Kempsey Shire Biodiversity Strategy 2022

Vision

Manage biodiversity values in Kempsey Shire for current and future generations

KEMPSEY Shire Council

FUTURE Environment

Kempsey Shire Council acknowledges the land of the Thunggutti/Dunghutti Nation.
We pay respect to Elders past and present.
We acknowledge the role of emerging leaders to continue to guide us in the future.
We acknowledge the Stolen Generations and the need to change practices to be inclusive.
This land always was and always will be Thunggutti/Dunghutti land.

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1. Introduction

1.1 What is biodiversity?

'Biological diversity' (or 'biodiversity') is the variety of all life forms on Earth and can be explored at three levels: genetic diversity, species diversity and ecosystem diversity.

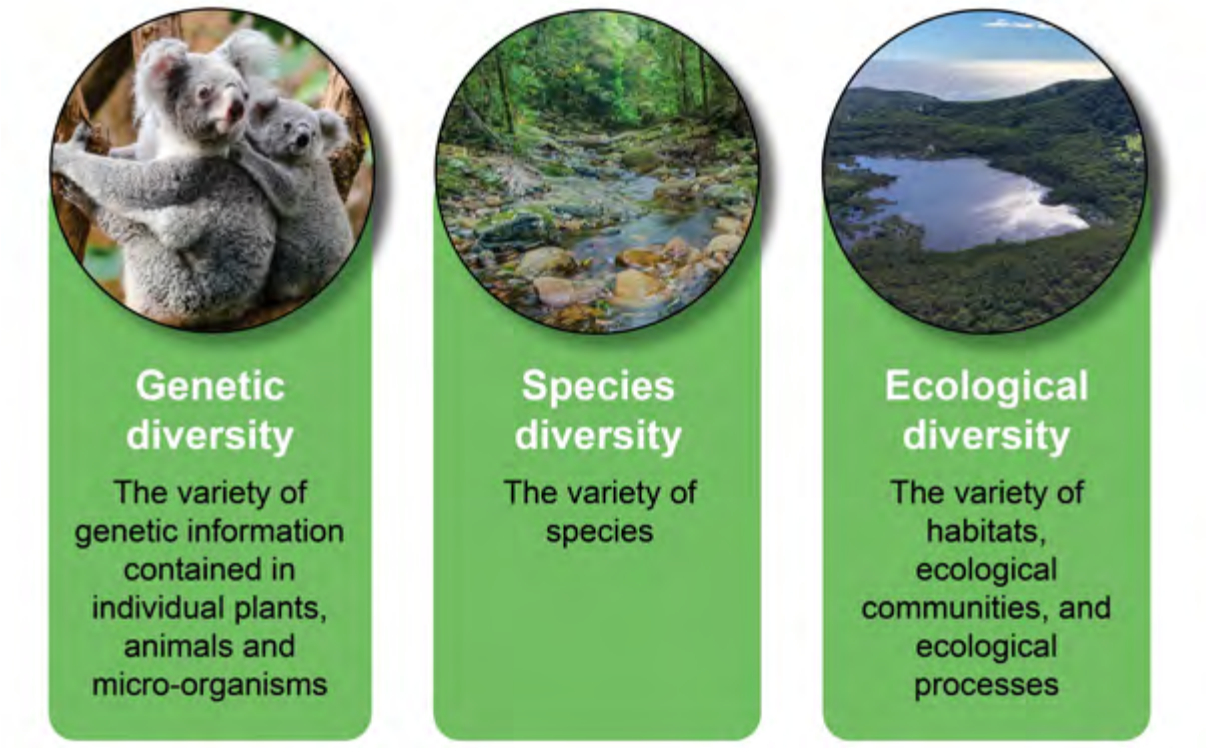


Figure 1: Three levels of biodiversity

Biodiversity occurs in all terrestrial, aquatic and marine environments on Earth. Biodiversity is dynamic and constantly changing. Biodiversity can increase through genetic change and evolutionary processes; or decrease in response to key threats such as habitat loss and/or change, invasive species and diseases.

1.2 Why is biodiversity important?

Biodiversity is important to all species (including humans) because we depend on the biological life support systems that different types of ecosystems provide. Ecosystems with high biodiversity can process nutrients faster and more consistently. Biodiversity improves the functioning of ecosystems which in turn provides humans with four types of services known as 'ecosystem services' (Bouma & Van Beukering 2015) that support healthy lives.

Biodiversity creates healthy ecosystems which improves human well being

(Bouma & Van Beukering 2015)

The four types of ecosystem services[1] are:

- **Provisioning** services are products we receive from the environment, for example, food, fresh water, biofuels, wood and fibre.
- **Regulating** services are services that regulate the environment, for example, climate control, flood control, disease control and water purification.
- **Cultural** services are non-material benefits we receive from the environment, for example, recreation, aesthetic, spiritual and educational values and benefits.
- **Supporting** services are services necessary to produce all other ecosystem services, for example, genetic diversity, soil formation, nutrient recycling.

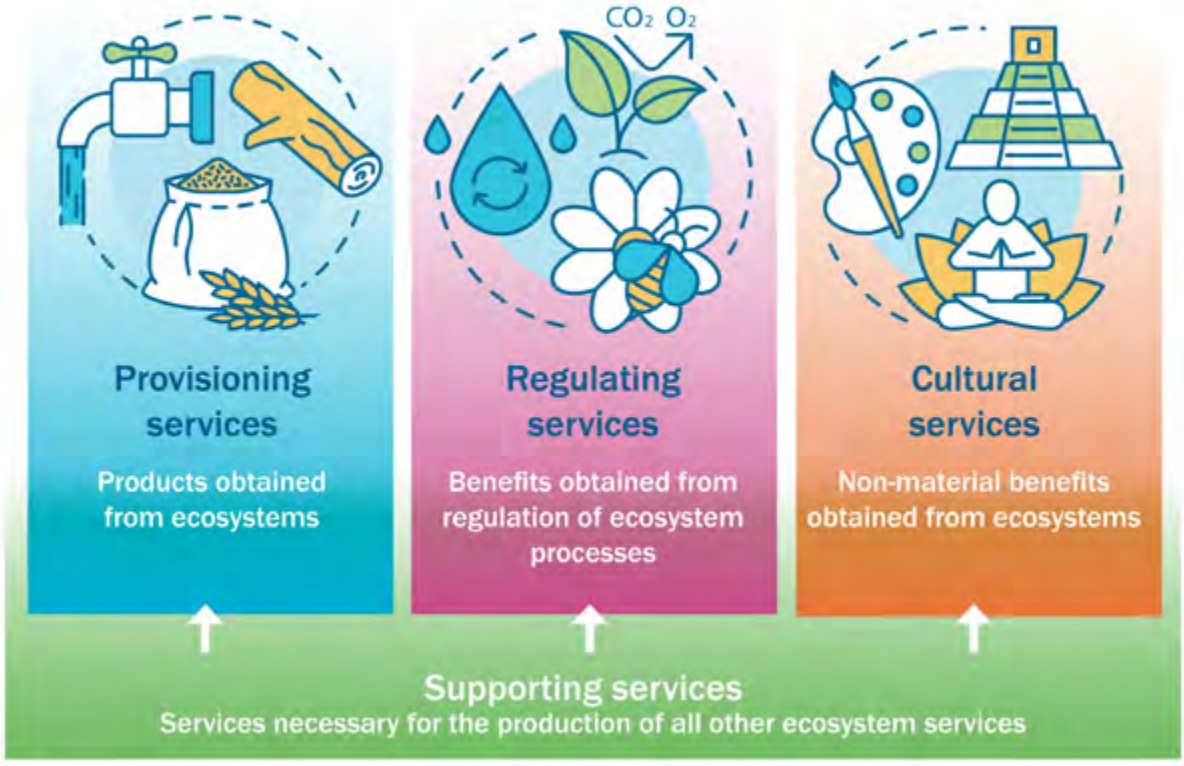


Figure 2: Four types of ecosystem services

1 The four types of ecosystem services used in this Biodiversity Strategy were originally defined in Millennium Ecosystem Assessment (2005, p.40).

1.3 What is a biodiversity strategy?

A biodiversity strategy is a document that:

- identifies the biodiversity values found in a particular area
- describes the key threats to those biodiversity values
- outlines a range of priorities and actions to protect those biodiversity values.

This *Kempsey Shire Biodiversity Strategy 2022* aims to balance the ecological needs of the natural environment and the preferences of the community with Kempsey Shire Council's jurisdictional capabilities and resources to provide strategic delivery of environmental management activities in the Kempsey Local Government Area (LGA).

The Biodiversity Strategy describes Council's vision, objectives, priorities and actions for managing biodiversity across the Kempsey Shire. While Council has obligations to comply with all legislation requirements, several key pieces of biodiversity legislation and policies (from local to international level) have influenced the development of this Biodiversity Strategy and are illustrated in Figure 3.

Key legislation

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* is the key legislation for environmental protection and biodiversity conservation at a national scale. The Act lists the triggers for significant impacts to endangered and threatened communities.

The NSW *Environmental Planning and Assessment Act 1979* is the principal planning legislation which provides a framework for environmental planning and assessment of development proposals across the State. The Environmental Planning and Assessment Act provides for the development of environmental planning instruments such as the *Kempsey Local Environmental Plan 2013*.

The NSW *Biodiversity Conservation Act 2016* outlines the requirement for local government authorities to consider the potential impact of activities on threatened species, populations and communities in implementing their statutory responsibilities under the Environmental Planning and Assessment Act.

Regional planning context

The NSW Government has developed the *North Coast Regional Plan 2036* which includes the following directions under 'Goal 1: The most stunning environment in NSW', relevant to this Strategy:

- Direction 1: Deliver environmentally sustainable growth.
- Direction 2: Enhance biodiversity, coastal and aquatic habitats, and water catchments.

Figure 3: Kempsey Shire Council's environmental planning framework

Local planning context

Council developed the *Macleay Valley 2036: Community Strategic Plan* (Community Strategic Plan) for the Shire in 2017. The plan identified four themes in response to priorities identified by the community. The key theme of 'Being healthy' outlines strategies to retain or improve health, including the following two which are relevant to this Strategy:

- Restore damaged environments and removal of environmental threats (HS-03).
- Use planning controls to ensure that environmental impacts do not negatively affect lifestyle (HS-04).

Council developed the *Local Strategic Planning Statement* for the Shire in 2020 which identified four themes in response to priorities identified by the community. 'Theme 1: Healthy Environment' outlines the following planning priority and action which are relevant to this Strategy:

- Planning priority H1: Deliver growth that does not compromise the Shire's rich biodiversity.
    - Action H1.2: Prepare a Biodiversity Strategy for the Shire.

1.4 Vision of the Kempsey Shire Biodiversity Strategy 2022

The vision for this Biodiversity Strategy is:

Manage biodiversity values in Kempsey Shire for current and future generations.

This vision is consistent with the Community's Vision for Kempsey Shire identified in the Community Strategic Plan.

1.5 Scope of the Biodiversity Strategy

Determining the scope of the Biodiversity Strategy was a vital step in the planning process.

To be effective, strategies must be realistic and achievable, which means including the most relevant issues. But this also means leaving some issues out. See Figure 4.

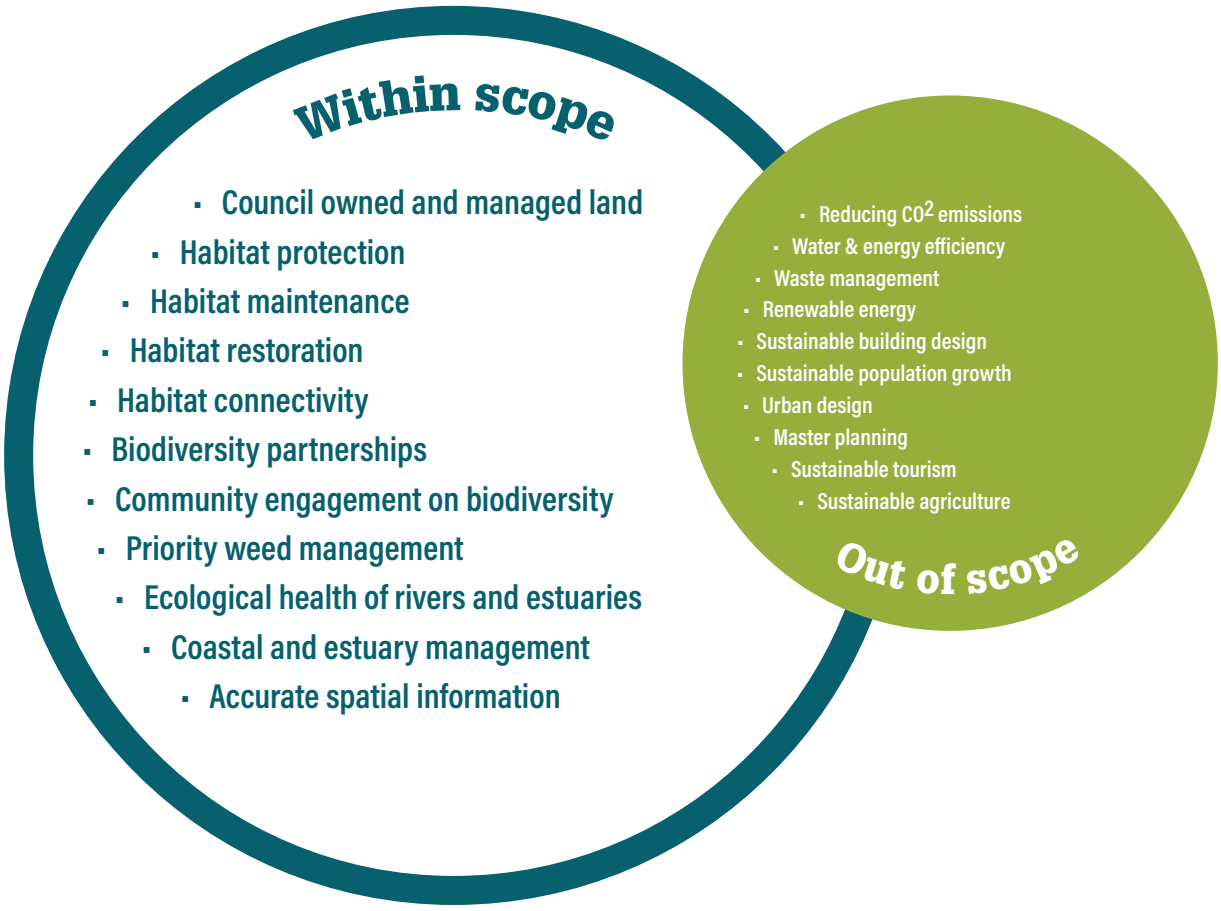


Figure 4: The scope of the Biodiversity Strategy

The issues that are out of scope of this Strategy have not been excluded because they are less important, but because they are central to other Council strategies, programs or plans (or those currently in development).

Key existing strategies include:

- *Long-term Renewable Energy and Water Strategy* (2020)
- *Kempsey Waste and Education Management Strategy* (2015).

Key existing strategies, plans and programs under revision include:

- *Macleay Valley 2036 Community Strategic Plan* (2017)
- *Local Growth Management Strategy* (2010).

Key strategies currently in development:

- Reconciliation Action Plan
- Agribusiness Industry Plan
- Sustainability and Resilience Strategy.

Local development that results in the loss of native vegetation is regulated by NSW planning and environmental legislation. Strategic plans which identify where it is appropriate for new housing and development to be located are developed by both the NSW Government and local government, for example, the *North Coast Regional Plan 2036* and the *Future Macleay Growth and Character Local Strategic Planning Statement.*

The Biodiversity Strategy will have input into future land-use planning within Kempsey Shire, including the Local Strategic Planning Statement, Local Growth Management Strategy, future structure plans, development control plans, and revisions to the *Kempsey Local Environmental Plan 2013* and the *Kempsey Development Control Plan 2013.* In the short-term (1–2 years), the Biodiversity Strategy will have input into:

- Local Growth Management Strategy
- Structure Plan and Development Control Plan for South West Rocks.

These strategic plans and their implications for development continue to be revised in response to legislative changes and population growth through collaborative engagement with the community and stakeholders.

1.6 Purpose of the Biodiversity Strategy

The purpose of this Biodiversity Strategy is to ensure that the management of biodiversity in the Kempsey Shire allows for population growth while protecting, maintaining, restoring and connecting the rich biodiversity of our area for current and future generations. Critically, this Strategy builds our foundational knowledge of biodiversity values in Kempsey Shire and identifies the threats to those biodiversity values. Building our foundational knowledge will help inform other Council strategies around land-use planning, specifically the Local Growth Management Strategy.

This Strategy sets a clear direction for managing biodiversity in Kempsey Shire and demonstrates how Council will contribute to achieving our Community's Vision:

We live in a community that provides opportunity to all, to prosper in an environment that supports well-being, connectedness and access to resources the community wants and needs

(Community Strategic Plan 2017, p.5).

1.7 Who is the Biodiversity Strategy for?

This Biodiversity Strategy is for all individuals living, working or visiting Kempsey Shire. As biodiversity plays a key role in the wellbeing of our community, this Strategy is intended for:

- the people of Kempsey Shire
- private land managers
- Council staff and Councillors
- government and non-government agencies.

It is important to note that some impacts on biodiversity values in Kempsey Shire are outside the control of Council. This will depend on the scope, scale and significance of the impact, jurisdictional boundaries and/or Council's financial restrictions. Council will, however, work towards the objectives of the themes described in this Strategy to support our community and other sectors to work together on impacts outside of Council's control.

In addition, while the Biodiversity Strategy focuses on Kempsey Shire, it takes into consideration the wider regional context of neighbouring LGAs (such as Nambucca Shire Council, Bellingen Shire Council and Port Macquarie-Hastings Council), the broader Macleay catchment area, as well as the biodiversity requirements of the NSW Government and the Commonwealth Government.

1.8 How was the Biodiversity Strategy developed?

This Biodiversity Strategy was developed in consultation with the following:

1. Natural Resource Consultative Group (NRCG[2]) and an established expert panel through presentations and dedicated workshops in March and April 2019.
2. The Kempsey community via a dedicated 'Your Say Macleay' online platform (https://yoursay.macleay.nsw.gov.au/biodiversity-strategy) and online survey during May and June 2019, which included a discussion paper and background information on the biodiversity found in the Shire. The online platform had 239 visits and 48 individuals participated in the online survey.
3. Various government departments and community organisations[3] via written request during May and June 2019, which included a discussion paper and background information on the biodiversity found in Kempsey Shire.

The results of the community survey and government department submissions were taken into consideration when developing the Biodiversity Strategy.

2 The Natural Resources Consultative Group was established as per legislative requirements during the development of Council's Coastal Management Plan. In 2019, membership included the Department of Planning, Industry and Environment (DPIE), National Parks and Wildlife Service (NPWS), Department of Primary Industries (Fisheries), North Coast Local Land Services (LLS), Kempsey Local Aboriginal Land Council (LALC), Roads and Maritime Service and Macleay Landcare Network.

3 Roads and Maritime Services NSW, DPIE, NPWS, Kempsey LALC, Macleay Landcare Network, Department of Primary Industry (Lands and Water) and North Coast LLS.

2. Our biodiversity values

2.1 Threatened species and ecological communities

Kempsey Shire encompasses 337,070 hectares in the Mid North Coast region of New South Wales. Due to its location, size and topography, Kempsey Shire spans both subtropical and temperate climatic zones, and this influences the unique flora and fauna that are found here.

The Shire's distinct and diverse biodiversity contains over 2,500 plant and animal species with 240 of these species currently identified as threatened with extinction. This includes 14 threatened ecological communities, 72 threatened flora species and 152 threatened fauna species listed under the Biodiversity Conservation Act and/or the Environment Protection and Biodiversity Conservation Act; as well as two threatened fauna species listed under the Fisheries Management Act 1994 (see Appendix 1).

2.2 Vegetation and land use

Over 260,000 hectares of Kempsey Shire is covered by native vegetation. A wide range of broad vegetation formations (as described by Keith 2004) are represented in the Shire, with Dry Sclerophyll Shrub/Grass Forests (69,508 hectares) being the most extensive, followed by Wet Sclerophyll Shrub Forests (66,835 hectares) and Rainforests (63,365 hectares). Combined, these three formations make up about three-quarters of the native vegetation in the Kempsey Shire. See Table 1.

Table 1: Vegetation formations in Kempsey Shire

Keith vegetation formation	Area (ha)	% of total
Dry Sclerophyll Shrub/Grass Forests	69,508	27
Wet Sclerophyll Shrub Forests	66,835	26
Rainforests	63,365	24
Swamp Sclerophyll Forests	23,940	9
Wet Sclerophyll Grass Forests	15,015	6
Freshwater Wetlands	7,792	3
Dry Sclerophyll Shrub Forests	7,737	3
Heathlands	3,699	1
Estuarine and Saline Wetlands	1,438	<1
Wet Sclerophyll Forests	1,261	<1
Sclerophyll Grassy Woodlands	612	<1
Grasslands	26	<1
Total vegetation	261,228	100

Source: Keith (2004).

In terms of 'woody vegetation', approximately 135,255 hectares of woody vegetation occurs on privately owned land, and the total area of cleared land in the Shire has been estimated to be 70,047 hectares. Around 99,518 hectares are within National Parks and Wildlife Service (NPWS) estate and 30,894 hectares in state forest, with the combined area covering about 40% of Kempsey Shire.

Table 2: Vegetation and tenure coverage across the Kempsey Shire

Vegetation coverage	Hectares	% of total
Private land – with woody vegetation cover	133,999	39.75
Private land – estimated cleared area	70,047	20.78
NPWS estate	99,518	29.52
State forests	30,894	9.17
Biodiversity Conservation Trust conservation agreements	2,612	0.77
Total Shire area	337,070	100

NOTE: Figures in this table are based on 2021 data.

The biodiversity values of Kempsey Shire are heavily influenced by three distinct landscape units which are based on different biophysical characteristics and geographic position (see Figure 5). From west to east, these landscape units are:

- Escarpment Ranges, covering 166,240 hectares or 49% of the Shire
- Midland Hills, covering 101,100 hectares or 30% of the Shire
- Coastal Plains, covering 70,000 hectares or 21% of the Shire.

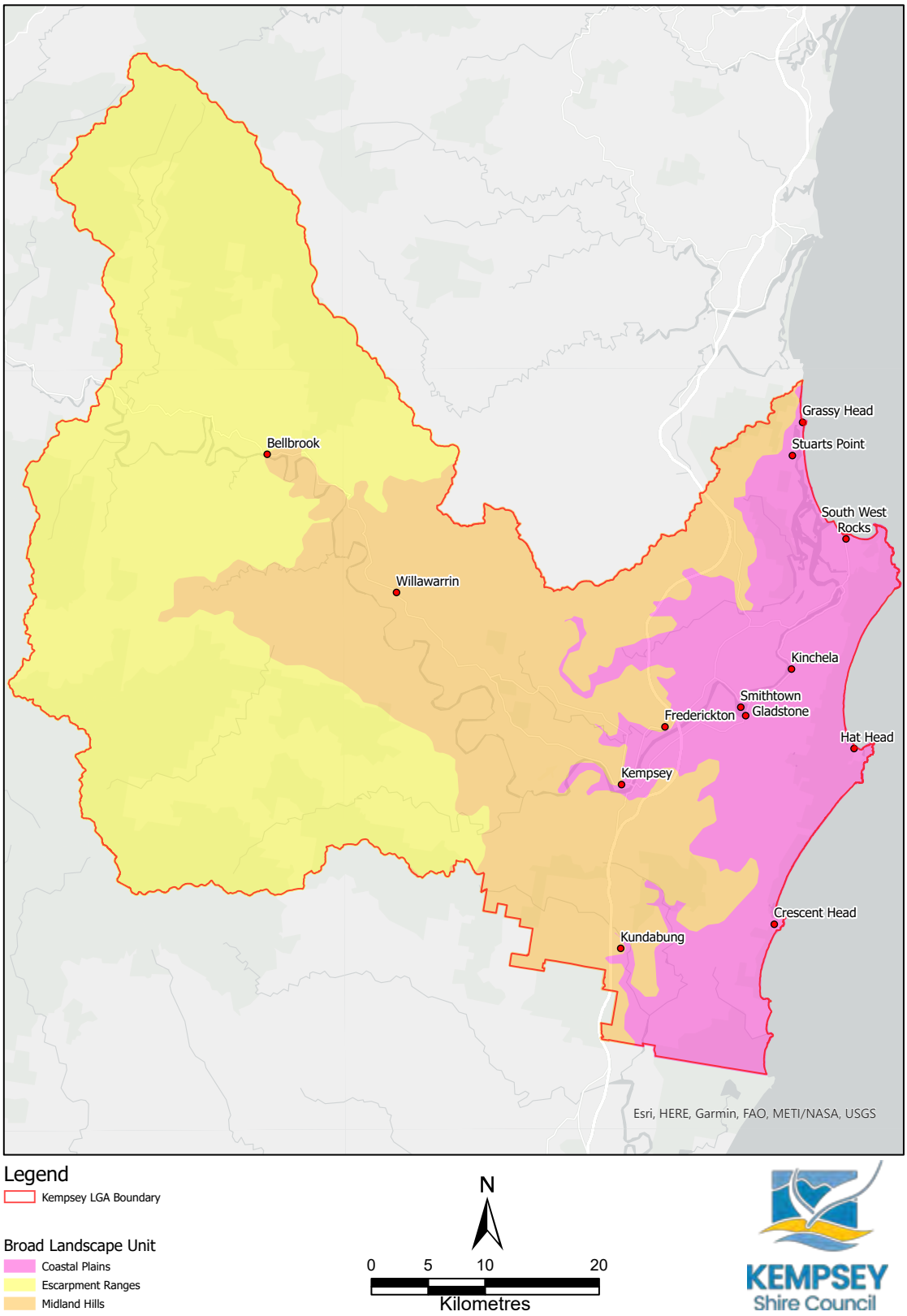


Figure 5: Landscape units in Kempsey Shire

Viewing the Shire as three distinct landscape units provides an overview of the conservation status, land uses and estimated clearing rates across different parts of the Shire (Table 3 and Figure 6). Factors that have influenced the current status include historic land clearing activities, settlement patterns, current population and development pressures, topography and climate as well as the distribution of public lands.

Table 3: Vegetation and tenure coverage across landscape units

Vegetation and tenure	Escarpment Ranges		Midland Hills		Coastal Plains		Total
	ha	%	ha	%	ha	%	
NPWS estate	79,328	48	5,720	6	14,470	22	**99,518**
State forest	9,160	5	16,429	16	5,305	8	**30,894**
Private land – with woody vegetation cover	61,087	37	51,918	50	23,605	36	**136,610**
Private land – estimated cleared area	17,430	10	29,920	29	22,697	34	**70,047**
Total	**167,005**	**100**	**103,987**	**100**	**66,077**	**100**	**337,070**

NOTE: Figures in this table are based on 2016 data.

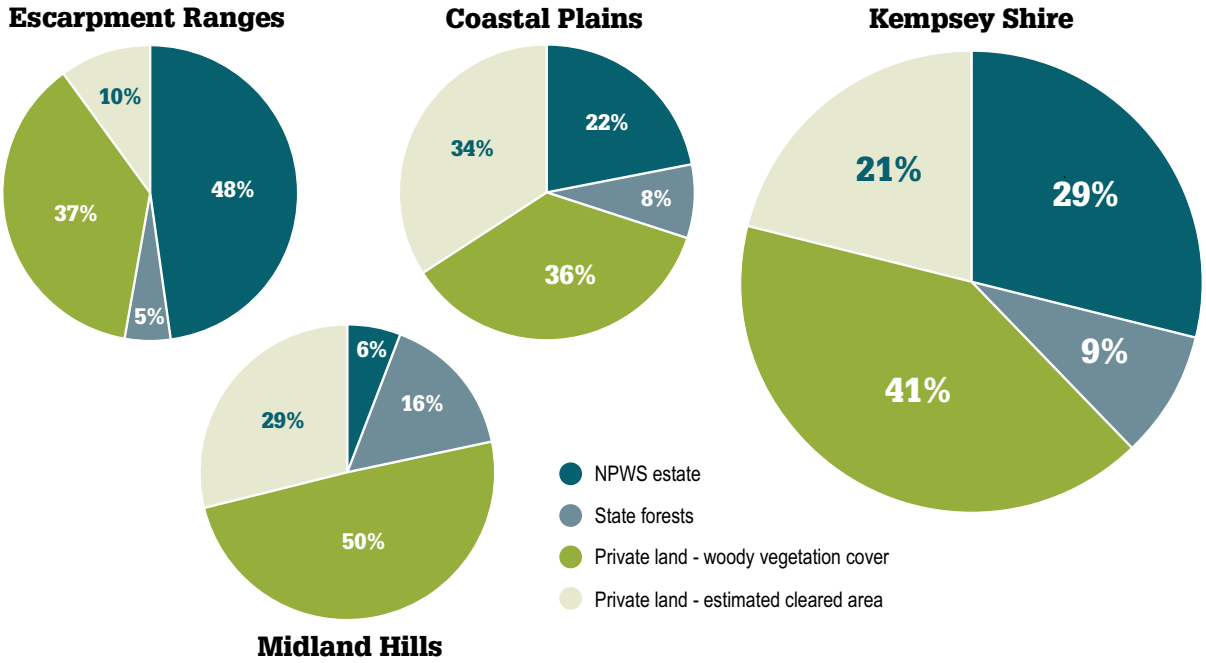


Figure 6: Charts showing vegetation and tenure coverage across landscape units

While there are a range of land-use and land management classes across Kempsey (see Figure 7), the Shire is dominated by four:

1) NPWS estate (managed by NPWS)
2) state forests (managed by Forestry Corporation of NSW)
3) grazing and cropping lands
4) tree and shrub cover.

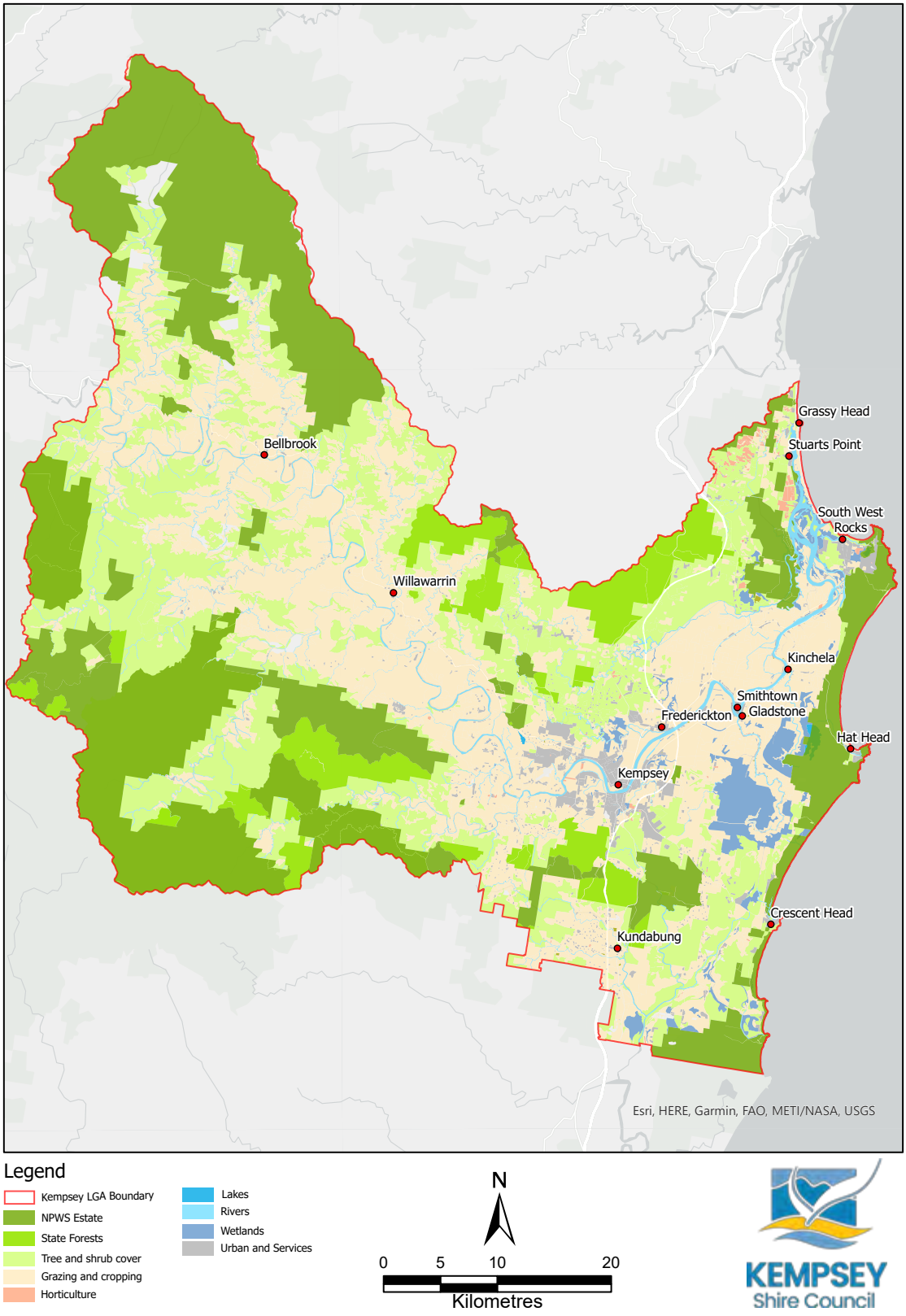


Figure 7: Land-use and management classes across Kempsey Shire

'Conservation land' (i.e. NPWS estate and state forests) accounts for around 39% of the Shire. Grazing tends to occur on the flatter parts of the Coastal Plains and the central parts of the Midland Hills and Escarpment Ranges and along major floodplains. Tree and shrub cover, a land management class, predominantly occurs on the fringes of the Midland Hills and Escarpment Ranges.

The dominant land use in the Escarpment Ranges is conservation land. This land use accounts for around 88,000 hectares or 53% of the landscape unit. The two largest national parks in this landscape are New England National Park and Willi Willi National Park. Grazing is also a significant activity in the Escarpment Ranges, occurring on just over 50,000 hectares or around 30% of the landscape.

The main land use in the Midland Hills is grazing, accounting for just over 48,000 hectares or 48% of the landscape unit. A further 21,500 hectares or 21% is identified as tree and shrub cover which is often used for grazing activities, but has higher woody vegetation cover than land identified as grazing land use.

Most of the Coastal Plains landscape is privately owned, accounting for approximately 51,000 hectares or 73% of the total area. More than half of this, approximately 27,500 hectares, is classified as grazing land use. Conservation land accounts for around 19,775 hectares or 30% of the Coastal Plains, with the bulk of national park area occurring along the coastal margins. At 7,397 hectares, Hat Head National Park is the largest national park in the Coastal Plains landscape. Other sizeable national park areas are Yarrahapinni Wetlands National Park (1,300 hectares) and Limeburners Creek National Park (around 2,800 hectares). An estimated 75% of the linear coastal portion in the Kempsey Shire is NPWS estate. Crown reserve land occupies an area of around 4,715 hectares or approximately 7% of the Coastal Plains landscape unit. State forests occupy an area of 5,305 hectares or approximately 8% of the Coastal Plains.

Fragmentation and vegetation disturbance is higher in the Coastal Plains and Midland Hills landscapes where rural agriculture is concentrated. Across all landscape units, the estimated area of cleared land is over 70,000 hectares or just under 21% of Kempsey Shire.

3. Threats to our biodiversity values

There are three major threats to our biodiversity values in Kempsey Shire:

1. habitat loss or change
2. weed invasion
3. pest animals.

Each type of threat is a result of a combination of key threatening processes (or threat activities). A number of key threatening processes that threaten existing biodiversity values have been identified as occurring in Kempsey Shire, including 35 of the 39 key threatening processes listed under the NSW Biodiversity Conservation Act.

At a broader, bioregional level, 14 of the 21 key threatening processes listed under the Environment Protection and Biodiversity Conservation Act occur in the Macleay-Hastings IBRA[4] Bioregion, which encompasses Kempsey Shire. Appendix 2 lists these key threatening processes.

The key threatening processes impacting biodiversity in Kempsey Shire are characteristic of the competing land uses and population growth seen throughout the broader North Coast region. The demand for development, particularly along the coast, causes subsequent pressure on our biodiversity values as a result of land clearing for residential and rural-residential developments. Land clearing and modification for rural activities, including agriculture (primarily cattle grazing) also put pressure on our biodiversity values.

Appendix 2 presents a risk profile of the key threatening processes in Kempsey Shire across the three landscape units: Escarpment Ranges, Midland Hills and Coastal Plains. Habitat loss/change has been identified as a high risk threat to biodiversity values across Kempsey Shire.

The top three key threatening process in the Shire are:

1. clearing of native vegetation
2. loss of hollow-bearing trees
3. anthropogenic (human-caused) climate change.

4 The Interim Biogeographic Regionalisation for Australia (IBRA) was developed by Thackway and Cresswell (1995) as a key tool for identifying land for conservation (Department of Agriculture, Water and Environment 2021).

4. What can we do?

4.1 Contribute to building resilient ecosystems in our Shire

Council's response to address the key threats to biodiversity values in Kempsey Shire is to contribute to building resilient ecosystems. Resilience is the key to sustaining ecosystem services (DEWHA 2009, p.6).

Resilient ecosystems have the capacity to withstand natural and/or human-induced impacts and still maintain their core function, structure and feedbacks (Fischer et al. 2006). Modified ecosystems tend to have less complex ecological structures than ecosystems that have not been modified. As a result, modified ecosystems have an increased risk of collapse when faced with external pressures, such as variations in climate, when compared to more complex ecosystems (Fischer et al. 2006).

While collectively the threats to biodiversity values can appear overwhelming and beyond our individual or organisational control, together we can contribute to building the resilience of ecosystems in our Shire. Council staff and Councillors, residents of the Shire and visitors to our Shire can all play a role.

Four key concepts underpin this Biodiversity Strategy and will guide how we will contribute to building resilient ecosystems in our Shire.

Habitat protection

The protection of existing habitat is essential to reduce key threats to biodiversity values in Kempsey Shire. To ensure the protection of existing habitat, any development and/or maintenance of infrastructure on Council owned or managed land and proposed development on private land will be undertaken in accordance with the mitigation hierarchy shown in Figure 8. Where possible, development and/or maintenance activities should be designed and constructed, in order of preference, to:

1. avoid change to, or loss of, habitat
2. minimise change to, or loss of, habitat
3. mitigate change to, or loss of, habitat.

Only as a last resort, should the offsetting of change to or loss of habitat be considered.

Figure 8: The mitigation hierarchy

Habitat restoration

The restoration of habitat is needed to improve the health of habitats that are in decline due to past changes or loss. Habitat restoration provides suitable environments and resources for specific species or groups of species that are in decline. With careful planning, habitats on appropriate sites can be restored, maintained and enhanced. Habitat restoration aims to identify habitats that are in decline and restore the native flora and fauna that occur there to a healthy state.

Habitat connectivity

Habitat connectivity (achieved through biodiversity corridors or ecological corridors) ensures that important areas of habitat are connected, allowing a variety of organisms (and their genes) to move across the landscape. Areas of connection vary in size and scale across the landscape and centre around core habitats (or refugia). Core habitats can be linked through patches of vegetation, smaller patches known as 'stepping stones', or larger corridors.

Habitat connections, or corridors, occur within and across different land tenures, from protected conservation areas to private land. Different species of plants and animals have different requirements and abilities to move within and through different parts of the landscape.

Community engagement

This Biodiversity Strategy recognises the value of the natural environment to our community and the importance of engaging with our community on biodiversity management in the Shire. As captured in the Community Strategic Plan in 2017, our community values 'Being healthy' which was identified as 'living in a healthy environment' and 'the environment being in a healthy state' (Community Strategic Plan, 2017, p.7). In 2020, a community survey ranked the 'natural environment' as our community's most valued aspect of living in Kempsey Shire (Micromex Survey 2020).

This Biodiversity Strategy also acknowledges the important role our community continues to play in managing biodiversity, through sharing their extensive knowledge and working to protect our biodiversity from key threats.

The role of Kempsey Shire Council

Council has a key role to play in contributing to building resilient ecosystems in our Shire through several management tools available under regulatory and non-regulatory functions. Regulatory functions form part of Council's operational requirements and include legislation that seeks to ensure the protection of environmental values. This legislation guides Council through the regulatory role in biodiversity conservation with land-use planning, zoning and the development approval processes. Through this legislation, Council is required to ensure that the environment is properly managed, developed, protected, restored, enhanced and conserved in the areas of Council's responsibility.

There are several non-regulatory functions available to Council to implement biodiversity initiatives. However, these functions generally fall outside Council's operational budgets. This means Council requires external funding support to undertake these non-regulatory functions. For each of the actions identified in this Strategy, Council will consider which function will be most appropriate to achieve our objectives.

4.2 Themes and biodiversity priorities

The practical steps which will deliver on the vision of the Biodiversity Strategy are structured under five key themes drawn from key biodiversity concepts (Figure 9).

Figure 9: Five key themes of the Biodiversity Strategy

The objectives of the five themes are:

- Theme 1: To PROTECT biodiversity values in Kempsey Shire through land-use planning, development controls, zoning and development assessment processes.
- Theme 2: To MAINTAIN biodiversity values in Kempsey Shire through operational planning, strategies, plans and programs.
- Theme 3: To RESTORE biodiversity values in Kempsey Shire through operational planning, strategies, plans and programs.
- Theme 4: To CONNECT biodiversity values in Kempsey Shire through supporting existing regional, state, federal and private biodiversity conservation programs.
- Theme 5: To ENGAGE with our community on biodiversity values and threats to those values in Kempsey Shire through targeted environmental management initiatives.

The five key themes are consistent with the planning priorities identified in the *North Coast Regional Plan 2036* as well as Council's Community Strategic Plan of 2017. The intent of the five key themes will be implemented through 12 **biodiversity priorities**. Each biodiversity priority will in turn have associated **actions** to ensure the objectives of each theme can be realised (see Section 5).

4.3 Funding the Strategy

Funding the Biodiversity Strategy will be in alignment with Council's Procurement Policy and the legislative framework proscribed by the *Local Government Act 1993* and Local Government (General) Regulation 2005.

It is important to note that while funding is not identified as an individual theme of the Biodiversity Strategy, it is essential to implement the actions identified for each of the biodiversity priorities in the five key themes. Successful implementation of the Biodiversity Strategy requires adequate financing. It is therefore imperative to consider how identified actions will be financed.

Council has several sources of revenue including rates, annual charges, user charges, fees, financial assistance grants, special purpose grants, developer contributions, borrowings and investment income. Council has identified the following financial sources to fund the biodiversity actions outlined in this Strategy:

1. Council's existing budget – general fund, environmental levy and developer contributions
2. grant funding – external funding sources from state and federal governments and public trusts
3. philanthropic endeavours – private funding sources.

The funding required to implement actions in this Strategy occur at three levels and are aligned with Council's Procurement Policy (see tables in Section 5):

- Low (less than $10,000)
- Medium ($10,000 to $50,000)
- High (greater than $50,000).

4.4 Timeframes for the Strategy

The timeframes identified in this Strategy to implement each of the actions align with Council's *Local Strategic Planning Statement* (see tables in Section 5):

- Short-term – 2 years
- Medium-term – 3 to 5 years
- Long-term – 10+ years
- Ongoing.

5. Implementation

The following section identifies Council's biodiversity priorities under each of the five key themes, along with actions Council will take, timeframes, funding required and potential funding sources to ensure that the identified goals are realised through the Biodiversity Strategy. The Biodiversity Strategy 2022 will be implemented via five key themes: Protect, Maintain, Restore, Connect and Engage. The objective of each theme will help to address the key threats to biodiversity in Kempsey Shire.

Figure 10: Stages of implementation of the Biodiversity Strategy

Actions from the Biodiversity Strategy will be integrated into Council's four-year delivery program and implemented via Council's annual Operational Plan. Considerations such as external funding opportunities, internal resourcing requirements, Council's priorities and biodiversity goals will help determine which actions are undertaken each year.

In the short-term (1–2 years), the priority plans to be reviewed or developed under this Strategy are:

- *Kempsey Comprehensive Koala Plan of Management* to be reviewed in accordance with *State Environmental Planning Policy (Koala Habitat Protection) 2021* (Action 1.2.2)
- a Natural Areas Management Plan for Council owned and managed land will be developed to identify and manage biodiversity values in the Shire (in line with Council's approved plans of management as required by the Local Government Act) (Action 1.3.1).

While several existing programs will be continued under this Strategy, in the short-term (1–2 years), the priority programs to be revised under this Strategy are:

- Council's Weed Management Program will be revised in accordance with *North Coast Regional Strategic Weed Management Plan* and the *NSW Biosecurity Act 2015* (Action 1.2.4)
- Council's Water Quality Monitoring Program for ecological health of rivers and estuaries will be reviewed (Action 2.1.2).

This Biodiversity Strategy will continue to be influenced by future studies, program development and delivery as the document continues to be implemented, reviewed and developed over time. It is anticipated that 80% of the actions will be completed within five years, with the Biodiversity Strategy to be reviewed every five years. Actions completed under the Biodiversity Strategy each year will be reported annually as part of Council's Annual Report, available on Council's publications webpage.

5.1 Theme 1 – Protect

Objective: To protect biodiversity values in Kempsey Shire through land-use planning, zoning and development assessment processes						
Priority 1.1 Biodiversity values and threats to those values are identified, and adequate spatial information is generated for use in future land-use planning						
ID	**Action**	**Deliverable**	**Threat addressed**	**Timeframe**	**Funding required**	**Funding source**
1.1.1	Update spatial mapping for the following environmental values in Kempsey LGA: • coastal wetlands and littoral rainforests area • plant community type (PCT) mapping in accordance with the NSW Department of Planning, Industry and Environment (DPIE) PCT classifications as revised in 2022 • threatened ecological communities (TEC) mapping in accordance with DPIE PCT classifications as revised in 2022	Environmental values spatial datasets for Kempsey LGA are updated in accordance with DPIE revised PCT classifications 2022	Habitat loss/ change	Short-term	High	Grant funding Environmental levy
1.1.2	Update spatial mapping of priority weed species in Kempsey LGA	Priority weed species spatial dataset(s) for Kempsey LGA are kept up to date	Habitat loss/ change	Ongoing	Medium	Grant funding Environmental Levy
1.1.3	Rezone high environmental value land in Kempsey LGA to Environmental Conservation (C2) or Environmental Management (C3), where possible, as part of rezoning requirements prior to development assessment processes	High environmental value land is identified from Action 1.1.1	Habitat loss/ change	Short-term	Medium	General fund Environmental levy
1.1.4	Encourage proponents of planning proposals to attend pre-lodgement meetings to ensure a clear understanding of Council's expectations for biodiversity management (as identified in Council Procedure 1.1.9 Rezoning applications[5])	Pre-lodgement meetings with proponents of planning proposals are continued to be promoted and undertaken	Habitat loss/ change	Ongoing	Low	General fund
1.1.5	Review and amend the Kempsey Development Control Plan (DCP) 2013 to support the protection of biodiversity values in Kempsey Shire	Chapter B10 of the Kempsey DCP 2013 is amended by June 2023	Habitat loss/ change	Medium-term	Medium	General fund

5 Council Procedure 1.1.9. Rezoning applications was adopted by Council in Feb 2016 http://www.kempsey.nsw.gov.au/corporate/policies/pubs/procedure-1-01-09-rezoning-applications.pdf

Objective: To protect biodiversity values in Kempsey Shire through land-use planning, zoning and development assessment processes

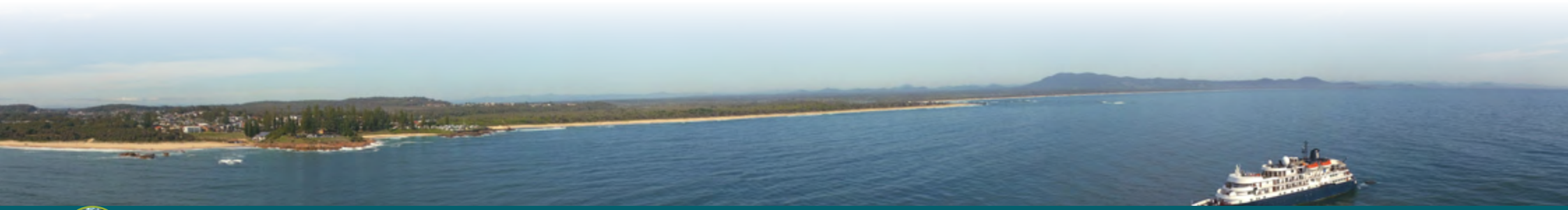
Priority 1.2 Biodiversity knowledge is adequate to support decision-making, conditions of consent and strategic planning

ID	Action	Deliverable	Threat addressed	Timeframe	Funding required	Funding source
1.2.1	Investigate incorporating the GapCloser connectivity mapping (carried out in 2016) into Council's strategic planning and land-use assessments	GapCloser procedure is developed and incorporated into Council's strategic land-use planning assessment	Habitat loss/ change	Short-term	Low	Grant funding Environmental levy
1.2.2	Review the Kempsey Comprehensive Koala Plan of Management (CKPoM) in accordance with *State Environmental Planning Policy (Koala Habitat Protection) 2021*	Revised CKPoM for Kempsey LGA finalised	Habitat loss/ change	Short-term	High	Environmental levy
1.2.3	Develop a Coastal Management Program (CMP) in accordance with the *State Environmental Planning Policy (Coastal Management) 2018*	Revised CMP for Kempsey LGA finalised	Habitat loss/ change	Medium-term	High	Grant funding Environmental levy
1.2.4	Revise the Weed Management Program (WMP) for Kempsey LGA in accordance with *North Coast Regional Strategic Weed Management Plan* and the NSW *Biosecurity Act 2015*	WMP for Kempsey LGA revised	Weeds	Short-term	Medium	Environmental levy

Priority 1.3 Protect biodiversity values on Council owned and managed public land

ID	Action	Deliverable	Threat addressed	Timeframe	Funding required	Funding source
1.3.1	Develop a Natural Areas Management Plan for Council owned and managed land to identify and manage biodiversity values in the Shire (in line with Council's approved plans of management as required by the Local Government Act).	Natural Areas Management Plan for Council owned and managed land	Habitat loss/ change	Short-term	High	Grant funding Environmental levy
1.3.2	Prepare a business case for Biodiversity Stewardship Sites on Council owned and managed public land	Present business case to Council for consideration	Habitat loss/ change	Short-term	Medium	Environmental Levy General funding

Objective: To protect biodiversity values in Kempsey Shire through land-use planning, zoning and development assessment processes						
1.3.3	Develop a Street Tree Policy for Kempsey Shire for Council owned and managed land to provide guidance for the care, control and management of trees in road reserves and public places.	Street Tree Policy for Kempsey Shire implemented	Habitat loss/ change Weeds	Medium-term	Low	Environmental levy
Priority 1.4 Encourage the protection of biodiversity values on private land						
ID	**Action**	**Deliverable**	**Threat addressed**	**Timeframe**	**Funding required**	**Funding source**
1.4.1	Encourage landholders to conserve biodiversity values on their land via the promotion of existing state, federal and private biodiversity conservation programs, including Biodiversity Conservation Trust conservation covenants, Conservation Agreement Program and Biodiversity Stewardship Agreement Program, and associated rate exemptions on land protected under eligible covenanting agreements as described under the Local Government Act	Existing state, federal and private biodiversity conservation programs are actively promoted by Council	Habitat loss/ change	Ongoing	Low	Environmental levy
1.4.2	Encourage landholders to identify and manage threats to biodiversity values on their land via the promotion of existing Council, state and federal programs, such as NSW Local Land Services' (LLS) Native Vegetation Management Advice and Approvals Framework, Future Ready Farms Program, Healthy Country Action Program and NSW Environmental Trust	Existing state and federal weed and vertebrate pest management programs are actively promoted by Council	Habitat loss/ change Weeds Pest animals	Ongoing	Low	Environmental levy



5.2 Theme 2 – Maintain

Objective: To maintain biodiversity values in Kempsey Shire through operational planning, strategies, plans and programs						
Priority 2.1 Maintain biodiversity values on Council owned and managed public land						
ID	**Action**	**Deliverable**	**Threat addressed**	**Timeframe**	**Funding required**	**Funding source**
2.1.1	Develop a Natural Areas Management Plan for Council owned and managed land that provides guiding information, strategies and management actions to protect, enhance and restore the biodiversity natural areas (in line with Council's approved plans of management as required by the Local Government Act)	Natural Areas Management Plan for Council owned and managed land developed	Habitat loss/ change Weeds Pest animals	Medium-term	High	Grant funding Environmental levy
2.1.2	Review Council's Water Quality Monitoring Program for ecological health of rivers and estuaries	Revised Water Quality Monitoring Program for ecological health of rivers and estuaries	Habitat loss/ change	Short-term	Medium	Environmental levy
2.1.3	Continue the annual maintenance program at Council-managed rehabilitation sites of Boyters Lane, Jerseyville and Gills Creek	Annual maintenance program at rehabilitation sites is continued in line with existing site management plans	Habitat loss/ change Weeds Pest animals	Ongoing	Medium	Environmental levy
2.1.4	Develop and implement vegetation management plans (VMPs) for bushland restoration on sites identified in the South West Rocks Contribution Plan	VMPs developed and implemented for sites identified in South West Rocks Contribution Plan	Habitat loss/ change Weeds	Short-term	Medium	South West Rocks Contribution Plan
2.1.5	Establish a weed removal program linked to the Street Tree Policy (see Action 1.3.2) on Council owned or managed land	High priority weed species on Council owned or managed land are progressively removed	Weeds	Medium-term	High	Environmental levy

Objective: To maintain biodiversity values in Kempsey Shire through operational planning, strategies, plans and programs						
Priority 2.2 Maintain biodiversity values on private land						
ID	**Action**	**Deliverable**	**Threat addressed**	**Timeframe**	**Funding required**	**Funding source**
2.2.1	Encourage landholders to restore biodiversity values on their land via the promotion of existing state, federal and private biodiversity conservation programs, including NSW Environmental Trust and NSW *Saving our Species* program	Existing state, federal and private biodiversity conservation programs are actively promoted by Council	Habitat loss/ change	Ongoing	Low	Environmental levy
2.2.2	Encourage landholders to manage threats to biodiversity values on their land via the promotion of existing Council, state and federal weed and vertebrate pest management programs such as LLS' Native Vegetation Management Advice and Approvals Framework, Biosecurity Plans, Future Ready Farms Program, Healthy Country Action Program and NSW Environmental Trust	Existing state, federal and private weed and vertebrate pest management programs are actively promoted by Council	Habitat loss/ change Weeds Pest animals	Ongoing	Low	Environmental levy

5.3 Theme 3 – Restore

Objective: To restore biodiversity values in Kempsey Shire through operational planning, strategies, plans and programs

Priority 3.1 Restore biodiversity values on Council owned and managed public land

ID	Action	Deliverable	Threat addressed	Timeframe	Funding required	Funding source
3.1.1	Implement site management plans to rehabilitate high priority rehabilitation sites identified in the Natural Areas Management Plan (see Action 2.1.1)	Rehabilitation Program for Kempsey Shire is developed and implemented progressively	Habitat loss/ change	Long-term	High	Grant funding Environmental levy
3.1.2	Continue rehabilitation of riparian vegetation at Council-managed Christmas Creek location	Rehabilitation works are implemented in accordance with rehabilitation management plan	Habitat loss/ change	Short-term	Low	Environmental levy
3.1.3	Continue to fund the annual Environmental Levy Grants to support volunteer environmental groups with environmental protection and restoration works on public land	Small community projects are funded though the annual Environmental Levy Grants in October–November	Habitat loss/ change Weeds Pest animals	Ongoing	Low	Environmental levy

Priority 3.2 Restore biodiversity values on private land

ID	Action	Deliverable	Threat Addressed	Timeframe	Funding Required	Funding Source
3.2.1	Encourage landholders to restore biodiversity values on their land via the promotion of existing state, federal and private biodiversity conservation programs, including NSW Environmental Trust and NSW *Saving our Species* program	Existing state, federal and private biodiversity conservation programs are actively promoted by Council	Habitat loss/ change	Ongoing	Low	Environmental levy
3.2.2	Encourage and support landholders in the area covered by the Kempsey CKPoM to plant Koala food tree species on their properties as part of the Koala Conservation Australia Inc.'s annual Koala Food Tree Giveaway	Local pick-up locations of seedlings for the annual Koala Food Tree Giveaway in March–April are promoted and coordinated each year	Habitat loss/ change	Ongoing	Low	Environmental levy
3.2.3	Encourage and support landholders in the Kempsey Shire to plant native garden species on their properties via an annual Native Garden Species Seedling Giveaway	An annual Native Garden Species Seedling Giveaway and guidebook is developed and promoted by Council	Weeds	Ongoing	Low	Environmental levy

5.4 Theme 4 – Connect

Objective: To connect biodiversity values in Kempsey Shire through supporting existing regional, state, federal and private biodiversity conservation programs						
Priority 4.1 Connect biodiversity values on Council owned and managed public land						
ID	**Action**	**Deliverable**	**Threat addressed**	**Timeframe**	**Funding required**	**Funding source**
4.1.1	Update Council's GapCloser connectivity mapping across the Kempsey LGA using revised multi-spectral imagery	GapCloser connectivity mapping spatial dataset in Kempsey LGA is updated and new connectivity mapping produced	Habitat loss/ change	Medium-term	High	Environmental levy
4.1.2	Continue to support the Biodiversity Stewardship Project which aims to investigate opportunities, costs, benefits and barriers for Mid-North Coast Joint Organisation (MNCJO) member Council's to participate in the NSW Biodiversity Offsets Scheme via the MNCJO	Membership on the Project Control Group for the Biodiversity Stewardship Project is continued (as agreed by the MNCJO)	Habitat loss/ change	Short-term	Low	Environmental levy
Priority 4.2 Connect biodiversity values on private land						
ID	**Action**	**Deliverable**	**Threat addressed**	**Timeframe**	**Required resources**	**Funding source**
4.2.1	Encourage landholders to connect biodiversity values on their land to neighbouring biodiversity values via the promotion of existing state, federal and private biodiversity conservation corridor programs, including LLS' Northern NSW Biodiverse Carbon Project, Biodiversity Conservation Trust private land conservation and the Great Eastern Ranges Initiative	Existing state, federal and private biodiversity conservation corridors programs are actively promoted by Council	Habitat loss/ change	Ongoing	Low	Environmental levy
4.2.2	Continue to support The Koala Recovery Partnership which aims to improve Koala conservation across the Hastings-Macleay Region via the MNCJO	Financially contribute and continue membership of The Koala Recovery Partnership (as agreed by the MNCJO)	Habitat loss/ change	Medium-term	Low	Environmental levy

5.5 Theme 5 – Engage

Objective: To engage with our community on biodiversity values and threats to those values in Kempsey Shire through targeted environmental management initiatives

Priority 5.1 Create community partnerships

ID	Action	Deliverable	Threat addressed	Timeframe	Required resources	Funding source
5.1.1	Establish new (and continue to support established) regional partnerships to leverage knowledge, experience and funding opportunities, such as Mid-North Coast Joint Organisation (MNCJO), Fire and Biodiversity Consortium (FABCON) and the Mid-North Coast Biodiversity Network	Regional partnerships for Council are supported and maintained	All	Ongoing	Low	Environmental levy
5.1.2	Continue to partner and support volunteer environmental groups with environmental protection, maintenance and restoration works on public land	A register of community-led projects in Kempsey Shire is established and maintained to seek future partnership opportunities	All	Ongoing	Medium	Grant funding Environmental levy
5.1.3	Investigate opportunities for research partnerships with universities undertaking biodiversity-related research in Kempsey Shire	Research partnerships with universities are established and maintained	All	Ongoing	Low	Grant funding Environmental levy
5.1.4	Engage with the development industry to improve biodiversity outcomes for the Kempsey Shire through the submission of quality development assessments (in addition to Action 1.1.4)	Quality development assessments are supported	All	Ongoing	Low	General funding

Priority 5.2 Promote community appreciation of biodiversity and participation in biodiversity protection in Kempsey Shire

ID	Action	Deliverable	Threat Addressed	Timeframe	Resources	Funding source
5.2.1	Establish online environmental webpages to promote biodiversity values, impacts and programs in the Shire	Online environmental webpages are revised and kept up to date	All	Short-term	Low	General fund

Objective: To engage with our community on biodiversity values and threats to those values in Kempsey Shire through targeted environmental management initiatives						
5.2.2	Support the Macleay Sustainable Schools' Network (MSSN) through the promotion of educators' toolkits related to biodiversity values, impacts to biodiversity and biodiversity programs in Kempsey Shire. Example toolkits include NSW Government Environmental Education – Sustainability Action Process, Sustainable Schools NSW: biodiversity and nature and WWF's Biodiversity Toolkit	A register of educators' toolkits related to biodiversity values in Kempsey Shire is established and kept up to date for dissemination to Sustainable Schools NSW	All	Ongoing	Low	Environmental levy
5.2.3	Establish a Cultural Connections Program that focuses on supporting the Thunggutti/Dunghutti community to record cultural connections related to biodiversity on Council owned and managed land	Scope the Cultural Connections Program in consultation with the Thunggutti/ Dunghutti community	All	Medium-term	Medium	General fund Grant funding Environmental levy

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- Key threatening processes www.environment.nsw.gov.au/topics/animals-and-plants/threatened-species/about-threatened-species/key-threatening-processes

Appendix 1: Biodiversity values in Kempsey Shire

Table A1-1: Threatened ecological communities in Kempsey Shire

Threatened ecological community	BC Act status	EPBC Act status	Escarpment Ranges	Midlands	Coastal
Coastal Saltmarsh in the NSW North Coast, Sydney Basin and South East Corner Bioregions	Endangered	Vulnerable			✓
Freshwater Wetlands on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions	Endangered				✓
Littoral Rainforest in the NSW North Coast, Sydney Basin and South East Corner Bioregions	Endangered	Critically endangered			✓
Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions	Endangered	Critically endangered		✓	✓
Lowland Rainforest on Floodplain in the NSW North Coast Bioregion	Endangered	Critically endangered		✓	✓
Montane Peatlands and Swamps of the New England Tableland, NSW North Coast, Sydney Basin, South East Corner, South Eastern Highlands and Australian Alps Bioregions	Endangered	Endangered	✓		
Subtropical Coastal Floodplain Forest of the NSW North Coast Bioregion	Endangered			✓	✓
Swamp Oak Floodplain Forest of the NSW Coast, Sydney Basin and South East Corner Bioregions	Endangered				✓
Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions	Endangered				✓
Themeda Grassland on Seacliffs and Coastal Headlands in the NSW North Coast, Sydney Basin and South East Corner Bioregions	Endangered				✓

Source: Office of Environment & Heritage (OEH) threatened species search by region online tool, downloaded 31 March 2021, retrieved from www.environment.nsw.gov.au/threatenedspeciesapp/AreaHabitatSearch.aspx?cmaname=NSW+North+Coast

BC Act = *Biodiversity Conservation Act 2016*

EPBC Act = *Environment Protection and Biodiversity Conservation Act 1999*

Table A1-2: Threatened flora species recorded in Kempsey Shire

Scientific name	Common name	BC Act status	EPBC Act status
Acacia courtii	North Brother Wattle	Vulnerable	Vulnerable
Acronychia littoralis	Scented Acronychia	Endangered	Endangered
Alexfloydia repens	Floyd's Grass	Endangered	
Allocasuarina defungens	Dwarf Heath Casuarina	Endangered	Endangered
Allocasuarina simulans	Nabiac Casuarina	Vulnerable	Vulnerable
Allocasuarina thalassoscopica			Endangered
Arthraxon hispidus	Hairy Jointgrass	Vulnerable	Vulnerable
Arthropteris palisotii	Lesser Creeping Fern	Endangered	
Asperula asthenes	Trailing Woodruff	Vulnerable	Vulnerable
Banksia conferta subsp. *conferta*		Critically endangered	
Caesalpinia bonduc	Knicker Nut	Endangered	
Callistemon linearifolius	Netted Bottle Brush	Vulnerable	
Chamaesyce psammogeton	Sand Spurge	Endangered	
Cryptostylis hunteriana	Leafless Tongue Orchid	Vulnerable	Vulnerable
Cynanchum elegans	White-flowered Wax Plant	Endangered	Endangered
Dendrobium melaleucaphilum	Spider orchid	Endangered	
Diuris disposita	Willawarrin Doubletail	Endangered	
Dracophyllum macranthum		Vulnerable	
Eucalyptus largeana	Craven Grey Box	Endangered	Endangered
Eucalyptus seeana	Narrow-leaved Red Gum population in the Greater Taree Local Government Area	Endangered population	
Galium australe	Tangled Bedstraw	Endangered	
Grevillea guthrieana	Guthrie's Grevillea	Endangered	Endangered
Hakea archaeoides	Big Nellie Hakea	Vulnerable	Vulnerable
Haloragis exalata subsp. *velutina*	Tall Velvet Sea-berry	Vulnerable	Vulnerable
Hibbertia hexandra	Tree Guinea Flower	Endangered	
Lindernia alsinoides	Noah's False Chickweed	Endangered	
Lindsaea incisa	Slender Screw Fern	Endangered	

Scientific name	Common name	BC Act status	EPBC Act status
Macadamia integrifolia	Macadamia		Vulnerable
Maundia triglochinoides		Vulnerable	
Marsdenia longiloba	Slender Marsdenia	Endangered	Vulnerable
Melaleuca biconvexa	Biconvex Paperbark	Vulnerable	Vulnerable
Melaleuca groveana	Grove's Paperbark	Vulnerable	
Niemeyera whitei	Rusty Plum, Plum Boxwood	Vulnerable	
Oberonia titania	Red-flowered King of the Fairies	Vulnerable	
Parsonsia dorrigoensis	Milky Silkpod	Vulnerable	Endangered
Peristeranthus hillii	Brown Fairy-chain Orchid	Vulnerable	
Phaius australis	Southern Swamp Orchid	Endangered	Endangered
Philotheca obovatifolia		Endangered	
Pomaderris queenslandica	Scant Pomaderris	Endangered	
Pultenaea maritima	Coast Headland Pea	Endangered	
Rhodamnia rubescens	Scrub Turpentine	Critically endangered	
Rhodomyrtus psidioides	Native Guava	Critically endangered	
Senna acclinis	Rainforest Cassia	Endangered	
Solanum sulphureum	Manning Yellow Solanum	Endangered	Endangered
Sophora tomentosa	Silverbush	Endangered	
Syzygium paniculatum	Magenta Lilly Pilly	Endangered	Vulnerable
Thesium australe	Austral Toadflax	Vulnerable	Vulnerable
Tinospora smilacina	Tinospora Vine	Endangered	
Tylophora woollsii	Cryptic Forest Twiner	Endangered	Endangered
Zieria lasiocaulis	Willi Willi Zieria	Endangered	Endangered

Source: Office of Environment & Heritage (OEH) threatened species search by region online tool, downloaded 31 March 2021, retrieved from: www.environment.nsw.gov.au/threatenedspeciesapp/AreaHabitatSearch.aspx?cmaname=NSW+North+Coast

BC Act = *Biodiversity Conservation Act 2016*

EPBC Act = *Environment Protection and Biodiversity Conservation Act 1999*

Table A1-3: Threatened fauna species recorded in Kempsey Shire

Scientific name	Common name	BC Act status	EPBC Act status	FM Act status
Amphibians				
Crinia tinnula	Wallum Froglet	Vulnerable		
Litoria aurea	Green and Golden Bell Frog	Endangered	Vulnerable	
Litoria booroolongensis	Booroolong Frog	Endangered	Endangered	
Litoria brevipalmata	Green-thighed Frog	Vulnerable		
Litoria daviesae	Davies' Tree Frog	Vulnerable		
Litoria subglandulosa	Glandular Frog	Vulnerable		
Mixophyes balbus	Stuttering Frog	Endangered	Vulnerable	
Mixophyes iteratus	Giant Barred Frog	Endangered	Endangered	
Philoria sphagnicolus	Sphagnum Frog	Vulnerable		
Bats				
Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable	Vulnerable	
Chalinolobus nigrogriseus	Hoary Wattled Bat	Vulnerable		
Falsistrellus tasmaniensis	Eastern False Pipistrelle	Vulnerable		
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	Vulnerable		
Miniopterus australis	Little Bent-winged Bat	Vulnerable		
Miniopterus orianae oceanensis	Large Bent-winged Bat	Vulnerable		
Myotis macropus	Southern Myotis	Vulnerable		
Nyctophilus bifax	Eastern Long-eared Bat	Vulnerable		
Phoniscus papuensis	Golden-tipped Bat	Vulnerable		
Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable		
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	Vulnerable		
Scoteanax rueppellii	Greater Broad-nosed Bat	Vulnerable		
Syconycteris australis	Common Blossom-bat	Vulnerable		

Scientific name	Common name	BC Act status	EPBC Act status	FM Act status
Vespadelus troughtoni	Eastern Cave Bat	Vulnerable		
Birds				
Amaurornis moluccana	Pale-vented Bush-hen	Vulnerable		
Anseranas semipalmata	Magpie Goose	Vulnerable		
Anthochaera phrygia	Regent Honeyeater	Critically endangered	Critically endangered	
Ardenna carneipes	Flesh-footed Shearwater	Vulnerable		
Artamus cyanopterus cyanopterus	Dusky Woodswallow	Vulnerable		
Atrichornis rufescens	Rufous Scrub-bird	Vulnerable		
Botaurus poiciloptilus	Australasian Bittern	Endangered	Endangered	
Burhinus grallarius	Bush Stone-curlew	Endangered		
Calidris canutus	Red Knot		Endangered	
Calidris ferruginea	Curlew Sandpiper	Endangered	Critically endangered	
Calidris tenuirostris	Great Knot	Vulnerable	Critically endangered	
Calyptorhynchus lathami	Glossy Black-Cockatoo	Vulnerable		
Carterornis leucotis	White-eared Monarch	Vulnerable		
Charadrius leschenaultii	Greater Sand-plover	Vulnerable	Vulnerable	
Charadrius mongolus	Lesser Sand-plover	Vulnerable	Endangered	
Chthonicola sagittata	Speckled Warbler	Vulnerable		
Circus assimilis	Spotted Harrier	Vulnerable		
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	Vulnerable		
Coracina lineata	Barred Cuckoo-shrike	Vulnerable		
Daphoenositta chrysoptera	Varied Sittella	Vulnerable		
Dromaius novaehollandiae - endangered population	Emu population in the NSW North Coast Bioregion and Port Stephens Local Government Area	Endangered population		
Ephippiorhynchus asiaticus	Black-necked Stork	Endangered		
Epthianura albifrons	White-fronted Chat	Vulnerable		

Scientific name	Common name	BC Act status	EPBC Act status	FM Act status
Esacus magnirostris	Beach Stone-curlew	Critically endangered		
Glossopsitta pusilla	Little Lorikeet	Vulnerable		
Grantiella picta	Painted Honeyeater	Vulnerable	Vulnerable	
Grus rubicunda	Brolga	Vulnerable		
Haematopus fuliginosus	Sooty Oystercatcher	Vulnerable		
Haematopus longirostris	Pied Oystercatcher	Endangered		
Hamirostra melanosternon	Black-breasted Buzzard	Vulnerable		
Haliaeetus leucogaster	White-bellied sea eagle	Vulnerable		
Hieraaetus morphnoides	Little Eagle	Vulnerable		
Hirundapus caudacutus	White-throated Needletail		Vulnerable	
Irediparra gallinacea	Comb-crested Jacana	Vulnerable		
Ixobrychus flavicollis	Black Bittern	Vulnerable		
Lathamus discolor	Swift Parrot	Endangered	Critically endangered	
Lichenostomus fasciogularis	Mangrove Honeyeater	Vulnerable		
Limicola falcinellus	Broad-billed Sandpiper	Vulnerable		
Limosa lapponica baueri	Bar-tailed Godwit (Western Alaskan)		Vulnerable	
Limosa limosa	Black-tailed Godwit	Vulnerable		
Lophoictinia isura	Square-tailed Kite	Vulnerable		
Macronectes giganteus	Southern Giant Petrel	Endangered	Endangered	
Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	Vulnerable		
Neophema pulchella	Turquoise Parrot	Vulnerable		
Ninox connivens	Barking Owl	Vulnerable		
Ninox strenua	Powerful Owl	Vulnerable		
Numenius madagascariensis	Eastern Curlew		Critically endangered	
Oxyura australis	Blue-billed Duck	Vulnerable		
Pachycephala inornata	Gilbert's Whistler	Vulnerable		

Scientific name	Common name	BC Act status	EPBC Act status	FM Act status
Pachycephala olivacea	Olive Whistler	Vulnerable		
Pandion cristatus	Eastern Osprey	Vulnerable		
Petroica boodang	Scarlet Robin	Vulnerable		
Petroica phoenicea	Flame Robin	Vulnerable		
Pezoporus wallicus wallicus	Eastern Ground Parrot	Vulnerable		
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	Vulnerable		
Pterodroma solandri	Providence Petrel	Vulnerable		
Ptilinopus magnificus	Wompoo Fruit-Dove	Vulnerable		
Ptilinopus regina	Rose-crowned Fruit-Dove	Vulnerable		
Ptilinopus superbus	Superb Fruit-Dove	Vulnerable		
Rostratula australis	Australian Painted Snipe	Endangered	Endangered	
Stagonopleura guttata	Diamond Firetail	Vulnerable		
Sternula albifrons	Little Tern	Endangered		
Stictonetta naevosa	Freckled Duck	Vulnerable		
Turnix maculosus	Red-backed Button-quail	Vulnerable		
Tyto longimembris	Eastern Grass Owl	Vulnerable		
Tyto novaehollandiae	Masked Owl	Vulnerable		
Tyto tenebricosa	Sooty Owl	Vulnerable		
Xenus cinereus	Terek Sandpiper	Vulnerable		
Fish				
Carcharias taurus	Greynurse Shark			Critically endangered
Mogurnda adspersa	Southern Purple Spotted Gudgeon			Endangered
Invertebrates				
Argynnis hyperbius	Australian Fritillary	Endangered	Critically endangered	
Ocybadistes knightorum	Black Grass-dart Butterfly	Endangered		
Petalura gigantea	Giant Dragonfly	Endangered		

Scientific name	Common name	BC Act status	EPBC Act status	FM Act status
Marine mammals				
Arctocephalus forsteri	New Zealand Fur-seal	Vulnerable		
Arctocephalus pusillus doriferus	Australian Fur-seal	Vulnerable		
Dugong dugon	Dugong	Endangered		
Megaptera novaeangliae	Humpback Whale	Vulnerable	Vulnerable	
Physeter macrocephalus	Sperm Whale	Vulnerable		
Marsupials				
Aepyprymnus rufescens	Rufous Bettong	Vulnerable		
Cercartetus nanus	Eastern Pygmy-possum	Vulnerable		
Dasyurus maculatus	Spotted-tailed Quoll	Vulnerable	Endangered	
Macropus parma	Parma Wallaby	Vulnerable		
Petaurus australis	Yellow-bellied Glider	Vulnerable		
Petaurus norfolcensis	Squirrel Glider	Vulnerable		
Petauroides volans	Greater Glider		Vulnerable	
Petrogale penicillata	Brush-tailed Rock-wallaby	Endangered	Vulnerable	
Phascogale tapoatafa	Brush-tailed Phascogale	Endangered		
Phascolarctos cinereus	Koala	Vulnerable	Vulnerable	
Planigale maculata	Common Planigale	Vulnerable		
Potorous tridactylus	Long-nosed Potoroo	Vulnerable	Vulnerable	
Thylogale stigmatica	Red-legged Pademelon	Vulnerable		
Rodents				
Pseudomys gracilicaudatus	Eastern Chestnut Mouse	Vulnerable		
Pseudomys oralis	Hastings River Mouse	Endangered	Endangered	
Reptiles				
Caretta caretta	Loggerhead Turtle	Endangered	Endangered	
Chelonia mydas	Green Turtle	Vulnerable	Vulnerable	
Coeranoscincus reticulatus	Three-toed Snake-tooth Skink	Vulnerable	Vulnerable	

Scientific name	Common name	BC Act status	EPBC Act status	FM Act status
Dermochelys coriacea	Leatherback Turtle	Endangered	Endangered	
Eretmochelys imbricata	Hawksbill Turtle		Vulnerable	
Hoplocephalus bitorquatus	Pale-headed Snake	Vulnerable		
Hoplocephalus bungaroides	Broad-headed Snake	Endangered	Vulnerable	
Hoplocephalus stephensii	Stephens' Banded Snake	Vulnerable		
Myuchelys purvisi	Manning River Helmeted Turtle, Purvis' Turtle	Endangered		

BC Act = *Biodiversity Conservation Act 2016*
EPBC Act = *Environment Protection and Biodiversity Conservation Act 1999*
FM Act 1994 = *Fisheries Management Act 1994*

Source: BC Act and EPBC Act: Department of Planning, Industry and Environment threatened species search by region online tool, downloaded 31 March 2021, retrieved from:
www.environment.nsw.gov.au/threatenedspeciesapp/AreaHabitatSearch.aspx?cmaname=NSW+North+Coast

Table A1-4: NPWS estate in Kempsey Shire

Park category and name	Area (ha)
Aboriginal area	
Clybucca Aboriginal Area	925.5
Historic site	
Clybucca Historic Site	482.1
National parks	
Arakoon National Park	146.17
Carrai National Park	3,455.95
Cunnawarra National Park	1.47
Goolawah National Park	567.83
Gumbaynggirr National Park	0.12
Hat Head National Park	7,394.24
Kumbatine National Park	6,693.06
Limeburners Creek National Park	3,036.54
Maria National Park	2,416.73
New England National Park	34,430.69
Oxley Wild Rivers National Park	29.85
Werrikimbe National Park	22.08
Willi Willi National Park	23,581.28
Yarrahapinni Wetlands National Park	1,345.78
Yarriabini National Park	712.46
Total area of national park	**83,834.27**

Park category and name	Area (ha)
Nature reserves	
Boonanghi Nature Reserve	4,546.40
Fifes Knob Nature Reserve	550.64
Fishermans Bend Nature Reserve	202.08
Gads Sugarloaf Nature Reserve	477.44
Jobs Mountain Nature Reserve	50.50
Ngambaa Nature Reserve	625.90
Pee Dee Nature Reserve	435.54
Skillion Nature Reserve	677.53
The Castles Nature Reserve	2,658.91
Verges Creek Nature Reserve	75.72
Willi Willi Caves Nature Reserve	8.08
Yarravel Nature Reserve	310.43
Yessabah Nature Reserve	16.16
Total area of nature reserves	**10,635.32**
Regional parks	
Goolawah Regional Park	65.63
State conservation areas	
Boonanghi State Conservation Area	1,242.45
Carrai State Conservation Area	2,460.31
Kumbatine State Conservation Area	5.81
Total area of state conservation areas	3,708.57
Total of NPWS estate	**99,651.32**

Source: NSW National Parks and Wildlife Estate data - Version 1/2021 created on 31 March 2021, retrieved from:

https://datasets.seed.nsw.gov.au/organization/department-of-planning-industry-and-environment

Table A1-5: State forests in Kempsey Shire

Name	Area (ha)
Ballengarra State Forest	2.45
Boonanghi State Forest	5,197.00
Carrai State Forest	1,283.80
Coolombatti State Forest	5,636.45
Ingalba State Forest	5.53
Kalateenee State Forest	1,844.09
Kippara State Forest	0.20
Maria River State Forest	2,823.78
Mount Boss State Forest	338.18
Old Station State Forest	308.18
Skillion Flat State Forest	7.44
Tamban State Forest	8,003.64
Yessabah State Forest	2,584.44
Total state forest	**30,894.26**

Source: NSW dedicated state forest data – published date 7 January 2021, retrieved from:

https://data-fcnsw.opendata.arcgis.com/

Table A1-6: Biodiversity Conservation Trust (BCT) conservation agreements in Kempsey Shire

Biodiversity Conservation Trust (BCT) conservation agreements	No.	Area (ha)
Wildlife Refuge agreements	3	324.66
In-perpetuity agreements	12	2,287.72
Termed agreements	0	0
Total	**15**	**2,612.38**

Source: Biodiversity Conservation Trust Agreements data received from DPIE - Digital Information Office on Friday 13 August 2021. The data is current as at 30 June 2021.

Appendix 2: Key threatening processes in Kempsey Shire

= Low
= Medium
= High

Table A2-1: Risk profile of key threatening processes in Kempsey Shire

Threat activity	Type of threat	BC Act 2016	EPBC Act 1999	FM Act 1994	Escarpment Ranges	Midland Hills	Coastal Plains
Aggressive exclusion of birds from woodland and forest habitat by abundant Noisy Miners *(Manorina melanocephala)*	Pest animal	✓	✓				
Alteration of habitat following subsidence due to longwall mining	Habitat loss/change	✓					
Alteration to the natural flow regimes of rivers, streams, floodplains and wetlands	Habitat loss/change	✓					
Anthropogenic (human-caused) climate change	Habitat loss/change	✓	✓				
Bushrock removal	Habitat loss/change	✓					
Clearing of native vegetation	Habitat loss/change	✓	✓				
Competition and grazing by the feral European Rabbit	Pest animal	✓	✓				
Competition and habitat degradation by Feral Goats, *Capra hircus Linnaeus 1758*	Pest animal	✓	✓				
Competition from feral Honeybees	Pest animal	✓					
Degradation of native riparian vegetation along New South Wales water courses	Habitat loss/change			✓			
Ecological consequences of high frequency fires	Habitat loss/change	✓					
Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners	Pest animal	✓					
Herbivory and environmental degradation caused by feral deer	Pest animal	✓					
Human-caused climate change	Climate change	✓		✓			

Threat activity	Type of threat	BC Act 2016	EPBC Act 1999	FM Act 1994	Escarpment Ranges	Midland Hills	Coastal Plains
Importation of red imported fire ants (*Solenopsis invict)* into NSW	Pest animal	✓	✓				
Infection by *Psittacine circoviral* (beak and feather) disease affecting endangered psittacine species	Disease	✓	✓				
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis	Disease	✓	✓				
Infection of native plants by *Phytophthora cinnamomi*	Disease	✓	✓				
Installation and operation of instream structures & other mechanisms that alter natural flow regimes of rivers and streams	Habitat loss/change			✓			
Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceous	Disease	✓					
Introduction of fish to waters within a catchment outside their natural range	Habitat loss/change			✓			
Introduction of the Large Earth Bumblebee (*Bombus terrestris*)	Pest animal	✓					
Invasion and establishment of exotic vines and scramblers	Weed	✓					
Invasion and establishment of Scotch Broom (*Cytisus scoparius)*	Weed	✓					
Invasion and establishment of the Cane Toad	Pest animal	✓	✓				
Invasion of native plant communities by African Olive *Olea europaea* subsp. *cuspidata*	Weed	✓					
Invasion Of native plant communities by Bitou Bush & Boneseed	Weed	✓					
Invasion of native plant communities by exotic perennial grasses	Weed	✓					
Invasion of the Yellow Crazy Ant (*Anoplolepis gracilipes*) into NSW	Pest animal	✓					
Invasion, establishment and spread of Lantana (*Lantana camara L. sens. lat*)	Weed	✓					

Threat activity	Type of threat	BC Act 2016	EPBC Act 1999	FM Act 1994	Escarpment Ranges	Midland Hills	Coastal Plains
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	Weed	✓	✓				
Loss and/or degradation of sites used for hill-topping by butterflies	Habitat loss/change	✓					
Loss of hollow-bearing trees	Habitat loss/change	✓					
Loss of climatic habitat caused by anthropogenic emissions of greenhouse gases	Habitat loss/change		✓				
Predation by the Plague Minnow (*Gambusia holbrooki*)	Pest animal	✓					
Predation by the European Red Fox (*Vulpes Vulpes*)	Pest animal	✓	✓				
Predation by feral Cats (*Felis catus*)	Pest animal	✓	✓				
Predation and hybridisation by feral Dogs, (*Canis lupus familiaris*)	Pest animal	✓					
Predation, habitat degradation, competition and disease transmission by feral Pigs (*Sus scrofa*)	Pest animal	✓	✓				
Removal of dead wood and dead trees	Habitat loss/change	✓					
Removal of large woody debris from NSW rivers & streams	Habitat loss/change			✓			

BC Act = *Biodiversity Conservation Act 2016*

EPBC Act = *Environment Protection and Biodiversity Conservation Act 1999*

FM Act 1994 = Fisheries Management Act 1994

Sources:

BC Act and EPBC Act: Department of Planning, Industry and Environment threatened species search by region online tool, downloaded 31 March 2021, retrieved from: www.environment.nsw.gov.au/threatenedspeciesapp/AreaHabitatSearch.aspx?cmaname=NSW+North+Coast

FM Act 1994, Schedule 6

Kempsey Shire

Biodiversity Strategy 2022

KEMPSEY Shire Council

FUTURE Environment