lismore city council

BIODIVERSITY MANAGEMENT STRATEGY

for the Lismore Local Government Area 2015-2035

Revised 2nd Edition

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Illustration of a Rose-crowned Fruit-dove (*Ptilinopus regina*) by Greg Hodgson

We acknowledge the Widjabal/Wyabal people of the Bundjalung nation, Traditional Owners of the land and waters on which we operate our business. We honour their unique cultural and spiritual relationship to the land and waters and pay our respects to them and their culture, their Elders and community leaders both past and present.

Table of Contents

Summary

The Biodiversity Management Strategy (BMS) covers the Lismore Local Government Area (LGA), an area rich in biodiversity with natural values that are the reason so many people enjoying living in and visiting the area. The first edition of BMS was prepared by Lismore City Council over 2013-2015 and adopted in May 2015.

The BMS identifies the most important natural assets of the area, the threats to these and the strategies and actions to manage these threats. It is integral to delivering goals of the *Imagine Lismore Community Strategic Plan* and other local and regional strategic plans which are outlined in Chapter 1.

This second edition of the BMS follows the first four-yearly review, which identified relevant changes to the scientific and legislative context, progress on actions to date, barriers to implementation, and priorities for the next period. A separate report, the *Biodiversity Management Strategy – Year 4 Operational Review,* outlines the approach undertaken in this review and how it has informed this revised BMS. While the first edition of BMS focused building on existing partnerships and developing new partnerships in the community, the need to better integrate biodiversity management into all of Council's functions has been identified and is a focus of actions for the next period. The BMS is designed as a medium to long term strategy (20 years) with a number of positive gains already in the initial four-year phase of delivery. The continued implementation of this strategy is highly desirable, and this review sets out a detailed approach for the next phase of implementation.

Chapter 1 provides an introduction to biodiversity, its importance and why we need a BMS.

Chapter 2 gives a snapshot of the Lismore LGA, its biodiversity values, the long-term pressures that cause biodiversity loss, but also previous and current biodiversity management by Council and the communities in the area to mitigate these impacts.

Chapter 3 outlines the goals of the BMS, and a new strategic framework created to achieve those goals. There are three (3) program areas within which ten (10) strategies have been developed that encompass the work in the BMS:

INTERNAL
Cleaning up our own backyard

RURAL
Working with rural landholders

URBAN
Working in the urban environment

Chapter 4 sets out specific objectives within each strategy, and the actions to be undertaken within the next 5-year period.

Chapter 5 sets out how funding from the Special Rate Variation is to be allocated between the program areas, according to the Independent Pricing and Regulatory Tribunal (IPART) approval.

Chapter 6 finishes with a list of references.

In addition to these chapters, the BMS is supported by four (4) appendices that provide more in-depth discussion and detail to chapters, as well as three (3) technical reports that are stand-alone documents. The technical reports for the BMS are:

1 **Vegetation mapping for the Lismore LGA (2011)**
Landmark Ecological Services

2 **Key habitats and corridors system (2012)**
Landmark Ecological Services

3 **Vegetation mapping for the Lismore LGA Green (Northern) Zone (2019)**
Landmark Ecological Services

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    - Annie McWilliam, Integrated Planning Manager
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List of abbreviations

BC Act	*Biodiversity Conservation Act 2016* (NSW)
BMS	Biodiversity Management Strategy
CZMP	*Coastal Zone Management Plan for the Richmond River Estuary*
DECCW	Department of Environment, Climate Change and Water (NSW)
DEWHA	Department of Water, Heritage and the Arts (Commonwealth)
DFAT	Department of Foreign Affairs and Trade (Commonwealth)
DII	Department of Industry and Investment (NSW)
DPIE	Department of Planning, Industry and Environment (NSW)
EPA Act	*Environmental Planning and Assessment Act 1979* (NSW)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
FoK	Friends of the Koala
HCV	High Conservation Value
Imagine Lismore	*Imagine Lismore Community Strategic Plan 2017–2027*
KPoM	Comprehensive Koala Plan of Management for South-east Lismore
LCC	Lismore City Council
LG Act	*Local Government Act 1993* (NSW)
LGA	Local Government Area
NCLLS	North Coast Local Land Services
NRCMA	Northern Rivers Catchment Management Authority
OEH	Office of Environment and Heritage (NSW)
RCC	Rous County Council
SEPP	State Environmental Planning Policy

1 Introduction

1.1 What is biodiversity?

Put simply, biodiversity (or biological diversity) is the variety of all life forms. It includes all living species, the genes they possess and the ecosystems and landscapes that make up our living world. Biodiversity is constantly changing and can be increased (positive change) through genetic changes or decreased (negative change) through extinctions of species, subspecies or even local populations (Natural Resource Management Ministerial Council 2010).

The concept of biodiversity also emphasises the interconnectedness and interdependence of all life and is generally considered at three levels:

- **Genetic diversity:** The range of genetic information contained in individual plants, animals and micro-organisms.
- **Species diversity:** The number of different species in existence within a given area. It is the most common way that people think about biodiversity.
- **Ecosystem diversity:** The variety of habitats, ecological communities and ecological processes.

1.2 Why is biodiversity important?

Conserving biodiversity is an essential part of safeguarding the biological life-support systems of our planet. For example, we need oxygen to breathe, clean fresh water to drink, fertile soil for food production and physical materials for shelter and fuel. These necessities that are fundamental to our physical, social, cultural and economic well-being are collectively known as 'ecosystem services' (DEWHA 2009).

Ecosystem services are produced by the functions that occur in healthy ecosystems. These functions are supported by biodiversity and its attributes, including the number of individuals and species, and their relative abundance, composition and interactions. Ecosystem services can be divided into four groups (see **Figure 1):**

Figure 1. The four main types of ecosystem services

PROVISIONING SERVICES

Any type of benefit to people that can be extracted from nature.

- Food, including bushtucker, fibre, fuel and many medicines
- Genetic resources
- Biochemicals
- Fresh water

REGULATING SERVICES

The benefit provided by ecosystem processes that moderate natural phenomena.

- Resistance to invasion by weeds
- Herbivory
- Pollination of crops and natural vegetation
- Seed dispersal of crops and natural vegetation
- Climate regulation
- Pest regulation
- Disease regulation
- Natural hazard protection
- Moderation of extreme weather and its impacts
- Regulation and protection from erosion and flood damage
- Mitigation of the impacts of drought and flood
- Water purification

SUPPORTING SERVICES

The most fundamental services the natural world provides that sustain basic life forms, ecosystems and people, such as photosynthesis, nutrient cycling, the creation of soils and the water cycle.

- Primary production – maintaining industry viability (e.g. agriculture, forestry and fisheries)
- Provision of habitat
- Nutrient cycling
- Soil formation and retention
- Decomposition of wastes and cycling of nutrients
- Production of oxygen and maintain air quality
- Water cycling

CULTURAL SERVICES

A non-material benefit that contributes to the development and cultural advancement of people.

- Tourism and recreation resources
- Enhancement of landscape and aesthetic amenity
- Spiritual and religious values
- Knowledge system
- Education and inspiration
- Sense of place
- Improvement of the overall health of the community

1.3 Why do we need a Biodiversity Management Strategy?

The Lismore Local Government Area (LGA) is located within the Northern Rivers Region and recognised for its amazing biodiversity, much of which is endemic to the region and under threat.

Globally, pressures on biodiversity have been increasing and there is recognition of the need to address biodiversity loss. Although many of the environmental and planning issues faced by Lismore City Council and its community are common to local governments in NSW and across Australia more broadly, they require a local response. Consequently, a locally focused Biodiversity Management Strategy (BMS) aims to help ensure that local ecosystems, species and genes survive in their natural habitat, and that connection and stewardship of land is nurtured locally as well. Furthermore, natural systems take time to change and recover and so a long-term vision and commitment is required.

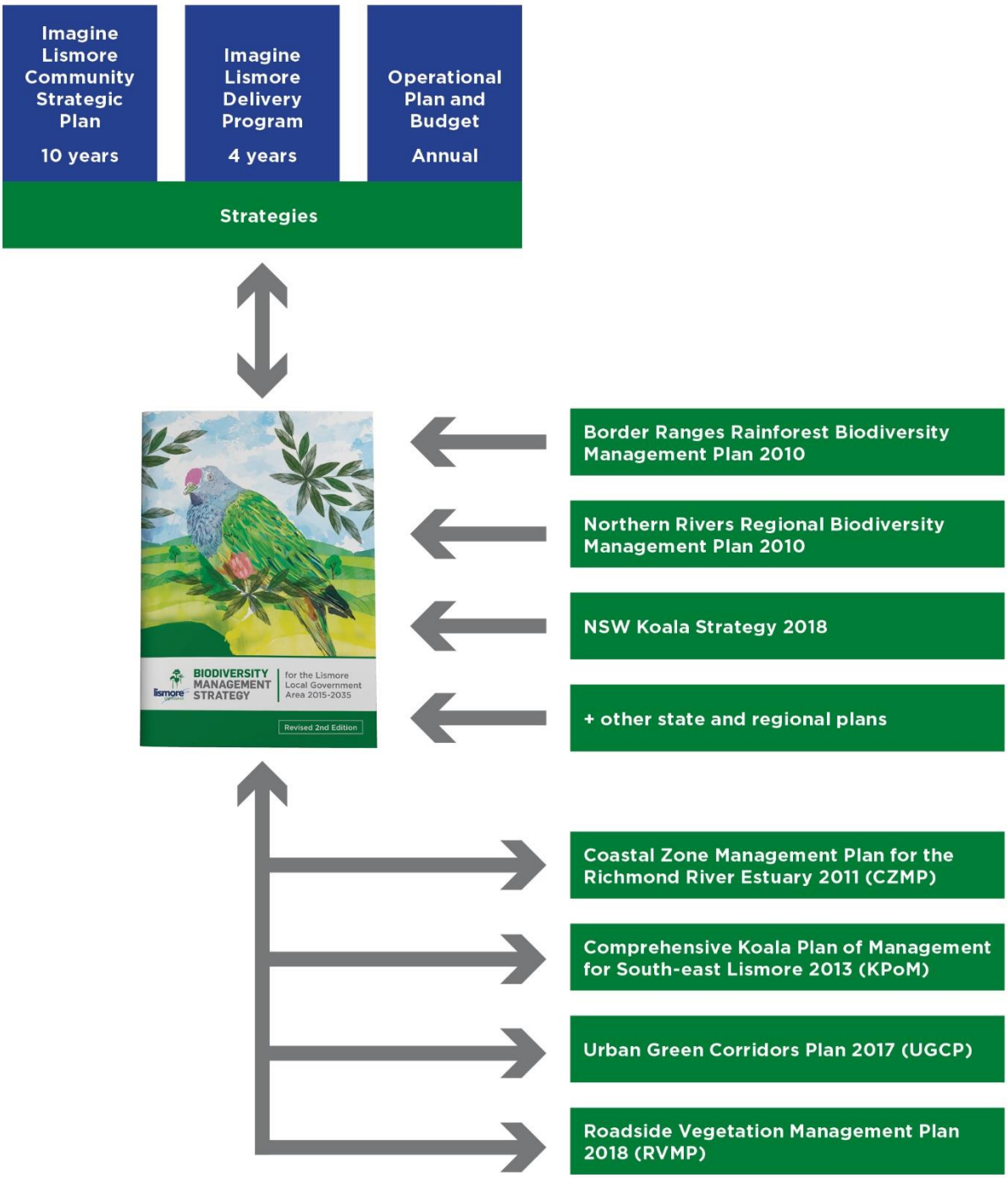
In developing the first *Image Lismore Community Strategic Plan 2013-2023*, it was clear that the community wanted Council to take a greater role in the management, protection and enhancement of the natural environment and so this was a strong driver in developing the BMS and securing steady, long term funding to deliver on actions.

1.3.1 Legislative and strategic framework

The BMS has been developed within a framework of national, state and regional biodiversity agreements, legislation, policies, strategies and plans. These are outlined in detail in **Appendix 1.**

The key strategies and plans that have most influenced the BMS, as well as plans whose actions have been incorporated into the BMS, are illustrated in **Figure 2**. Given that the BMS has an approved Special Rate Variation for its implementation, this is the primary channel for the delivery of actions.

Figure 2: How the BMS fits in with Council's Integrated Planning and Reporting Framework and the strategies and plans that are incorporated into the BMS



1.4 Who is this strategy for?

The BMS is intended for:

- **The people of the Lismore LGA** that aspired to Council providing environmental leadership as a key value in the first *Imagine Lismore* community strategic plan. The BMS is designed to engage the community in biodiversity management and to demonstrate Council's commitment to this goal.
- **Council staff**, to assist in developing policy and to inform strategic planning and development approval as well as improving Council's management activities and procedures.
- **Land managers across all tenures.** Most of the land within the Lismore LGA is privately owned and the role for Lismore's community is therefore significant. This BMS is designed to involve landholders, the agricultural industry, Landcare, Indigenous Australians and environmental and other community interest groups in on-ground biodiversity management.
- **Government and non-government agencies** and funding bodies with a role in biodiversity management, to ensure clear direction for these partnerships. Council will take the lead role in managing the natural values on Council-owned and managed land.

However, every person who enjoys the benefits of having a biodiverse natural environment has a role and responsibility in its management and protection!

2 Snapshot of the Lismore Local Government Area

The Lismore Local Government Area (LGA) supports a total population of approximately 44,741 across its 1,290km^2, with an urban population of 29,080 and a rural population of 15,661 (Lismore City Council 2017).

Broadly, the Lismore LGA can be divided into three landscapes which reflect broad patterns in topography, human settlement and land-use (DECCW 2010b, RCC & LCC, 2016). These landscapes are:

- **Coastal plains** - encompasses the broad, flat river valleys and floodplains of major rivers, and includes estuaries, beaches, headlands, coastal lakes and coastal sand masses. Lismore's urban centre is located within the Richmond River floodplain. Besides urban centres, other land-uses include cropping and grazing. Locations include Bexhill, Blakebrook, Boatharbour, Booerie Creek, Booyong, Broadwater, Buckendoon, Coraki, Corndale, Dungarubba, East Coraki, Eltham, Fernside, Green Forest, Goolmangar, Howards Grass, Jiggi, Kilgin, Koonirigin, Lagoon Grass, Lismore (South, North, CBD), Loftville, Monaltrie, Ruthven, South Gundurimba, Spring Grove, Tatham, Tuckurimba, Tuncester, North Woodburn, Woodlawn and Whyrallah.
- **Midland hills** - covers the undulating foothills and low ranges west of the coastal plains. Grazing and forestry are the main land-uses and there are several large towns, numerous villages and rural residential estates. Locations are Bentley, Blue Knob, Bungabee, Caniaba, Chilcotts Grass, Corndale, Clunes, Coffee Camp, Dorroughby, Dunoon, East Lismore, Girards Hill, Goonellabah, Georgica, Keerrong, Larnook, Leycester, Lindendale, Lismore Heights, Marom Creek, McLeans Ridges, McKees Hill, Modanville, Mountain Top, Numulgi, Nimbin, Pearces Creek, Repentance Creek, Richmond Hill, Rock Valley, Rosebank, Stoney Chute, The Channon, Terania Creek, Tregeagle, Tucki Tucki, Tullera and Tuntable Creek.
- **Escarpment ranges -** includes the steep ranges and mountains west of the midland hills, encompassing many rugged gorges and upper catchments of smaller rivers. Nature conservation, forestry and forest grazing are the main land-uses. Locations are the ridges surrounding The Channon, Dorroughby, Nimbin, Repentance Creek, Terania Creek and Whian Whian.

This section focuses on the biological features in these landscapes – the ecosystems, vegetation communities, populations and species, which we collectively call 'biodiversity values', and explains why in the Lismore LGA these are of High Conservation Value (HCV).

2.1 Biodiversity values

2.1.1 The Border Ranges Rainforest region

A significant portion of the Lismore LGA is within the Border Ranges Rainforest region. As outlined in the *Border Ranges Rainforest Biodiversity Management Plan – NSW & Queensland*; DECCW 2010a), this area spans north-eastern New South Wales (NSW) and south-eastern Queensland – it extends along the coast from Beenleigh in the north to Evans Head in the south and as far west as Killarney. The region is an overlap of the southernmost limit for many tropical species and the northernmost limit for many temperate ones – an area known as the MacPherson–Macleay Overlap (DECCW 2010a).

The Border Ranges region has been recognised by the Australian government as one of 15 Australian National Biodiversity Hotspots. These hotspots are areas that support largely intact natural ecosystems where native species and communities are well-represented, and where a high diversity of locally endemic species persists.

In most of the Lismore LGA only fragments of the component ecosystems that existed before European settlement remain.

2.1.2 The Big Scrub

Supported by fertile, basalt-derived soils and substantial rainfall, the Big Scrub was Australia's largest tract of lowland subtropical rainforest. Covering an area of approximately 75,000 hectares before European settlement, the almost continuous tract of rainforest extended from the Nightcap Range in the north to Meerschaum Vale in the south and from Ballina on the coast to Lismore in the west.

The Big Scrub was dominated by White Booyong (*Heritiera trifiolata*) and Australian Red Cedar (*Toona australis*). The latter was eagerly sought by the 'cedar-getters' for its fine quality timber. Historical accounts suggest that only a small part of the Big Scrub rainforest was cleared in the mid-1880s but, by the 1920s, the Big Scrub had been almost entirely cleared. The Big Scrub now covers an area of about 700 hectares in small, scattered remnants that represent less than 1% of the original area of rainforest before European settlement. About half of the remaining area of the Big Scrub is in the Lismore LGA.

2.1.3 Richmond River floodplain

The Richmond River floodplain is the largest coastal floodplain on the NSW coast, covering 1,000 km^2 with a waterway area of 19km^2. The tidal limit is 110 kilometres, extending to Casino on the Richmond River and Boat Harbour near Lismore on the Wilsons River.

Floodplains and estuaries are dynamic environments, supporting a rich biodiversity that performs a range of important ecosystem services. In addition to the Big Scrub rainforest, the floodplain and estuaries of the Richmond River and its tributaries supported vast areas of estuarine and freshwater wetlands, swamp sclerophyll forest, mangroves and lowland rainforest before European settlement.

Undertaken or funded by both local and the State governments, there was extensive drainage of coastal floodplains on the NSW north coast for flood mitigation during the 1950s and 1960s. Construction of drains enabled quicker removal of floodwaters, drained groundwater and prevented tidal water from entering creeks. Rural, urban and industrial land-uses, as well as poor historical

management of floodplains, have had an adverse impact on water quality and the function of floodplain ecosystems.

2.1.4 High Conservation Value

The concept of High Conservation Value (HCV) can be applied to species, populations, habitats or communities, or areas of land that support these elements. It identifies biodiversity values of outstanding significance or critical importance - much of which has gained recognition and protection under international, national or state legislation, but much of which also recognises local conservation priority due to various factors.

Due to the interdependence of species and ecosystems, it is important to protect not just individual species but ALL species in their habitats. For example, estuarine and freshwater wetlands on the Richmond River floodplain provide food and shelter for many threatened migratory waders and other species of birds. Within the Lismore LGA, Council has identified 9 categories of HCV land (**Table 1**).

Table 1: Categories of HCV land in Lismore LGA (for details see Appendix 2).

No.	Category
HCV-1	**Areas of land identified as containing threatened species or populations and/or of local conservation priority**
HCV-2	**Areas of land identified as containing endangered ecological communities (EECs)**
HCV-3	**Areas of land identified as key habitat for priority vertebrate assemblages**
HCV-4	**Areas of land identified as Primary, Secondary A and Secondary B koala habitat**
HCV-5	**Mapped coastal management areas under the Coastal Management SEPP 2018**
HCV-6	**Areas of land identified as supporting riparian, wetland and estuarine native vegetation other than Coastal Management SEPP mapped wetlands**
HCV-7	**Areas of land identified as providing very high habitat corridor values**
HCV-8	**Areas of land identified as supporting any type of rainforest**
HCV-9	**Areas of land identified as supporting native vegetation defined as old-growth forest**

The following tables which identify the species, populations, communities and habitats within these lands are included in **Appendix 2**:

- **Table A1** contains a list of **82 terrestrial vertebrate species** – amphibians, reptiles, birds and mammals recorded in the Lismore LGA - that are listed as threatened and/or are of local conservation priority (Milledge 2012).
- **Table A2** contains a list of **7 invertebrate species** known or predicted to occur in the Lismore LGA that are listed as endangered under one or both the BC Act or EPBC Act.
- **Table A3** contains a list of **17 migratory and marine bird species** known or predicted to occur in the Lismore LGA, that are listed under one or more of the CAMBA, JAMBA or ROKAMBAs or are listed as migratory or marine under the EPBC Act.

- **Table A4** contains a list of **146 plant species** known or predicted to occur in the Lismore LGA that are listed as threatened under one or both the BC Act or EPBC Act.
- **Table A5** contains **9 endangered ecological communities** (EECs) occurring in the Lismore LGA that are listed under either the BC Act or EPBC Act. For example, the Big Scrub was the largest area of *Lowland Rainforest of Subtropical Australia* and the Richmond River floodplain also comprises several of these communities.
- **Table A6** outlines **27 key habitats supporting priority vertebrate assemblages** considered most at risk from habitat fragmentation, isolation and degradation and other landscape-scale threatening processes such as climate change (Milledge 2012).

2.2 Pressures on biodiversity

Human land-uses and populations exert a range of pressures on biodiversity, which in turn almost inevitably change the state or condition of the biodiverse system.

Both historical and existing land-uses can have current and future impacts on biodiversity. Impacts on biodiversity from historical land-uses can last for decades or even centuries. Identifying these historical land-use legacies is not about placing blame – people have always used resources from the land to build industries and prosperous communities and result in the societies we have today. However, identification of such legacies is often needed to help conserve biodiversity and maintain or repair the damaged ecosystems services essential for life support for now and the future.

Below, we discuss a range of pressures on biodiversity in the Lismore LGA, some of which relate directly to key threatening processes (KTPs). A KTP threatens or may threaten the survival, abundance or evolutionary development of a native species or ecological community. **Appendix 3** provides a full list of KTPs expected to occur in the Lismore LGA.

2.2.1 Clearing and fragmentation of native vegetation

The results of the historical clearing of the Big Scrub, of the Richmond River floodplain and of native vegetation elsewhere in the LGA is the principal pressure on biodiversity in the Lismore LGA today, and 'clearing of native vegetation' is recognised under both the EPBC Act and BC Act, as a key threatening process.

The direct impact of historical clearing includes the loss of individuals and habitat and has led to significant fragmentation of the remaining native vegetation in small and isolated remnants. The fragmentation of native vegetation disrupts ecosystem function, increases habitat for invasive species and isolates individuals and populations.

Currently within the Lismore LGA, small-scale clearing for urban and rural residential development predominates. Secondary clearing associated with these activities also occurs (e.g. under-scrubbing of rural residential blocks and maintenance of asset protection zones for bushfire control). On rural land native vegetation can be removed without consent through various routine agricultural management activities permitted under the *Local Land Services Amendment Act 2016*, part of the NSW Government's recent biodiversity conservation and land management reforms. Illegal clearing of vegetation may also occur.

The other pressures described below have a direct relationship with clearing and fragmentation of native vegetation in that they may cause or be caused by vegetation clearing and fragmentation.

2.2.2 Weeds

Weeds are plants that are unwanted in a given situation and which usually have detectable negative economic, environmental or social impacts and that require some form of action to reduce their effects (NCLLS 2017). For example, weeds can:

- Invade native vegetation communities by out-competing native plants for light, nutrients and water
- Disrupt the effective function of terrestrial and aquatic ecosystems
- Provide habitat for animal pests
- Cause or influence bank erosion along waterways

Weeds are among the most significant and costly threats to Australia's natural environment (Natural Resource Management Ministerial Council 2006) and, once established, pose an ongoing challenge to government, industry and communities. The invasion of several plant species, such as exotic vines and scramblers, and woody weeds such as Lantana (*Lantana camara*) and African Olive (*Olea europaea* subsp *cuspidata*) are listed as key threatening processes (KTPs) under the BC Act. 'Novel biota and their impact on biodiversity' is the KTP under the EPBC Act which broadly recognises that anything novel introduced to Australia's unique environments runs the risk of becoming invasive.

In NSW, weed management reforms have tried to address the increasing need to manage weeds more strategically and efficiently over the long term and are a response to the new Commonwealth biosecurity measures to protect the economy, environment and community from the negative impacts of weeds, pests and diseases. The hierarchy of weed management is in preventing invasion, containing and eradicating priority weeds and managing the impacts of established and widespread weeds. Weed management for biodiversity often falls into the latter category. That is, managing the impacts of established widespread weeds such as lantana and vine weeds on specific areas of High Conservation Value.

Local Land Services is now responsible for implementing these changes to weed management in NSW, and leading other state agencies and local government. The *North Coast Regional Weeds Plan 2017-2022* has been developed using the technical advice and expertise from local control authorities and state government land managers across the NSW north coast.

This Plan provides the current framework and direction for the control of priority weeds in the North Coast Region under the NSW *Biosecurity Act 2015*. It contains Appendix 1: Priority Weeds for North Coast Local Land Services Region and Appendix 2: North Coast Local Land Services – Other Regional Weeds Lists, which are referenced when undertaking work.

2.2.3 Pest animals

Australia's native plants and animals have evolved and adapted to life in isolation over millions of years. Since European settlement, a range of exotic animals have been deliberately or accidentally introduced and have become pests. Exotic animals that become established in the wild and have become pests typically have a history of doing so in many places. These species often have attributes that pre-adapts them to new environments, such as high reproductive rates, generalised diets and an ability to live in modified landscapes in varying climatic conditions. Pest animals also typically have few natural predators or fatal diseases in their new habitats and their populations can multiply rapidly if conditions are favourable (Natural Resource Management Ministerial Council 2007). Competition and habitat degradation by pest animals comprise several KTPs under state and/or federal legislation (**Appendix 3**).

Along with weeds and diseases, pest animals are part of the new biosecurity measures in Australia and in NSW. Pest animals can be considered as any species (other than native species) that present a biosecurity threat and are to be addressed currently through the *North Coast Regional Strategic Pest Animal Management Plan 2018-2023*.

In the Lismore LGA, there is a range of well-established pest animals and their impacts:

- **Indian Mynas** (also called Common Mynas) can compete with native species for food, roosting and nesting sites. Native mammals and birds that depend on tree-hollows for nesting are particularly at risk.
- **Cane Toads** eat a wide range of native species and compete with others for habitat, food and shelter. These amphibians can also kill native predators through the toxic effects following their ingestion.
- **European Red Foxes, Feral Cats** and **Wild Dogs** hunt and kill native birds, mammals, reptiles and insects and threaten the survival of many threatened native species.
- **Wild Rabbits and Feral Goats** graze or burrow heavily, degrading vegetation and habitat for native animals.

Many of the species above can also spread parasites and disease.

Some of these animals are expanding their distribution within the LGA (e.g. Cane Toads). Others have the potential to become established (e.g. Feral Pigs, Deer) and so prevention and eradication of new incursions is the goal of management actions.

2.2.4 Water quality and hydrological changes

The historical draining of extensive areas of the Richmond River floodplain and the clearing of native vegetation communities, including Big Scrub rainforest, that come with increased urbanisation and industrial agriculture have caused a variety of impacts on the biodiversity of aquatic and riparian habitats which affect water quality and hydrological systems.

Impacts, which occur broadly across a catchment and at specific locations, include:

- Alteration to natural flow regimes
- Alteration of groundwater hydrology
- Increased nutrient load and turbidity of runoff
- Sedimentation
- Pollution via runoff
- Activation of acid sulphate soils
- Fish kills resulting from blackwater events following floods

For example, a legacy of high tree density and low light penetration in many Macadamia orchards results in poor ground cover and may contribute to soil erosion and increased sediment and nutrient loads in runoff that then enters water catchments[1].

2.2.5 Urbanisation

Urbanisation is the general increase in human population and its associated habitation and industrialisation, resulting in increases in the extent and density of human settlements in urban and peri-urban areas. Human population density is greater in urban and peri-urban areas than rural and unsettled areas. The activities of more people in a small area can have a range of direct and indirect impacts on local biodiversity.

Apart from direct impacts on biodiversity resulting from loss of habitat owing to vegetation clearing for urban development, the pressure of many human activities in urban areas can adversely affect biodiversity, particularly in urban and peri-urban bushland. Activities that fall within this category include:

[1] Best Practice recommendations within the industry are addressing these issues through retrofitting older orchards and design of new orchards to maximise ground cover.

- The effects of roads and traffics (i.e. road kills or injuries)
- Predation on native animals by domestic pets
- Illegal dumping of rubbish and green waste in urban and peri-urban bushland creating habitat for pest animals and facilitating the spread of weeds
- Inappropriate fire regimes (i.e. too frequent or too infrequent) altering the species composition and structure of vegetation
- Unmanaged recreational activities in urban and peri-urban bushland (e.g. trail bikes and off-road vehicles) compacting soils, degrading vegetation and facilitating the spread of weeds

2.2.6 Grazing of livestock and the agricultural landscape matrix

In the Lismore LGA, land use is classed as primary production for over 80% of the land area and together, dairy, grazing and nut orchards account for over 70% of agricultural produce. Even though many rural landholders describe themselves as 'lifestylers' and do not rely on primary production for income, the landscape is predominantly agricultural, and the management of this matrix can have positive and negative impacts on intact natural ecosystems.

For the most part, over 200 years of clearing has had negative impacts on the entire landscape, including depleted soils, degraded waterways, species and habitat loss and fragmentation. The grazing of livestock can adversely affect biodiversity, for example, by changing the species composition, diversity and structure of native plant communities, and trampling can also physically damage plants and compact the soil. In environmentally sensitive areas, such as watercourses and freshwater wetlands, livestock can change the shape, composition and structure of the stream banks and the channel of watercourses and reduce water quality. This can in turn affect habitat essential for the survival of fish and other aquatic species that are vital to the healthy functioning of aquatic ecosystems.

Industrial agriculture, as developed over the past several decades, may have increased yields, but there is a growing recognition of an unbearable cost to the landscape, to the climate, to biodiversity and to financial systems.

2.2.7 Climate change

In Australia, climate change is already causing a rise in average and extreme (high and low) temperatures, changed patterns of precipitation, and increased frequency and intensity of extreme weather events including droughts, high-fire danger weather and tropical cyclones. The scale, rate and nature of projected climate change, and the unpredictable interactions between climate change and other pressures that cause stress to ecosystems have the potential to overwhelm their current capacity to adapt (Commonwealth of Australia 2019).

The NSW Government, through its AdaptNSW Climate Change portal and in recent publications (OEH 2019), has also recognised biodiversity as one of nine 'regional systems' identified as being particularly vulnerable to the effects of climate change, including increasing impacts from weeds, pests and diseases. The most vulnerable ecosystems include coastal, alpine, rainforest or fragmented terrestrial ecosystems, or ecosystems in areas vulnerable to fire or low freshwater availability. Several of these exist within the Lismore LGA and are listed in detail in **Appendix 2.**

Government is investing significantly in research to increase knowledge of the capacity of species, ecosystems and landscapes to adapt to climate variability. For example, some species have a greater capacity to disperse than others but even for those that do, action is required to ensure there is sufficient remnant habitat, that invasive species are controlled and that there are links between habitats.

2.3 Previous and current biodiversity management

The BMS brings together and builds on many other programs, projects and initiatives focused on biodiversity that has been undertaken by Council and the rural and urban communities, particularly over the last 10-15 years. Listed below is a snapshot of these, with some of the earlier work provided greater detail in the first edition of the BMS. The *BMS Year 4 Operational Review Report* also documents in detail the progress and achievements over the first four years of implementation.

2.3.1 Council

Notwithstanding the BMS itself, some of the most important projects and programs that Council has implemented over recent years are:

- **The Rural Landholder Initiative (RLI) -** commenced after the adoption of the original BMS and has become a flagship program working with the rural community. As at 2019 the RLI has delivered over 130 ha of restoration work on private land, planted more than 26,800 native and endemic plants and partnered with around 100 landholders. Through the field day extension program, Council has been able to engage with a much wider audience and reached over 480 individual private rural landholders on topics ranging from riparian and rainforest habitat restoration to composting and ground cover in orchard management.
- **Ecological development assessment -** in 2018, a new role was created to provide specialist ecological advice in the assessment of ecological matters associated with development applications and planning proposals.
- **Bushland restoration -** in 2017, the Urban Green Corridors Plan was developed, including a 5-year program of works across 24 bushland reserves in the urban areas of Lismore and Goonellabah.
- **Koalas -** since the Comprehensive Koala Plan of Management for South-east Lismore (KPoM) was developed in 2013, Council has also been involved in many projects aimed at the protection of Koalas and their habitats.
- **Roadside vegetation management -** in 2017, the original Roadside Vegetation Management Plan from 2005 was reviewed and updated. This Plan aims to maintain a balance between asset maintenance, traffic safety and environmental protection.
- **Wildlife roadstrike mitigation** – in 2018-19 Council commissioned a report to identify and prioritise wildlife roadstrike hotspots for mitigation. To reduce the incidence of roadstrike in one of the major hotspots a koala zone was established on Wyrallah and Tuckurimba Roads.
- **Vegetation mapping for the Lismore LGA** - fine scale mapping of vegetation communities across the LGA, including Endangered Ecological Communities and Koala habitat was done by Landmark Ecological Services (2011, 2019).
- **Key habitats and corridors system -** a system of key habitats and corridors for the Lismore LGA, using vertebrate fauna (threatened species and other conservation-priority species) as surrogates to determine overall biodiversity values was identified and mapped (Landmark Ecological Services 2012).
- **Other projects and programs**
    - Establishment of the Lismore Rainforest Botanic Gardens
    - Supporting Landcare and other community groups
    - Indian Myna Control Program
    - Natural stormwater treatment projects (for example, Slaters Creek in North Lismore)
    - Education programs and projects (for example, citizen science- wildlife monitoring using cameras, fire and biodiversity workshops)

2.3.2 The rural community

There are many active Landcare and industry groups in Lismore's rural areas that contribute significantly to the management of biodiversity, working mainly on private land with both primary producers and lifestyle landholders, including multiple occupancies. This capacity has increased with the rollout of Council's Rural Landholder Initiative (RLI).

- Member groups of **Richmond Landcare Inc** have contributed greatly to the management of native vegetation, working with both primary producers and lifestyle landholders. For example:
    - **SoilCare Inc** is a community organisation working with primary producers to address soil issues such as sustainability and productivity. They offer a variety of resources such as access to current information, seminars, workshops and field trips.
    - **Jiggi Catchment Landcare Group** and **Nimbin Rocks Coop Landcare Group** and other Landcare partners delivered a NSW Environmental Trust project (2012-2018) to restore and connect habitats and corridors for threatened species
- **Industry groups** operating in the Lismore LGA make considerable effort towards biodiversity management. Through a partnering program with Industry and community groups, Council supports positive development of the mutual benefits of biodiversity management for primary producers and the environment. Several practical projects are already indicating successful partnerships with industry in this way.
    - **Macadamia growers** are increasingly interested in the pollination benefits of native stingless bees through a project with The Australian Native Bee Company, Australian Macadamia Society, Bees Business, Western Sydney University, Basically Bush Restoration, and local growers. In this project, restoration of bushland adjacent to macadamia orchards with diverse flowering plants provides floral resources for native bees also improves the habitat and connectivity of Big Scrub Rainforest.
    - A project with **Golden Grove Naturals** of riparian repair and weed control along the Wilsons River at Tucki Tucki is providing koala habitat improvement and increasing the bank stability for essential oil tree plantations.
    - A partnering project with **Northern Cooperative Meat Company** and cattle producers is leading to off-stream watering benefits for cattle, and protection of waterway environments, reduced erosion, and improvement in water quality in catchment streams.

In addition to groups, there is significant restoration work undertaken by individual landholders. Two such landholders who have invested their time and money into their properties over the years were also part of the first Champion round of the RLI in 2016:

- **Wilsons River beef graziers Tony and Lindy Margan** – have become champions for floodplain grazing land management. Their work on the 36ha Monaltrie farm began in 2012 and has involved riverbank restoration through planting and fencing off cattle access to the river, planting food trees for resident koalas, supplying alternate access for shade and drinking water for the cattle, as well as rotating their grazing lands.
- **Georgica rural lifestyle landholders Ken Williams and Adrian George** – have become champions for rural lifestyle bush regeneration. Their work began some 30 years ago with careful planning of their short-term and long-term goals for their 40ha property, networking with Landcare groups. Ken and Adrian continue to lead others through the challenges of bushland restoration by hosting a monthly mentoring workshop with practical demonstrations and support.

Emerging opportunities

Council recognises that whilst the BMS has primary objectives towards enhancing and protecting complex higher order natural ecosystems, understanding the history of landscape change and development suggests that the agricultural landscape matrix needs to be managed in synergy with natural systems to provide the goods and services expected to sustain healthy and worthwhile life locally and on the planet.

An emerging opportunity for the rural component of this BMS is greater exploration and investment in regenerative agriculture programs, where practices that help buffer and protect high conservation value areas, produce healthy food, provide diversity and opportunity for local employment, reduce greenhouse gas emissions, and make better use of natural resources without depleting them can contribute to achieving multiple goals in the BMS.

2.3.3 The urban community

The BMS also builds on the many achievements and projects that the community has undertaken and advocated for in Lismore's urban environment to protect and enhance biodiversity. Listed below are just some examples of the important urban projects implemented over recent years.

- Member groups of **Richmond Landcare Inc** have also contributed greatly to the management of native vegetation at important sites located on both private and Council owned land in the urban area. For example:
    - **Wilsons River Landcare Group** has actively managed and restored rainforest on both private and Council owned land along both sides of the Wilsons River between Fawcett Bridge and Simes Bridge for over 20 years
    - **South Lismore Duckpond Landcare Group** manages riparian and wetland vegetation on Council reserve at Hollingsworth Creek and on private land in South Lismore.
    - **Banyam-Baigham Landcare Group** is restoring riparian vegetation on Council land at Slaters Creek in North Lismore
    - **Upper Tucki Tucki Landcare Group** manages riparian rainforest at various sites within the Tuck Tucki Creek Recreation Park in Goonellabah.
- **Friends of the Koala (FoK)** is a community group that has worked to conserve koalas in the Northern Rivers region for the last 20 years. Run predominantly by volunteers, FoK operates a care centre in East Lismore that cares for sick and injured koalas. They also operate a nursery dedicated to raising koala food tree seedlings that are available for the community to plant.
- **Envite Environment**, a not-for-profit organisation based in Lismore, is also a significant contributor to biodiversity restoration in Lismore's urban areas. In 1993, Envite was established to assist long term unemployed and disadvantaged job seekers by providing opportunities to participate in conservation and environmental restoration projects. While it still provides this service, the organisation has evolved as the Environment Division of Workways Australia to also provide environmental services and related training. Council has partnered with Envite on a range of government funded work programs including *Jobskills*, *New Work Opportunities*, *Work for the Dole*, *Job Services Australia*, *Green Corp* and *National Green Jobs Corp*.

3 Goals & BMS strategic framework

The goals of the Biodiversity Management Strategy for the Lismore LGA are to:

- Develop a greater understanding of the flora and fauna, habitats and ecological processes of the area and their value
- Identify and mitigate the pressures on these biodiversity values
- Improve the broader community's awareness of biodiversity through education and engagement activities
- Foster partnerships with and build capacity for rural landholders, industry and community groups to improve biodiversity stewardship on private lands
- Foster partnerships with and build capacity for community groups to protect and improve biodiversity on Council-managed, public lands
- Promote a landscape connectivity approach as the basis for managing biodiversity and building landscape resilience to climate change
- Embed the principles of ecologically sustainable development into planning processes
- Provide a long-term strategic framework to guide on-the-ground actions that lead to measurable biodiversity outcomes
- Foster an adaptive management approach so that the strategy can continuously improve on its delivery

These goals have shaped the formation of a strategic framework to achieve them. Progress towards these goals are measured and reported on annually using the performance indicators in **Appendix 4.**

Figure 3 provides a visual overview of the framework and the interrelatedness of the strategies. This is followed by **Table 2** outlining the framework in greater detail, with objectives and a brief description of what they are about.

Figure 3: The Biodiversity Management Strategy framework

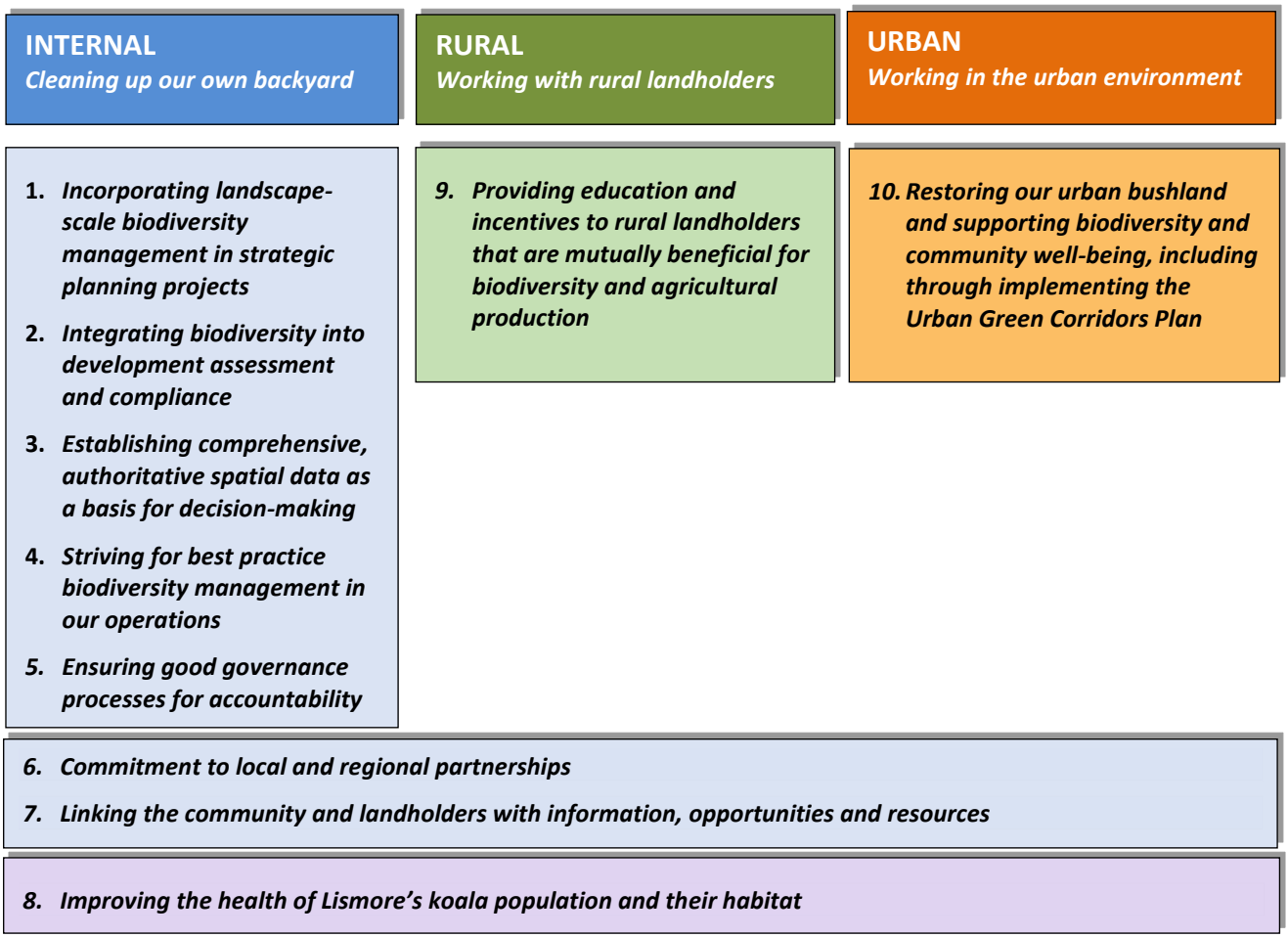


Table 2: The Biodiversity Management Strategy framework in greater detail - the strategies, objectives and a brief description of what they are about.

INTERNAL

Cleaning up our own backyard

Planning, Processes and Operations

To fulfil the community's expectations of environmental leadership, Council will review and update its planning, processes and operations to strive for best practice environmental management. Council also aims to equip staff with the skills necessary to be able to apply operational changes effectively. Over time, Council will monitor, report on and continually improve its approaches to ensure ongoing improvement of its environmental management

1. ***Incorporating landscape-scale biodiversity management in strategic planning projects***
   - *1.1 Review and update Council strategies, plans, policies to incorporate biodiversity values*
2. ***Integrating biodiversity into development assessment and compliance***
   - *2.1. Implement a comprehensive biodiversity Development Assessment (DA) framework*
   - *2.2. Monitor the effectiveness of habitat compensatory measures*
   - *2.3. Provide staff training to address gaps in knowledge and barriers to implementation*
3. ***Establishing comprehensive, authoritative spatial data as a basis for decision-making***
   - *3.1. Build a fit-for purpose spatial data structure*
   - *3.2. Investigate the feasibility of capturing historical data associated with habitat lost and gained, and restoration works as far as possible*
   - *3.3. Ensure all decisions and operations reference the authoritative data*
4. ***Striving for best practice biodiversity management in our operations***
   - *4.1. Manage roadside vegetation in High Conservation Value (HCV) areas*
   - *4.2. Mitigate wildlife roadstrike in identified hotspots*
   - *4.3. Ensure Standard Operating Procedures (SOPs) incorporate best practice biodiversity management*
5. ***Ensuring good governance process for accountability and continuous improvement***
   - *5.1. Report through Council's Integrated Planning and Reporting (IP&R) framework*
   - *5.2. Ongoing evaluation of the Biodiversity Management Strategy (BMS)*

Supporting the Community

Council will also demonstrate effective environmental management by providing support to its community through long-term commitment to partnerships, providing information and resources and celebrating its community's achievements

6. ***Upholding commitment to local and regional partnerships***
   - *6.1. Participate in regional environmental programs, including the Northern Rivers Joint Organisation (NRJO) and the Coastal Zone Management Plan (CZMP)*
7. ***Linking the community with information, opportunities and resources***
   - *7.1. Provide up-to-date information*
   - *7.2. Recognise and celebrate our community's contributions to biodiversity protection and enhancement*

Koalas

As an iconic threatened species with a significant population in the Lismore LGA, koalas have a specific role in contributing towards the character of the area, attracting visitors and providing the opportunity to protect other High Conservation Value (HCV) elements.

8. Improving the health of Lismore's koala population and their habitat

8.1. Contribute to regional projects that support koala conservation

8.2. Provide support to Friends of the Koala (FOK)

8.3. Restore koala habitat

RURAL

Working with rural landholders

Implementation

The Rural Landholder Initiative (RLI) aims to broaden the region's capacity to develop and maintain a sustainable environment through partnerships with rural landholders and primary producers, other private sector businesses, rural Landcare groups and natural resource managers. It has become the delivery mechanism for all rural components of the BMS.

9. Providing education and incentives to rural landholders that are mutually beneficial for biodiversity and agricultural production

9.1. Continue implementation of the Rural Landholder Initiative (RLI)

9.2. Distribute information to eligible landholders

9.3. Partner with industry and community groups

URBAN

Working in the urban environment

Implementation

Growing urbanisation places significant pressures on biodiversity, particularly in the fragmentation of habitat and connectivity. Restoring the habitat value and connectivity of urban bushland as well as supporting existing community initiatives and tailoring opportunities for people to interact with and be stewards of the natural environment are the aims of these components of the BMS.

10. Restoring our urban bushland and supporting biodiversity and community well-being, including through implementing the Urban Green Corridors Plan

10.1. Restore and maintain the habitat values and connectivity of urban bushland

10.2. Provide support for Landcare, schools and community groups undertaking management of urban and/or riparian bushland

10.3. Enable and support our residents' connection with urban bushland and stewardship of the land within their own property

4 Actions

The following table describes 75 actions that are the focus for the next 5 years (2020-2025) to continue meeting the longer-term strategies and objectives. Where relevant, links to other plans are identified in brackets after the action. The associated implementation budget for these 5 years can be found in **Chapter 5 – Implementation**. The format has changed to reflect how the work flows from strategy to actions and is represented as such:

PROGRAM AREA

1. ***Strategy***

1.1 Objective

1.1.1 Action

INTERNAL – Cleaning up our own backyard							
1.	***Incorporating landscape-scale biodiversity management in strategic planning projects***						
1.1	**Review and update of Council policies, strategies and plans to incorporate biodiversity values**	**Responsibility**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**
1.1.1	Staff from Environmental Strategies are part of internal engagement in the early planning stages of projects, including: • Plans of Management • Asset Management Plans • Street Tree Master Plan • LEP and DCP reviews • Growth Management Strategy • Local Strategic Planning Statement	Strategic Planning, Assets (Parks)					
1.1.2	Identify sites with potential habitat value on Council-owned or managed land that could be used be used as receive sites for compensatory habitat for smaller impact development	Environmental Strategies, Civic Pride, Assets (Parks)					
2.	***Integrating biodiversity into development assessment and compliance processes***						
2.1	**Implement a comprehensive biodiversity DA framework**	**Responsibility**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**
2.1.1	Complete the new Vegetation DCP and supporting documentation / guidelines	Strategic Planning, Development Assessment, Environmental Strategies					

2.1.2	Work with the NRJO on developing a Regional Biodiversity Offset Program where development triggers the Biodiversity Offsets Scheme	Environmental Strategies	✓				
2.1.3	Update internal DA procedural documents to accommodate the new DCP, guidelines, application assessment checklists and standard Conditions of Consent	Development Assessment, Environmental Strategies	✓				
2.2	**Monitor the effectiveness of habitat compensatory measures**	**Responsibility**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**
2.2.1	Develop a framework to track habitat lost and gained as a result of development impacts and compensatory measures (KPoM #3,#7)	Environmental Strategies, Development Assessment	✓	✓			
2.3	**Provide training to address gaps in knowledge and barriers to implementation**	**Responsibility**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**
2.3.1	Continue to deliver training to DA staff as required (KPoM #12)	Environmental Strategies, Development Assessment	✓	✓	✓	✓	✓
3.	***Establishing comprehensive, authoritative spatial data as a basis for decision-making***						
3.1	**Build a fit-for-purpose spatial data structure**	**Responsibility**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**
3.1.1	Review Council's spatial environmental data, including existing data layers and archiving old data	Environmental Strategies, GIS	✓				
3.2	**Investigate the feasibility of capturing historical data associated with habitat lost and gained, and restoration works as far as possible under the KPoM, UGCP and RLI**	**Responsibility**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**
3.2.1	Update GIS mapping with the locations of koala habitat removed, restored and/or replaced (KPoM #3c)	Environmental Strategies	✓	✓	✓	✓	✓
3.2.2	Update GIS mapping to identify the locations of restoration projects carried out on private land under the Rural Landholder Initiative (RLI)	Environmental Strategies	✓	✓	✓	✓	✓
3.2.3	Update GIS mapping with the locations of restoration projects carried out on public land under the urban bushland restoration program	Environmental Strategies	✓	✓	✓	✓	✓
3.3	**Ensure all decisions and operations reference authoritative spatial data**	**Responsibility**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**
3.3.1	Undertake an internal stakeholder survey of spatial data use	Environmental Strategies, GIS	✓				
3.3.2	Develop a mechanism to keep the spatial data live and current	Environmental Strategies, GIS		✓			
3.3.3	Run capacity-building workshops to train staff in use of this spatial data	Environmental Strategies, GIS		✓	✓		
3.3.4	Liaise with State Government departments to discover their data needs	Environmental Strategies, GIS	✓	✓	✓	✓	✓

4.	***Striving for best practice environmental management in our operations***						
4.1	**Manage roadside vegetation in High Conservation Value (HCV) areas**	**Responsibility**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**
4.1.1	Develop and implement an annual works schedule which prioritises weed control in areas of HCV around road infrastructure (RVMP #5.2.2)	Roads Maintenance Environmental Strategies	✓	✓	✓	✓	✓
4.1.2	Install guideposts to mark roadside HCV and threatened species locations identified by 2019 survey work and mapping in the northern Lismore LGA 'Green Zone' (RVMP #8.5)	Roads Maintenance Environmental Strategies	✓				
4.1.3	Undertake a biennial audit of roadside HCV guideposts and reinstall as required (RVMP #8.8)	Roads Maintenance	✓		✓		✓
4.1.4	Identify roads that are priorities for HCV restoration, and prepare Action Plans which document vegetation types, threatened species and habitat, threats, restoration methods. These plans will incorporate a Review of Environmental Factors (RVMP #6)	Environmental Strategies, Roads Maintenance	✓	✓	✓		
4.1.5	Review implementation of the RVMP 5 years after adoption to identify achievements, barriers and pathways for improvement	Environmental Strategies, Infrastructure Services			✓		
4.2	**Mitigate wildlife roadstrike in identified hotspots**	**Responsibility**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**
4.2.1	Continue to implement mitigation measures according to the priorities identified in the Wildlife Roadkill Mitigation Report 2019 and monitor their effectiveness	Environmental Strategies	✓	✓	✓	✓	✓
4.2.2	Work with community partners and other stakeholders to improve data capture on wildlife roadstrikes for adaptive management of current and future wildlife strike zones	Environmental Strategies	✓	✓	✓	✓	✓
4.2.3	Continue to work with neighbouring councils and other stakeholders on a regional approach to mitigating roadstrike including behaviour change strategies, for example projects under the NSW Koala Strategy (KPoM #24)	Environmental Strategies	✓	✓	✓	✓	✓
4.2.4	Maintain any installed roadstrike mitigation infrastructure including retrofitted culverts, fencing, grids, pavement markings and signs	Roads Maintenance	✓	✓	✓	✓	✓
4.3	**Standard Operating Procedures (SOPs) incorporate best practice biodiversity management**	**Responsibility**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**
4.3.1	Identify Council operations that have high risk to biodiversity and review and update Standard Operating Procedures to manage that risk	Environmental Strategies, Infrastructure Services	✓	✓	✓	✓	✓
5.	***Ensuring good governance processes for accountability and continuous improvement***						
5.1	**Report through Council's Integrated Planning and Reporting (IP & R) framework**	**Responsibility**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**
5.1.1	Detail the activities (programs, projects and events) from the BMS that will be undertaken during a financial year as part of Council's Operational Plan	Environmental Strategies	✓	✓	✓	✓	✓

5.1.2	Report on these activities and the measures of success	Environmental Strategies					
5.2	**Ongoing evaluation of the Biodiversity Management Strategy (BMS)**	**Responsibility**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**
5.2.1	Undertake a comprehensive operational review of the BMS, including: • Updates to mapping, biodiversity databases, scientific knowledge, legislation and industry practice • The progress on all actions, their prioritisation and resourcing needs • Engagement with key internal and external stakeholders	Environmental Strategies					
5.2.2	Establish and work with a reference group to develop a strategy to measure and evaluate biodiversity outcomes of the BMS	Environmental Strategies					
6.	***Exploring and upholding commitment to local and regional partnerships***						
6.1	**Participate in regional environmental programs, including the Northern Rivers Joint Organisation (NRJO) and the Coastal Zone Management Plan (CZMP)**	**Responsibility**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**
6.1.1	Contribute to the preparation of a Coastal Management Program (CMP) when review of the CZMP is due	Environmental Strategies					
6.1.2	Implement the CZMP and then the CMP together with relevant partners	Environmental Strategies					
6.1.3	Participate in collaborative regional projects to access external funds to achieve biodiversity outcomes	Environmental Strategies					
6.2	**Partner with the local community on projects that have biodiversity outcomes**	**Responsibility**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**
6.2.1	Develop a formal partnership with Richmond Landcare Inc. to increase the capacity for restoration projects in rural and urban areas	Environmental Strategies					
6.2.2	Participate in collaborative projects with local community groups to access external funds to achieve biodiversity outcomes	Environmental Strategies					
7.	***Linking the community with resources, information and opportunities***						
7.1	**Provide up-to-date information**	**Responsibility**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**
7.1.1	Review existing website content and prioritise updating pages where information is outdated (e.g. legislation, initiatives, mapping)	Environmental Strategies					
7.1.2	Disseminate information to the broader community through various media (e.g. the quarterly *Biodiversity News* e-newsletter, fortnightly *Local Matters* publication, media releases, static displays at Council facilities)	Environmental Strategies					
7.1.3	Prepare an annual summary on BMS implementation for the community	Environmental Strategies					

7.2	**Recognise and celebrate our community's connection with biodiversity and their contribution to its protection and enhancement**	**Responsibility**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**
7.2.1	Hold one recognition event per year to acknowledge and celebrate our community's achievements, for example: • A breakfast or morning tea for all volunteers • Biodiversity Awards • An open day / showcase of urban Landcare groups	Environmental Strategies					
8.	***Improving the health of Lismore's koala population and their habitat***						
8.1	**Contribute to regional projects that support koala conservation**	**Responsibility**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**
8.1.1	Identify the most effective mechanisms for stakeholder participation in the delivery of the KPoM and other koala programs	Environmental Strategies					
8.1.2	Council to produce an annual report on management activities as required by the Comprehensive Koala Plan of Management (KPoM #2)	Environmental Strategies					
8.1.3	Engage with prospective research partners and contribute to their projects (KPoM #36)	Environmental Strategies					
8.1.5	Collaborate on the regional communications program to inform and educate the community	Environmental Strategies					
8.1.6	Conduct a study to estimate koala density and population size within the koala planning area every 3 years (KPoM #29)	Environmental Strategies					
8.2	**Provide support to Friends of the Koala (FOK)**	**Responsibility**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**
8.2.1	Support FOK and other wildlife care groups regarding standardising and improving the quality of data provided to the State Government (KPoM #31)	Environmental Strategies					
8.2.2	Continue identifying potential sites for, and supporting the establishment of, food tree plantations to supply leaf for koalas in care (KPoM #30)	Environmental Strategies, Civic Pride					
8.2.3	Contribute to community education for fire management in preferred koala habitat (KPoM #32b)	Environmental Strategies					
8.3	**Restore koala habitat**	**Responsibility**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**
8.3.1	Provide an extension service to support individuals and community groups engaged in koala habitat restoration (KPoM #14)	Environmental Strategies					
8.3.2	Develop and implement priorities for a koala habitat restoration program (KPoM #15)	Environmental Strategies					
8.3.3	Continue to utilise external funding opportunities to implement the program (KPoM #15)	Environmental Strategies					

RURAL – Working with rural landholders							
9.	***Providing education and incentives to rural landholders that are mutually beneficial for biodiversity and agricultural production***						
9.1	**Continue implementation of the Rural Landholder Initiative (RLI) program**	**Responsibility**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**
9.1.1	Continue to employ the RLI Extension Officer to provide extension services to rural landholders	Environmental Strategies	✓	✓	✓	✓	✓
9.1.2	Hold up to 5 field days per annum	Environmental Strategies	✓	✓	✓	✓	✓
9.1.3	Deliver a small grants program to support the rural community to undertake restoration	Environmental Strategies	✓	✓	✓	✓	✓
9.1.4	Commence a trial of changing the delivery framework to individual grants and community grants in alternate years	Environmental Strategies				✓	
9.1.5	Investigate options to incentivise ongoing monitoring of RLI projects by landholders	Environmental Strategies	✓	✓	✓	✓	✓
9.2	**Distribute information to eligible rural landholders**	**Responsibility**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**
9.2.1	Review and update the following resources on RLI webpages - Farm Health Assessment Tool, education booklets and planning tools	Environmental Strategies			✓		
9.2.2	Review and update the following resources for an annual mailout to new landholders: • Cover letter about the RLI and their eligibility • Case studies from RLI champions relevant to their location / land use	Environmental Strategies	✓	✓	✓	✓	✓
9.3	**Partner with industry and community groups**	**Responsibility**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**
9.3.1	Continue to work with industry, primary producers and other partners on existing and emerging projects	Environmental Strategies	✓	✓	✓	✓	✓
9.3.2	Develop a strategic framework for investing in regenerative / sustainable agriculture (soil, water, air elements)	Environmental Strategies	✓				
URBAN – Working in the urban environment							
10.	***Restoring our urban bushland and supporting biodiversity and community well-being, including through implementing the Urban Green Corridors Plan***						
10.1	**Restore and maintain the ecological integrity and connectivity of urban bushland**	**Responsibility**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**
10.1.1	Continue implementing the bushland restoration works program (UGCP #1)	Civic Pride Environmental Strategies	✓	✓	✓	✓	✓
10.1.2	Continue weed management and bush regeneration in high priority urban riparian areas to improve connectivity	Civic Pride Environmental Strategies	✓	✓	✓	✓	✓
10.1.3	Continue to identify threats to biodiversity and undertake control projects where required	Environmental Strategies	✓	✓	✓	✓	✓

10.1.4	Investigate opportunities for applying fire management in urban bushland reserves (UGCP #6,7)	Civic Pride, Environmental Strategies					
10.1.5	Continue the monitoring and evaluation actions in the UGCP 2017 (UGCP #24-28)	Environmental Strategies					
10.1.6	Review the UGCP and management activities undertaken to inform the development of a works program for 2021-2026 (UGCP #29)	Civic Pride Environmental Strategies					
10.2	**Provide support for Landcare, schools and community groups undertaking management of urban and/or riparian bushland**	**Responsibility**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**
10.2.1	Provide in-kind support and financial support for Landcare groups, including to develop site action plans and work reports	Environmental Strategies					
10.2.2	Provide in-kind support for schools and groups to apply for external funding	Environmental Strategies					
10.2.3	Provide opportunities for Landcare groups to develop their capacity to work safely	Environmental Strategies					
10.3	**Enable our residents' connection with and stewardship of urban bushland**	**Responsibility**	**2020/21**	**2021/22**	**2022/23**	**2023/24**	**2024/25**
10.3.1	Design and pilot a Habitat for Wildlife program for local residents	Environmental Strategies					
10.3.2	Implement a Habitat for Wildlife program, as trialled in the pilot and adjusted based on experience and feedback	Environmental Strategies					
10.3.3	Integrate behaviour change programs into existing pet ownership initiatives, as external funding becomes available	Environmental Strategies, Rangers					
10.3.4	Develop appropriate place-based responses/initiatives to protect urban bushland reserves from weeds on adjacent private property as identified during bushland health assessments or restoration works (UGCP #8-11)	Environmental Strategies, Civic Pride					
10.3.5	Provide appropriate infrastructure and interpretation to connect residents with urban bushland reserves	Environmental Strategies, Civic Pride					
10.3.6	Seek opportunities to partner with organisations, including Northern Rivers Science Hub (NRSH), Southern Cross University (SCU) and health organisations, to deliver educational and wellbeing activities around local biodiversity	Environmental Strategies					
10.3.7	Identify and promote established citizen science projects, for example Backyard Bird Count and the Great Koala Count and communicate the local results	Environmental Strategies					
10.3.8	Continue to facilitate the loaning of traps and information for landholders wanting to control Indian Mynas on their property (UGCP #13)	Environmental Strategies					

5 Implementation

Implementation of the BMS is primarily funded by the Special Rate Variation (SRV) that commenced on 1 July 2016 and has been permanently secured in the rates base.

From 2016/17, the SRV comprises $500,000 annually plus an increase by up to the rate peg percentage determined each year by the NSW Independent Pricing and Regulatory Tribunal (IPART). This is supplemented by an operating budget for bushland restoration.

As a condition of IPART's approval of the SRV, Council reports annually how its actual expenditure compares with the proposed program of expenditure set out in their application. This program of expenditure was based on the Budget Summary in Appendix 11 of the original BMS, which allocated funding over the first 10 years from 2015/16 to 2023/24 under the assumption that an SRV would be secured to deliver on these key programs and actions.

In undertaking the first operational review of the BMS 4 years into implementation, recommendations were made to create more flexibility in the allocation of SRV funds. **Table 3** outlines proposed expenditure over the next 5 years, with the detail of allocation across projects being confirmed each financial year depending on what the actions are.

In addition to direct allocation to projects identified in the BMS Actions, the SRV will be used to leverage external funding to carry out projects directly by Council and in partnerships.

Table 3: Proposed program of expenditure for the next 5 years (2020-2025)

	IMPLEMENTATION YEAR				
PROGRAM AREA	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-2025**
INTERNAL ***Getting our house in order***					
Planning, Processes & Ops	$39,000	$40,000	$41,000	$42,000	$43,000
Supporting the Community	$50,000	$51,000	$52,000	$53,000	$55,000
RURAL ***Working with rural landholders***					
Implementation	$325,000	$334,000	$339,000	$371,000	$363,000
URBAN ***Working in the urban environment***					
Implementation	$105,000	$106,000	$107,000	$91,000	$112,000
INTERNAL, RURAL & URBAN ***Koalas***					
Implementation	$34,000	$35,000	$42,000	$37,000	$38,000
TOTAL	**$552,000**	**$566,000**	**$580,000**	**$594,000**	**$609,000**

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Appendix 1 Planning, policy and legislative context

The Biodiversity Management Strategy (BMS) has been developed within a framework of national, state and regional biodiversity agreements, legislation, plans and other initiatives. These are described below.

1.1 International conventions and treaties

International treaties, conventions and agreements to which Australia is a signatory are of special importance for the protection of fauna, flora and biodiversity, as these provide a context for Commonwealth and state government legislation. These agreements are not binding on local government, but they demonstrate Australia's commitment to conserving biodiversity as a global resource. They can be found through the Commonwealth Department of Agriculture, Water and the Environment website.

The **United Nations Convention on Biological Diversity** (UNESCO 1993; ratified by Australia in 1993) deals with the conservation of biodiversity at the levels of genes, species and ecosystems. It is primarily a framework for international and national conservation measures and the sustainable use of biological resources. Importantly, the Convention emphasises the need for biodiversity conservation to extend across the entire landscape, rather than being restricted to places or issues. The Convention requires that environmental impact assessments should be prepared for projects that are likely to have a significantly adverse effect on the environment. As a signatory nation, Australia is bound to develop and implement strategies that will ensure the conservation and sustainable use of its biological resources.

The **Japan–Australia Migratory Bird Agreement** (JAMBA; DFA 1995), **China–Australia Migratory Bird Agreement** (CAMBA; DFAT 1995) and **Republic of Korea–Australia Migratory Bird Agreement** (ROKAMBA; DFAT 2007) are bilateral agreements between the government of Australia and the respective governments of the treaties – Japan, China and the Republic of Korea – that provide for co-operation to protect birds that migrate between Australia and the respective treaty countries and the habitats of the birds. There are 76 species listed under JAMBA and 114 under CAMBA, many of which are threatened with extinction. See Appendix 2 (Table A2) for the migratory birds listed under the treaties and that are known to occur in the Lismore LGA.

Both the **Rio Declaration on Environment and Development** (UN 1992) and **Agenda 21**, entered into at the Rio Earth Summit in 1992, are important international statements of intent and reflect Australia's commitment to ecologically sustainable development and biodiversity conservation. Chapter 28 of Agenda 21 is devoted to the role of local government. Numerous 'Local Agenda 21' (LA21) sustainability programs have been developed by councils across Australia and throughout the world. The role of indigenous cultures in biodiversity conservation is also recognised in these agreements.

The Paris Climate Agreement (United Nations Framework Convention on Climate Change 2015). At the sustainable development summit held in Paris, all UNFCCC participants signed yet another international pact for all countries to take climate action from 2020, building on existing efforts in the period up to 2020 under the Kyoto Protocol. Australia signed the agreement in 2016 along with 194 states and the European Union.

1.2 National strategies and legislation

As a result of being signatory to the international treaties and conventions detailed above, the Commonwealth has taken significant steps to develop a planning and legislative framework to meet its obligations under these treaties.

1.2.1 Commonwealth planning framework

Intergovernmental Agreement on the Environment (Commonwealth of Australia 1992). In 1992 all Australian governments and the Australian Local Government Association signed the *Intergovernmental Agreement on the Environment*. This agreement provides for a cooperative approach to environmental management and it recognises the coordinating role of the Commonwealth in matters of national environmental significance. The agreement also specifically recognises the role of local government in developing and implementing environmental policies.

National Local Government Biodiversity Strategy 1998 (Australian Local Government Association 1998). The Biological Diversity Advisory Council worked with local governments from each state and the Northern Territory to develop a strategy for local governments to include biodiversity management as a core activity of local government. The *National Local Government Biodiversity Strategy* was endorsed by unanimous vote at the National Local Government General Assembly in November 1998. The document represents an agreed local government position at the national level on the management of biodiversity.

Australia's Strategy for Nature 2019 – 2030 (Commonwealth of Australia 2019). This new strategy brings together existing work across the country and will guide the development of new and innovate approaches. It focuses on overarching goals that support healthy and functioning biological systems by promoting a stronger connection between people and nature, improving the way we care for nature in our ancient landscapes, lands managed under fire regimes for thousands of years, agricultural lands hundreds of years old and more recent urban and suburban development.

1.2.2 Commonwealth legislation

The ***Environment Protection and Biodiversity Conservation Act 1999*** (EPBC Act) provides a national scheme for environmental protection and biodiversity conservation. It incorporates referral mechanisms and environmental impact assessment processes for projects of national significance. Triggers for referral to the Commonwealth include the occurrence of endangered ecological communities (EECs) and critically endangered ecological communities (CEECs), threatened species and migratory species listed under the JAMBA, CAMBA or ROKAMBA. The EPBC Act is under review at the time of writing.

1.3 State planning and legislation

1.3.1 NSW planning framework

Draft NSW Biodiversity Strategy 2010–2015 (DECCW and DII 2010). While this publication was never finalised, it is still relevant in that it provides a framework to coordinate and guide investment in biodiversity conservation.

NSW Koala Strategy (OEH 2018). The NSW Government has set an ambitious goal of securing threatened species in the wild for the next 100 years. This Strategy sets out the first phase of actions to achieve this goal for koalas with the objective to stabilise and then increase koala numbers over the longer term, ensuring genetically diverse and viable populations across New South Wales.

NSW Priorities for Biodiversity Adaptation to Climate Change 2010 (DECCW 2010). This document was developed as a statement of intent in response to the listing of Anthropogenic Climate Change as a Key Threatening Process under the then NSW *Threatened Species Conservation Act 1995* (now the BC Act). This document outlines priority measures that the environment authority will undertake to help biodiversity adapt to a changing climate. It focuses on four key areas:

- Enhancing our understanding of the likely responses of biodiversity to climate change and readjusting management programs where necessary considering this information.
- Protecting a diverse range of habitats by building a comprehensive, adequate and representative public reserve system in NSW, with a focus on under-represented bioregions.
- Increasing opportunities for species to move across the landscape by working with partners and the community to protect habitat and create the necessary connections.
- Assessing adaptation options for those ecosystems most at risk from climate change in NSW.

North Coast Enabling Regional Adaptation (AdaptNSW; OEH 2019). This report contains a collective understanding of the likely vulnerability to climate change of the North Coast region and aims to stimulate action to plan adaptation. It outlines biodiversity as one of nine regional systems that are particularly vulnerable to climate change.

The ***North Coast Regional Weeds Plan 2017-2022*** and ***North Coast Regional Strategic Pest Animal Management Plan 2018-2023*** are the state government's response to the new Commonwealth biosecurity measures to protect the economy, environment and community from the negative impacts of weeds, pests and diseases.

1.3.2 NSW legislation

There is a range of NSW legislation that has implications for biodiversity conservation at State and local government levels.

Local Government Act 1993. One of the many amendments to this Act was in 1997, so as "to require local councils to take into consideration principles of ecologically sustainable development", including biodiversity conservation, as a key aspect of local government operations. Other changes to the Act also require the preparation of plans of management (PoM) for all land owned by local government and provides for the classification of land into, among other things, natural areas and various subcategories.

Local government has a specific charter about biodiversity conservation set out in the LG Act. Section 8 of the Act requires Council:

- *To properly manage, develop, protect, restore, enhance and conserve the environment of the area for which it is responsible, in a manner that is consistent with and promotes the principles of ecologically sustainable development.*

Then, in its role as a regulator of development under the *Environmental Planning and Assessment Act 1979*, Council is required to encourage:

- *The protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats.*
- *Ecologically sustainable development.*

Environmental Planning and Assessment Act 1979. This Act is the principal planning legislation for NSW, providing a framework for the overall environmental planning and assessment of development proposals. The Act provides for the preparation of several environmental planning instruments (including SEPP and LEP). This Act guides the proper management, development and conservation of natural resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages. It also provides for the protection of the environment, including the protection and

conservation of native animals and plants, including threatened species, populations and ecological communities and their habitats, and ecologically sustainable development.

Biodiversity Conservation Act 2016. Sets out the framework for biodiversity conservation licences and replaces the previous licencing regime under the *Threatened Species Conservation Act 1995* (TSC Act) and *National Parks and Wildlife Act 1974.* Establishes areas of outstanding value to replace critical habitats under the TSC Act; sets out the process for listing threatened plants and animals; establishes a private land conservation framework and a Biodiversity Offsets Scheme (BOS); sets out biodiversity assessment requirements for different activities and approvals under the EP & A Act; establishes the framework for biodiversity certification of land and the Biodiversity Conservation Trust among its most relevant parts.

Local Land Services Act 2013, formalised the establishment of Local Land Services which became operational in 2014. It repealed the *Rural Lands Protection Act 1998*, the *Rural Lands Protection Amendment Act 2008* and the *Catchment Management Authorities Act 2003*. It was amended by the ***Local Land Services Amendment Act 2016*** to ensure the proper management of natural resources in the social, economic and environmental interests of the State, consistently with the principles of ecologically sustainable development. This legislation was passed with the BC Act as part of biodiversity conservation and land management reforms governing the clearing of native vegetation on rural lands outside of the National Park Estate, State Forests and urban areas. A new State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017 (**Vegetation SEPP**) aims to protect the biodiversity values of trees and other vegetation in urban/non-rural areas.

Biosecurity Act 2015. Repealed all the *Noxious Weeds Act 1993*, as well bringing together all or part of 13 other Acts and introduces the principle of shared responsibility of government, industry and community in the 'general biosecurity duty' of protecting the state from biosecurity risks, such as weeds, pests and diseases.

Coastal Management Act 2016. As with biodiversity conservation and land management and biosecurity, this Act is the key part of the new framework aimed at establishing better, more integrated coastal management, and replaces the *Coastal Protection Act 1979*. The framework also comprises a new State Environmental Planning Policy (Coastal Management) 2018 (**Coastal Management SEPP**). The CM SEPP updates and consolidates into one integrated policy SEPP 14 (Coastal Wetlands), SEPP 26 (Littoral Rainforests) and SEPP 71 (Coastal Protection), including clause 5.5. of the Standard Instrument – Principal Local Environmental Plan. These policies are now repealed. In addition, the new framework outlines the need to transition to a Coastal Management Program (CMP) once a certified Coastal Zone Management Plan (CZMP) has expired.

National Parks and Wildlife Act 1974. Provides for the establishment and management of national parks and other conservation reserves (including through voluntary conservation agreements). The protection of plants and animals that previously came under this Act now comes under the *Biodiversity Conservation Act 2016*.

Fisheries Management Act 1994. This Act aims to preserve fish stocks, habitats and species and to maintain and promote ecologically sustainable development while ensuring the commercial viability of fisheries in the state. It provides for listing of threatened species, habitat, communities and processes in a similar manner to the BC Act.

Rural Fires Act 1997. Requires the preparation of bushfire management plans by each Bushfire Management Committee for a rural fire district, constituting a:

a) plan of operations; and
b) bushfire risk management plan

1.4 Regional plans and strategies

Border Ranges Rainforest Biodiversity Management Plan – NSW & Queensland (DECCW 2010a). The NSW Government, in partnership with the Commonwealth Government, developed this plan to guide the recovery of threatened species and communities in the Border Ranges North and South (Queensland and NSW) Biodiversity Hotspot (Department of Environment 2014). This plan constitutes the formal national recovery plan for those rainforest species (flora and fauna) that are endemic to this hotspot. The plan identifies actions to be taken to ensure the long-term viability of rainforest, related vegetation and associated threatened species. It also emphasises the importance of collaborative actions involving agencies, landholders and local communities for successful implementation of the plan. This plan is a guiding document for the BMS for the Lismore LGA.

Northern Rivers Regional Biodiversity Management Plan (DECCW 2010b). This plan was developed by the NSW Government with assistance from the Commonwealth. The plan, in association with the approved *Border Ranges Rainforest Biodiversity Management Plan* (above), sets out an overall strategy for the conservation and restoration of biodiversity in the Northern Rivers Region. Combined, these plans constituent the formal national recovery plan under the EPBC Act for threatened species and ecological communities principally distributed in the Northern Rivers Region of NSW. This plan remains a guiding document for the BMS for the Lismore LGA.

North Coast Local Strategic Plan 2016 – 2021 (NCLLS 2016) moves on from the *Northern Rivers Catchment Action Plan 2: 2013-2023.* It provides the specific priorities and actions to deliver the goals of the Local Land Services State Strategic Plan in the North Coast Region. The Plan outlines a commitment to building the sustainability of our local communities, primary industries and the natural environment on the North Coast. The Plan's actions and measures of success focus on our customers, stakeholders and investors, through excellence in business.

Northern Rivers Bushfire Risk Management Plan (NRBRMP) 2011. The Northern Rivers Bushfire Management Committee (NRBMC) is required to develop this Plan for its Local Government Areas of Kyogle, Lismore and Richmond Valley. It recognises risks of out-of-control bushfire to environmental assets such as threatened species, populations and ecological communities, as well as locally important species and ecological communities that are sensitive to fire and outlines options for treating those risks.

1.5 Local plans and strategies

Imagine Lismore Community Strategic Plan 2017-2027. Under the LG Act, Council has a legislated role in initiating, preparing and maintaining the community strategic plan on behalf of the Lismore LGA. The Imagine Lismore plans and partnering strategy are the highest level of planning that Council prepares. The purposes of these plans are to identify the community's priorities and aspirations for the future and to plan strategies for achieving these goals. The community feedback around the first *Imagine Lismore 10 Year Plan 2013–2023* was integral in developing a Biodiversity Management Strategy for the Lismore LGA.

Coastal Zone Management Plan for the Richmond River Estuary (CZMP; Hydrosphere Consulting 2011). The CZMP is a 10-year plan that details key actions needed to address management of the Richmond River estuary. The primary goal of the CZMP is to develop integrated and balanced methods to restore and maintain the ecological sustainability of the estuary as well as the associated recreational and commercial activities. The Richmond River estuary extends approximately 90 kilometres from the mouth of the Richmond River to the tidal limit near Boat Harbour. The CZMP was prepared for local governments operating on the estuary – Ballina Shire Council, Lismore City Council, Richmond Valley Council, as well as Rous County Council.

Comprehensive Koala Plan of Management for South-east Lismore (KPoM; Lismore City Council 2013). This plan of management is a 15-year plan made under the auspices of State Environmental Planning Policy No. 44–Koala Habitat Protection (SEPP 44). The KPoM applies to land in the Koala planning area in the south-east portion of the Lismore LGA. The KPOM identifies a regulatory Development Assessment Framework that details how development applications that potentially affect preferred Koala food trees are assessed. The KPoM also details a non-regulatory framework of management activities designed to increase habitat for Koalas and address a range of threats. The KPoM is considered subservient to the BMS, as it only applies to a subset of the Lismore LGA and relates to only one species. The State Environmental Planning Policy – Koala Habitat Protection (**Koala Habitat Protection SEPP**) came into effect in March 2020 and includes a new definition for 'core koala habitat', two maps of koalas across NSW (that cover the area in Lismore LGA outside the KPoM) and the most up-to date tree species data**.**

Urban Green Corridors Plan 2017-2022 (UGCP; Lismore City Council 2017). The UGCP was a priority project within the original BMS. This document was written in-house and identifies a network of 6 wildlife corridors which link bushland reserves and important habitat within the urban areas of Lismore, South Lismore, North Lismore, East Lismore and Goonellabah. It also developed a program of ecological restoration that enhances existing bushland and improves the connectivity these corridors.

Roadside Vegetation Management Plan 2017 (RVMP; Lismore City Council 2017b). The RVMP was another priority project within the original BMS, to review the Operational Plan for Roadside Vegetation Management from 2005. The new RVMP now replaces the previous Plan. Its aim is to guide Council staff and contractors to undertake routine maintenance of roadside vegetation in a way that protects and conserves high conservation value vegetation and threatened plant species.

Appendix 2 Communities, populations and species of high conservation value

This Appendix provides further details regarding High Conservation Value (HCV) land and the species, populations and communities of HCV in the Lismore LGA. These areas are represented in Council's online mapping system and this data is used for strategic planning and decision making.

HCV–1:	**Areas of land identified as containing species or populations that are either threatened and/or of local conservation priority**

Threatened species or populations listed under the BC Act or EPBC Act or of local conservation priority occurring in the Lismore LGA are shown in the following tables:

- **Table A1** – Terrestrial Vertebrate Fauna
- **Table A2** – Migratory Birds
- **Table A3** – Invertebrates
- **Table A4** – Flora

Table A1. HCV terrestrial vertebrates recorded in the Lismore LGA

	Status		Dispersal capacity	Core habitat in LGA
	BC Act	EPBC Act		
Amphibians				
Green-thighed Frog *Litoria brevipalmata*	V		low	
Pearson's Tree Frog *Litoria pearsoniana*			low	✓
Whirring Tree Frog *Litoria revelata*			low–moderate	✓
Pouched Frog *Assa darlingtoni*	V		low	✓
Fletcher's Frog *Lechriodus fletcheri*			low	✓
Fleay's Barred Frog *Mixophyes fleayi*	E	E	low	✓
Giant Barred Frog *Mixophyes iterates*	E	E	low	✓
Loveridge's Frog *Philoria loveridgei*	E		low	✓
Reptiles				
Southern Leaf-tailed Gecko *Saltuarius swainii*			low	✓
Scute-snouted Calyptotis *Calyptotis scutirostrum*			low	
Three-toed Snake-toothed Skink *Coeranoscincus reticulatus*	V		low	
Major Skink *Bellatorius frerei*			low–moderate	✓
Land Mullet *Bellatorius major*			low–moderate	✓
McPhee's Skink *Bellatorius mcpheei*			low–moderate	✓
Martin's Skink *Eulamprus martini*			low–moderate	
Blue-speckled Forest-skink *Eulamprus murrayi*			low–moderate	✓
Short-limbed Snake-skink *Ophioscincus truncates*			low	✓
Orange-tailed Shadeskink *Saproscincus challengeri*			low	✓
Rose's Skink *Saproscincus rosei*			low	✓
Gully Shadeskink *Saproscincus spectabilis*			low	
Southern Angle-headed Dragon *Hypsilurus spinipes*			low	

	Status		Dispersal capacity	Core habitat in LGA
	BC Act	EPBC Act		
White Crowned Snake *Cacophis harriettae*	V		moderate	
Dwarf Crowned Snake *Cacophis krefftii*			low–moderate	✓
Stephen's Banded Snake *Hoplocephalus stephensi*	V		moderate	✓
Rough-scaled Snake *Tropidechis carinatus*			moderate	✓
Birds				
Wompoo Fruit-dove *Ptilinopus magnificus*	V		high	✓
Superb Fruit-dove *Ptilinopus superbus*	V		high	✓
Rose-crowned Fruit-dove *Ptilinopus regina*	V		high	✓
Topknot Pigeon *Lopholaimus antarcticus*			high	
Marbled Frogmouth *Podargus ocellatus*	V		moderate	✓
Black Bittern *Ixobrychus flavicollis*	V		high	✓
Little Eagle *Hieraaetus morphnoides*	V		high	
Pale-vented Bush-hen *Amaurornis moluccana*	V		moderate–high	✓
Glossy Black-cockatoo *Calyptorhynchus lathami*	V		high	
Black-necked Stork (Jabiru) *Ephippiorhynchus asiaticus*				
Little Lorikeet *Glossopsitta pusilla*	V		high	
Little Bronze-cuckoo *Chalcites minutillus*			high	
Powerful Owl *Ninox strenua*	V		high	
Barking Owl *Ninox connivens*	V		high	
Sooty Owl *Tyto tenebricosa*	V		moderate–high	✓
Masked Owl *Tyto novaehollandiae*	V		high	
Albert's Lyrebird *Menura alberti*	V		moderate	✓
Regent Bowerbird *Sericulus chrysocephalus*			high	✓
Eastern Bristlebird *Dasyornis brachypterus*	E	E	moderate	
Regent Honeyeater *Anthochaera phrygia*	E	E	high	
Little Shrike-thrush *Colluricincla megarhyncha*			moderate–high	✓
Paradise Riflebird *Ptiloris paradiseus*			moderate	✓
Pale-yellow Robin *Tregellasia capito*			moderate	✓
Grey-crowned Babbler *Pomatostomus temporalis*	V		moderate–high	
Varied Sittella *Daphoenositta chrysoptera*	V		moderate–high	
Barred Cuckoo-shrike *Coracina lineata*	V		high	✓
Olive Whistler *Pachycephala olivacea*	V		moderate	
White-eared Monarch *Carterornis leucotis*	V		moderate–high	✓
Mammals				
Spotted-tailed Quoll *Dasyurus maculatus*	V	E	moderate–high	
Subtropical Antechinus *Antechinus subtropicus*			low–moderate	✓
Common Planigale *Planigale maculata*	V		low–moderate	

	Status		Dispersal capacity	Core habitat in LGA
	BC Act	EPBC Act		
Koala *Phascolarctos cinereus*	V	V	moderate–high	✓
Yellow-bellied Glider *Petaurus australis*	V		moderate–high	
Squirrel Glider *Petaurus norfolcensis*	V		moderate–high	
Greater Glider *Petauroides volans*			moderate	
Long-nosed Potoroo *Potorous tridactylus*	V	V	moderate	✓
Parma Wallaby *Macropus parma*	V		moderate	
Red-legged Pademelon *Thylogale stigmatica*	V		moderate	✓
Red-necked Pademelon *Thylogale thetis*			moderate	✓
Eastern Blossom-bat *Syconycteris australis*	V		moderate–high	
Eastern Tube-nosed Bat *Nyctimene robinsoni*	V		moderate	✓
Black Flying-fox *Pteropus alecto*			high	✓
Grey-headed Flying-fox *Pteropus poliocephalus*	V	V	high	✓
Eastern Horseshoe Bat *Rhinolophus megaphyllus*			moderate–high	✓
Yellow-bellied Sheath-tailed Bat *Saccolaimus flaviventris*	V		high	
Beccari's Free-tailed Bat *Mormopterus beccarii*	V		high	
East-coast Free-tailed Bat *Mormopterus norfolkensis*	V		high	
Little Bent-winged Bat *Miniopterus australis*	V		high	✓
Eastern Bent-winged Bat *Miniopterus schreibersii*	V		high	
Golden-tipped Bat *Kerivoula papuensis*	V		moderate	✓
Eastern Long-eared Bat *Nyctophilus bifax*	V		moderate	✓
Large-eared Pied Bat *Chalinolobus dwyeri*	V	V	moderate–high	✓
Eastern False Pipistrelle *Falsistrellus tasmaniensis*	V		high	
Southern Myotis *Myotis adversus*	V		high	✓
Greater Broad-nosed Bat *Scoteanax rueppellii*	V			✓
Central-eastern Broad-nosed Bat *Scotorepens* sp.			high	
Eastern Forest Bat *Vespadelus pumilus*			moderate–high	✓
Fawn-footed Melomys *Melomys cervinipes*			low–moderate	✓

Status: E – Endangered; V – Vulnerable under both the BC Act and/or EPBC Act.

Key: Where they are not listed under either Commonwealth or State legislation, they are included in this list according to their local conservation priority. Local conservation priority is determined by the animal's dispersal capacity and presence of core habitat in the LGA, and is based on Table 1 in technical report 1 by Landmark Ecological Services (2012).

Table A2. Migratory birds known or predicted to occur in the Lismore LGA

These species are of HCV as they are listed under one or more of: China–Australia Migratory Bird Agreement (CAMBA; DFAT 1995), Japan–Australia Migratory Bird Agreement (JAMBA; DFA 1995) or Republic of Korea–Australia Migratory Bird Agreement (ROKAMBA; DFAT 2007), or are listed as migratory and marine birds under the EPBC Act.

Species Name	Common Name	Listed
*Apus pacificus**	Fork-tailed Swift	C, J, K, M
*Anseranas semipalmata**	Magpie Goose	M
Ardea alba	Great Egret / White Egret	C, J, M
Ardea ibis	Cattle Egret	C, J, M
*Calidris acuminata**	Sharp-tailed Sandpiper	C, J, K, M
*Cuculus optatus**	Oriental Cuckoo / Horsfield's Cuckoo	M
Gallinago hardwickii	Latham's Snipe	C, J, K, M
Haliaeetus leucogaster	White-bellied Sea-eagle	C, M
Hirundapus caudacutus	White-throated Needletail	C, J, K, M
Merops ornatus	Rainbow Bee-eater	J, M
Monarcha melanopsis	Black-faced Monarch	M
Monarcha trivirgatus	Spectacled Monarch	M
Myiagra cyanoleuca	Satin Flycatcher	M
*Pandion haliaetus**	Osprey	M
Plegadis falcinellus	Glossy Ibis	C, M
Rhipidura rufifrons	Rufous Fantail	M
Rostratula benghalensis	Painted Snipe	C, M

*Denotes new records since the report generated for the original BMS in 2014.

Key*:* C – listed in CAMBA; J – listed in JAMBA; K – listed in ROKAMBA; M – migratory and marine.

Records acquired from:
(1) *Atlas of NSW Wildlife* database, NSW DPIE BioNet (6 March 2020)
(2) *Protected Matters Search Tool - Report by Region* 'Lismore LGA', Commonwealth DEE (20 May 2020)
(3) *Birdata,* Birdlife Australia (20 May 2020)

Table A3. Threatened invertebrates known or predicted to occur in the Lismore LGA

Family	Scientific Name	Common Name	Status	
			BC Act	EPBC Act
Carabidae	*Nurus atlas*	Atlas Rainforest Ground-beetle	E	
Carabidae	*Nurus brevis*	Shorter Rainforest Ground-beetle	E	
Noctuidae	*Phyllodes imperialis* (southern subsp*)*	Southern Pink Underwing Moth	E	E
Nymphalidae	*Argynnis hyperbius**	Laced Fritillary	E	CE
Petaluridae	*Petalura gigantea*	Giant Dragonfly	E	
	Petalura litorea	Coastal Petaltail	E	
Camaenidae	*Thersites mitchellae*	Mitchell's Rainforest Snail	E	CE

*****Predicted to occur as its larval food plant Arrowhead Violet (*Viola betonicifolia*) occurs in the Lismore LGA

Status: CE – Critically Endangered; E – Endangered

Records acquired from:
(1) *Atlas of NSW Wildlife* database, NSW DPIE BioNet (6 March 2020)
(2) *Protected Matters Search Tool - Report by Region* 'Lismore LGA', Commonwealth DEE (10 March 2020)

Table A4. Threatened flora known or predicted to occur in the Lismore LGA.

Family	Species Name	Common Name	Status	
			BC Act	EPBC Act
Acanthaceae	*Isoglossa eranthemoides*	Isoglossa	E	E
Apocynaceae	*Cynanchum elegans*	White-flowered Wax Plant	E	E
	Marsdenia longiloba	Slender Marsdenia	E	V
	Ochrosia moorei	Southern Ochrosia	E	E
	Parsonsia dorrigoensis	Milky Silkpod	V	E
	Tylophora woollsii	Cryptic Forest Twiner	E	E
Argophyllaceae	*Corokia whiteana*	Corokia	V	V
Asteraceae	*Brachyscome ascendens*	Border Ranges Daisy	E	
	Ozothamnus vagans	Wollumbin Dogwood	E	V
	Rutidosis heterogama	Heath Wrinklewort	V	V
Brassicaceae	*Lepidium peregrinium*	Wandering Peppercress		E
Campanulaceae	*Wahlenbergia scopulicola*	Rock-face Bluebell	E	

Family	Species Name	Common Name	Status	
			BC Act	EPBC Act
Casuarinaceae	*Allocasuarina defungens*	Dwarf Heath Casuarina	E	E
Corynocarpaceae	*Corynocarpus rupestris* subsp. *Rupestris*	Glenugie Karaka	V	V
Cunoniaceae	*Davidsonia jerseyana*	Davidson's Plum	E	E
	Davidsonia johnsonii	Smooth Davidson's Plum	E	E
Cupressaceae	*Callitris baileyi*	Bailey's Cypress Pine	E	
Cyperaceae	*Cyperus aquatilis*	Water Nutgrass	E	
	Cyperus rupicola	Cliff Sedge	V	
	Cyperus semifertilis	Missionary Nutgrass	E	V
	Eleocharis tetraquetra	Square-stemmed Spike-rush	E	
Dilleniaceae	*Hibbertia hexandra*	Tree Guinea Flower	E	
	Hibbertia marginata	Bordered Guinea Flower	V	V
Doryanthaceae	*Doryanthes palmeri*	Giant Spear Lily	V	
Droseraceae	*Aldrovanda vesiculosa*	Waterwheel Plant	E	
Ebenaceae	*Diospyros mabacea*	Red-fruited Ebony	E	E
Elaeocarpaceae	*Elaeocarpus sedentarius*	Minyon Quandong	E	E
	Elaeocarpus williamsianus	Hairy Quandong	E	E
Ericaceae	*Gaultheria viridicarpa*	Green Waxberry	E	V
	Melichrus sp. Gibberagee	Narrow-leaf Melichrus	E	E
	Melichrus sp. Newfoundland State Forest / Melichrus hirsutus	Hairy Melichrus	E	E
Euphorbiaceae	*Acalypha eremorum*	Acalypha	E	
	Baloghia marmorata	Jointed Baloghia	V	V
	Chamaesyce psammogeton	Sand Spurge	E	
	Fontainea australis	Southern Fontainea	V	V
	Fontainea oraria	Coastal Fontainea	E	E
Fabaceae (Caesalpinioideae)	*Caesalpinia bonduc*	Knicker Nut	E	
	Cassia marksiana	Brush Cassia	E	

Family	Species Name	Common Name	Status	
			BC Act	EPBC Act
	Senna acclinis	Rainforest Cassia	E	
Fabaceae (Faboideae)	*Desmodium acanthocladum*	Thorny Pea	V	V
	Indigofera baileyi	Bailey's Indigo	E	
	Pultenaea maritima	Coast Headland Pea	V	
	Rhynchosia acuminatissima	Pointed Trefoil	V	
	Sophora fraseri	Brush Sophora	V	V
	Sophora tomentosa	Silverbush	E	
	Tephrosia filipes	Smooth Darling Pea	V	
Fabaceae (Mimosoideae)	*Acacia bakeri*	Marblewood	V	
	Acacia ruppii	Rupp's Wattle	E	E
	Archidendron hendersonii	White Lace Flower		
Flacourtiaceae	*Xylosma terrae-reginae*	Queensland Xylosma	E	
Grammitidaceae	*Grammitis stenophylla*	Narrow-leaf Finger Fern	E	
Juncaginaceae	*Maundia triglochinoides*	Woodrush	V	
Lamiaceae	*Plectranthus alloplectus*	Narrow-leaved Plectranthus	E	
	Plectranthus nitidus	Nightcap Plectranthus	E	E
	Prostanthera palustris	Swamp Mint-bush	V	V
	Prostanthera sejuncta		V	
Lauraceae	*Cryptocarya foetida*	Stinking Cryptocarya	V	V
	Endiandra floydii	Crystal Creek Walnut	E	E
	Endiandra hayesii	Rusty Rose Walnut	V	V
	Endiandra muelleri subsp. *bracteata*	Green-leaved Rose Walnut	E	
Linderniaceae	*Lindernia alsinoides*	Noah's False Chickweed	E	
Lindsaeaceae	*Lindsaea brachypoda*	Short-footed Screw Fern	E	
	Lindsaea incisa	Slender Screw Fern	E	
Loganiaceae	*Mitrasacme pygmaea*	Pygmy Bishop's Hat	E	
Loranthaceae	*Amyema plicatula*	Box Mistletoe	E	E

Family	Species Name	Common Name	Status	
			BC Act	EPBC Act
	Muellerina myrtifolia	Myrtle-leaf Mistletoe	E	
Lythraceae	*Rotala tripartita*	Scrambling Lily	E	
Marattiaceae	*Angiopteris evecta*	Giant Fern	E	
Meliaceae	*Owenia cepiodora*	Onion Cedar, Onionwood	V	V
Menispermaceae	*Tinospora smilacina*	Tinospora Vine		
	Tinospora tinosporoides	Arrow-head Vine	V	
Moraceae	*Streblus pendulinus*	Sia's Backbone, Isaac Wood		E
Myrtaceae	*Angophora robur*	Sandstone Rough-barked Apple	V	V
	Callistemon linearifolius	Netted Bottle Brush	V	
	Choricarpia subargentea	Giant Ironwood	E	
	Eucalyptus glaucina	Slaty Red Gum	V	V
	Eucalyptus microcodon	Border Mallee	E	
	Eucalyptus tetrapleura	Square-fruited Ironbark	V	V
	Gossia fragrantissima	Sweet Myrtle	E	E
	Lenwebbia sp. Main Range		E	
	Melaleuca irbyana	Weeping Paperbark	E	
	Rhodamnia rubescens	Scrub Turpentine	E	
	Rhodomyrtus psidioides	Native Guava	E	
	Syzygium hodgkinsoniae	Red Lilly Pilly	V	V
	Syzygium moorei	Durobby, Rose Apple	V	V
	Uromyrtus australis	Peach Myrtle	E	E
Olacaceae	*Olax angulata*	Square-stemmed Olax	V	V
Orchidaceae	*Bulbophyllum globuliforme*	Hoop Pine Orchid	V	V
	Cryptostylis hunteriana	Leafless Tongue-orchid		V
	Dendrobium melaleucaphilum	Spider Orchid	E	
	Diuris byronensis	Byron Bay Diuris	E	
	Geodorum densiflorum	Pink Nodding Orchid	E	
	Oberonia complanata	Yellow-flowered King of the Fairies	E	

Family	Species Name	Common Name	Status	
			BC Act	EPBC Act
	Oberonia titania	Red-flowered King of the Fairies	V	
	Peristeranthus hillii	Brown Fairy-chain Orchid	V	
	Phaius tankervilleae var. australis	Lady Tankerville's Swamp Orchid, Southern Swamp Orchid	E	E
	Pterostylis bicornis	Horned Greenhood	E	V
	Pterostylis nigricans	Dark Greenhood	V	
	Sarcochilus dilatatus	Brown Butterfly Orchid	E	
	Sarcochilus fitzgeraldii	Ravine Orchid	V	V
	Sarcochilus hartmannii	Hartman's Sarcochilus	V	V
	Sarcochilus weinthalii	Blotched Sarcochilus	V	V
Orobanchaceae	*Centranthera cochinchinensis*	Swamp Foxglove	E	
	Euphrasia bella	Pretty Eyebright	V	V
Phyllanthaceae	*Phyllanthus microcladus*	Brush Sauropus	E	
Poaceae	*Ancistrachne maidenii*		V	
	Arthraxon hispidus	Hairy Jointgrass	V	V
	Dichanthium setosum	Bluegrass		V
	Elionurus citreus	Lemon-scented Grass	E	
	Paspalidium grandispiculatum	Panicum	V	V
Polygalaceae	*Polygala linariifolia*	Native Milkwort	E	
	Persicaria elatior	Tall Knotweed	V	V
Polypodiaceae	*Belvisia mucronata*	Needle-leaf Fern	E	
	Drynaria rigidula	Basket Fern	E	
Primulaceae	*Myrsine richmondensis*	Ripple-leaf Muttonwood, Lismore Muttonwood	E	E
Proteaceae	*Eidothea hardeniana*	Nightcap Oak	E	CE
	Floydia praealta	Ball Nut, Possum Nut	V	V
	Grevillea banyabba	Banyabba Grevillea	V	V
	Grevillea masonii	Mason's Grevillea	E	E
	Grevillea quadricauda	Four-tailed Grevillea	V	V
	Hicksbeachia pinnatifolia	Red Boppel Nut	V	V

Family	Species Name	Common Name	Status	
			BC Act	EPBC Act
	Macadamia tetraphylla	Rough-shelled Bush Nut	V	V
	Macadamia integrifolia	Macadamia Nut		V
Psilotaceae	*Psilotum complanatum*	Flat Fork Fern	E	
Ranunculaceae	*Clematis fawcettii*	Northern Clematis	V	V
Rhamnaceae	*Pomaderris notata*	McPherson Range Pomaderris	V	
Rubiaceae	*Oldenlandia galioides*	Sweet Morinda	E	
	Randia moorei	Spiny Gardenia	E	E
	Triflorensia cameronii	Cameron's Tarenna	E	
Rutaceae	*Acronychia littoralis*	Scented Acronychia	E	E
	Boronia umbellata	Orara Boronia	V	V
	Bosistoa selwynii	Heart-leaved Bosistoa		V
	Bosistoa transversa	Three-leaved Bosistoa, Yellow Satinheart	V	V
	Coatesia paniculata	Axe-breaker	E	
	Melicope vitiflora	Coast Euodia	E	
	Zieria adenodonta	Wollumbin Zieria	E	
Santalaceae	*Thesium australe*	Austral Toadflax, Toadflax	V	V
Sapindaceae	*Cupaniopsis serrata*	Smooth Tuckeroo	E	
	Diploglottis campbellii	Small-leaved Tamarind	E	E
	Lepiderema pulchella	Fine-leaved Tuckeroo	V	
Sapotaceae	*Niemeyera whitei*	Rusty Plum, Plum Boxwood	V	
Simaroubaceae	*Quassia sp. Moonee Creek*	Moonee Quassia	E	E
Solanaceae	*Solanum limitare*	Border Ranges Nightshade	E	
Symplocaceae	*Symplocos baeuerlenii*	Small-leaved Hazelwood	V	V
Tiliaceae	*Corchorus cunninghamii*	Native Jute	E	E
Urticaceae	*Dendrocnide moroides*	Gympie Stinger	E	

Status: CE – Critically Endangered; E – Endangered; V – Vulnerable

Records acquired from:
(1) *Atlas of NSW Wildlife* database, NSW DPIE BioNet (6 March 2020)
(2) *Protected Matters Search Tool - Report by Region* 'Lismore LGA', Commonwealth DEE (10 March 2020)

HCV–2:	Areas of land identified as containing endangered ecological communities (EECs)

Table A5 lists EECs listed under the EPBC Act or BC Act known to occur in the Lismore LGA. This includes EECs identified in technical report 1 by Landmark Ecological Services (2011).

Table A5. Endangered Ecological Communities (EECs) that occur in the Lismore LGA.

EPBC Act
Lowland Rainforest of Subtropical Australia (http://www.environment.gov.au/cgi-bin/sprat/public/publicshowcommunity.pl?id=101)
Subtropical and Temperate Coastal Saltmarsh (http://www.environment.gov.au/cgi-bin/sprat/public/publicshowcommunity.pl?id=118)
BC Act
Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (http://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10866)
Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (http://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10929)
Lowland Rainforest in the New South Wales North Coast and Sydney Basin Bioregions (http://www.environment.nsw.gov.au/determinations/LowlandRainforestEndCom.htm)
Lowland Rainforest on Floodplain in the New South Wales North Coast Bioregion (http://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10497)
Subtropical coastal floodplain forest of the NSW North Coast bioregion (http://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10944)
Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (http://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10945)
Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (http://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10786)

HCV–3:	Areas of land identified as key habitat for threatened species or priority vertebrate assemblages

Table A6. Key habitats supporting priority vertebrate assemblages in the Lismore LGA.

Landmark mapping (2011, Grey and Blue Zones)	NRCMA mapping (2005, Green Zone)
Flooded Gum-Tallowwood–Brush Box	Sub-Tropical Rainforest
Brush Box tall moist forest	Sub-Tropical and Warm Temperate Rainforest
Subtropical Rainforest	Coastal Flooded Gum
Blackbutt–Tallowwood	Wet Flooded Gum–Tallowwood
Riparian rainforest – lower reaches	Northern Wet Tallowwood–Blue Gum
Riparian rainforest – mid reaches	Wet Bangalow–Brushbox
Dry Rainforest	Northern Moist Blackbutt
Forest Red Gum grassy open forest	Warm Temperate Rainforest
Forest Red Gum–Tallowwood	Turpentine
Forest Red Gum–Swamp Box	Escarpment Red Gum
Forest Red Gum–River Oak	Grey Box–Northern Grey Gum
Paperbark	Northern Ranges Dry Tallowwood
Paperbark–Swamp Oak	Open Shrubby Brushbox –Tallowwood
River Oak	River Oak
Swamp Oak	Wet Bloodwood–Tallowwood
Swamp Oak–River Oak	

Landmark mapping refers to identification of key habitats based on fine-scale mapping in southern and eastern two-thirds of the Lismore LGA (the Grey and Blue Zones); key habitats in the remaining third of the LGA (the Green Zone) were identified using Northern Rivers CMA mapping (2005). Landmark 2011 vegetation mapping can be viewed online on Council's mapping system. The NRCMA vegetation map is available online from NSW Spatial Data Catalogue. Note that the key habitats in each column are not aligned as equivalent communities.

HCV–4:	Mapped coastal management areas under the Coastal Management SEPP 2018

Lismore LGA contains *coastal wetlands and littoral rainforest areas* and *coastal environment areas*, which are outlined in detailed interactive maps accompany the CM SEPP.

HCV–5:	Areas of land identified as providing very high habitat corridor values

Mapping of areas of very high habitat corridor values is based on Landmark Ecological Services (2012). Key habitats were identified and ranked on the basis of their known/potential value as habitat for threatened vertebrate species and for other conservation-priority terrestrial vertebrate species with core habitat in the Lismore LGA. The key habitats and corridors system contains 26 sectors, comprising five blocks and 21 connectors or corridors, together with riparian links. Sectors are ranked in order of significance according to conformity with the regional system of key habitats and corridors proposed by Scotts (2003) and suitability as habitat for the highest ranked assemblages. The connectors are ranked on the basis of their provision of links to significant blocks of habitat.

HCV–6:	Areas of land identified as Primary, Secondary A and Secondary B koala habitat as mapped by Landmark Ecological Services 2011 and 2019

Definition of this category of HCV land is described in the CKPoM for South-east Lismore. Preferred koala habitat is now mapped and available for the Lismore LGA (Landmark 2011, 2019.)

HCV–7:	Areas of land identified as supporting riparian, wetland and estuarine native vegetation other than Coastal Management SEPP mapped wetlands

The current available spatial data for these HCV areas is sourced from state agencies. Local scale occurrences and amendments to mapping will be made on a case-by-case basis by Council.

HCV–8:	Areas of land identified as supporting any type of rainforest

Rainforest, of varying types, was included in vegetation mapping undertaken by Landmark Ecological Services 2011 and 2019.

HCV–9:	Areas of land identified as supporting native vegetation defined as old-growth forest

Old-growth forest was included in vegetation mapping undertaken by Landmark Ecological Services 2011 and 2019.

Appendix 3 Listed key threatening processes

Table A7 below lists the 35 key threatening processes (KTPs) that are known or predicted to occur in the Lismore LGA. Where KTPs are common to both the EPBC Act and the BC Act but have slightly different wording, the wording used below follows the state legislation.

Table A7. Key threatening processes that are known or predicted to occur in the Lismore LGA

	Key threatening process	BC Act	EPBC Act
1.	**Aggressive exclusion of birds from woodland and forest habitat by abundant Noisy Miners**, *Manorina melanocephala*	✓	✓
2.	**Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands**	✓	
3.	**Anthropogenic Climate Change**	✓	✓
4.	**Bushrock removal**	✓	
5.	**Clearing of native vegetation**	✓	✓
6.	**Competition and grazing by the feral European Rabbit** *Oryctolagus cuniculus* **(L.)**	✓	✓
7.	**Competition and habitat degradation by Feral Goats** *Capra hircus* **Linnaeus 1758**	✓	✓
8.	**Competition from feral honey bees,** *Apis mellifera* **L.**	✓	
9.	**Forest eucalypt dieback associated with over-abundant** *psyllids* **and Bell Miners**	✓	
10.	**Herbivory and environmental degradation caused by feral deer**	✓	
11.	**High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition**	✓	
12.	**Importation of Red Imported Fire Ants** *Solenopsis invicta* **Buren 1972**	✓	✓
13.	**Infection by *Psittacine Circoviral* (beak and feather) Disease affecting endangered** psittacine **species and populations**	✓	✓
14.	**Infection of frogs by amphibian chytrid causing the disease** *chytridiomycosis*	✓	✓
15.	**Infection of native plants by** *Phytophthora cinnamomi*	✓	✓
16.	**Introduction and establishment of Exotic Rust Fungi of the order** *Pucciniales* **pathogenic on plants of the family *Myrtaceae***	✓	
17.	**Introduction of the Large Earth Bumblebee** *Bombus terrestris* ***(L.)***	✓	
18.	**Invasion and establishment of exotic vines and scramblers**	✓	
19.	**Invasion and establishment of Scotch Broom *(Cytisus scoparius)***	✓	
20.	**Invasion and establishment of the cane toad (***Bufo marinus***)**	✓	✓
21.	**Invasion of native plant communities by African Olive** *Olea europaea* ***subsp.*** *cuspidata* (Wall. ex G. Don) Cif.	✓	
22.	**Invasion, establishment and spread of (***Lantana camara* ***L. sens. Lat)***	✓	
23.	**Invasion of native plant communities by** *Chrysanthemoides monilifera*	✓	
24.	**Invasion of native plant communities by exotic perennial grasses**	✓	✓
25.	**Invasion of the Yellow Crazy Ant,** *Anoplolepis gracilipes* **(Fr. Smith) into NSW**	✓	
26.	**Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants**	✓	✓
27.	**Loss of Hollow-bearing Trees**	✓	
28.	**Loss or degradation (or both) of sites used for hill-topping by butterflies**	✓	
29.	**Predation by *Gambusia holbrooki* Girard, 1859 (Plague Minnow or Mosquito Fish)**		✓
30.	**Predation and hybridisation of Feral Dogs** *Canis lupus familiaris*	✓	
31.	**Predation by the European Red Fox** *Vulpes vulpes* **(Linnaeus, 1758)**	✓	
32.	**Predation by the Feral Cat** *Felis catus* **(Linnaeus, 1758)**	✓	✓
33.	**Predation, habitat degradation, competition and disease transmission by Feral Pigs,** *Sus scrofa* **Linnaeus 1758**	✓	✓
34.	**Removal of dead wood and dead trees**	✓	
35.	**Novel biota and their impact on biodiversity**		✓

Appendix 4 Performance indicators

Table A8 contains 10 performance indicators that were developed with the original BMS. Note that these indicators will be refined over time to ensure delivery of BMS actions can be measured for success and that individual BMS projects/actions will also be developed with their own measurable outputs.

Table A8. BMS performance indicators

	Performance Indicators
1.	Projects delivered under the BMS have measurable indicators of success including, but not limited to: hectares of priority areas regenerated and revegetated; kilometres of riverbank protected; area of HCV areas restored and protected.
2.	Council has signed agreements with a minimum of 25 landholders per annum to engage in the Rural Landholder Initiative (RLI).
3.	Annual surveys show a minimum of 80% satisfaction by RLI participants with the program's delivery.
4.	80% of attendees to selected education programs are satisfied
5.	Each year Council has a minimum of 5 active partnerships with relevant stakeholder groups, including community conservation groups and industry groups.
6.	Once a Biodiversity Development Control Plan is in place, there are no examples of relevant development applications not being assessed for impacts on biodiversity.
7.	Council delivers all outstanding KPoM actions within 2 years (aside from ongoing actions).
8.	All ongoing actions in the KPoM and CZMP are carried out.
9.	Riparian areas on the western side of the Wilsons River, between the two bridges are regenerated and restored within 10 years.
10.	An annual random surveys of rate payers and residents identifies an increased awareness of BMS related actions.