub-region scale through local and internal expertise. Priorities include both physical and social objectives and are linked to quantifiable targets with identified measures of success. There is strong alignment between NRM priorities identified at varying scales, from local to national. Appendix 3 shows alignment across NLP2 Outcomes, Greater Sydney LLS NRM Plan Priorities and Actions, Greater Sydney LLS Local Strategic Plan and the LLS NRM Framework.

## NRM Plan priorities for investment



Improving the condition and extent of native vegetation including connectivity



Improving habitat and condition of threatened species and communities



Reducing the impact of invasive species of flora and fauna



Support First Nations people to Care for Country and continue traditional Aboriginal land management practices



Increasing the sustainability of agriculturally productive landscapes



Rehabilitating waterways and their riparian zones in priority catchment locations



Rehabilitating priority wetlands, lagoons, and estuaries



Gaining and sharing knowledge that contributes to practice change and improved NRM outcomes

# Actions

Actions to mitigate threats have been identified through a review of evidence bases including Recovery Plans and Conservation Advice for MNES, and the application of local knowledge and expertise for other assets at a region and sub-region scale. Actions are the level at which Greater Sydney LLS makes its investments in NRM.

There are numerous pathways for implementing actions to achieve natural resource condition change including direct investments in on-ground outcomes or through investments in knowledge. This flexible investment model accounts for the many complexities in operating in the NRM space and recognises that a holistic approach is often required to achieve successful and lasting outcomes.

## NRM plan actions:

- The most effective pathway to successful outcomes
- Are a 'best fit' for driving customer practice change
- Include direct investment in resource condition change and investments in knowledge
- Are measurable using objective metrics and targets.

Actions have been identified for all 8 Priorities in the NRM Plan and include investments in on-ground activities, extension, and knowledge products. Priorities, actions and measures of success are shown in Table 4.

**Table 4.** NRM Plan Priorities, Actions and Measures of Success.

NRM Priorities	Actions	Measures of Success
Improving the condition and extent of native vegetation including connectivity.	<p>Target key customers to implement on-ground activities to support improvements in native vegetation condition, extent and connectivity.</p> <p>Develop knowledge products to facilitate the improved management of native vegetation condition, extent and connectivity.</p>	<ul style="list-style-type: none"> <li>• Area (ha) improvement in native vegetation condition</li> <li>• Area (ha) increase in native vegetation extent</li> <li>• Number of individuals implementing NRM practice change</li> <li>• Number of knowledge products developed to support NRM practice change</li> </ul>
Improving habitat and condition of threatened species and communities.	<p>Target key customers to implement on-ground activities to support improvements to the habitat and condition of threatened species and communities.</p> <p>Develop knowledge products to facilitate the improved management of threatened species and communities.</p>	<ul style="list-style-type: none"> <li>• Area (ha) of threatened species or communities habitat improved</li> <li>• Number of threatened species or communities improved through NRM practice change</li> <li>• Number of individuals implementing NRM practice change</li> <li>• Number of knowledge products developed to support NRM practice change</li> </ul>
Reducing the impact of invasive species of flora and fauna.	<p>Investment in extension, engagement, and on-ground activities. Develop knowledge products to promote the importance of, and benefits arising from invasive species management.</p>	<ul style="list-style-type: none"> <li>• Area (ha) of land treated to reduce impacts of invasive species of flora and fauna</li> <li>• Number of individuals implementing NRM practice change</li> <li>• Number of knowledge products developed to support NRM practice change</li> </ul>

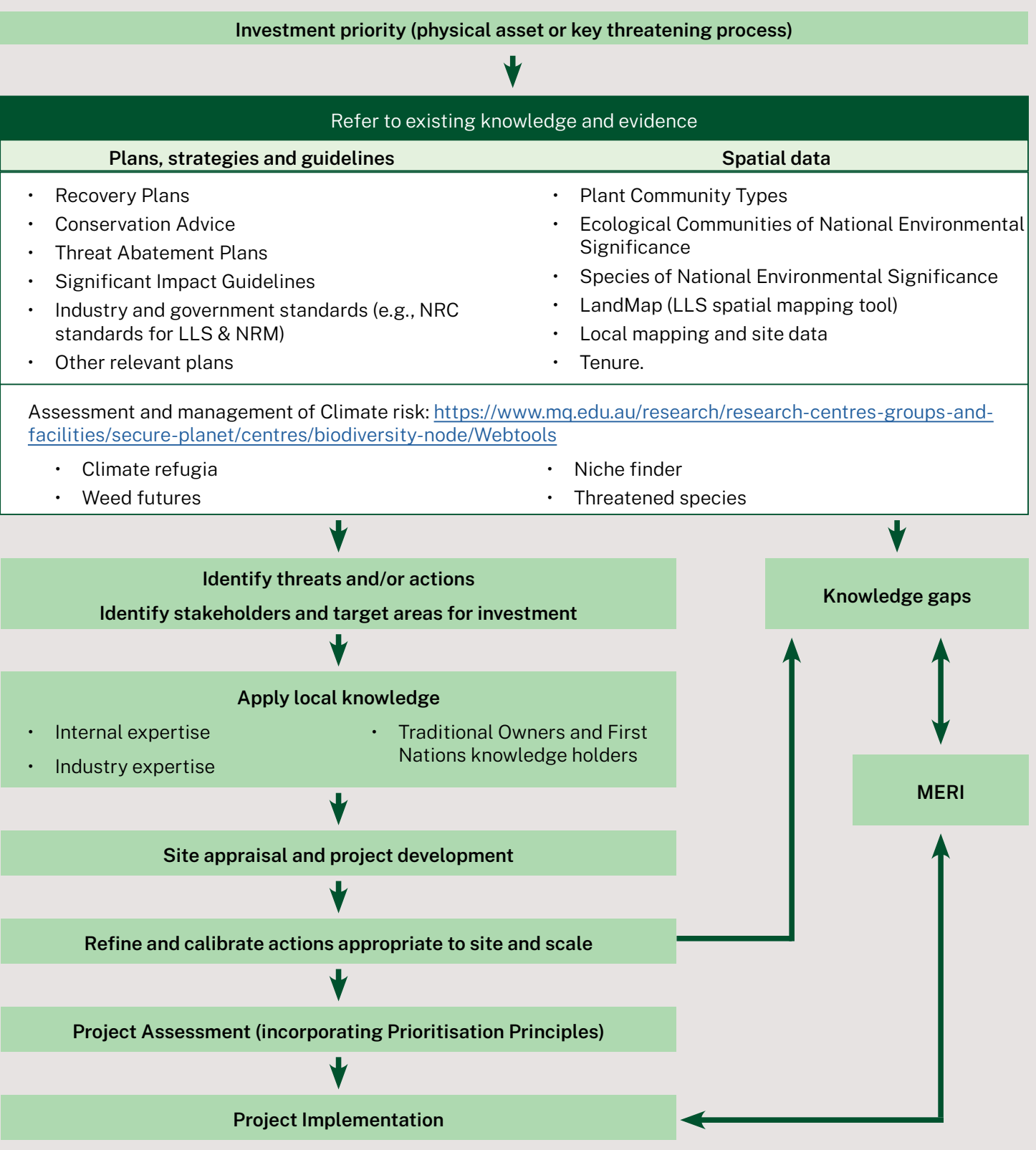


NRM Priorities	Actions	Measures of Success
Support First Nations people to Care for Country and continue traditional Aboriginal land management practices.	Investments to support opportunities for First Nations people and organisations to develop and maintain partnerships, promote, and share knowledge and culture, and undertake traditional and contemporary land management practices in order to Care for Country.	<ul style="list-style-type: none"> <li>• Number of First Nations individuals and organisations</li> <li>• Implementing NRM practice change and Caring for Country</li> </ul>
Increasing the sustainability of agriculturally productive landscapes.	Investment in extension, engagement, and knowledge products to support adoption of sustainable agricultural land-use practices. Invest in on-ground works to drive practice change and improvements to agricultural sustainability.	<ul style="list-style-type: none"> <li>• Area (ha) of land managed through sustainable agricultural activities</li> <li>• Number of individuals implementing NRM practice change</li> <li>• Number of knowledge products developed to support NRM practice change</li> </ul>
Rehabilitating waterways and their riparian zones in priority catchment locations.	<p>Target key customers to implement on-ground activities to support improvements to waterways, water quality and riparian zones.</p> <p>Develop knowledge products to facilitate the improved management of waterways, water quality, riparian zones and the importance of catchment management.</p>	<ul style="list-style-type: none"> <li>• Area (ha) of land with improvements to waterways and riparian zones</li> <li>• Stream bank length (km) implementing riparian improvements</li> <li>• Number of individuals implementing NRM practice change</li> <li>• Number of knowledge products developed to support NRM practice change.</li> </ul>
Rehabilitating priority wetlands, lagoons, and estuaries.	<p>Target key customers to implement on-ground activities.</p> <p>Develop knowledge products to facilitate the improved management of wetland systems, lagoons, and estuaries.</p>	<ul style="list-style-type: none"> <li>• Area (ha) of land with improvements to wetlands, lagoons, or estuaries</li> <li>• Number of individuals implementing NRM practice change</li> <li>• Number of knowledge products developed to support NRM practice change</li> </ul>
Gaining and sharing knowledge that contributes to practice change and improved NRM outcomes.	Invest in knowledge products and educational resources to build customer knowledge and capacity to support practice change and improvements to NRM. Investments to facilitate the communication and sharing of knowledge to build customer capacity to support practice change and improvements to NRM.	<ul style="list-style-type: none"> <li>• Number of knowledge products developed to support NRM practice change</li> <li>• Number of individuals and groups implementing NRM practice change</li> </ul>

**NRM Priorities – Sources of evidence:** NLP2 RLP 5-year Outcomes, MNES (Threat level, Recovery Plans, Conservation Advice), LLS NRM Framework (2021-2026), GS LLS Local Strategic Plan (2021-2026), GS LLS internal prioritisation, stakeholder consultation, GS LLS Aboriginal Advisory Group, Community Advisory Groups.

Greater Sydney LLS undertakes project development for physical NRM assets or for addressing key threatening processes in a structured and methodical way. Existing evidence bases and knowledge products are reviewed to identify threats and actions, stakeholders and target-areas for investment. Assessment of climate risk can occur at this stage supported by existing datasets and predictive models.

Following this, the process of reality checking at the local level is undertaken by the application of local knowledge including internal and industry expertise and First Nations communities such as seeking relevant advice from Traditional Owners or LALCs based on their cultural knowledge and values for that area of Country. Further calibration takes place by on-ground site appraisal and through the iterative process of project development. Knowledge gaps emerge at all stages, from initial desktop review to site appraisal and are used to inform project planning and MERI frameworks. Figure 8 illustrates the process of project development for a priority physical asset or key threatening process.



**Figure 8.** Greater Sydney LLS Process or project development.

# Prioritisation principles

For this Plan, Greater Sydney LLS has identified a series of prioritisation principles. These sit at a higher level than NRM Priorities and provide a framework to guide decision making for NRM investment.

Greater Sydney LLS prioritisation principles also provide a strong statement of values of Greater Sydney LLS as an NRM service provider.

Greater Sydney LLS prioritisation principles for NRM:

- Are effective at multiple scales
- Have been informed by existing evidence and knowledge
- Meet investor requirements, rulesets and priorities
- Provide objective criteria for the assessment and ranking of project proposals.

Prioritisation principles have been grouped into 3 categories:

- Indices from Natural Systems (Physical Attributes)
- Practice Change, Capacity Building and Extension Services (Human AND Social Attributes)
- Internal rulesets and methodologies (Methodology).

Greater Sydney LLS prioritisation principles are listed below.

Physical Attributes	Human and Social Attributes	Rulesets Methodology
<ul style="list-style-type: none"> <li>• Preventing decline (Including non-threatened to threatened species status).</li> <li>• Conservation Value (Including threatened species status and proximity to reserved bushland).</li> <li>• Improving or restoring landscape connectivity (Corridors).</li> <li>• Resilience to climate change impacts.</li> <li>• Mitigation of climate change impacts.</li> <li>• Targeting landscape transformer species (Invasive species with the capacity to disrupt or transform ecosystem structure and function).</li> <li>• Recovery potential.</li> </ul>	<ul style="list-style-type: none"> <li>• Results in practice change.</li> <li>• Catalyst for further investment (value adding).</li> <li>• Community value.</li> <li>• Supporting landholders affected by natural disasters.</li> <li>• Goal setting (setting targets at catchment or sub-catchment level).</li> <li>• Urban liveability.</li> <li>• Continuation and reclamation of traditional and contemporary Aboriginal Land Management knowledge and practice.</li> </ul>	<ul style="list-style-type: none"> <li>• Benefits multiple scales (local – landscape level).</li> <li>• Compound benefits (projects that result in multiple physical and/or social benefits).</li> <li>• Tenure blind.</li> <li>• Informed by or implementing recommendations of existing NRM plans or strategies.</li> <li>• Triple bottom line (environment, social, economic).</li> <li>• Informed by traditional and contemporary Aboriginal Land Management knowledge and practice.</li> <li>• Addressing the cause, not the symptom.</li> </ul>

Prioritisation Principles are closely aligned with a series of state-wide Local Land Services Prioritisation Principles developed in support of the LLS NRM Framework (see Figure 9 below).

These statewide Prioritisation Principles are aimed at fostering a consistent approach in the design and implementation of NRM services at a state scale for Objective 3 of the NRM Framework: **To take action on the top threats to the health and resilience of NSW landscapes and catchments.**

This has identified prioritisation principles and matters for consideration when setting NRM priorities at multiple scales.



## Prioritisation Framework Attributes

LLS NRM State Prioritisation Framework:

- will involve spatial and non-spatial decision support criteria
- will put climate change adaptation front and center by enabling natural disaster impacts and mapping to be included into NRM decision making
- will recognise that prioritisation is not static - it changes based on the outcome being sought or purchased and will require platforms and resources to facilitate this agility
- will describe baseline prioritisation principles and methodologies (recipes) for each NRM theme to enable consistent decision making at the State level and provide guidance for additional customisation at the regional level
- will keep practice change outcomes front and centre alongside the mitigation of key threats to the health and resilience of landscapes and catchments
- will apply a strong risk-based approach to NRM services decision making
- will identify and adopt consistent base units for each theme area
- will be applied when designing projects and programs, and assessing or comparing one proposal to another
- will describe/impose a consistent hierarchy: baseline priorities first, followed by investor specific priorities (as per Figure 1 and described further below).

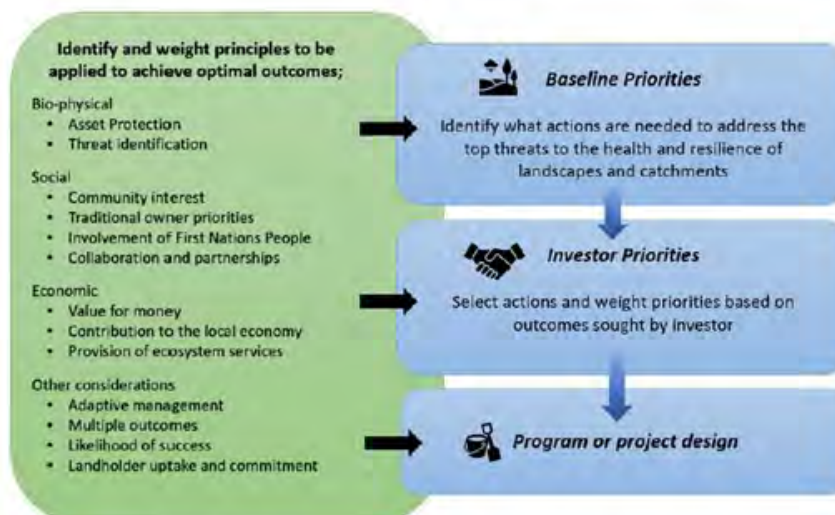


Figure 9. Prioritisation Framework Attributes.

# Knowledge gaps

As NRM projects are developed and implemented knowledge gaps emerge at various natural points including:

- reviews of existing evidence
- stakeholder consultation
- site inspection
- monitoring.

Reviews of existing evidence provides a means to identify and collate known knowledge gaps and is primarily undertaken during the initial stages of project development. This information can be further augmented and refined by consultation with relevant stakeholders and local experts.

For MNES, a determination made by the Threatened Species Scientific Committee may reveal knowledge gaps whereby a Recovery Plan is deemed necessary however has not yet been produced, a Recovery Plan is out of date, or exists but has not been approved. A key feature within Recovery Plans and Conservation Advice (and often within other relevant plans and strategies) is an assessment of the status of knowledge including research priorities and knowledge gaps.

Importantly, knowledge gaps may also emerge during site appraisal where site-specific issues arise or through project implementation and the MERI process.

Due to the lasting impacts of colonisation in the Greater Sydney Region there are gaps in traditional Aboriginal Land Management knowledge and practice. However, through this NRM plan and other strategic approaches by Greater Sydney LLS there are opportunities to redress gaps in traditional knowledge through reclamation approaches, where possible.

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# Customers and stakeholders

Greater Sydney LLS NRM customers and stakeholders are as diverse as the region itself, representing a multiplicity of skills, backgrounds and interests working within different environments across varying scales and land tenures. Customer skill sets vary widely and range from NRM professionals within industry or government to new rural landholders with limited or no experience in NRM activities or principles. Customers can also vary from a single decision maker such as a private landowner to a collective as in a community group or organisation.

Greater Sydney LLS operates at a landscape scale, undertaking an integrated approach, seeking to address NRM priorities based on need irrespective of land tenure. As Greater Sydney LLS does not have statutory obligations as a land manager unlike many government entities, it is ideally placed to play a leading role in working directly with private landowners and community groups. These interactions may vary broadly and include: the provision of expert advice, funding opportunities, assistance with project planning, guidance through project implementation and assistance with monitoring and reporting.

For activities in partnership with public land managers and other suitably equipped organisations, the role of Greater Sydney LLS may primarily be to offer support through the provision of expert advice and opportunities for funding. Greater Sydney LLS also excels at seeking out and linking key individuals and organisations to build partnerships, adding value at multiple points through project implementation.

Greater Sydney LLS plays a pivotal role in NSW emergency management response and recovery in the Animal and Agriculture Services Functional Area (AASFA). During emergencies LLS staff act in a range of roles including the coordination and facilitation of evacuation centres for livestock and companion animals, emergency fodder deliveries and the recovery and disposal of stock losses. Close interaction with affected landholders is integral and may also include the provision of specific and timely NRM services particularly during the recovery phase. Greater Sydney LLS is unique in the Greater Sydney region in having the organisational structure: The necessary breadth of in-house expertise, administration frameworks, and monitoring and reporting processes to work within the NRM space to deliver the best possible project outcomes.

Key Greater Sydney LLS customers and stakeholders for each NRM Plan priority are identified in Table 5 below along with a summary of the role of Greater Sydney LLS in servicing these groups.

**Table 5.** Key customers and stakeholders and role of Greater Sydney LLS.

NRM priorities	Key customers and stakeholders	Role of Greater Sydney LLS
<b>Improving the condition and extent of native vegetation including connectivity</b>	<ul style="list-style-type: none"> <li>• NSW Government land managers (e.g., NPWS, WaterNSW, DPIE)</li> <li>• Local councils</li> <li>• County councils</li> </ul>	Supporting role, facilitation, networking, funding, project management
	<ul style="list-style-type: none"> <li>• Landcare and bushcare groups</li> </ul>	Leading or supporting role, funding, extension, advice, education
	<ul style="list-style-type: none"> <li>• Traditional Owner groups, LALCs and First Nations Organisations</li> </ul>	Leading or supporting role, facilitation, networking, funding, project management
	<ul style="list-style-type: none"> <li>• Private landowners</li> </ul>	Leading role, facilitation, networking, funding, extension, advice, education
<b>Improving habitat and/or condition of threatened species and communities</b>	<ul style="list-style-type: none"> <li>• NSW Government land managers (e.g., NPWS, WaterNSW, DPIE)</li> <li>• Local councils</li> <li>• County councils</li> </ul>	Supporting role, facilitation, networking, funding, project management
	<ul style="list-style-type: none"> <li>• Landcare and bushcare groups</li> </ul>	Leading or supporting role, funding, extension, advice, education
	<ul style="list-style-type: none"> <li>• Traditional Owner groups, LALCs and First Nations Organisations</li> </ul>	Supporting role, facilitation, networking, funding, project management
	<ul style="list-style-type: none"> <li>• Private landowners</li> </ul>	Leading role, facilitation, networking, funding, extension, advice, education
<b>Reducing the impact of invasive species of flora and fauna</b>	<ul style="list-style-type: none"> <li>• NSW Government land managers (e.g. NPWS, WaterNSW, DPIE)</li> <li>• Local councils</li> <li>• County councils</li> </ul>	Supporting role, facilitation, networking, funding, project management
	<ul style="list-style-type: none"> <li>• Landcare and bushcare groups</li> </ul>	Leading or supporting role, funding, extension, advice, education
	<ul style="list-style-type: none"> <li>• Traditional Owner groups, LALCs and First Nations Organisations</li> </ul>	Supporting role, facilitation, networking, funding, project management
	<ul style="list-style-type: none"> <li>• Private landowners</li> </ul>	Leading role, facilitation, networking, funding, extension, advice, education



NRM priorities	Key customers and stakeholders	Role of Greater Sydney LLS
<b>Support First Nations people to Care for Country and continue traditional Aboriginal land management practices</b>	<ul style="list-style-type: none"> <li>• Traditional Owners</li> <li>• First Nations cultural and ecological knowledge holders</li> <li>• First Nations Organisations and Networks</li> <li>• LALCs</li> <li>• Cultural Fire Practitioners</li> <li>• Public and private landholders</li> </ul>	Leading or supporting role, facilitation, networking, funding, project management
<b>Increasing the sustainability of agriculturally productive landscapes</b>	<ul style="list-style-type: none"> <li>• Private landowners</li> <li>• Small farmer networks</li> <li>• Landcare groups</li> </ul>	Leading or supporting role, facilitation, funding, extension, advice, education
<b>Rehabilitating waterways and their riparian zones in priority catchment locations</b>	<ul style="list-style-type: none"> <li>• Local councils</li> <li>• Water authorities</li> </ul>	Supporting role, facilitation, networking, funding, project management
	<ul style="list-style-type: none"> <li>• Landcare and bushcare groups</li> </ul>	Leading or supporting role, facilitation, funding, extension, advice, education
	<ul style="list-style-type: none"> <li>• Private landowners</li> </ul>	Leading role, facilitation, networking, funding, extension, advice, education
<b>Rehabilitating priority wetlands, lagoons, and estuaries</b>	<ul style="list-style-type: none"> <li>• NSW Government land managers (e.g., NPWS, WaterNSW, DPIE, MEMA)</li> <li>• Local councils</li> </ul>	Supporting role, facilitation, networking, funding, project management
	<ul style="list-style-type: none"> <li>• Landcare and bushcare groups</li> </ul>	Leading or supporting role, facilitation, funding, extension, advice, education
	<ul style="list-style-type: none"> <li>• Traditional Owner groups, LALCs and First Nations Organisations</li> </ul>	Leading or supporting role, facilitation, networking, funding, project management
	<ul style="list-style-type: none"> <li>• Private landowners</li> </ul>	Leading role, facilitation, networking, funding, extension, advice, education
<b>Gaining and sharing knowledge that contributes to practice change and improved NRM outcomes.</b>	<ul style="list-style-type: none"> <li>• Private landowners</li> <li>• Landcare and bushcare groups</li> <li>• Landcare and Bushcare Volunteer Coordinators (Local Councils, Landcare NSW, LLS and NPWS)</li> <li>• Landcare networks</li> <li>• Small farmer groups</li> <li>• Local and broader First Nations Organisations and Networks</li> </ul>	Leading role, facilitation, networking, extension, advice, education

# Stakeholder Consultation

Targeted stakeholder consultation was undertaken at multiple points during the preparation of this Plan (see Table 6 for an overview of this process).

Significant input was provided by Greater Sydney LLS staff in the initial stages of plan development at an internal workshop held in October 2021. The focus of this work was to undertake a region-wide and sub-region analysis of NRM assets and threats, prioritisation principles and a review of evidence bases. This provided a framework from which NRM priorities and actions were then developed. Participating staff were also provided an opportunity to review and provide comment on a late-stage draft in February 2022.

External consultation was undertaken during April 2022. In addition to being provided a summary of the content and methodology of the NRM Plan, key participants were also invited to workshop NRM assets and threats undertaking a process similar to the internal staff workshop held in October 2021. Consultation outcomes were then reviewed and incorporated into the NRM Plan.

**Table 6.** Overview of NRM Plan Stakeholder Consultation.

Date	Stakeholder	Number of participants	Activity	Intent	Outcome
October 2021	Greater Sydney LLS staff	19	Workshop	Identify and collate regional scale and sub-region assets, threats, prioritisation principles and evidence.	Region-wide and sub-region assets and threats identified, prioritisation principles identified, evidence listed.
February 2022	Greater Sydney LLS staff	12	Review of draft	Improve document, identify and correct errors.	Feedback from 12 staff integrated into draft NRM Plan.
April 2022	Greater Sydney LLS Aboriginal Advisory Group	10	Presentation and workshop	Effective engagement with First Nations community. Identification of regional scale assets and threats to address possible knowledge gaps	Assets and threats validated. New assets and threats identified and incorporated into draft NRM Plan.
April 2022	Landcare Coordinators Network	10	Presentation and workshop	Efficient and effective engagement with Landcare community. Identification of regional scale assets and threats to address possible knowledge gaps.	Assets and threats validated. New assets and threats identified and incorporated into draft NRM Plan.

Date	Stakeholder	Number of participants	Activity	Intent	Outcome
April 2022	Greater Sydney LLS Board	10	Presentation	Communicate status of draft NRM Plan.	Greater Sydney LLS Board updated.
August/ September 2022	Australian Government	1	Review of draft	Improve document, identify and correct errors.	Feedback integrated into draft NRM Plan.
September 2022	GS LLS Aboriginal Advisory Group	4	Presentation and discussion	Communicate status of draft NRM Plan and First Nations content.	Review and changes to key wording and phrasing.

## Stakeholder aspirations for natural resource management in Greater Sydney

Stakeholder aspirations for NRM in Greater Sydney are wide ranging and diverse, however most hinge on the intrinsic values of natural systems and the quality of ecosystem services they provide, and their influence on our quality of life.

Ecosystem services, such as clean air and water, scenic amenity, and temperature regulation also support social and recreational opportunities, along with industries such as agriculture and tourism. The importance of natural areas to the people of Greater Sydney has become particularly obvious during the COVID-19 pandemic with people craving a connection to nature.

Stakeholder aspirations for NRM are reflected in this NRM Plan predominantly by the key values and assets identified by analysis of MNES and those identified at a region and sub-region scale by local analysis.

Greater Sydney LLS has sought and documented stakeholder aspirations for NRM in development of its current and previous strategic plans.

Greater Sydney LLS recently undertook targeted consultation in developing its Local Strategic Plan (2021-2026), which included our key priorities for natural resource management in the Greater Sydney region:

- Protecting biodiversity assets and improving the condition of bushland, waterways and coastal ecosystems, and
- Creating opportunities for Aboriginal communities to Care for Country and protect and preserve Cultural Heritage.

Extensive community consultation and stakeholder input (through the work of 4 Community Advisory Groups) documented stakeholder aspirations for NRM in the Greater Sydney LLS Strategic Plan (2016-21). In developing our current Local Strategic Plan these aspirations were deemed still current, timely and relevant and have formed the basis of the priorities in this Plan. Alignment of stakeholder aspirations and NLP investment priorities are shown in Table 7. Appendix 3 shows alignment across NLP2 Outcomes, Greater Sydney LLS NRM Plan Priorities and Actions, Greater Sydney LLS Local Strategic Plan and the LLS NRM Framework.

### IPSOS Survey

In 2021, market research company IPSOS was contracted to undertake a comprehensive survey of landholders and LLS customers in the Greater Sydney region. Participants completed an on-line questionnaire and telephone survey designed to inform the depth of understanding and scale of adoption of a broad range of land management practices relevant to Greater Sydney LLS core business and service delivery including NRM services. This work provides key foundational information on stakeholder aspirations and community capacity within the Greater Sydney region and has identified areas of opportunity and focus for Greater Sydney LLS NRM service delivery.



**Table 7.** Alignment of RLP 5-year Outcomes and relevant community aspirations for NRM.

Greater Sydney Management Unit RLP 5-year Outcomes	Relevant community aspirations for NRM
Protecting the values of the GBMWHa through management of pest species.	GBMWHa is listed as a priority asset for the Sydney Metropolitan and Cumberland Plain sub-region.
Continuing actions to maintain the ecological character of the Towra Point Nature Reserve Ramsar site.	Towra Point Nature Reserve Ramsar site is listed as a priority asset for Sydney Metropolitan and Cumberland Plain sub-region.
Continuing services to improve the trajectory of the priority threatened species <i>Grevillea caleyi</i> .	No specific reference to this species, although threatened species are listed as a region wide NRM asset. Improving the habitat and condition of threatened species is an NRM Plan priority.
On-going assistance to farmers in the Greater Sydney region to adapt to changes in climate and market demands.	Fertile, agriculturally productive landscapes is listed as a region wide NRM asset. Increasing the sustainability of agriculturally productive landscapes is an NRM Plan priority.
Continuing the protection and enhancement of native vegetation, biodiversity, and soil condition in the Greater Sydney region.	Biodiverse bushland areas are listed as a region wide NRM asset. Improving the condition and extent of native vegetation including connectivity is an NRM priority.
Restoration of important habitat for the Swift Parrot and Regent Honeyeater in the Greater Sydney Region.	No specific reference to this species, although threatened species are listed as a region wide NRM asset. Improving the habitat and condition of threatened species is an NRM Plan priority.

# Case study

## Management of a Matter of National Environmental Significance

### Swift Parrot and Regent Honeyeater

#### Target Species

##### Swift Parrot (*Lathamus discolor*)

- Critically endangered EPBC Act (Federal)
- Endangered BC Act (NSW)
- 1,000 (approx.) wild birds remaining

##### Regent Honeyeater (*Anthochaera Phrygia*)

- Critically endangered EPBC Act (Federal)
- Critically endangered BC Act (NSW)
- 300 (approx.) wild birds remaining



Swift Parrot



Regent Honeyeater

#### Threats

##### Swift Parrot

- Habitat loss, fragmentation, and degradation, including the loss of preferred tree species.
- Lack of regeneration or seedlings of feed trees.
- Reduction in food resources due to drought, changes in available habitat range and gum flowering times and range due to climate change.
- Feral animals including cats and foxes.
- Collision mortality with vehicles and houses (windows).
- Weed impacts on native vegetation.
- Aggression and competition of noisy miners excluding swift parrots from woodland habitat.
- Resource competition by introduced bees within feeding areas.
- Psittacine beak and feather disease.
- In Tasmania, predation by introduced sugar gliders and loss of nesting hollows is having a significant impact on breeding swift parrots.

##### Regent Honeyeater

- Habitat loss, fragmentation, and degradation, including the loss of preferred tree species.
- Lack of regeneration of canopy trees due to stock grazing, weed competition are also contributing to the decline in numbers.
- She-oak forests along riversides have been particularly impacted by overgrazing and clearing.
- Competition and predation by other birds, such as the noisy miner and pied currawong (native birds).
- The small population size and restricted habitat availability make the species highly vulnerable to local extinction through issues such as drought, wildfire, competition, and disease.

## Project Description

### ***Restoration of Important habitat for the Swift Parrot and Regent Honeyeater in the Greater Sydney Region, NLP2 multiyear (4 years) project \$400,000.***

The regent honeyeater and swift parrot are listed as critically endangered under the EPBC Act and critically endangered and Endangered respectively under the BC Act.

Both species share the same habitat in the Central Coast/Lower Hawkesbury regions and are seen foraging mostly in swamp mahogany and spotted gum from February to October. This project's goal is to raise the community's awareness of these 2 critically endangered species and to recreate and rehabilitate critical habitat by undertaking bush regeneration and tree planting activities on private and crown land.

The project has engaged specialist stakeholders and used plans, evidence, and guidelines to deliver several multiyear projects to achieve solid outcomes for both woodland birds. Greater Sydney LLS has engaged National Parks and Wildlife Services, Central Coast Council, Hornsby Shire Council, Northern Beaches Council, Landcare and private landholders to deliver 6 projects over 11 sites. Undertaking this work has multiple benefits. Many other endangered and threatened entities share or are a part of the of the swift parrot and regent honeyeater's foraging habitat. Some of these entities include flying foxes, gliders, owls, glossy black cockatoo, swamp sclerophyll forest, and river flat eucalyptus forest.

## Actions and Priority projects

### **Weed Control (primary and maintenance)**

- Contracted –primary control and maintenance of 18 ha of weed control swift parrot/regent honeyeater habitat.
- Achieved –approximately 40 ha of primary weed control and project is on track to complete 40 ha of weed control maintenance.

### **Revegetation (initial & maintenance)**

- Contracted –Revegetation and maintenance of 2 ha of swift parrot/regent honeyeater habitat.
- Achieved –approximately 8 ha of revegetation and revegetation maintenance on track to be completed by June 2023.

## Baseline Data Collection

- Contracted –3 pre works project area weed density/distribution reports.
- Achieved –8 reports/mapping completed to date.

## Flora Survey

- Contracted –3 post work surveys.
- Achieved –4 completed to date.

## Communication materials

- Contracted –one.
- Achieved –6 including newspaper articles, case study and printed handouts.

## Workshops/Training

- Contracted –4.
- Achieved –12 including webinars, guided birdwatching events, workshops, event stalls and tree planting events.
- Due to the successes and strong partnerships developed through this program, Greater Sydney LLS is seeking to continue the implementation of on-ground works, practice-change extension activities and MERI beyond 2022.

## Plans and Evidence:

- National Recovery Plan for the regent honeyeater and/or swift parrot.
- Saving Our Species –Conservation Projects –Site Managed Species –Management Plan.
- Recorded sightings.
- Birdlife Australia support material.
- Council bushcare plans.



Regent Honeyeater



# Case study

## Management of a Matter of National Environmental Significance

### Towra Point Nature Reserve Ramsar Site

Listed Matter of National Environmental Significance – Wetland of International Significance

#### Description

Towra Point Nature Reserve is a 603 ha nature reserve located on the southern shores of Botany Bay in Sutherland Shire, southern Sydney. The reserve is protected under the Ramsar Convention as a wetland of international importance and comprises a range of critical habitats for migratory birds and other threatened species. Vegetation communities and other natural habitat within the reserve include saltmarsh, mangroves, littoral rainforest, swamp forests, lagoons, and beaches. The reserve comprises 60% of the saltmarsh and 40% of the mangrove forest within the Greater Sydney Region and supports the largest wetland of its type in the Greater Sydney Region. Towra Point is a significant roosting and feeding habitat for large volumes of migratory shorebird species and a critical nesting site for the endangered little tern. The mangroves and seagrass provide important protection and food for juvenile fish species and the release of crab larvae from saltmarsh areas during spring ebb tides provides a reliable source of food for a wide variety of fish species and a critical link in the estuary's food web.

#### Threats

Towra Point Nature Reserve has high levels of environmental impacts due to its proximity to Port Botany and associated changes in hydrology through previous dredging of the main channel. This has increased the erosive impacts on the exposed areas of the Towra Point Nature Reserve. Increased development within the catchment area including the installation of the Sydney Airport runways has changed the natural swell within the bay and altered sediment transport rates and direction of sediment movement. This can be erosive to some areas and create deposition zones in other areas.

Adjoining privately owned landholders have also impacted on Towra Point through fragmentation of the reserve as well as recreational users travelling through the area for fishing, dog walking and camping. Other impacts include weed infestations, invasive feral animals such as deer, foxes and rats, and recreational horse riders from nearby properties. Foxes, rats and even Australian ravens have had a particular impact on the breeding success of the endangered little tern through predation, however, removal of a sand bridge has reduced access for non-avian predators to the main breeding grounds on the sand spit off the western edge of Towra Point Nature Reserve.

Approximately 30% of 300 recorded plants species at the reserve are introduced, including 10 species of highly invasive weeds (lantana, bitou, blackberry, prickly pear, pampas grass, African olive, African box-thorn, ground asparagus).



## Actions and priority projects

Priority actions under the NLP2 funding have focused on:

- Tracking of feral animals including cane toads, deer, foxes, pigs etc through the use of motion sensing cameras and DNA testing for cane toads.
- Targeted baiting of foxes at strategic locations throughout the reserve.
- Comprehensive monthly shorebird and wader surveys carried out by boat to limit disturbance of feeding populations or those breeding. This also includes the recording of the Australian raven proximal to highly utilised shorebird population locations. LLS has existing agreements for these works through The Georges Riverkeeper and NSW Wader Study Group. Surveys also include shorebird and wading locations in other locations throughout Botany Bay, Wooloware Bay, Quibray Bay and Weeney Bay.
- The provision of educational material aimed at particular groups within the local area such as local environment groups, Council Bushcare and schools. This can be in the form of articles, webinars and presentations to name a few.
- Agreements and working partnerships with the National Parks and Wildlife Service that manage the Kamay Botany Bay National Park due east of the Nature Reserve in Kurnell. This includes much of the tracking and baiting of foxes as well as weed management.
- Agreements and working partnerships with the Sutherland Shire Council who also aid in the tracking and baiting programs, bush regeneration within the reserve as well as working with community through education.
- Weed distribution surveys as well as flora surveys.
- LLS, in conjunction with the National Parks and Wildlife Service, are waiting on a quotation to carry out sand augmentation on the north-eastern section of the reserve. This beach area has had sand eroded over the past 10-15 years and transported to the beach on the western side of Towra Point. The augmentation works are aimed at mitigating the risk of saltwater inundation of Towra Lagoon and to protect the habitats of Towra Bay.

## Plans and Evidence:

### **Towra Point Nature Reserve Ramsar site Ecological Character Description.**

Purpose is to assist in implementing Australia's obligations under the Ramsar Convention, as stated in Schedule 6 (Managing wetlands of international importance) RAMSAR convention 1987, Article 3.2 and further clarifies by the Parties in Resolution VIII.8, 2002; Ramsar Convention 2005, Resolution IX.1 Annex B).

### **Towra Point Nature Reserve Ramsar Site Article 3.2 Response Strategy (Draft 2018)**

Primary purpose of the Response Strategy is the halt the decline and improve the condition of the TPNRRS to meet new ecological condition objectives.

### **Towra Point Nature Reserve Plan of Management 2001**

Drafted under Section 72 of the *NPWS Act (1974)*

Key aim: Improve protection and conservation of the reserve's natural and cultural heritage values by establishing clear, prioritised management strategies and actions for the nature reserve.

Key objective: Actively conserve and enhance the viability of the reserve as a sanctuary for protected, threatened and migratory species, and to retain and protect the existing landforms and other natural values for the long term.

International agreements relating to Towra Point and adjacent wetlands

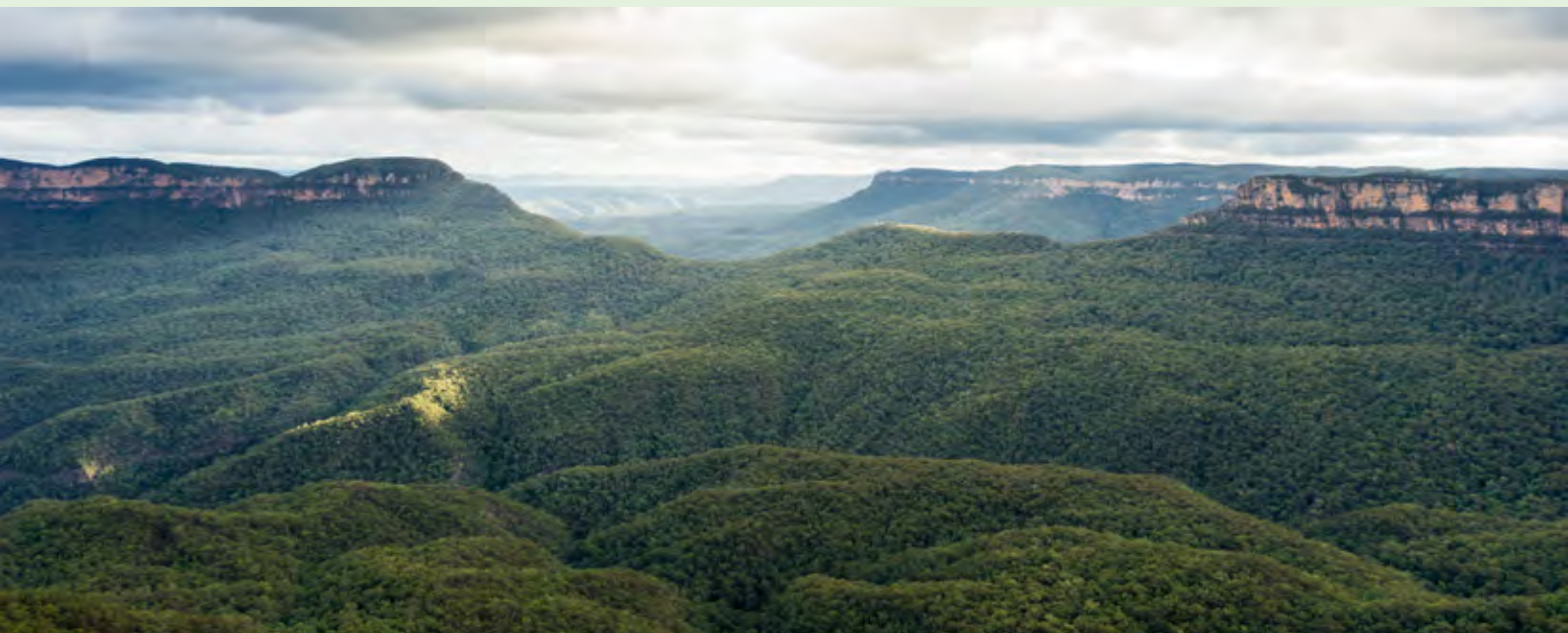
- Japan–Australia Migratory Bird Agreement (JAMBA).
- China-Australia Migratory Bird Agreement (CAMBA).
- Ramsar Convention on Wetlands of International Importance.
- Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA).

# Case study

## Management of a Matter of National Environmental Significance Greater Blue Mountains World Heritage Area

UNESCO World Heritage Convention values

1. A centre of diversification for the Australian scleromorphic flora
2. An outstanding diversity of habitats and plant communities.



### Description

The Greater Blue Mountains Area consists of 1.03 million ha of sandstone plateaux, escarpments and gorges dominated by temperate eucalypt forest. The site, comprised of 8 protected areas, is noted for its representation of the evolutionary adaptation and diversification of the eucalypts in post-Gondwana isolation on the Australian continent. Ninety-one eucalypt taxa occur within the Greater Blue Mountains Area which is also outstanding for its exceptional expression of the structural and ecological diversity of the eucalypts associated with its wide range of habitats. The site provides significant representation of Australia's biodiversity with 10% of the vascular flora as well as significant numbers of rare or threatened species, including endemic and evolutionary relict species, such as the Wollemi pine, which have persisted in highly restricted microsites.

© UNESCO

### Threats

Many of the current threats are from activities outside the GBMWhA boundary. Management of these threats could benefit from a broad planning overlay (or buffer zone) over adjacent lands identifying the source of these threats and limiting these activities.

#### Fire/fire suppression

Main threats relate to the impact of altered or inappropriate fire regimes on the ecological, biological and evolutionary processes within the eucalypt dominated ecosystems.

#### Water pollution

Denser urban development in the central corridor causing hardening of surfaces, greater storm water run off and water and air pollution.

#### Invasive non-native/alien species

Invasive plant and animal pests (including carp, deer, foxes, goats, pigs, rabbits) are managed in national parks management plans and implemented in cooperation with neighbours.



## Actions and priority projects

Priority actions under the NLP2 funding have focused on protecting the values of the GBMWH through management of pest species.

Weed projects have been targeted on both private and public land, partnering with local government, community groups and landowners. The projects have reduced densities of priority weeds to improve function of the EPBC Act listed threatened ecological communities including temperate highland peat-based swamps on sandstone, Sydney turpentine ironbark forest, shale sandstone transition forest (listed as critically endangered under the EPBC Act) and upland basalt eucalypt forests of the Sydney Basin bioregion (listed as endangered under the EPBC Act).

Pest animal control on private land is synchronised with National Parks and Wildlife Service to reduce the impact of pigs on biodiversity values. Pest animal projects have included tracking of feral animals including pigs, deer, and foxes using motion sensing cameras. Targeted baiting and trapping of pigs and foxes at strategic locations to reduce feral numbers.

The Blue Mountains Firesticks program on the eastern margin of the GBMWH which is reviving and evolving Traditional Indigenous Knowledge in the use of fire as a management tool in the environment. This attracts a large amount of in-kind co-investment through community involvement.

The project also includes an Aboriginal employment component to continue a program to reduce risk to Aboriginal cultural sites (rock shelters, rock art etc) in the GBMWH by manually reducing fuel loads to reduce the intensity of burns. This will be managed through the Traditional Owners group Gundungurra Aboriginal Heritage Association Inc.

## Plans and Evidence:

The Greater Blue Mountains World Heritage Area Strategic Plan, NSW National Parks and Wildlife Service 2009

Greater Blue Mountains World Heritage Area Strategic Plan Addendum 2016, Office of Environment and Heritage 2018

Sustainable Blue Mountains 2035, Blue Mountains City Council 2022

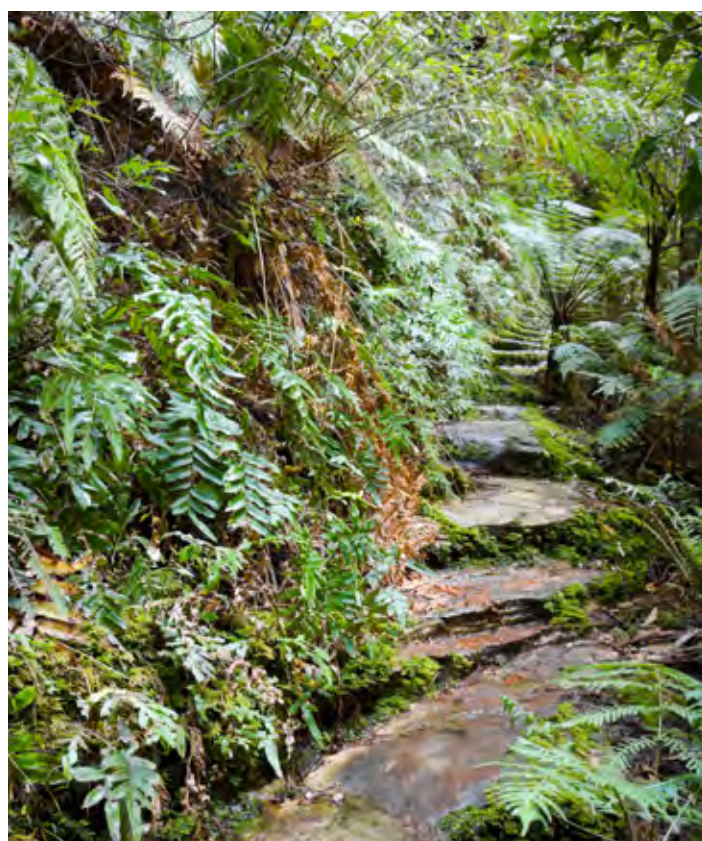
Protecting biodiversity values in response to long-term impacts: additional areas recommended for inclusion in the Greater Blue Mountains World Heritage Area Chapter 2 in Values for a New Generation, Greater Blue Mountains World Heritage Advisory Committee, Katoomba 2015 Benson, D and Smith, J (2015)

Vegetation, fauna and groundwater interrelations in low temperate montane peat swamps in Upper Blue Mountains' in Cunninghamia, 2012 12(4) 267-307. Benson, D. and Baird, I.R.C. (2012)

4 Blue Mountains World Heritage Institute (2006) Impact of Climate Change on World Heritage Sites, Greater Blue Mountains World Heritage Area, Australia.

## Key Delivery Partners

- Local government, community groups and landowners
- Traditional Owners group Gundungurra Aboriginal Heritage Association Inc.



# Program logic and linking NRM activities with the achievement of outcomes for investment priorities

Once investment priorities are known, NRM project planning and design involves the development of a Program Logic specific to each investment priority. This logic shows how the delivery of projects will contribute to identified short-term, medium-term and end of project outcomes.

Outcomes are designed to demonstrate actual change that will influence elements of the investment priority (typically resource condition or knowledge) over time. It is important that these outcomes are defined for different time periods, with short-term outcomes contributing to the medium term and end of project outcomes. Outcomes are also required to be SMART (Specific, Measurable, Achievable, Realistic and Time bound).

Greater Sydney LLS has considerable experience in the design of Program Logics and has been using them to demonstrate the links between activity and outcomes for all of its NRM projects.

Its NRM Services Program is underpinned by a series of NRM Core Services Program Logics and all Program Logics are supported by assumptions and evidence bases.

Specific Investment Priority Program Logics exist for all RLP 2018-2023 Programs as well as for projects developed under investment priorities as part of our NLP2 RLP Tender, that were not funded. These are summarised in Table 8.

**Table 8.** NLP2 5-year Outcomes & Program logics.

NLP2 5-year outcome	Existing Program Logics
By 2023, there is restoration of, and reduction in threats to, the ecological character of Ramsar sites, through the implementation of priority actions.	Specific-Continuing actions to maintain the ecological character of the Towra Point Nature Reserve Site.
By 2023, the trajectory of species targeted under the Threatened Species Strategy, and other EPBC Act priority species, is stabilised or improved.	Providing services to improve the trajectory of the priority species <i>Grevillea caleyi</i> . Restoration of important habitat for the Swift Parrot and Regent Honeyeater in Greater Sydney.
By 2023, invasive species management has reduced threats to the natural heritage Outstanding Universal Value of World Heritage properties through the implementation of priority actions.	Protecting the values of the GBMWHa through the management of pest species.
By 2023, the implementation of priority actions is leading to an improvement in the condition of EPBC Act listed threatened ecological communities.	Recovery of threatened ecological communities.
By 2023, there is an increase in the awareness and adoption of land management practices that improve and protect the condition of soil, biodiversity and vegetation.	Continuing the protection and enhancement of native vegetation, biodiversity and soil condition in the Greater Sydney region.
By 2023, there is an increase in the capacity of agriculture systems to adapt to significant changes in climate and market demands for information on provenance and sustainable production.	On-going assistance to farmers in the Greater Sydney region to adapt to changes in climate and market demands.
Bushfire Recovery – MNES.	NRM Regional bushfire recovery in the GBMWHa – Greater Sydney.

# Monitoring, Evaluation, Reporting and Improvement

Monitoring, evaluation, reporting and improvement (MERI) processes are an integral component of all Greater Sydney LLS NRM service delivery with staff employing a range of methodologies at industry standard to ensure best practice. Figure 8 illustrates the various points of interaction between MERI processes and NRM projects from concept and design through to implementation. Rigorous MERI processes are also fundamental to meeting investor requirements.

## Greater Sydney LLS

- Utilises the MERI tool, detailed MERI plans and Project Logic and ensures rigour to all steps in the monitoring, evaluation, reporting and improvement cycle
- Has high quality monitoring processes in place to demonstrate changes from baseline
- Seeks feedback from Department of the Environment and Energy regarding our projects
- Undertakes workshop evaluations and annual 'Mini-NLP' evaluations to identify areas for improvement for project delivery
- Maintains a skilled and professional team to coordinate and deliver its MERI program including a dedicated MERI officer
- Utilises robust systems to support our MERI requirements: IRIS (Integrated Resource Information System); LandMap spatial mapping system and SAP accounting systems. The biosecurity information system FARMS is also linked to the IRIS system allowing further links to relevant land manager contacts and activities across the region.
- Utilises best practice external databases (e.g., FeralScan)
- Ongoing auditing by NSW Natural Resources Commission to ensure successful delivery of Greater Sydney LLS Local Strategic Plan.

## NRM Plan Review

The Greater Sydney LLS NRM Plan is a living document, subject to review and improvement during its lifetime.

The NRM plan has currency from 2021–2026, review will take place at the end of years 2, 3 and 5.

## References

Salafsky, N., Salzer, D., Stattersfield, A.J., Hilton-Taylor, C., Neugarten, R., Butchart, S.H.M., Collen, B., Cox, N., Master, L.L., O'Connor, S., Wilkie, D. (2008) A standard Lexicon for Biodiversity Conservation: Unified Classifications of Threats and Actions, *Conservation Biology*, 22, 4.



# Acronyms and Glossary of terms used in the NRM Plan

## Acronyms

AAG	Aboriginal Advisory Group
ARIA	Aboriginal Land Rights Act (1983)
BC Act	Biodiversity Conservation Act (2016)
CBD	Central Business District
DPIE	NSW Department of Planning and Environment
EPBC Act	Environment Protection and Biodiversity Conservation Act (1999)
EM	Emergency Management
GBMWA	Greater Blue Mountains World Heritage Area
GS LLS	Greater Sydney Local Land Services
LALC	Local Aboriginal Land Council
LLS	Local Land Services
MEMA	Marine Estate Management Authority
MERI	Monitoring, Evaluation, Reporting, and Improvement
MNES	Matters of National Environmental Significance (matters listed under the EPBC Act, 1999)
NPWS	NSW National Parks and Wildlife Service
NLP	National Landcare Program
NRM	Natural Resource Management
TEC	Threatened Ecological Community

## Glossary of terms

### Actions

Activities linked to NRM priorities aimed at mitigating threats to those priorities.

### Asset

Elements within the Greater Sydney region that are a component of, or provide support to, healthy and resilient ecosystems and landscapes.

### Matters of National Environmental Significance

Matters listed under the *EPBC Act 1999* that are considered of environmental importance at the national level. Includes threatened species and communities but also landscape features such as wetlands or bushland reserves.

### Measures of success

Metrics to quantify status of investment in NRM priorities.

### NRM priorities

Priorities for investment in the NRM Plan. There are 8 priority areas for investment designed to address threats for identified NRM assets.

### Prioritisation principles

Framework to guide decision making for NRM investment.

### Riparian

Relating to creeks, streams and rivers.

### Terrestrial

Relating to the earth, on dry land.

# Appendix 1

## Matters of National Environmental Significance, Greater Sydney LLS region

Greater Sydney LLS Region: Commonwealth Listed Threatened Ecological Community (EPBC Act, 1999)	Threat Level	Actions	Knowledge Gaps*
Blue Gum High Forest of the Sydney Basin Bioregion	Critically Endangered	Implement approved Conservation Advice. Refer to TAP/s	Yes
Central Hunter Valley eucalypt forest and woodland	Critically Endangered	Implement approved Conservation Advice	
Cooks River/Castlereagh Ironbark Forest of the Sydney Basin Bioregion	Critically Endangered	Implement approved Conservation Advice	Yes
Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest	Critically Endangered	Implement approved Conservation Advice. Refer to TAP/s	Yes
Eastern Suburbs Banksia Scrub of the Sydney Region	Critically Endangered	Implement approved Conservation Advice. Refer to TAP/s	Yes
Elderslie Banksia Scrub Forest in the Sydney Basin Bioregion	Critically Endangered	Implement approved Conservation Advice	Yes
Illawarra-Shoalhaven Subtropical Rainforest of the Sydney Basin Bioregion	Critically Endangered	Implement approved Conservation Advice	
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Critically Endangered	Implement approved Recovery Plan. Refer to TAP/s	Yes
Natural Temperate Grassland of the South Eastern Highlands	Critically Endangered	Implement approved Conservation Advice	Yes
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	Critically Endangered	Implement approved Conservation Advice	
Shale Sandstone Transition Forest of the Sydney Basin Bioregion	Critically Endangered	Implement approved Conservation Advice. Refer to TAP/s	Yes
Southern Highlands Shale Forest and Woodland in the Sydney Basin Bioregion	Critically Endangered	Implement approved Conservation Advice	
Turpentine-Ironbark Forest of the Sydney Basin Bioregion	Critically Endangered	Implement approved Conservation Advice. Refer to TAP/s	Yes
Western Sydney Dry Rainforest and Moist Woodland on Shale	Critically Endangered	Implement approved Conservation Advice. Refer to TAP/s	Yes
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Implement approved Recovery Plan. Refer to TAP/s	
Castlereagh Scribbly Gum and Agnes Banks Woodlands of the Sydney Basin Bioregion	Endangered	Implement approved Conservation Advice	Yes
Coastal Swamp Oak ( <i>Casuarina glauca</i> ) Forest of New South Wales and South East Queensland ecological community	Endangered	Implement approved Conservation Advice	
Coastal Upland Swamps in the Sydney Basin Bioregion	Endangered	Implement approved Conservation Advice. Refer to TAP/s	
Posidonia australis seagrass meadows of the Manning-Hawkesbury ecoregion	Endangered	Implement approved Conservation Advice. Refer to TAP/s	

Greater Sydney LLS Region: Commonwealth Listed Threatened Ecological Community (EPBC Act, 1999)	Threat Level	Actions	Knowledge Gaps*
Temperate Highland Peat Swamps on Sandstone	Endangered	Implement approved Conservation Advice	
Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion	Endangered	Implement approved Conservation Advice	
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Implement approved Conservation Advice. Refer to TAP/s	Yes
*Knowledge Gaps = No Approved Recovery Plan, Recovery Plan Required			

## Greater Sydney LLS region – EPBC Act 1999 listed plants

Scientific Name	Common Name	Threat Level	Actions	Knowledge Gaps*
<i>Callistemon megalongensis</i>	Megalong Valley Bottlebrush	Critically Endangered	Implement approved Conservation Advice	
<i>Callistemon purpurascens</i>	A bottlebrush	Critically Endangered	Implement approved Conservation Advice	
<i>Corunastylis insignis</i>	Wyong Midge Orchid 1, Variable Midge Orchid 1	Critically Endangered	Implement approved Conservation Advice	
<i>Corunastylis</i> sp. <i>Charmhaven</i> (NSW 896673)	Wyong Midge Orchid 2	Critically Endangered	Implement approved Conservation Advice	
<i>Eucalyptus</i> sp. <i>Cattai</i> (Gregson s.n., 28 Aug 1954)	null	Critically Endangered	Implement approved Conservation Advice	
<i>Euphrasia arguta</i>	null	Critically Endangered	Implement approved Conservation Advice	
<i>Grevillea caleyi</i>	Caley's Grevillea	Critically Endangered	Implement approved Conservation Advice. Refer to TAP/s	Yes
<i>Hibbertia puberula</i> subsp. <i>glabrescens</i>	null	Critically Endangered	Implement approved Conservation Advice	
<i>Hibbertia spanantha</i>	Julian's Hibbertia	Critically Endangered	Implement approved Conservation Advice	
<i>Prostanthera marifolia</i>	Seaforth Mintbush	Critically Endangered	Implement approved Conservation Advice	
<i>Rhodamnia rubescens</i>	Scrub Turpentine, Brown Malletwood	Critically Endangered	Implement approved Conservation Advice	
<i>Rhodomirtus psidioides</i>	Native Guava	Critically Endangered	Implement approved Conservation Advice	
<i>Thelymitra adorata</i>	Wyong Sun Orchid	Critically Endangered	Implement approved Conservation Advice	
<i>Thelymitra kangaloonica</i>	Kangaloon Sun Orchid	Critically Endangered	Implement approved Conservation Advice	
<i>Wollemia nobilis</i>	Wollemi Pine	Critically Endangered	Refer to Recovery Plan. Refer to TAP/s	
<i>Acacia gordonii</i>	null	Endangered	Implement approved Conservation Advice	
<i>Acacia terminalis</i> subsp. <i>terminalis</i> MS	Sunshine Wattle (Sydney region)	Endangered	Implement approved Recovery Plan. Refer to TAP/s	



Scientific Name	Common Name	Threat Level	Actions	Knowledge Gaps*
<i>Allocasuarina glareicola</i>	null	Endangered	Implement approved Conservation Advice	
<i>Allocasuarina portuensis</i>	Nielsen Park She-oak	Endangered	Refer to Recovery Plan	
<i>Asterolasia elegans</i>	null	Endangered	Implement approved Conservation Advice	Yes
<i>Commersonia prostrata</i>	Dwarf Kerrawang	Endangered	Implement approved Recovery Plan. Refer to TAP/s	
<i>Cynanchum elegans</i>	White-flowered Wax Plant	Endangered	Implement approved Conservation Advice. Refer to TAP/s	
<i>Deyeuxia appressa</i>	null	Endangered	Implement approved Conservation Advice	
<i>Diuris aequalis</i>	Buttercup Doubletail	Endangered	Implement approved Conservation Advice	
<i>Epacris hamiltonii</i>	null	Endangered	Refer to Recovery Plan	Yes
<i>Eucalyptus copulans</i>	null	Endangered	Implement approved Conservation Advice	
<i>Eucalyptus macarthurii</i>	Camden Woollybutt, Paddys River Box	Endangered	Implement approved Conservation Advice	
<i>Eucalyptus</i> sp. Howes Swamp Creek (M.Doherty 26)	null	Endangered	Implement approved Conservation Advice	
<i>Genoplesium baueri</i>	Yellow Gnat-orchid, Bauer's Midge Orchid, Brittle Midge Orchid	Endangered	Implement approved Conservation Advice	Yes
<i>Hakea dohertyi</i>	a shrub	Endangered	Implement approved Conservation Advice	
<i>Haloragodendron lucasii</i>	Hal	Endangered	Implement approved Conservation Advice	
<i>Leionema lachnaeoides</i>	null	Endangered	Refer to Recovery Plan	
<i>Leucochrysum albicans</i> subsp. <i>tricolor</i>	Hoary Sunray, Grassland Paper-daisy	Endangered	Implement approved Recovery Plan	
<i>Microtis angusii</i>	Angus's Onion Orchid	Endangered	Implement approved Conservation Advice. Refer to TAP/s	Yes
<i>Persoonia hirsuta</i>	Hairy Geebung, Hairy Persoonia	Endangered	Implement approved Conservation Advice	
<i>Persoonia mollis</i> subsp. <i>maxima</i>	null	Endangered	Refer to Recovery Plan	Yes
<i>Persoonia nutans</i>	Nodding Geebung	Endangered	Implement approved Conservation Advice	Yes
<i>Ptherosphaera fitzgeraldii</i>	Dwarf Mountain Pine	Endangered	Implement approved Conservation Advice	Yes
<i>Pimelea spicata</i>	Spiked Rice-flower	Endangered	Implement approved Conservation Advice	Yes
<i>Pomaderris cotoneaster</i>	Cotoneaster Pomaderris	Endangered	Implement approved Recovery Plan	
<i>Prasophyllum affine</i>	Jervis Bay Leek Orchid, Culburra Leek-orchid, Kinghorn Point Leek-orchid	Endangered	Implement approved Recovery Plan	

Scientific Name	Common Name	Threat Level	Actions	Knowledge Gaps*
<i>Prostanthera askania</i>	Tranquillity Mintbush, Tranquillity Mintbush	Endangered	Refer to Recovery Plan	Yes
<i>Prostanthera junonis</i>	Somersby Mintbush	Endangered	Refer to Recovery Plan	Yes
<i>Pterostylis gibbosa</i>	Illawarra Greenhood, Rufa Greenhood, Pouched Greenhood	Endangered	Refer to Recovery Plan. Refer to TAP/s	Yes
<i>Pterostylis saxicola</i>	Sydney Plains Greenhood	Endangered	Implement approved Conservation Advice	
<i>Pterostylis</i> sp. Botany Bay (A.Bishop J221/1-13)	Botany Bay Bearded Greenhood, Botany Bay Bearded Orchid	Endangered	Refer to Recovery Plan	Yes
<i>Rhizanthella slateri</i>	Eastern Underground Orchid	Endangered	Implement approved Conservation Advice	
<i>Zieria covenyi</i>	Coveny's Zieria	Endangered	Implement approved Conservation Advice	
<i>Acacia bynoeana</i>	Bynoe's Wattle, Tiny Wattle	Vulnerable	Implement approved Conservation Advice	Yes
<i>Acacia flocktoniae</i>	Flockton Wattle	Vulnerable	Implement approved Conservation Advice	
<i>Acacia pubescens</i>	Downy Wattle, Hairy Stemmed Wattle	Vulnerable	Refer to Recovery Plan	Yes
<i>Acrophyllum australe</i>	null	Vulnerable	Implement approved Conservation Advice	
<i>Angophora inopina</i>	Charmhaven Apple	Vulnerable	Implement approved Conservation Advice	
<i>Astrotricha crassifolia</i>	Thick-leaf Star-hair	Vulnerable	Implement approved Conservation Advice	
<i>Baloskion longipes</i>	Dense Cord-rush	Vulnerable	Implement approved Conservation Advice. Refer to TAP/s	
<i>Boronia deanei</i>	Deane's Boronia	Vulnerable	Implement approved Conservation Advice. Refer to TAP/s	
<i>Bossiaea oligosperma</i>	null	Vulnerable	Implement approved Conservation Advice	
<i>Caladenia tessellata</i>	Thick-lipped Spider-orchid, Daddy Long-legs	Vulnerable	Implement approved Recovery Plan. Refer to TAP/s	
<i>Cryptostylis hunteriana</i>	Leafless Tongue-orchid	Vulnerable	Implement approved Conservation Advice	
<i>Darwinia biflora</i>	null	Vulnerable	Implement approved Conservation Advice	
<i>Diuris praecox</i>	Newcastle Doubletail	Vulnerable	Implement approved Conservation Advice	
<i>Epacris sparsa</i>	null	Vulnerable	Implement approved Conservation Advice	
<i>Eucalyptus aggregata</i>	Black Gum	Vulnerable	Implement approved Conservation Advice	
<i>Eucalyptus benthamii</i>	Camden White Gum, Nepean River Gum	Vulnerable	Implement approved Conservation Advice	Yes

Scientific Name	Common Name	Threat Level	Actions	Knowledge Gaps*
<i>Eucalyptus camfieldii</i>	Camfield's Stringybark	Vulnerable	Implement approved Conservation Advice	
<i>Eucalyptus glaucina</i>	Slaty Red Gum	Vulnerable	Implement approved Conservation Advice	
<i>Eucalyptus parramattensis subsp. decadens</i>	Earp's Gum, Earp's Dirty Gum	Vulnerable	Implement approved Conservation Advice	Yes
<i>Eucalyptus pulverulenta</i>	Silver-leaved Mountain Gum, Silver-leaved Gum	Vulnerable	Implement approved Conservation Advice	
<i>Euphrasia bowdeniae</i>	null	Vulnerable	Implement approved Conservation Advice	
<i>Grevillea parviflora subsp. parviflora</i>	Small-flower Grevillea	Vulnerable	Implement approved Conservation Advice	
<i>Grevillea raybrownii</i>	null	Vulnerable	Implement approved Conservation Advice	
<i>Grevillea shiressii</i>	null	Vulnerable	Implement approved Conservation Advice	
<i>Haloragis exalata subsp. exalata</i>	Wingless Raspwort, Square Raspwort	Vulnerable	Implement approved Conservation Advice	
<i>Helichrysum calvertianum</i>	null	Vulnerable	Implement approved Conservation Advice	
<i>Homoranthus darwinioides</i>	null	Vulnerable	Implement approved Conservation Advice. Refer to TAP/s	
<i>Isopogon fletcheri</i>	Fletcher's Drumsticks	Vulnerable	Implement approved Conservation Advice. Refer to TAP/s	
<i>Kunzea cambagei</i>	null	Vulnerable	Implement approved Conservation Advice	
<i>Kunzea rupestris</i>	null	Vulnerable	Implement approved Conservation Advice	
<i>Lasiopetalum joyceae</i>	null	Vulnerable	Implement approved Conservation Advice	
<i>Leptospermum deanei</i>	Deane's Tea-tree	Vulnerable	Implement approved Conservation Advice	
<i>Leucopogon exolasius</i>	Woronora Beard-heath	Vulnerable	Implement approved Conservation Advice	
<i>Melaleuca biconvexa</i>	Biconvex Paperbark	Vulnerable	Implement approved Conservation Advice	
<i>Melaleuca deanei</i>	Deane's Melaleuca	Vulnerable	Implement approved Recovery Plan	
<i>Micromyrtus blakelyi</i>	null	Vulnerable	Implement approved Conservation Advice	
<i>Micromyrtus minutiflora</i>	null	Vulnerable	Implement approved Conservation Advice	



Scientific Name	Common Name	Threat Level	Actions	Knowledge Gaps*
<i>Olearia cordata</i>	null	Vulnerable	Implement approved Conservation Advice	
<i>Persicaria elatior</i>	Knotweed, Tall Knotweed	Vulnerable	Implement approved Conservation Advice	
<i>Persoonia acerosa</i>	Needle Geebung	Vulnerable	Implement approved Conservation Advice. Refer to TAP/s	
<i>Persoonia bargoensis</i>	Bargo Geebung	Vulnerable	Implement approved Conservation Advice	
<i>Persoonia glaucescens</i>	Mittagong Geebung	Vulnerable	Implement approved Conservation Advice	
<i>Persoonia mollis subsp. revoluta</i>	null	Vulnerable	Implement approved Conservation Advice	
<i>Pimelea curviflora var. curviflora</i>	null	Vulnerable	Implement approved Conservation Advice. Refer to TAP/s	
<i>Pomaderris brunnea</i>	Rufous Pomaderris, Brown Pomaderris	Vulnerable	Implement approved Conservation Advice	Yes
<i>Pomaderris pallida</i>	Pale Pomaderris	Vulnerable	Implement approved Conservation Advice	
<i>Pomaderris sericea</i>	Bent Pomaderris	Vulnerable	Implement approved Recovery Plan	
<i>Prasophyllum fuscum</i>	Tawny Leek-orchid, Slaty Leek-orchid	Vulnerable	Implement approved Conservation Advice	
<i>Prostanthera densa</i>	Villous Mintbush	Vulnerable	Implement approved Conservation Advice	
<i>Pultenaea aristata</i>	null	Vulnerable	Implement approved Conservation Advice	
<i>Pultenaea glabra</i>	Smooth Bush-pea, Swamp Bush-pea	Vulnerable	Implement approved Conservation Advice	
<i>Pultenaea parviflora</i>	null	Vulnerable	Implement approved Conservation Advice	
<i>Rutidosia heterogama</i>	Heath Wrinklewort	Vulnerable	Implement approved Conservation Advice. Refer to TAP/s	
<i>Syzygium paniculatum</i>	Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry	Vulnerable	Implement approved Recovery Plan	
<i>Tetradlea juncea</i>	Black-eyed Susan	Vulnerable	Implement approved Conservation Advice. Refer to TAP/s	
<i>Thesium australe</i>	Austral Toadflax, Toadflax	Vulnerable	Implement approved Conservation Advice. Refer to TAP/s	Yes

Scientific Name	Common Name	Threat Level	Actions	Knowledge Gaps*
<i>Velleia perfoliata</i>	null	Vulnerable	Implement approved Conservation Advice	
<i>Xerochrysum palustre</i>	Swamp Everlasting, Swamp Paper Daisy	Vulnerable	Implement approved Recovery Plan	
<i>Zieria involucrata</i>	null	Vulnerable	Implement approved Recovery Plan	
<i>Zieria murphyi</i>	Velvet Zieria	Vulnerable	Implement approved Conservation Advice	
*Knowledge Gaps = No Approved Recovery Plan, Recovery Plan Required				

## Greater Sydney LLS region – EPBC Act 1999 listed mammals

Scientific Name	Common Name	Threat Level	Actions	Knowledge Gaps*
<i>Balaenoptera musculus</i>	Blue Whale	Endangered	Implement approved Recovery Plan. Refer to TAP/s	
<i>Dasyurus maculatus maculatus</i> (SE mainland population)	Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population)	Endangered	Refer to Significant Impact Guidelines. There is no Recovery Plan or Conservation Advice for this species	Yes
<i>Eubalaena australis</i>	Southern Right Whale	Endangered	Implement approved Recovery Plan. Refer to TAP/s	
<i>Isodon obesulus obesulus</i>	Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern)	Endangered	Implement Approved Conservation Advice. Refer to TAP/s	Yes
<i>Balaenoptera borealis</i>	Sei Whale	Vulnerable	Implement approved Conservation Advice. Refer to TAP/s	Yes
<i>Balaenoptera physalus</i>	Fin Whale	Vulnerable	Implement approved Conservation Advice. Refer to TAP/s	Yes
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat, Large Pied Bat	Vulnerable	Implement approved Recovery Plan	
<i>Megaptera novaeangliae</i>	Humpback Whale	Vulnerable	Implement Approved Conservation Advice. Refer to TAP/s	Yes
<i>Petauroides volans</i>	Greater Glider	Vulnerable	Implement Approved Conservation Advice	Yes
<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby	Vulnerable	Implement approved Recovery Plan. Refer to TAP/s	

Scientific Name	Common Name	Threat Level	Actions	Knowledge Gaps*
<i>Phascolarctos cinereus</i> (combined populations of Qld, NSW and the ACT)	Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)	Vulnerable	Implement Approved Conservation Advice	Yes
<i>Potorous tridactylus tridactylus</i>	Long-nosed Potoroo (SE Mainland)	Vulnerable	Implement approved Conservation Advice. Refer to TAP/s	Yes
<i>Pseudomys novaehollandiae</i>	New Holland Mouse, Pookila	Vulnerable	Implement approved Conservation Advice. Refer to TAP/s	Yes
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	Vulnerable	Implement approved Recovery Plan.	
*Knowledge Gaps = No Approved Recovery Plan, Recovery Plan Required				

## Greater Sydney LLS region – EPBC Act 1999 listed birds

Scientific Name	Common Name	Threat Level	Actions	Knowledge Gaps*
<i>Anthochaera phrygia</i>	Regent Honeyeater	Critically Endangered	Implement approved Recovery Plan. Refer to TAP/s	
<i>Calidris ferruginea</i>	Curlew Sandpiper	Critically Endangered	Implement approved Conservation Advice	
<i>Calidris tenuirostris</i>	Great Knot	Critically Endangered	Implement approved Conservation Advice	
<i>Lathamus discolor</i>	Swift Parrot	Critically Endangered	Implement approved Recovery Plan. Refer to TAP/s	
<i>Neophema chrysogaster</i>	Orange-bellied Parrot	Critically Endangered	Implement approved Recovery Plan. Refer to TAP/s	
<i>Numenius madagascariensis</i>	Eastern Curlew, Far Eastern Curlew	Critically Endangered	Implement approved Conservation Advice	
<i>Botaurus poiciloptilus</i>	Australasian Bittern	Endangered	Implement approved Conservation Advice. Refer to TAP/s	Yes
<i>Calidris canutus</i>	Red Knot, Knot	Endangered	Implement approved Conservation Advice	
<i>Charadrius mongolus</i>	Lesser Sand Plover, Mongolian Plover	Endangered	Implement approved Conservation Advice	
<i>Dasyornis brachypterus</i>	Eastern Bristlebird	Endangered	Implement approved Recovery Plan. Refer to TAP/s	
<i>Diomedea sanfordi</i>	Northern Royal Albatross	Endangered	Implement approved Recovery Plan. Refer to TAP/s	



Scientific Name	Common Name	Threat Level	Actions	Knowledge Gaps*
<i>Macronectes giganteus</i>	Southern Giant-Petrel, Southern Giant Petrel	Endangered	Implement approved Recovery Plan. Refer to TAP/s	
<i>Pterodroma leucoptera leucoptera</i>	Gould's Petrel, Australian Gould's Petrel	Endangered	Implement approved Recovery Plan. Refer to TAP/s	
<i>Rostratula australis</i>	Australian Painted Snipe	Endangered	Implement approved Conservation Advice	Yes
<i>Thalassarche cauta</i>	Shy Albatross	Endangered	Implement approved Recovery Plan. Refer to TAP/s	
<i>Thalassarche eremita</i>	Chatham Albatross	Endangered	Implement approved Recovery Plan. Refer to TAP/s	
<i>Charadrius leschenaultii</i>	Greater Sand Plover, Large Sand Plover	Vulnerable	Implement approved Conservation Advice	
<i>Diomedea antipodensis</i>	Antipodean Albatross	Vulnerable	Implement approved Recovery Plan. Refer to TAP/s	
<i>Diomedea antipodensis gibsoni</i>	Gibson's Albatross	Vulnerable	Implement approved Recovery Plan. Refer to TAP/s	
<i>Diomedea epomophora</i>	Southern Royal Albatross	Vulnerable	Implement approved Recovery Plan. Refer to TAP/s	
<i>Diomedea exulans</i>	Wandering Albatross	Vulnerable	Implement approved Recovery Plan. Refer to TAP/s	
<i>Falco hypoleucos</i>	Grey Falcon	Vulnerable	Implement approved Conservation Advice	
<i>Fregetta grallaria grallaria</i>	White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian)	Vulnerable	There is no approved Conservation Advice or Recovery Plan for this species	Yes
<i>Grantiella picta</i>	Painted Honeyeater	Vulnerable	Implement approved Conservation Advice	Yes
<i>Hirundapus caudacutus</i>	White-throated Needletail	Vulnerable	Implement approved Conservation Advice	
<i>Limosa lapponica baueri</i>	Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit	Vulnerable	Implement approved Conservation Advice	
<i>Macronectes halli</i>	Northern Giant Petrel	Vulnerable	Refer to Recovery Plan. Recovery Plan requires updating. Refer to TAP/s	Yes
<i>Pachyptila turtur subantarctica</i>	Fairy Prion (southern)	Vulnerable	Implement approved Conservation Advice. Refer to TAP/s	Yes
<i>Phoebastria fusca</i>	Sooty Albatross	Vulnerable	Implement approved Recovery Plan. Refer to TAP/s	

Scientific Name	Common Name	Threat Level	Actions	Knowledge Gaps*
<i>Polytelis swainsonii</i>	Superb Parrot	Vulnerable	Refer to Recovery Plan and Conservation Advice. Recovery Plan requires updating	Yes
<i>Pterodroma neglecta neglecta</i>	Kermadec Petrel (western)	Vulnerable	There is no approved Conservation Advice or Recovery Plan for this species	Yes
<i>Sternula nereis nereis</i>	Australian Fairy Tern	Vulnerable	Implement approved Conservation Advice. Refer to TAP/s	Yes
<i>Thalassarche bulleri</i>	Buller's Albatross, Pacific Albatross	Vulnerable	Implement approved Recovery Plan. Refer to TAP/s	
<i>Thalassarche bulleri platei</i>	Northern Buller's Albatross, Pacific Albatross	Vulnerable	Implement approved Recovery Plan. Refer to TAP/s	
<i>Thalassarche carteri</i>	Indian Yellow-nosed Albatross	Vulnerable	Implement approved Recovery Plan. Refer to TAP/s	
<i>Thalassarche impavida</i>	Campbell Albatross, Campbell Black-browed Albatross	Vulnerable	Implement approved Recovery Plan. Refer to TAP/s	
<i>Thalassarche melanophris</i>	Black-browed Albatross	Vulnerable	Implement approved Recovery Plan. Refer to TAP/s	
<i>Thalassarche salvini</i>	Salvin's Albatross	Vulnerable	Implement approved Recovery Plan. Refer to TAP/s	
<i>Thalassarche steadi</i>	White-capped Albatross	Vulnerable	Implement approved Recovery Plan. Refer to TAP/s	
<i>Thinornis cucullatus cucullatus</i>	Eastern Hooded Plover, Eastern Hooded Plover	Vulnerable	Implement approved Conservation Advice. Refer to TAP/s	
*Knowledge Gaps = No Approved Recovery Plan, Recovery Plan Required				

## Greater Sydney LLS region – EPBC Act 1999 listed reptiles

Scientific Name	Common Name	Threat Level	Actions	Knowledge Gaps*
<i>Caretta caretta</i>	Loggerhead Turtle	Endangered	Implement approved Recovery Plan. Refer to TAP/s	
<i>Dermochelys coriacea</i>	Leatherback Turtle, Leathery Turtle, Luth	Endangered	Implement approved Recovery Plan. Refer to TAP/s	
<i>Eulamprus leuraensis</i>	Blue Mountains Water Skink	Endangered	Implement approved Recovery Plan. Refer to TAP/s	
<i>Aprasia parapulchella</i>	Pink-tailed Worm-lizard, Pink-tailed Legless Lizard	Vulnerable	Implement approved Conservation Advice. Refer to TAP/s	Yes
<i>Chelonia mydas</i>	Green Turtle	Vulnerable	Implement approved Recovery Plan. Refer to TAP/s	
<i>Delma impar</i>	Striped Legless Lizard, Striped Snake-lizard	Vulnerable	Implement approved Recovery Plan. Refer to TAP/s	
<i>Eretmochelys imbricata</i>	Hawksbill Turtle	Vulnerable	Implement approved Recovery Plan. Refer to TAP/s	
<i>Hoplocephalus bungaroides</i>	Broad-headed Snake	Vulnerable	Implement approved Conservation Advice. Refer to TAP/s	Yes
<i>Natator depressus</i>	Flatback Turtle	Vulnerable	Implement approved Recovery Plan. Refer to TAP/s	
*Knowledge Gaps = No Approved Recovery Plan, Recovery Plan Required				

## Greater Sydney LLS region – EPBC Act 1999 listed amphibians

Scientific Name	Common Name	Threat Level	Actions	Knowledge Gaps*
<i>Litoria booroolongensis</i>	Booroolong Frog	Endangered	Implement approved Recovery Plan. Refer to TAP/s	
<i>Uperoleia mahonyi</i>	Mahony's Toadlet	Endangered	Implement approved Conservation Advice	
<i>Heleioporus australiacus</i>	Giant Burrowing Frog	Vulnerable	Implement approved Conservation Advice. Refer to TAP/s	Yes
<i>Litoria aurea</i>	Green and Golden Bell Frog	Vulnerable	Refer to Significant Impact Guidelines	
<i>Litoria littlejohni</i>	Littlejohn's Tree Frog, Heath Frog	Vulnerable	Implement approved Conservation Advice. Refer to TAP/s	
<i>Litoria raniformis</i>	Growling Grass Frog, Southern Bell Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog	Vulnerable	Refer to Significant Impact Guidelines	
<i>Mixophyes balbus</i>	Stuttering Frog, Southern Barred Frog (in Victoria)	Vulnerable	Implement approved Recovery Plan. Refer to TAP/s	
<i>Mixophyes iteratus</i>	Giant Barred Frog, Southern Barred Frog	Vulnerable	Implement approved Recovery Plan. Refer to TAP/s	
*Knowledge Gaps = No Approved Recovery Plan, Recovery Plan Required				



## Greater Sydney LLS region – EPBC Act 1999 listed fish

Scientific Name	Common Name	Threat Level	Actions	Knowledge Gaps*
<i>Bidyanus bidyanus</i>	Silver Perch, Bidyan	Critically Endangered	Implement approved Conservation Advice	Yes
<i>Hippocampus whitei</i>	White's Seahorse, Crowned Seahorse, Sydney Seahorse	Endangered	Implement approved Conservation Advice	
<i>Macquaria australasica</i>	Macquarie Perch	Endangered	Implement approved Recovery Plan	
<i>Epinephelus daemeli</i>	Black Rockcod, Black Cod, Saddled Rockcod	Vulnerable	Implement approved Conservation Advice	
<i>Maccullochella peelii</i>	Murray Cod	Vulnerable	Implement approved Recovery Plan	
<i>Prototroctes maraena</i>	Australian Grayling	Vulnerable	Implement approved Recovery Plan. Refer to TAP/s	
<i>Rexea solandri</i> (eastern Australian population)	Eastern Gemfish	Conservation Dependent		
<i>Seriola brama</i>	Blue Warehou	Conservation Dependent		
<i>Thunnus maccoyii</i>	Southern Bluefin Tuna	Conservation Dependent		
*Knowledge Gaps = No Approved Recovery Plan, Recovery Plan Required				

## Greater Sydney LLS region – EPBC Act 1999 listed sharks

Scientific Name	Common Name	Threat Level	Actions	Knowledge Gaps*
<i>Carcharias taurus</i> (east coast population)	Grey Nurse Shark (east coast population)	Critically Endangered	Implement approved Recovery Plan. Refer to TAP/s	
<i>Carcharodon carcharias</i>	White Shark, Great White Shark	Vulnerable	Implement approved Recovery Plan	
<i>Rhincodon typus</i>	Whale Shark	Vulnerable	Implement approved Conservation Advice	Yes
<i>Galeorhinus galeus</i>	School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark	Conservation Dependent		
<i>Sphyrna lewini</i>	Scalloped Hammerhead	Conservation Dependent		
*Knowledge Gaps = No Approved Recovery Plan, Recovery Plan Required				

## Greater Sydney LLS region – EPBC Act 1999 listed invertebrates

Scientific Name	Common Name	Threat Level	Actions	Knowledge Gaps*
<i>Dendronephthya australis</i>	Cauliflower Soft Coral	Endangered	Implement approved Conservation Advice	
<i>Pommerhelix duralensis</i>	Dural Land Snail	Endangered	Implement approved Conservation Advice	
<i>Paralucia spinifera</i>	Bathurst Copper Butterfly, Purple Copper Butterfly, Bathurst Copper, Bathurst Copper Wing, Bathurst-Lithgow Copper, Purple Copper	Vulnerable	Implement approved Recovery Plan. Refer to TAP/s	

## GS LLS region – Protected Areas (listed under the EPBC Act 1999)

Protected Area Name	Reserve Type	Protected Area Name	Reserve Type
Marramarra	National Park	Pitt Town	Nature Reserve
Wollemi	National Park	Bents Basin	State Conservation Area
Rileys Island	Nature Reserve	Heathcote	National Park
Pelican Island	Nature Reserve	Kanangra-Boyd	National Park
Dharawal	National Park	Cockle Bay	Nature Reserve
Tuggerah	Nature Reserve	Ku-ring-gai Chase	National Park
Wambina	Nature Reserve	Mulgoa	Nature Reserve
Towra Point	Nature Reserve	Dharug	National Park
Palm Grove	Nature Reserve	Gulguer	Nature Reserve
Colongra Swamp	Nature Reserve	Castlereagh	Nature Reserve
Gosford Coastal Open Space System	NRS Addition – Gazettal in progress	Maroota Ridge	State Conservation Area
Agnes Banks	Nature Reserve	Brisbane Water	National Park
Royal	National Park	Bouddi	National Park
Bar	Flora Reserve	Blue Mountains	National Park
Richters Caves	Flora Reserve	Saratoga Island	Nature Reserve
Sydney Harbour	National Park	Berowra Valley	Regional Park
Warrawolong	Flora Reserve	Dural	Nature Reserve
Thirlmere Lakes	National Park	Yellomundee	Regional Park
Windsor Downs	Nature Reserve	Wolli Creek	Regional Park
Kamay Botany Bay	National Park	Parramatta River	Regional Park
Malabar Headland	National Park	Bargo	State Conservation Area
Wallumatta	Nature Reserve	Edmonson	Regional Park
Scheyville	National Park	William Howe	Regional Park
Dalrymple-Hay	Nature Reserve	Wianamatta	Regional Park
Muogamarra	Nature Reserve	Rouse Hill	Regional Park
Wyrabalong	National Park	Leacock	Regional Park
Garigal	National Park	Bird Island	Nature Reserve

Protected Area Name	Reserve Type	Protected Area Name	Reserve Type
Cattai	National Park	Wamberal Lagoon	Nature Reserve
Jiliby	State Conservation Area	Nattai	State Conservation Area
Long Island	Nature Reserve	Ngula Bulgarabang	Regional Park
Lion Island	Nature Reserve	Yerranderie	State Conservation Area
Yengo	National Park	Burraborang	State Conservation Area
Newington	Nature Reserve	Lake Macquarie	State Conservation Area
102 Rosedale Road	NRS Addition –Gazettal in Progress	Tuggerah	State Conservation Area
Spectacle Island	Nature Reserve	Parr	State Conservation Area
North Head	Private Nature Reserve	Garawarra	State Conservation Area
Popran	National Park	Dharawal	State Conservation Area
Kemps Creek	Nature Reserve	Bronte-Coogee	Aquatic Reserve
Georges River	National Park	Boat Harbour	Aquatic Reserve
Lane Cove	National Park	Barrenjoey	Aquatic Reserve
Berowra Valley	National Park	Cape Banks	Aquatic Reserve
Gandangara	State Conservation Area	Narrabeen	Aquatic Reserve
Yerranderie	Regional Park	Cabbage Tree Bay	Aquatic Reserve
Wianamatta	Nature Reserve	Towra Point	Aquatic Reserve
Prospect	Nature Reserve	Long Reef	Aquatic Reserve
Upper Nepean	State Conservation Area	North Sydney Harbour	Aquatic Reserve
Munmorah	State Conservation Area	Shiprock	Aquatic Reserve
Nattai	National Park		

## Greater Sydney LLS region – Nationally Important Wetlands (listed under the EPBC Act 1999)

Reference Code	Wetland Name
NSW182	Cockrone Lagoon
NSW180	Terrigal Lagoon
NSW077	Eve St. Marsh, Arncliffe
NSW143	Wyong Racecourse Swamp
NSW177	Liverpool Military Training
NSW134	Colongra Swamp
NSW141	Tuggerah Lake
NSW179	Wamberal Lagoon
NSW181	Avoca Lagoon
NSW142	Voyager Point
NSW133	Budgewoi Lake Sand Mass
NSW132	Brisbane Water Estuary
NSW091	Thirlmere Lakes
NSW092	Towra Point Estuarine
NSW085	Newington Wetlands
NSW087	Pitt Town Lagoon
NSW086	O'Hares Creek Catchment
NSW083	Longneck Lagoon
NSW072	Blue Mountains Sedge
NSW073	Botany Wetlands
NSW071	Bicentennial Park



# Appendix 2

## Greater Sydney LLS sub-region NRM assets and threats

**Table 9.** Blue Mountains sub region.

Sub-region assets	Sub-Region threats
<b>Key Sub-region assets</b> <ul style="list-style-type: none"> <li>Greater Blue Mountains World Heritage Area</li> </ul>	<ul style="list-style-type: none"> <li>Weeds</li> <li>Run off and nutrients</li> <li>Feral animals</li> <li>Pathogens</li> <li>Fire regimes</li> </ul>
<b>Parks and reserves</b> <ul style="list-style-type: none"> <li>Blue Mountains National Park</li> <li>Wollemi National Park</li> <li>Kanangra Boyd National Park</li> </ul>	<ul style="list-style-type: none"> <li>Weeds</li> <li>Run off and nutrients</li> <li>Feral animals</li> <li>Pathogens</li> <li>Fire regimes</li> </ul>
<b>Rivers</b> <ul style="list-style-type: none"> <li>Hawkesbury and Nepean Rivers</li> <li>Macdonald River</li> <li>Grose, Colo Wild Rivers.</li> </ul>	<ul style="list-style-type: none"> <li>Weeds</li> <li>Run off and nutrients</li> <li>Accelerated riverbank erosion</li> <li>Unmanaged livestock</li> <li>Barriers to fish passage</li> <li>Wash from recreational boating.</li> </ul>
<b>Wetlands</b> Hanging swamps – Temperate highland peat swamps on sandstone	<ul style="list-style-type: none"> <li>Weeds</li> <li>Run off and nutrients</li> <li>Channelisation, erosion and sedimentation</li> <li>Inappropriate or lack of fire regimes in contemporary land management practices.</li> </ul>
<b>Threatened Ecological Communities</b> <ul style="list-style-type: none"> <li>Western Sydney Dry Rainforest</li> <li>Blue Mountains Basalt Forest in the Sydney Basin Bioregion</li> <li>Shale Sandstone Transition Forest</li> <li>Sydney Turpentine Ironbark Forest</li> <li>River Flat Eucalypt Forest on Coastal Floodplains</li> <li>Blue Gum High Forest of the Sydney Basin Bioregion.</li> </ul>	<ul style="list-style-type: none"> <li>Weeds</li> <li>Run off and nutrients</li> <li>Feral animals</li> <li>Pathogens</li> <li>Development</li> </ul>
<b>Threatened species and populations</b> <ul style="list-style-type: none"> <li>Blue Mountains /Hawkesbury Koala population</li> </ul>	<ul style="list-style-type: none"> <li>Climate change</li> <li>Bushfire</li> <li>Predation by feral and domestic animals</li> <li>Vehicle strike</li> <li>Land clearing and habitat fragmentation.</li> </ul>
<b>Social</b> <ul style="list-style-type: none"> <li>Traditional Owners / First Nations communities</li> <li>LALCs</li> <li>Hawkesbury-Nepean Landcare Network</li> <li>Hawkesbury Environment Network</li> <li>Landcare and bushcare groups.</li> </ul>	<ul style="list-style-type: none"> <li>Dwindling membership</li> <li>Lack of funding and support</li> <li>Barriers to the transmission of intergenerational Traditional Aboriginal Ecological Knowledge.</li> </ul>

**Table 10.** Sydney Metropolitan and Cumberland Plain sub-region

Sub-region assets	Sub-Region threats
<b>Key Sub-region assets</b> <ul style="list-style-type: none"> <li>• Ramsar Wetland – Towra point</li> <li>• Cumberland Plain Woodland.</li> </ul>	<ul style="list-style-type: none"> <li>• Human impacts</li> <li>• Development</li> <li>• Feral animals</li> <li>• Recreational pressures</li> </ul>
<b>Parks and reserves</b> <ul style="list-style-type: none"> <li>• Sydney Harbour National Park</li> <li>• Ku ring ai Chase National Park</li> <li>• Royal National Park</li> <li>• Garrigal and Land Cove National Parks.</li> </ul>	<ul style="list-style-type: none"> <li>• Weeds</li> <li>• Run off and nutrients</li> <li>• Feral animals</li> <li>• Pathogens</li> <li>• Erosion/sedimentation</li> <li>• Recreational pressures</li> </ul>
<b>Rivers</b> <ul style="list-style-type: none"> <li>• Hawkesbury and Nepean Rivers</li> <li>• Georges River</li> <li>• Parramatta River</li> <li>• Woronora River</li> <li>• Deep Creek</li> </ul>	<ul style="list-style-type: none"> <li>• Weeds</li> <li>• Run off and nutrients</li> <li>• Accelerated riverbank erosion</li> <li>• Unmanaged livestock</li> <li>• Barriers to fish passage</li> <li>• Recreational pressures</li> </ul>
<b>Wetlands</b> <ul style="list-style-type: none"> <li>• Lime Kiln Bay</li> <li>• Dee Why Wildlife Refuge</li> <li>• Warriewood Wetlands</li> <li>• Nareen Wetlands</li> <li>• Narrabeen Lagoon</li> </ul>	<ul style="list-style-type: none"> <li>• Weeds</li> <li>• Erosion and sedimentation</li> <li>• Recreational pressures</li> <li>• Sea-level rise</li> </ul>
<b>Estuaries</b> <ul style="list-style-type: none"> <li>• Sydney Harbour</li> <li>• Middle Harbour</li> </ul>	<ul style="list-style-type: none"> <li>• Stormwater and nutrients</li> <li>• Weeds</li> <li>• Litter</li> </ul>
<b>Threatened Ecological Communities</b> <ul style="list-style-type: none"> <li>• Cumberland Plain Woodland in the Sydney Basin Bioregion</li> <li>• Western Sydney Dry Rainforest</li> <li>• Shale Sandstone Transition Forest</li> <li>• Sydney Turpentine Ironbark Forest</li> <li>• River Flat Eucalypt Forest on Coastal Floodplains</li> <li>• Blue Gum High Forest of the Sydney Basin Bioregion</li> <li>• Littoral Rainforest</li> <li>• Eastern Suburbs Banksia Scrub</li> </ul>	<ul style="list-style-type: none"> <li>• Weeds</li> <li>• Run off and nutrients</li> <li>• Feral animals</li> <li>• Pathogens</li> <li>• Development</li> </ul>
<b>Social</b> <ul style="list-style-type: none"> <li>• Greater Sydney Landcare Network</li> <li>• Cattai Hills Environment Network</li> <li>• First Nations community / Traditional Owners</li> <li>• LALCs</li> </ul>	<ul style="list-style-type: none"> <li>• Dwindling membership</li> <li>• Lack of funding and support</li> <li>• Barriers to the transmission of intergenerational Traditional Aboriginal Ecological Knowledge</li> </ul>

**Table 11.** Central Coast sub-region

Sub-region assets	Sub-Region threats
<b>Key Sub-region assets</b> <ul style="list-style-type: none"> <li>Tuggerah Lakes and Tuggerah Lakes Catchment</li> </ul>	<ul style="list-style-type: none"> <li>Weeds</li> <li>Run off and nutrients</li> <li>Accelerated bank erosion</li> <li>Unmanaged livestock</li> <li>Recreational pressures.</li> </ul>
<b>Parks and reserves</b> <ul style="list-style-type: none"> <li>Brisbane Water National Park</li> <li>Bouddi National Park</li> <li>Dharug National Park</li> <li>Popran National Park</li> <li>Coastal Open Space System</li> </ul>	<ul style="list-style-type: none"> <li>Weeds</li> <li>Run off and nutrients</li> <li>Feral animals</li> <li>Pathogens</li> </ul>
<b>Rivers</b> <ul style="list-style-type: none"> <li>Hawkesbury River</li> <li>Mangrove Creek</li> <li>Wyong River</li> <li>Ourimbah Creek</li> <li>Erina Creek</li> </ul>	<ul style="list-style-type: none"> <li>Weeds</li> <li>Run off &amp; nutrients</li> <li>Accelerated riverbank erosion</li> <li>Unmanaged livestock</li> <li>Barriers to fish passage</li> <li>Recreational pressures.</li> </ul>
<b>Wetlands</b> <ul style="list-style-type: none"> <li>Terrigal Lagoon</li> <li>Cockrone Lagoon</li> <li>Wamberal Lagoon</li> </ul>	<ul style="list-style-type: none"> <li>Weeds</li> <li>Erosion &amp; sedimentation</li> <li>Sea-level rise</li> <li>Recreational pressures.</li> </ul>
<b>Estuaries</b> <ul style="list-style-type: none"> <li>Tuggerah Lakes</li> <li>Broken Bay</li> </ul>	<ul style="list-style-type: none"> <li>Stormwater and nutrients</li> <li>Weeds</li> <li>Litter</li> </ul>
<b>Threatened Ecological Communities</b> <ul style="list-style-type: none"> <li>Umina Coastal Sandplain Woodland</li> <li>Lowland Rainforest</li> <li>Littoral Rainforest</li> <li>Swamp Oak Forest on Coastal Floodplains</li> </ul>	<ul style="list-style-type: none"> <li>Weeds</li> <li>Run off and nutrients</li> <li>Feral animals</li> <li>Pathogens</li> <li>Development</li> <li>Edge effects</li> </ul>
<b>Threatened species and populations</b> <ul style="list-style-type: none"> <li>Wyong threatened orchids (e.g. <i>Thelymitra adorata</i>)</li> <li>Grey Headed Flying Fox populations</li> <li>Swift Parrot</li> <li><i>Prostanthera askania</i></li> <li><i>Prostanthera junonis</i></li> <li><i>Grevillea shiressii</i></li> </ul>	<ul style="list-style-type: none"> <li>Weeds</li> <li>Run off &amp; nutrients</li> <li>Development</li> <li>Edge effects</li> <li>Inappropriate or lack of fire regimes in contemporary land management practices</li> <li>Feral animals</li> </ul>
<b>Social</b> <ul style="list-style-type: none"> <li>Community Environment Network</li> <li>Landcare and Bushcare groups</li> <li>First Nations / Traditional Owners</li> <li>LALCs</li> </ul>	<ul style="list-style-type: none"> <li>Dwindling membership</li> <li>Lack of funding and support</li> <li>Barriers to the transmission of intergenerational Traditional Aboriginal Ecological Knowledge</li> </ul>

# Appendix 3

## Alignment of NLP2 Outcomes with Greater Sydney LLS NRM Plan Priorities and Actions, Greater Sydney LLS Local Strategic Plan and LLS NRM Framework

NLP2 Outcomes	Greater Sydney LLS NRM Plan (2021 - 2026)	Greater Sydney LLS - Local Strategic Plan (2021 - 2026)	LLS - NRM Framework (2021 - 2026)
Long Term Outcomes	NRM Priorities	What we do	Objectives
NLP2 Outcomes inclusive 1-6	NRM Plan Priorities	Deliver projects and provide expert advice to assist in the protection and restoration of natural assets and the ecosystems services they provide.	To take action on the Top Threats to the health and resilience of NSW landscapes and catchments.
	NRM Plan Priority: Support First Nations people to Care for Country and Continue traditional Aboriginal land management practices.	Aboriginal Engagement -to develop relationships of engagement and inclusivity with Aboriginal people in our regions.	To champion opportunities for Aboriginal people and communities to care for Country and enhance contemporary land management practices.
5-year Outcomes	Actions	Greater Sydney LLS actions and priority programs	Actions and initiatives
By 2023, there is an increase in the awareness and adoption of land management practices that improve and protect the condition of soil, biodiversity and vegetation.	Invest in knowledge products and educational resources to build customer knowledge and capacity to support practice change and improvements to NRM  Investments to facilitate the communication and sharing of knowledge to build customer capacity to support practice change and improvements to NRM.	Implement a landscape scale approach to management to achieve overall environmental improvements. Assist and enable land managers and community to undertake actions that protect and enhance the environment.	3.a. Identify targets and priority areas across the state for the highest return-on-investment in: native vegetation management; riparian management, groundcover management; and environmental biosecurity.  2.f Provide extension and information services on the economic benefits derived from investing in conservation and restoration of natural resources and landscapes, and connectivity.



NLP2 Outcomes	Greater Sydney LLS NRM Plan (2021 - 2026)	Greater Sydney LLS - Local Strategic Plan (2021 - 2026)	LLS - NRM Framework (2021 - 2026)
<p>By 2023, there is restoration of, and reduction in threats to, the ecological character of Ramsar sites, through the implementation of priority actions.</p> <p>By 2023, the trajectory of species targeted under the Threatened Species Strategy, and other EPBC Act priority species, is stabilised or improved.</p> <p>By 2023, invasive species management has reduced threats to the natural heritage Outstanding Universal Value of World Heritage properties through the implementation of priority actions.</p> <p>By 2023, the implementation of priority actions is leading to an improvement in the condition of EPBC Act listed Threatened Ecological Communities.</p>	<p>Target key customers to implement on-ground activities to support improvements in:</p> <ul style="list-style-type: none"> <li>• Native vegetation condition and connectivity</li> <li>• Threatened species and communities</li> <li>• Invasive species</li> <li>• Waterways, including riparian zones</li> <li>• Wetlands, lagoons, and estuaries.</li> </ul> <p>Undertake engagement and investment in knowledge products to facilitate the improved management of:</p> <ul style="list-style-type: none"> <li>• Native vegetation condition and connectivity</li> <li>• Threatened species and communities</li> <li>• Invasive species</li> <li>• Waterways, including riparian zones,</li> <li>• Wetlands, lagoons, and estuaries.</li> </ul>	<p>Enable actions that manage or address threats degrading local environments or assist in recovery following disturbance.</p> <p>Implement a landscape scale approach to management to achieve overall environmental improvements. Protecting biodiversity assets and improving the condition of bushland, waterways, and coastal ecosystems.</p>	<p>3.b. Deliver targeted threat and pressure minimisation programs and projects that arrest decline in natural resources.</p> <p>3.c. Deliver integrated land management practice change programs, landscape scale rehabilitation activities and riparian land management programs in priority catchments, coordinating action and investment of agencies, industry and land managers.</p>
<p>By 2023, invasive species management has reduced threats to the natural heritage Outstanding Universal Value of World Heritage properties through the implementation of priority actions.</p>	<p>Investment in extension, engagement, and on-ground activities</p> <p>Develop knowledge products to promote the importance of, and benefits arising from invasive species management</p>	<p>Implement priority pest animal and plant programs as per the Greater Sydney Regional Weed and Pest Plans. Support coordinated pest animal programs with landholders.</p>	<p>3.d. Facilitate greater integration of environmental outcomes in regional pest and weed plans in 2022 and 2023, and increase collaboration with biosecurity teams on environmental biosecurity.</p>



# Appendix 4

## GS LLS Local Strategic Plan (2021-2026)



Local Land  
Services

### GREATER SYDNEY | July 2021 - June 2026

With only 6,300 rate payers but more than 30,000 unrated small holdings, the Greater Sydney region has unique challenges. Over 50 percent of the region is National Park, and the region produces 7 percent of agricultural output in NSW on only 1.5 percent of the total land mass. Biosecurity is a significant risk with new incursions occurring regularly. We meet these challenges by maintaining exceptional customer service and supporting our landholders through education, collaboration and innovation.



# Appendix 5

## Regional and sectoral priorities identified by Greater Sydney Community Advisory Groups (Greater Sydney LLS Strategic Plan 2016-21)

Metropolitan Community Advisory Group	Peri-urban Community Advisory Group	Central Coast Community Advisory Group	Aboriginal Advisory Group
Improving riparian vegetation and stream/river health	Improve native vegetation extent and condition	Improve native vegetation extent and condition	Protection of threatened plant and animal species and communities
Improving estuarine and coastal biodiversity and water quality	Nil-tenure approach to managing pest plant and animal impacts on priority assets, including natural assets and agriculture	Improving estuarine and coastal biodiversity and water quality	Improving riparian vegetation and stream/river health
Maintain and extend biodiversity corridors	Controlling invasive environmental weeds	Protection of threatened plant and animal species and communities	Controlling invasive environmental weeds
Planning pest animal control programs	Planning pest animal control programs	Planning pest animal control programs	Planning pest animal control programs
Surveillance for exotic plant pests and diseases	Surveillance for exotic plant pests and diseases	Surveillance for exotic plant pests and diseases	Detection and control of infectious animal diseases
Surveillance for notifiable animal diseases and chemical residues	Raising community capacity to reduce the risk of animal disease transmission	Surveillance for notifiable animal diseases and chemical residues	Surveillance for notifiable animal diseases and chemical residues
Linking research programs to producers	Running production improvement programs e.g., trials, demonstrations	Linking research programs to producers	Providing extension services to producers
Providing extension services to producers	Linking research programs to producers	Advice to producers on climate change adaptation and mitigation	Making new technology available to producers
Advice to producers on climate change adaption and mitigation	Delivering training courses for agricultural productivity	Providing extension services to producers	Advice to producers on climate change adaptation and mitigation
Supporting community environmental action, e.g., Bushcare and Coastcare	Supporting community environmental action, e.g., Bushcare and Coastcare	Supporting community environmental action, e.g., Bushcare and Coastcare	Increasing participation of Aboriginal communities in natural resource management and identifying opportunities for employment
Increasing participation of Aboriginal communities in natural resource management and identifying opportunities for employment	Increasing participation of Aboriginal communities in natural resource management and identifying opportunities for employment	Evaluating community vulnerability to extreme events (e.g., fire, storm, flood) and building capacity and resilience	Supporting community environmental action, e.g., Bushcare and Coastcare
Evaluating community vulnerability to extreme events (e.g., fire, storm, flood) and building capacity and resilience	Evaluating community vulnerability to extreme events (e.g., fire, storm, flood) and building capacity and resilience	Increasing participation of Aboriginal communities in natural resource management and identifying opportunities for employment	Evaluating community vulnerability to extreme events (e.g., fire, storm, flood) and building capacity and resilience



# Appendix 6

## Sub-regional priorities for the Greater Sydney region (Greater Sydney LLS Strategic Plan 2016-21)

Strategic Objectives	Metropolitan	Peri-urban	Central Coast
Reduce risks from animal and plant pests and disease	<b>Priority pest species:</b> European red fox	<b>Priority pest species:</b> Feral pigs	<b>Priority pest species:</b> Wild dogs
Productive and sustainable agriculture	<b>Priorities are:</b> Supply chain efficiencies; Security of food supply	<b>Priorities are:</b> Retention of agriculture; Energy, nutrient and water use efficiency  Innovation to increase productivity	<b>Priorities are:</b> Retention of agriculture; Energy, nutrient and water use efficiency  Innovation to increase productivity
Healthy harbours rivers and waterways	<b>Priority waterways for management:</b>  Sydney Harbour, Botany Bay, Georges River, Port Hacking and Pittwater; Coastal beaches, lagoons and headlands from Barrenjoey to Bundeena	<b>Priority waterways for management:</b>  Nepean-Hawkesbury, Colo, Macdonald, Mangrove and upper reaches of the Georges Rivers	<b>Priority waterways for management:</b>  Tuggerah Lake and Brisbane Waters
Healthy native vegetation and habitats	<b>Management Priorities are:</b>  Threatened Ecological Communities  Towra Point Ramsar Wetland  Ecosystem services provided by remnant urban bushland	<b>Management Priorities are:</b>  Threatened Ecological Communities of the Cumberland Plan and lower Blue Mountains; The World Heritage estate of the Greater Blue Mountains	<b>Management Priorities are:</b>  Threatened Ecological Communities of the Central Coast  Building connectivity between the Great Eastern Ranges and coastal reserves
Emergency management	<b>Priorities are:</b>  Building community capacity to extreme events such as East Coast Low storm impacts  Provide trained staff in response to emergencies; Assistance with response to high level biosecurity threats such as Argentinian Fire Ants	<b>Priorities are:</b>  Building community capacity to extreme events such as flooding and bushfire  Provide trained staff in response to emergencies; Assistance with response to high level biosecurity threats such as Hendra and Equine Influenza	<b>Priorities are:</b>  Building community capacity to extreme events such as flooding and bushfire  Provide trained staff in response to emergencies; Assistance with response to high level biosecurity threats such as Hendra and Avian Influenza
Service delivery	<b>Priorities are:</b>  Work to high standards of governance and accountability  Support Landcare and Bushcare to build community capacity to manage the environment  Engage with Aboriginal communities to increase participation in managing significant environments and to build skills for employment	<b>Priorities are:</b>  Work to high standards of governance and accountability  Support Landcare and Bushcare to build community capacity to manage the environment  Engage with Aboriginal communities to increase participation in managing significant environments and to build skills for employment	<b>Priorities are:</b>  Work to high standards of governance and accountability  Support Landcare and Bushcare to build community capacity to manage the environment  Engage with Aboriginal communities to increase participation in managing significant environments and to build skills for employment

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