2030

NRM Strategy

CRADLE COAST TASMANIA

Cradle Coast NRM
CRADLE COAST AUTHORITY

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Version 3.0

« Cover: *Boronia citriodora*, Lemon-scented Boronia at Cradle Mountain (Ernst Kemmerer)
« Inside cover: *Trametes versicolor*, Turkey Tail Fungi at Ferndene (Ernst Kemmerer)

Photos are credited throughout Strategy. Photos without acknowledged credits are supplied by Cradle Coast Authority.

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- funding partners;
- project partners including land managers, community groups and investors;
- organisational Boards, Management Committees and NRM Advisory Committees;
- industry and sector experts;
- Tasmanian Aboriginal communities and organisations;
- Australian, Tasmanian and local governments;
- Non-Government Organisations; and
- community members including individuals and groups.

The three Tasmanian NRM organisations worked collaboratively in the development of the 2030 NRM Strategies:

Cradle Coast NRM
CRADLE COAST AUTHORITY

NRM North

nrm SOUTH
NATURAL RESOURCE MANAGEMENT

Funding partners:

Australian Government

National Landcare Program

Tasmanian Government

Acknowledgement of the Tasmanian Aboriginal people as the Traditional and Original Owners of this land

We pay respect to the Traditional Owners of *lutruwita* (Tasmania), the Tasmanian Aboriginal people, and acknowledge their continued survival and connection with their land, sea and sky Country that spans millennia.

We acknowledge the many Nations of Tasmanian Aboriginal people, past and present, as the traditional and ongoing owners of their respective countries within lutruwita and the islands.

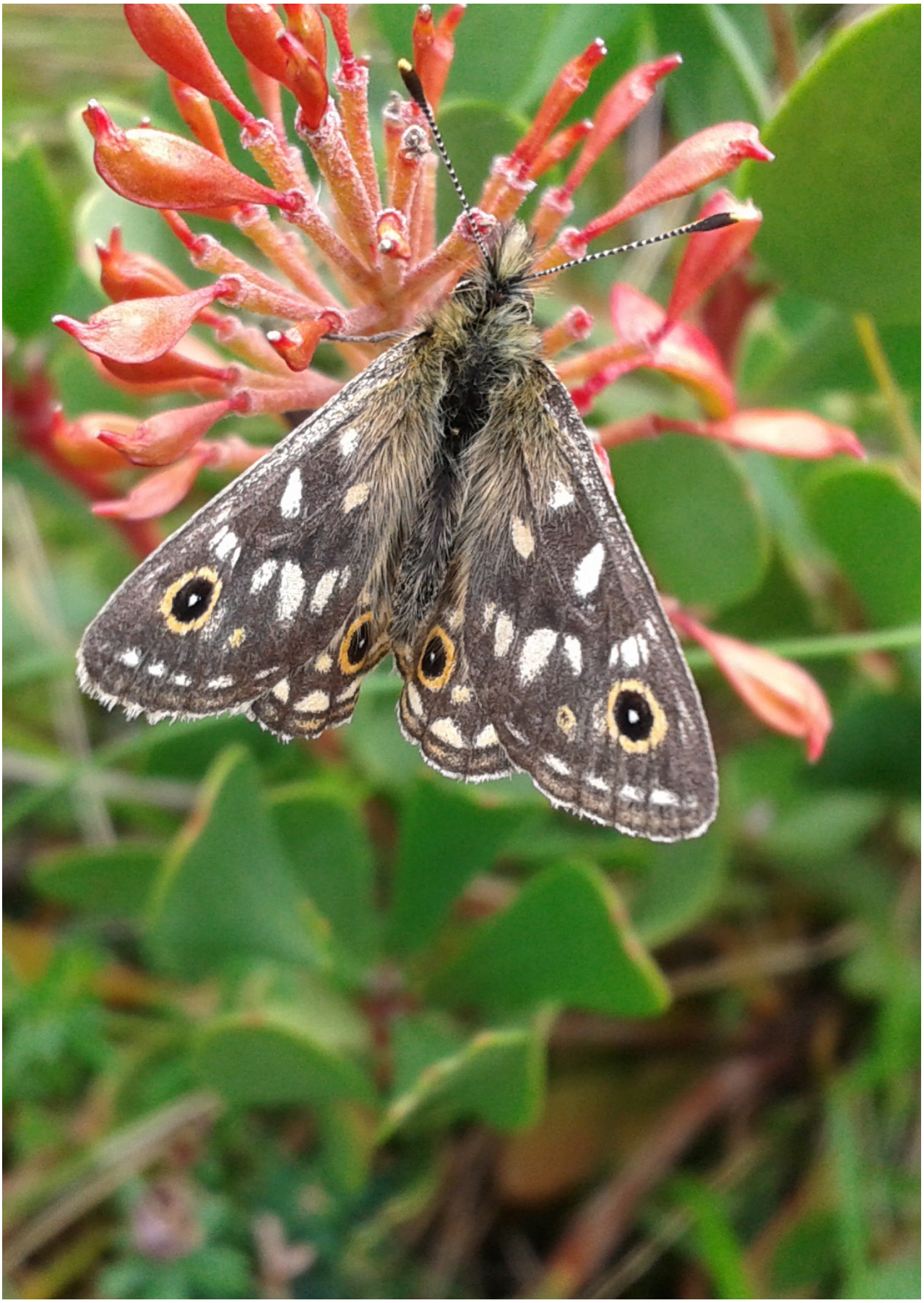
We pay respect to those who have passed and acknowledge today's Aboriginal people who are the custodians of this land.

We acknowledge that all land, sea, and sky Country holds cultural values that provide strong and continuing significance to the Tasmanian Aboriginal people. We acknowledge that Tasmanian Aboriginal people are part of a continuous culture that holds traditional knowledge about the ecosystems we all depend on. The landscapes of lutruwita have been shaped by Aboriginal management of plants, animals, and water (particularly using fire).

We acknowledge that colonisation and migration has caused injustice for Aboriginal people and impacted the living cultural landscape. This has created a legacy that we seek to improve.

We are working to integrate Aboriginal cultural heritage and knowledge in natural resource management, and to develop better understanding of the cultural, environmental, social and economic dimensions of the region's natural resources from the perspective of Aboriginal people.

Through our work, we aim to reflect these values by recognising that Tasmanian Aboriginal people determine both the boundaries for the sharing of their cultural heritage and opportunities for participation in NRM activities that embrace and support their aspirations. We pay respect to Tasmanian Aboriginal people's requirements to own, care and manage Country by aligning our strategic priorities to Tasmanian Aboriginal people's land, sea and sky Country priorities.



» Ptunarra Brown Butterfly at Surrey Hills

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Melalueca ericifolia

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Tasmanian Natural Resource Management

1 Tasmanian Natural Resource Management

1.1 NRM organisations

Cradle Coast Authority is one of 54 natural resource management (NRM) organisations in Australia and one of three in Tasmania (alongside NRM North and NRM South).

The role of NRM organisations is to protect, sustainably manage and improve natural resources for the shared environmental, cultural, social and economic benefit of the community.

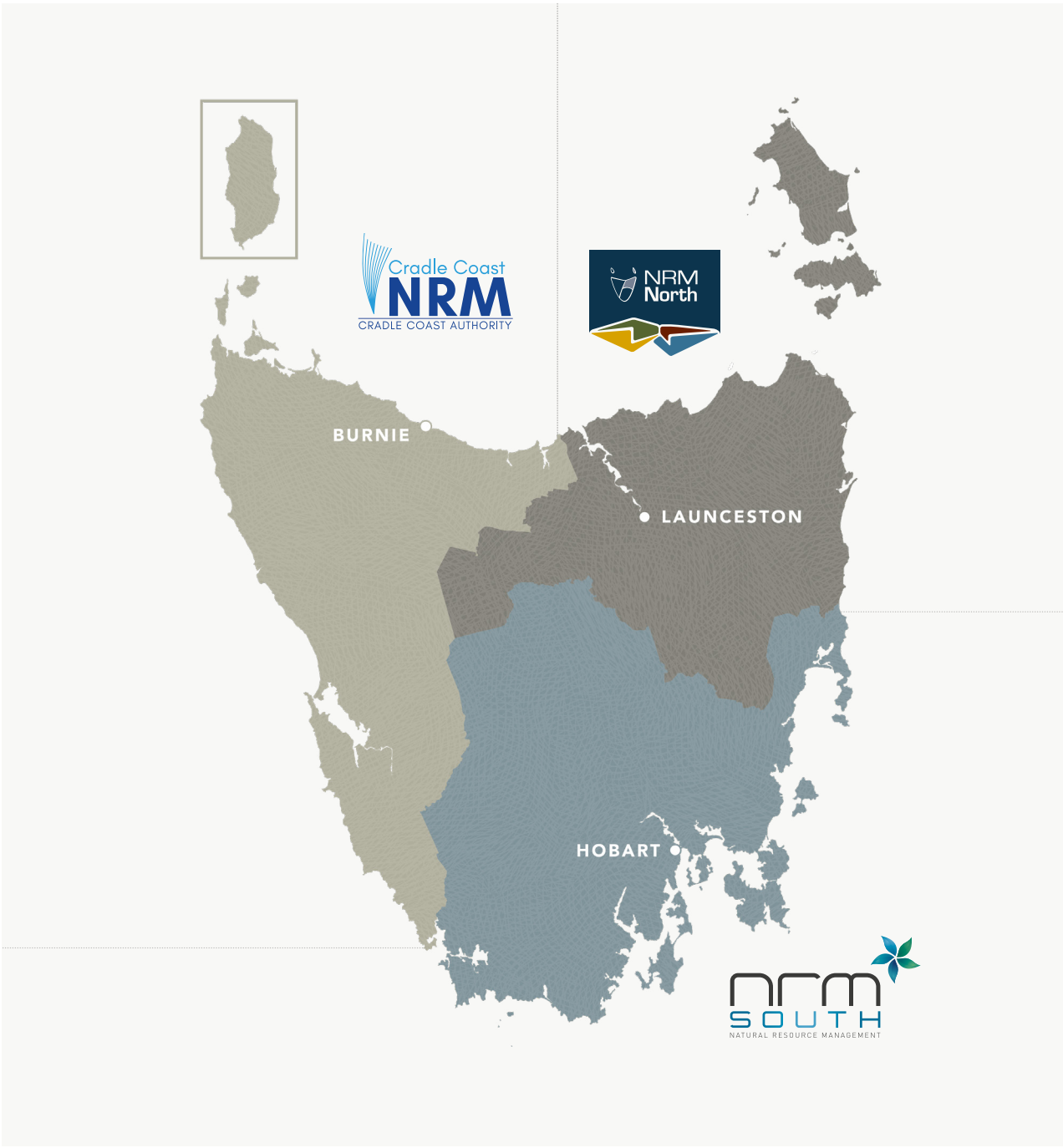


FIGURE 1: **Tasmanian NRM regions**

1.2 NRM in Cradle Coast Tasmania

The Cradle Coast region stretches from Narawntapu National Park in the east to Cape Grim in the far north-west, and to Port Davey in the south. The region's eastern border runs diagonally through Cradle Valley. The region also includes King Island and other islands in western Bass Strait as well as state waters extending to three nautical miles. The region's boundaries align to local government areas of nine municipalities – West Coast, Circular Head, King Island, Waratah-Wynyard, Burnie City, Central Coast, Devonport City, Latrobe and Kentish. It has a population of 111,300 and covers 2.2 million hectares including 5 bioregions and 20 river catchments.

One third of the Cradle Coast region is contained in the Tasmanian Wilderness World Heritage Area, and one fifth of the area is managed under native or plantation forestry. The extent of natural and wilderness areas within the region allows for landscape scale ecological processes with little human intervention, including natural predator/prey relationships and unfettered wildlife movement pathways from coast to alpine ecosystems.

The region has important areas of fertile, productive farming, grazing and forestry land, which support a strong primary production sector. The region produces a large proportion of Australia's frozen vegetables, most of Tasmania's beef and dairy, supplies poppies and other plants for medicinal industries and exports specialty timber, aquaculture, plant and livestock products to international markets. The region is also an attractive and viable tourist destination with a strong focus on nature-based activities.

The Cradle Coast region shares a rich and extensive history of habitation by Aboriginal communities and cultures. Coastal landscapes show evidence of generations of sovereign ownership and land management. The spiritual, cultural and physical reality of the region's Aboriginal heritage exists within and across the wider landscape. All Aboriginal cultural and spiritual sites are integral parts of Country.

FIGURE 2: **Cradle Coast Natural Resource Management (NRM) region**

1.3 Cradle Coast Authority and NRM Committee

Cradle Coast Authority (CCA) is a joint authority established under the Local Government Act (1993) by the nine Councils in the region to facilitate the sustainable development of the region, resolve regional issues and coordinate regional-scale activity. The Authority balances two key business streams, Regional Economic Development and Natural Resource Management. The Authority is governed by a Board of eight members with skills in best practice governance, business administration, legal and contractual issues.

The Cradle Coast Regional NRM Committee is a sub-committee of the Board and it is appointed under the *Natural Resource Management Act (2002)*. The NRM Committee is made up of ten members with collective skills in the achievement of natural resource management and conservation outcomes.

The NRM Committee works with the Regional Economic Development Steering Group as sub-committees supporting and advising the Board in the governance and delivery of NRM and Regional Development activities in the region.

» Measuring the emergence of a cover crop

» Cradle Mountain reflected in Dove Lake

2

VISION FOR NATURAL RESOURCE MANAGEMENT IN TASMANIA:

Collaborative action for healthy landscapes and seascapes, protected natural values, and sustainable livelihoods and lifestyles.

» European Honey Bee visiting Borage (*Borago officinalis*) flowers

3

The framework

3 The framework

3.1 Purpose

The 2030 Natural Resource Management (NRM) Strategy for Cradle Coast Tasmania provides a framework to facilitate sustainable management of the Cradle Coast region's natural resources. The Strategy is one of three in Tasmania and is complemented by the Strategies for northern Tasmania and southern Tasmania. These regional Strategies are consistent with state and national policies and priorities. The shared aims of the NRM strategies are to create a balanced approach to build, support and maintain:

- Healthy, resilient, and biodiverse environments;
- Healthy and productive water and marine resources; and
- Productive and sustainable land management.

Tasmania's three regional NRM organisations recognise the delicate balance between the environmental, social, and economic needs of the community and that natural and cultural landscapes are not confined by organisational boundaries. Working together towards a single vision for natural resource management in Tasmania is essential to effective long-term outcomes.

The Strategy framework is built on natural resource assets within the state and regions. Asset prioritisation and related opportunities and threats can differ at the regional or local scale. The Strategies reflect this complexity – with the vision, core values, aspirations and outcomes for Tasmania achieved through specific and targeted Outcomes, which are prioritised at a regional level.

In a changing world, it is important that there is a regular review and assessment of strategic approaches and priorities. The NRM Strategies are intended to not only meet the requirements under the Tasmanian Natural Resource Management Act 2002 and the Australian Government's Regional Land Partnerships Program, but also to create a framework for ongoing review, evaluation, and re-prioritisation as part of an adaptive management approach.

Cradle Coast Authority is the Australian Government's service provider for the north-west Tasmania NRM Management Unit. As a service provider, Cradle Coast Authority is obliged to maintain the currency of natural resource management planning and the prioritisation of management actions to ensure that:

- Projects can be identified and appropriately scaled and scoped, are based on best available scientific, economic and social information, take into account the Australian Government's investment priorities relevant to the region, and consider emerging science and innovations, climate change impacts, and the views of the community; and that
- Projects will effectively contribute to the Australian Government's six long-term outcomes, including through identification and on-going prioritisation of management actions that support the delivery of the outcomes.

The six outcomes of the current Regional Land Partnerships program are:

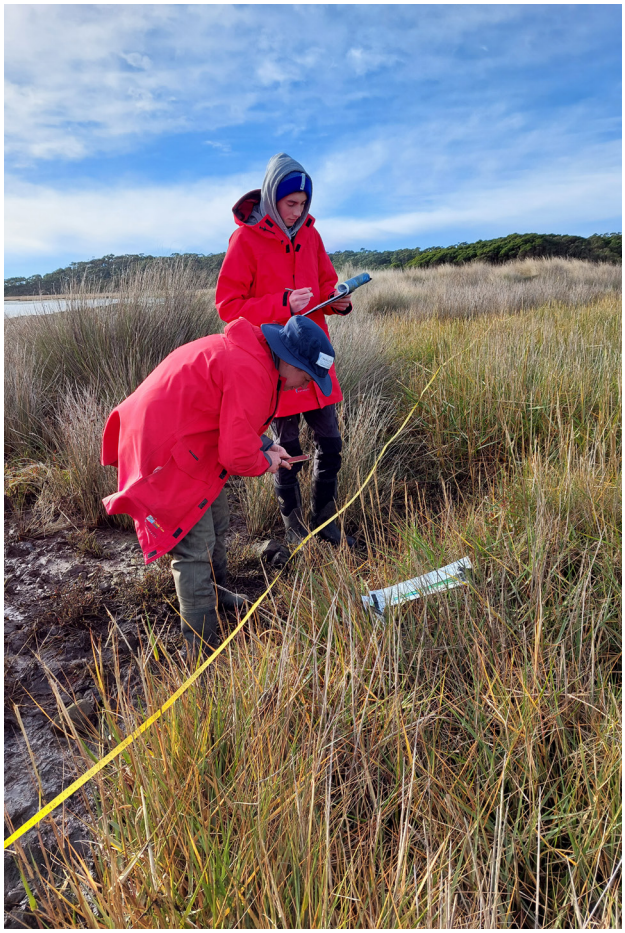
OUTCOME 1	The ecological character of Ramsar sites is maintained or improved.
OUTCOME 2	The trajectory of species targeted under the Threatened Species Strategy, and other EPBC Act priority species, is improved.
OUTCOME 3	The natural heritage Outstanding Universal Value of World Heritage properties is maintained or improved.
OUTCOME 4	The condition of EPBC Act listed Threatened Ecological Communities is improved.
OUTCOME 5	The condition of soil, biodiversity and vegetation are improved.
OUTCOME 6	Agriculture systems have adapted to significant changes in climate and market demands.

Attachment 5 to this Strategy specifies how Cradle Coast Authority is supporting the delivery of these outcomes, by ensuring that our regional priorities align with the Australian Government's outcomes, where appropriate.

3.2 Collaboration beyond regional boundaries

NRM South, NRM North and Cradle Coast Authority have worked together to ensure a high level of consistency across the three 2030 NRM Strategies for Tasmania. This collaborative approach builds on the previous work of the three organisations and provides a framework to:

- improve ease-of-use and accessibility of the Strategies for all stakeholders, particularly statewide and multi-region organisations;
- share information and other resources – to enable a statewide or multi-region approach to measuring success;
- promote a united state-wide approach to collectively contribute to delivering State and Australian Government policy and targets and respond to local expectations; and to
- consistently apply contemporary natural resource management planning practices.



Monitoring *Spartina anglica* treatment in a Smithton saltmarsh

3.3 Principles

The strategic framework is:

Responsive	to new approaches or information;
Adaptive	incorporating adaptive management in planning and delivery;
Relevant	to government and other investment programs as well as to community needs and expectations;
Consistent	with national and international systems including the United Nations Sustainable Development Goals; and
Informed	using evidence and sound program logic including a focus on outcomes, and a Monitoring, Evaluation, Reporting and Improvement (MERI) framework.

The following principles for natural resource management are applied through all projects and programs.

STEWARDSHIP

Promote and enable the growth and uptake of knowledge, capabilities and practices that support the natural environment and productive landscapes to sustain productivity, profitability and healthy functioning.

RISK AND RESILIENCE

Facilitate access to information that enables people to anticipate challenges, avoid or resist impacts, and recover without loss of economic, social or environmental functional capability or capacity, especially in relation to the direct and indirect consequences of changing regional climate conditions.

INFLUENCE

Work with planners and policy developers to inform regional environmental and agricultural initiatives at state and federal levels.

ABORIGINAL CULTURE AND KNOWLEDGE

Appropriately and respectfully recognise and engage with Tasmanian Aboriginal people around natural resource management knowledge, perspectives, and practices.

PARTICIPATION

Actively establish and nurture partnerships and collaborations as the preferred operating arrangement for the planning and implementation of regional, cross-regional and local NRM programs, projects and activities.

FIGURE 3: **Natural resource management principles in this strategy**

3.4 United Nations Sustainable Development Goals

The United Nations Sustainable Development Goals (UN SDGs) recognise environmental, economic and social aspects to sustainability and that action in one area will contribute to the outcomes in other areas. The UN SDGs provide a framework that outlines the linkages between actions in achieving sustainability outcomes – including for development and production. The 2030 NRM Strategies have been developed with clear linkages and alignment with this global framework and the following subset of the UN SDGs. Attachment 2 provides further detail.

FIGURE 4: **Subset of the United Nations Sustainable Development Goals relevant to the 2030 NRM Strategy**

3.5 State-wide drivers, opportunities and threats to natural resource management

3.5.1 Policy outlook overview

Global trends in international markets, climate change and unexpected events (such as the COVID-19 pandemic) present both risks and opportunities for Australia and Tasmania, adding to uncertainty while also providing growth and development opportunities. A detailed review of the current national, state and local policy setting, risks, opportunities and local drivers is provided in Attachment 1.

In summary, at the national level, the National Landcare Program, Regional Land Partnerships Program addresses agricultural sustainability and conservation of nationally significant natural values and landscapes. As preferred service providers to the Australian Government, the three Tasmanian NRM organisations deliver services and projects to meet the specific and targeted outcomes and priorities of the Australian Government. This work aligns with programs delivered by NRM organisations across Australia and supports national policy agendas such as *Australia's Strategy for Nature 2019-2030* – Australia's national biodiversity strategy and action plan; *Threatened Species Strategy; National Soil Strategy*; and the *Drought Resilience Funding Plan 2020-2024*.

Tasmania's policy outlook over the next five years and beyond is characterised by the drive to build the economy by expanding primary production and competitiveness of the agriculture, forestry, tourism, and fisheries sectors while significantly expanding renewable energy output and storage for export to mainland states.

Governments at state and local levels are planning for increased tourism and population growth from both interstate and international migration – attracting people to visit and make their home in the state.

Specific Tasmanian policy and agendas relevant to natural resource management include:

- The enhancement of primary production through policies and plans such the *Competitiveness of Tasmanian Agriculture for 2050 (White Paper 2020); Sustainable Agri-Food Plan 2019-23; Strategic Growth Plan for the Tasmanian Forests, Fine Timber and Wood Fibre Industry; Rural Water Use Strategy* and *Tasmanian Biosecurity Strategy*.

- Addressing climate change through *Climate Action 21 – Tasmania's Climate Change Action Plan*, the next climate action strategy (in development), and the *Tasmanian Renewable Energy Action Plan 2020*.
- The vision for the renewable energy sector over the next 20 years, as set out in the *Tasmanian Renewable Energy Action Plan* and *Tasmanian Renewable Hydrogen Action Plan*, includes 200 percent Tasmanian Renewable Energy Target and Renewable Energy Coordination Framework.
- Protection of natural values and biodiversity through the *Tasmanian Wilderness World Heritage Area Management Plan*, management planning for national parks and reserves and environmental management planning and monitoring activities.
- Management of the health, welfare and impact of cats under the *Cat Management Act 2009* (as amended 2020).
- Enhancing disaster resilience and recovery through the *Tasmanian Disaster Resilience Strategy 2020-25*; *Tasmanian Fuel Reduction Plan*, and other policies and programs.
- Addressing regional and state-wide land use planning through the Regional Land Use Strategies and the State-wide Planning Scheme.

These policy drivers create both opportunities and threats to natural resources – for example:

- While expansion of water and irrigation infrastructure will support agriculture and offset rainfall uncertainty, careful management of water, soils, on-farm vegetation and biodiversity is critical.
- While growth of the tourism sector contributes to regional economies, managing impacts on sensitive landscapes is critical.
- While the growth in renewables and establishment of Tasmania as a major exporter of renewal energy will support the transition of energy systems in Australia and globally from fossil fuels to renewables-based energy generation, consideration and mitigation of local impacts on water resources and native species is critical.

Within this context, NRM organisations focus at the local level – building resilience into the management of natural resources, working in a collaborative environment with many stakeholders and partners. The aim is to balance the complex environmental, social and economic needs of the community and Tasmania's natural resources.

Stakeholders in the commercial and non-government sectors are also vital contributors to natural resource management in Tasmania and have a direct or aligned interest in sustainable management of natural resources in Tasmania. NRM organisations aim to partner and work with a range of stakeholders as many have policies and strategic plans that support healthy ecosystems and sustainable use of natural resources.

3.5.2 Understanding drivers and threats to natural resource management

Natural resource management in Tasmania is affected by six categories of drivers (Figure 5), which may generate both positive influences (opportunities) and/or negative pressures (challenges) for the three organisations over the period to 2030. Known threats impacting on Tasmania's natural assets inform the selection of Priorities and mitigating Actions – these have been categorised into four key areas (Figure 5).

The impact of cumulative threats and pressures on natural assets and values is becoming increasingly important (i.e. the effect of multiple direct and indirect pressures). Sparse environmental baseline data, complex ecological processes and intensifying global issues – such as warming and climate variability – contribute to an issue that is difficult to predict, measure, assess and manage.

Limited resources coupled with system and habitat decline mean that it is not possible to manage all threats to natural resources, in all locations. For this reason, the Strategy provides a targeted approach to ensure investment is efficient and effective.

» *Isophysis tasmanica*, Frenchmans Cap

DRIVERS

CLIMATE CHANGE IMPLICATIONS

A changing climate presents clear risks to the region's resources such as reduced rainfall, increased likelihood of dry lightning strikes and bushfire risks, increased extreme weather events and potential for flooding, and increased coastal hazards. However, opportunities, such as renewable energy expansion, innovation in agriculture and forestry, and changes in suitable and profitable crops, are also emerging.

COMMUNITY ASPIRATIONS

The preferences and aspirations of community members and community groups determine many natural resource management priorities. Community perspectives underscore the need to balance economic productivity and social needs with conservation, in an environment with increasingly unpredictable ecosystem responses to changing climate. The will of the community is behind consumer choices, political decisions, and the important element of each region's volunteer workforce. Aboriginal community groups bring specialised aspirations and unique knowledge and perspectives to natural resource management work.

GOVERNMENT POLICIES AND STRATEGIES

Although NRM organisations usually work at the regional and local scales, guidance and direction is provided by the policies and legislation managed by the Tasmanian and Australian Governments. Of particular importance are the Commonwealth EPBC Act and Threatened Species Strategy, and Tasmania's plans for agricultural competitiveness, for land use planning and for renewable energy development.

THREATS

CLIMATE CHANGE IMPACTS

Changes to air and ocean temperatures, rainfall, evaporation, wind speed, storm frequency and sea level are all becoming apparent in Tasmania. With these changes will come impacts on our natural resources and the ecosystem services that humans rely on. Some natural resource management activities directly address these threats, and others work to improve ecosystem and human community resilience and adaptability.

HABITAT LOSS AND FRAGMENTATION

A key threatening process affecting many important biodiversity areas and communities is habitat loss. This could be because of historical conversion for agriculture, clearing for development or industry, or piecemeal and cumulative loss of ecological functions via a range of human impacts.

FIGURE 5: **Drivers and threats impacting Tasmania's natural resources**

AVAILABLE FUNDING

Funding opportunities influence each NRM organisation's capacity and priorities. Important sources of funding are currently the Australian Government's National Landcare Program (and its Investment Priorities) and the Tasmanian Government (which sets Key Performance Indicators for the NRM organisations). Independent, private (commercial) and philanthropic funding sources are also emerging.

INDUSTRY PRIORITIES

Agriculture, forestry, fisheries, aquaculture, tourism, energy and manufacturing industries all exert a wide range of pressures and influences on Tasmania's natural resources. Within this broad category, there are a range of opportunities for, and risks to, natural resource management.

INCREASING HUMAN POPULATION AND CHANGING DEMOGRAPHICS

Development pressures and land-use changes (including clearing of native vegetation) are strongly linked to changing demographics. Urban expansion, increased demand for food production, tourism, increased migration to Tasmania and interest in rural and peri-urban living all drive changes in natural resource management priorities, actions and activities. In addition, the uncertainty regarding COVID-19's effects on movement of people and availability of resources may impact organisational capabilities and outputs.

BIOSECURITY THREATS

Introduced plants, animals and diseases threaten Tasmania's ecosystems and productive industries through competition for space and resources, predation and population decline, or productivity loss. Climate change is also expected to exacerbate biosecurity threats, providing increased opportunity for pests and pathogens to establish.

URBAN AND INDUSTRIAL IMPACTS

Urban and industrial impacts contribute to pollution of waterways, coastlines and the atmosphere. Poor water quality, increased carbon dioxide in the atmosphere, soil degradation, and the impacts of plastics on coasts and oceans, are all clear threats to Tasmania's natural resources.

OUTCOMES AND ACTIONS

3.5.3 Climate change in Tasmania

Central to natural resource management planning is recognition and response to the observed and projected effects of climate change. Based on higher-level emission scenario modelling of climate change – the IPCC's SSP 8.5 projection – Tasmania can expect significant impacts over the current century. The Intergovernmental Panel on Climate Change (IPCC AR6) reports note that the changes in the climate, observed globally, are unprecedented at least in the last 2000 years. Locally, the *Climate Change in Australia Projections Cluster Report – Southern Slopes* identified significant climate change impacts for Tasmania (as summarised in Table 1).

Climate modelling predicts Tasmania is at increased risk of wildfires and higher rainfall intensity and associated flooding with global warming. However, on an annual and decadal basis, natural variability in the climate system can act to either mask or enhance any long-term human induced trend.

Many climate change driven phenomena are already occurring, significantly impacting people's health and wellbeing, damaging infrastructure and enterprises, and disrupting natural ecosystems and species. The State of the Climate 2020 report prepared by the Bureau of Meteorology observes "*The greatest ocean warming in the Australian region since 1970 has occurred around south-eastern Australia and Tasmania. The East Australian Current now extends further south, creating an area of more rapid warming in the Tasman Sea where the warming rate is now twice the global average.*"

Tasmania is actively engaged with climate change projection and response through the *Climate Change (State Action) Act 2008*, Climate Futures for Tasmania initiative and the work of the Climate Futures Research Group at the University of Tasmania. Tasmania's *Climate Change Action Plan 2017–2021* has expired, and Tasmania's next climate change action plan is under development.

» Checking for feral cats in Point Sorell shearwater colony

TABLE 1: **A summary of Climate Change impacts in Tasmania**

	Direction	Confidence	Tasmanian Detail
Temperature	**INCREASE ↑**	**Very High**	By 2050, Tasmania is projected to experience an increase of at least 1.5 °C, in all seasons, even if a low-emissions scenario is followed.
Extreme temperature	**INCREASE ↑**	**Very High**	More hot days and warm spells are projected, with fewer frosts. Projections under a high emission scenario indicate an increase from 1.6 days over 35°C to up to 4.2 days, and a decrease in days under 2°C from 9.1 to 0.3 days by 2090. All scenario assessments indicate an increase in all types of high temperature extremes, including maximum daily temperatures, heatwave intensity and heatwave duration.
Rainfall	**DECREASE ↓**	**Medium**	Strong regional differences. A decrease in spring rainfall (10-20% less rain in some areas, and up to 25% by 2050 in the central north). Large reduction in autumn rainfall (up to 50% less rain for some areas relative to 2010-2020). Some regional increases in winter rainfall over the next 20-50 years (e.g. western Tasmania).
Extreme rainfall	**INCREASE ↑**	**Medium**	Increased intensity of extreme rainfall events is projected. Increase in extreme rainfall, particularly along east coast in summer and autumn. Frequency of westerly rain-bearing fronts is expected to decrease gradually, and east-coast lows to increase. Intermittent, more damaging, high intensity rainfall is possible.
Evaporation rate	**INCREASE ↑**	**High**	Higher decline in soil moisture during summer and autumn in Tasmania. Increased evaporation associated with warming.
Drought	**INCREASE ↑**	**Medium**	Episodic and regional nature of drought events will continue. Projected decrease in rainfall and increase in evaporation contribute to more time in drought. The east coast of Tasmania will stay especially drought prone.
Wind speed	**INCREASE ↑**	**Medium**	Stronger wind speed in winter in western Tasmania, and a decrease in summer wind speed. Possible increase in extremes.
Fire weather	**INCREASE ↑**	**High**	A harsher fire-weather climate in the future with consistent increases in fire weather projected for Tasmania. A steady increase in fire danger throughout the current century, including an increase in the length of the fire season and an increase in the number of days at the highest range of fire danger. By the end of this century: twice the fire danger, over twice the area, twice as often in Tasmania. This is an eight-fold increase in fire risk.
Sea level	**INCREASE ↑**	**Very High**	Mean sea level will continue to rise and height of extreme sea-level events will also increase. By 2030, between 0.07-0.19 m rise from 1986-2005 sea levels is projected. By 2090, 0.27-0.66 m under low emission scenario and 0.39-0.89 m under high emission scenario. Some exposed locations are projected to see a 1-in-100-year coastal inundation event move towards an event occurring almost every year (during the annual high tide).
Ocean temperature	**INCREASE ↑**	**High**	South-eastern Australia is a hotspot for ocean temperature changes, with projected rise of >3°C under a high emission scenario. The western Tasman Sea is considered a global ocean warming hotspot. By 2060, intense marine heatwave events are expected to increase.
Ocean acidification CO_2	**INCREASE ↑**	**Medium**	Benthic and pelagic calcifiers, such as diatoms, molluscs and deep water coral, will show reduced calcification rates and/ or increased dissolution.

3.6 Reading this Strategy

This NRM Strategy is founded on a clear long-term Vision informed and supported by a framework of Outcomes and Actions. Aspirational Outcomes for natural resource management in the Cradle Coast region of Tasmania have been developed in the context of long-term (20+ year) state-wide Outcomes. These are informed and supported by regionally identified Priorities with specific 10-year Outcomes and Actions.

The structure of the Strategy is based on the concept of Program Logic where long-term (aspirational) Outcomes are clearly defined, and Priorities and Actions, are designed to contribute to the Vision and Outcomes.

Actions are presented under three interrelated **Themes** of Land, Water and Biodiversity and are prioritised within **Asset Classes** under each Theme. **Actions** are presented in a framework that shows the connection between the overall Vision and the Outcomes and Actions.

» Brown Tree Frog, *Litoria ewingii*

FIGURE 6: **Strategy framework**

3.7 Terminology

3.7.1 Themes

Land, Water, and Biodiversity are the key Themes (i.e. high-level categories) adopted to provide the structure of the regional NRM Strategies at the state-wide scale. These Themes are consistent with state and national policies and priorities and build upon a shared commitment to address the key issues confronting productive and environmental landscapes and achieve lasting and meaningful outcomes.

Land	Productive and sustainable land management in natural, cultural, and productive landscapes
Water	Healthy, resilient, sustainable, and productive water resources – coastal and riparian systems and fresh, estuarine, and marine waterways.
Biodiversity	Healthy, resilient, and biodiverse environments and species.

3.7.2 Asset Classes

Within each of the identified Themes, specific Asset Classes are identified at the state and regional scale. Asset identification provides a structure that focuses action and investment in priority areas.

3.7.3 Outcomes – measuring strategic success

Long-term (aspirational) and near-term Outcomes for Tasmanian natural resources were identified by the regional NRM organisations in consultation with stakeholders. These Outcomes form benchmarks for measuring the success of Actions described in this Strategy.

2050 Outcomes	These long-term aspirational Outcomes are broad (at the Asset Class level) focus on a 20+ year timeframe at a state-wide scale. The aspirations are informed by the longer-term objectives and priorities identified in Tasmanian and Australian Government strategies and policies, long-term goals identified by stakeholders, and through research.
2030 Outcomes	The medium-term outcomes have a 2030 planning horizon and are regionally specific. They apply to the Priorities within each Asset Class.

3.7.4 Priorities

Priorities are assets that have been identified under each Asset Class through a regional prioritisation process. Priorities within the Strategy are not necessarily listed in priority order. More information about the prioritisation process is in Section 4.4 (Prioritisation process).

3.7.5 Actions

Actions are the identified tangible steps to address the threatening processes affecting the Priorities. Actions have been informed by extensive consultation with partners, stakeholders, investors, and the wider community. The Actions outline potential investment options that will guide specific project development and activities further refined in a Regional Investment Plan or similar document. The Actions have been developed based on best available scientific, economic and social information. The defined Actions will enable the regional organisations to identify and develop appropriate and relevant projects, taking into account any emerging science and innovations, threats, drivers or impacts, and the views and aspirations of stakeholders and project partners.

» Myrtle Orange, *Cyttaria gunnii*, growing in the rainforest at Winterbrook Falls (Kaare Wind)

4

A shared approach

4 A shared approach

4.1 Acknowledging connections

Landscapes – living and productive – are made up of many interconnected ecosystems, communities and uses. The Themes (Land, Water, Biodiversity) of this Strategy are therefore intrinsically linked. This results in some Priorities and Actions crossing over more than one Theme. It is recognised that the delivery of Actions can also result in improvements benefiting multiple natural, cultural, and productive systems and across Themes.

In some cases, Priorities and Actions cross regional boundaries and the relevant NRM organisations endeavour to work jointly to achieve shared objectives. These shared objectives are identified throughout the Strategy by the following icons (Figure 7). These linkages may not necessarily result in identical projects or Outcomes, but are complementary and include cross-regional consultation and engagement.

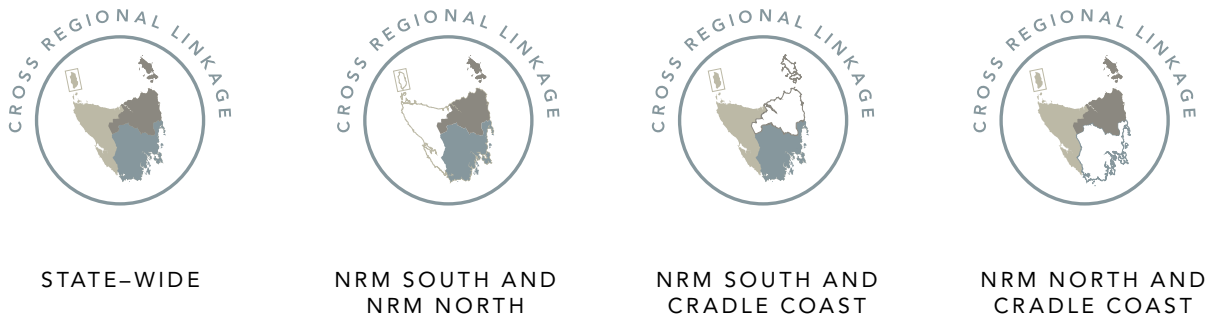


FIGURE 7: **Icons representing cross-regional linkages**

4.2 Working together for Healthy Country

It is important for this Strategy to articulate the fundamental philosophy of Aboriginal land, sea, and sky Country. Country holds special meaning for Aboriginal people – it is more than the place of origin; it has cultural and spiritual meanings, including beliefs, values, obligations, connections to ancestors, creation stories and all the animals and plants within. Aboriginal people know Country as an interconnected life-force with its own agency that encapsulates land, sea, and sky Country, while allowing each to exist in its own right and be interpreted in different ways.

Aboriginal land, sea, and sky Country is an important part of natural resource management – this view of Country integrates lore and respect for culture with caring for nature and landscapes. NRM organisations seek open engagement with Tasmanian Aboriginal people to understand their priorities for actions that support access, healing, protection and management of land, sea, and sky Country.

Working together, NRM organisations will:

- Honour, respect and value the strong physical and spiritual connection Aboriginal people have with Country and acknowledge their custodianship of land, sea, and sky Country.
- Look forward to a growing and influential role for Aboriginal people in natural resource management.
- Work respectfully, acknowledging that all landscapes are important and are integral parts of Country.
- Foster partnerships to better understand Aboriginal perspectives on natural resource management knowledge and practices.
- Support achievable projects, as identified by the Aboriginal community and organisations, through an ongoing process of consultation on project opportunities, planning and implementation.

4.3 Stakeholder engagement

The three regional NRM organisations have undertaken extensive and multi-faceted engagement with key stakeholders both state-wide and within their specific regions. The Strategies have received valuable guidance and input from the Tasmanian Aboriginal community and organisations, industry, research organisations, consultancies, Australian, Tasmanian and local government departments, peak bodies, and community interest groups. Stakeholder aspirations have been carefully considered in the Strategy development process and – where possible – are reflected in the relevant Priorities and Actions.

Further detail regarding the stakeholder engagement process is provided in Attachment 4.

4.4 Prioritisation process

Priorities and associated Actions have been identified by evaluating known natural resource assets and threats in each region. An assessment was undertaken to determine the importance of each asset in the region, and the potential for NRM strategic investment in actions to mitigate threats and improve or stabilise the health and trajectory of that asset. This process recognises that some regional assets and values of high significance may not be readily influenced by NRM investment, noting that other strategies, policies, agencies, or interest groups may be active in the management or protection of these assets.

Unlike previous NRM strategies, the 2030 NRM Strategy focusses on those assets that the NRM organisations have a capacity, capability, and role to act upon.

The prioritisation process used all available data and expert knowledge to list potential assets on which to focus. To short-list Priorities and Actions, six key criteria were identified, reflecting strategic considerations for decision-making, and expert knowledge of the required level of investment of resources (time, money, human effort and expertise) to make a difference to the asset. The six criteria are complex considerations expressed simply, so they can be scored and compared across diverse areas of proposed intent, and then ranked. For most of the asset classes in each region, the criteria were used in a fit-for-purpose Multi-Criteria Analysis (MCA).

The criteria used were:

1	**Strategic importance:**	Is the asset strategically significant at a regional, state, and/or national scale (considering environmental, social, and economic implications)?
2	**Influence:**	Are the NRM organisations the right organisation to do this work?
3	**Practicality:**	Can the NRM organisations do something valuable?
4	**Value:**	Is action worth it when considering the likely benefit?
5	**Risk:**	Can the NRM organisations reduce known or likely threats by acting locally?
6	**Priorities and linkages:**	Is this a priority of likely funders? Does it link with Government or stakeholder policy, priorities, or other drivers?

As key sources of funding to the natural resource management sector, linkages with Australian Government (e.g. Regional Land Partnership 5-year Outcomes and Investment Priorities) and Tasmanian Government priorities have been an important consideration.

Additionally, expert and community stakeholder knowledge has been sought through consultation, with expectations and aspirations considered. This engagement phase also highlighted some limitations to the available data and potential knowledge gaps. These have been addressed as actions, if appropriate to the broader achievement of outcomes.

It should be noted that the priorities, actions and outcomes for each prioritised asset class provide general guidance for the development of potential projects. Actions will be further assessed, refined, and developed into project designs/plans, based upon community interest and future investor potential and requirement. This phase of project development is described in Section 8.1.

Attachment 3 provides further detail on the prioritisation approach within each Theme.

» Eucalypt forest canopy

» Cropping on the Cradle Coast

5

Land

5 Land

The Land Theme identifies how NRM organisations partner with land managers to support sustainable natural and production landscapes and industries in a changing environment. Cradle Coast Authority aims to respect and acknowledge Aboriginal understanding of land and Country, conserve natural, cultural and production values associated with these assets, and to build capacity and develop resilience across these assets to protect them from ongoing and emerging threats.

Land assets encompass topography and the soils that support agriculture, plantation forestry and natural ecosystems, the vegetation that covers and protects these soils, and cultural heritage values.

Impacts to natural and cultural values, soil condition and vegetation are projected due to changes to land use, management practices and biosecurity threats.

Local threats and impacts can be compounded when combined with the global impacts of climate change (including changes in weather patterns and increased frequency and severity of extreme weather).

Asset Classes of Healthy Country, Resilient Landscapes and Soils and Vegetation have been developed to address these issues. Maintenance of healthy landscapes, soil and vegetation are essential components of all ecosystems – rural and urban, aquatic and terrestrial, domestic and wild. It is therefore acknowledged that the Land Theme is inextricably linked to the Themes of Water and Biodiversity, particularly in supporting vital ecosystem services. There are Priorities and Actions relevant to sustainable land management in all Themes, such as catchment management planning, soil erosion and nutrient management and the management of important vegetation communities, including riparian vegetation.

Supporting Tasmanian Aboriginal people to increase capacity to manage, access or heal Country, based on self-determined priorities.

Building the capacity of land managers to address the risk of adverse events, protect natural capital, and take advantage of opportunities for production industries in the face of challenges such as climate change, weeds, pests and diseases.

Supporting land managers to improve soil condition and manage vegetation cover to improve natural values, biodiversity, and production outcomes and mitigate emerging risks.

5.1 Land in Tasmania

TABLE 2: **A snapshot of Tasmania's land assets**

77	**PARCELS OF ABORIGINAL MANAGED LAND** 63,930 ha is under management by Aboriginal land authority	Indigenous Protected Areas include Preminghana, Risdon Cove, Putalina, Mount Chappell, Badger Island, Babel Island, Great Dog Island, lungtalanana
28%	**FARMLAND** 18,900 km^2 of Tasmania is used for farming	Sheep farming (2,646 km^2), beef cattle farming (5,670 km^2), dairy farming (3,591 km^2) and vegetable farming (2,079 km^2) account for 56% of agricultural land area
2,171	**FARM BUSINESSES** Generated $1.68B during 2018–19, increasing from $1.48B during 2015–16	Milk ($475M), cattle and calves ($342M) and potatoes ($127M) accounted for 57% of state-wide agricultural production
18	**IRRIGATION SCHEMES** Operated by Tasmanian Irrigation (GBE), the schemes supply over 85,000 ML of water to agriculture per year	Dial-Blythe, Duck, Cressy Longford, Great Forester, Greater Meander, Kindred-North Motton, Lower South Esk, Midlands, North Esk, Sassafras Wesleyvale, Scottsdale, Sorell, South East (Stages 1 & 2), Southern Highlands, Swan Valley, Upper Ringarooma, Whitemore, Winnaleah
37%	**OF FARMS WITH CONSERVATION AREAS** Combined total of 110,770 ha	812 Tasmanian farm businesses have an area of land set aside for conservation or protection purposes
812 K	**HECTARES OF PRODUCTION FOREST** Total area on public land	434k hectares of timber reserves on private land. 283k plantation forest across tenures. Annual value of $1.2B to the Tasmanian economy.

5.2 Healthy Country

5.2.1 State-wide Outcome

By 2050, Aboriginal communities have been supported to access, heal, protect and manage land, sea and sky Country in a way that respects their knowledge and rights as Traditional Owners, according to their priorities.

5.2.2 Regional context

Cradle Coast Authority acknowledges the Tasmanian Aboriginal peoples' strong connections to the coast, land, and waterways as well as plants and animals, which are associated with traditional uses and significance in ceremonies, creation stories, art and identity. Stewardship of these sites and the cultural landscapes of the whole Cradle Coast region are not only integral to Aboriginal identity, health and wellbeing, but also to Aboriginal rights and reconciliation.

Sites of cultural significance are found across the region with concentrations on the coast and along river valleys that provided pathways from alpine to coastal resources for the region's First Nations Peoples. Sites of significance include living places, burial areas, quarries, petroglyphs and rock art.

These sites are at risk from a number of threats including a changing climate (physical degradation of sites from sea level rise, changes to ecosystem function and native species assemblages), loss of knowledge and fewer opportunities to connect to or access Country, and changes to land use and/or condition (from urbanisation and development, changing fire regimes, pest species and biosecurity threats).

Aboriginal-managed land in the Region at Panatana, Preminghana, Kings Run, and in the Western Tasmania Aboriginal Cultural Landscape (takayna Country) are important places for re-establishing Aboriginal governance and reconnecting Tasmania's Aboriginal communities with Country.

Cradle Coast Authority recognises that land, sea and sky Country management requires culturally appropriate engagement processes to align our strategic work opportunities with Tasmanian Aboriginal peoples' self-determined priorities. Working in open, respectful and ongoing relationships with Tasmanian Aboriginal communities, appropriate Actions have been developed that support access, healing, protection and management of land, sea and sky Country.

Cradle Coast Authority recognises the importance and role of Traditional Ecological Knowledge in natural resource management and aims to facilitate opportunities for the continuation or reestablishment of traditional practices by Aboriginal people in looking after Country. CCA aims to support the integration of traditional land management practices, where possible and appropriate, to contribute to the Outcomes of the Strategy. This will occur across all Themes and in recognition of the importance of this, Aboriginal culture and knowledge is recognised in the Strategy Principles (Section 3.3).

5.2.3 Priorities and Actions

PRIORITY LH1: Aboriginal Cultural Landscape in the Cradle Coast Region

This section considers how Cradle Coast Authority can support Aboriginal people and organisations to access, heal and protect Country. Our Actions focus initially on community consultation to strengthen relationships and better respect and understand cultural knowledge and traditional practices. We then aim to develop partnerships to provide planning support and deliver on-ground activities together. Cradle Coast Authority also recognises the value in supporting opportunities for employment and training of Aboriginal people in land management, sharing skills and experiences in a meaningful way.

Outcome:

By 2030, All represented Aboriginal communities in the Cradle Coast region have been supported to manage Country and protect cultural heritage through meaningful consultation and the development of land management initiatives and partnerships.

Local threats that can be addressed by NRM actions:

- Loss of cultural knowledge
- Barriers to opportunities to connect and manage Country
- Unmanaged fire
- Degradation of culturally significant sites
- Inappropriate recreational and industrial land use/development
- Incursion of weeds and feral animals
- Loss of culturally significant species

Actions:

LH1.a	Work with Tasmanian Aboriginal communities to identify their priorities for protection and caring for takayna Country and West Coast cultural landscapes and identify opportunities to support their priorities, such as researching and applying cultural burning practices.
LH1.b	Support projects at Preminghana identified as priorities by Aboriginal communities in the *Preminghana Healthy Country Plan 2015*, such as fire management and weed and pest control, as well as supporting neighbouring land manager relations to foster caring for Country outcomes.
LH1.c	Work with Aboriginal communities to identify priorities that heal and protect the continuous Country of Panatana, Marshalls Hill and Narawntapu National Park and support opportunities to develop traditional practices such as native shellfish reef restoration and aquaculture.
LH1.d	Participate in initiatives that support Tasmanian Aboriginal community aspirations in the management of reserves and protected areas such as the TWWHA, such as access and participation through TWWHA co-management arrangements.
LH1.e	Support Tasmanian Aboriginal communities in building capacity to access and manage Country and protect cultural heritage.

Implementation:

Investment opportunity	✓ Australian Government	✓ Tasmanian Government	✓ Regional or Local	✓ Private or philanthropic

Potential delivery methods	• Consultation to identify opportunities and resources to respond to Tasmanian Aboriginal self-determined priorities to access, heal and protect Country. • Support Healthy Country planning and management at culturally important sites. • Support training and capacity-building opportunities to maintain traditional knowledge and practices and develop career pathways for local Aboriginal community members. • Support appropriate broader community engagement about natural and cultural values.
Potential collaborators	Local relevant Aboriginal groups, local councils; PWS; Landcare and Wildcare groups; State and Australian Governments.
Opportunities for community participation	Ongoing engagement with Aboriginal land managers and communities to develop partnerships and community participation initiatives, such as volunteer and citizen science opportunities, Change to: engagement, training and Traineeships for Aboriginal community members and appropriate broader community field days and events.

» Boat Harbour surf (Lucy Taylor)

» Revegetation at Lorinna

5.3 Resilient landscapes

5.3.1 State-wide Outcome

By 2050, actions have been implemented to improve the resilience of landscapes, communities, and enterprises, and the capacity to adapt to climate change.

5.3.2 Regional context

Agriculture in the Cradle Coast region is characterised by innovation and adaptive thinking through networking and collaboration. Land managers are supported by research organisations, secondary processors, consultants and government agencies to improve productivity and market access. The State Government's 2050 Agri-food Plan underscores the importance of agriculture's future growth to the regional economy.

Capacity-building among farmers and land managers to utilise emerging technology and predictive tools will maximise the benefit these opportunities present. Markets for regional products are built on social preference for clean, safe, healthy and environmentally responsible food for a global market. Maintaining credibility in this marketplace requires well-planned approaches to environmental impacts and change.

Climate change and its associated impacts are likely to have profound impacts on agriculture, particularly in coastal areas of north-west Tasmania. More extreme weather events may impact livestock health and welfare, erosion and pasture growth.

Changes in hydrology influenced by climate change will strongly influence soil degradation processes. Changes to rainfall, temperature, frosts and ocean temperatures will impact on crop viability, time to crop maturity, crop yields, and the incidence and severity of weeds, pests and diseases.

Climate change adaptation and mitigation opportunities in agriculture include expansion of irrigation to provide greater reliability of soil moisture for crops, pasture and horticulture; planting of vineyards and other crops currently suited to warmer and drier climates; sequestration of carbon in existing extensive forests, new plantations and farm forestry; and encouraging the uptake of agricultural practices that maintain and improve ground cover, improving soil carbon storage. Enterprise suitability mapping recently developed in Tasmania can also be used to identify local opportunities for enterprise change and adaptation.

5.3.3 Priorities and Actions

PRIORITY LR1: Adapting farms to changing climate and markets

Climate change will have a significant impact on the environment in the coming decades. More extreme weather, and changes in rainfall, temperature, frosts, and ocean temperatures will affect primary production (yields, crop viability, harvest scheduling). This Strategy includes a plan for the future viability of the Cradle Coast region's natural, cultural and production landscapes, to encourage resilience to change and realise opportunity through change. Emerging markets and opportunities for carbon storage in soils and vegetation provide mechanisms for land managers to profit from restorative and sustainable land management.

Outcome:

> By 2030, 30 % of land managers have increased awareness and improved capacity to adapt to significant changes in climate, have improved knowledge of emerging markets, or have improved capacity in disaster preparedness, compared to 2020 levels.

Local threats that can be addressed by NRM actions:

- Regional climate regime shift
- Market shifts
- Extreme weather events
- Land use change
- Land use intensification

Actions:

LR1.a	Improve land managers' knowledge of climate change impacts and access to information and networks to support farm business sustainability and profitability both now and into the future.
LR1.b	Improve smallholder, part-time and new land managers' knowledge of best land management practices, biosecurity threats, climate change impacts and access to information and networks to support farm sustainability and Best Management Practice (BMP) implementation.
LR1.c	Increase awareness of threats of increased frequency and intensity of extreme climatic events and build the capacity of land managers in disaster preparedness.
LR1.d	Actively support disaster recovery programs to maintain and build long-term resilience of farming and productive landscapes.
LR1.e	Seek opportunities to work with land managers, councils and community groups to consider the circular economy and minimise waste entering landfills and the environment.

Implementation:

Investment opportunity	✓ Australian Government	✓ Tasmanian Government	✓ Regional or Local	✓ Private or philanthropic

Potential delivery methods	• **Information gathering activities** including supporting flood mapping, threat assessment, market assessment and BMP benchmarking. • **Policy and planning activities** including disaster recovery planning. • **On-ground works** including bank stabilisation in flood prone areas, new weed management, coastal dune stabilisation. • **Behaviour-change and capacity-building activities** such as BMP education and support, Change to: Property Management Planning (PMP) facilitation, extension to landholders and communities focused on disaster preparedness, climate change awareness, threat mitigation, sustainability education.
Potential collaborators	Landholders; industry bodies; agri-service providers; processors; councils; community groups; State and Australian Government.
Opportunities for community participation	Engagement with landholders including through the development of extension and education materials and website resources; field days and public events.

» Cattle grazing

PRIORITY LR2: Increasing carbon storage in the region

Fostering the adoption of practice changes which give rise to increased carbon storage across productive farmland of the Cradle Coast region is key to maintaining and increasing the prosperity of Tasmanian agriculture. While sequestering greater amounts of carbon in production agriculture itself now provides an income stream, many practice changes which will assist in achieving this may also mitigate the effects of a changing climate on farm viability. Careful consideration of inputs, appropriate science-based use of irrigation, incorporating greater species diversity into pasture composition, reduced tillage operations and greater uptake of seasonal cover crops to replace bare fallow periods are all practices which will lead to greater biological activity within the soil and increase soil carbon levels. Restoring degraded riparian zones and increasing the uptake of farm shelterbelt plantings have the potential to store carbon for the long term, as well as providing benefits to farm production and local native species.

Outcome:

> By 2030, eight reforestation and/or carbon storage projects have been completed across the region, resulting in increased calculated and certified carbon draw-down, and increasing available habitat for biodiversity.

Local threats that can be addressed by NRM actions:

- Loss of biodiversity
- Market shifts
- Land use change and intensification
- Missed opportunities for carbon storage and ecological restoration projects in the region

Actions:

LR2.a Improve land managers' knowledge of emerging carbon markets and support them to participate. Support improved planning, implementation, and evaluation of carbon storage projects in the region.

Implementation:

Investment opportunity

- ✓ Australian Government
- ✓ Tasmanian Government
- ✓ Regional or Local
- ✓ Private or philanthropic

Potential delivery methods

- **Information gathering activities** including a review of opportunities for carbon storage projects in the region.
- **Policy and planning activities** including foundational spatial work to assess suitable sites and farm businesses and assess the level of interest in the community. Foundational work to develop monitoring methods.
- **On-ground works** including ecological restoration, farm forestry, shelterbelt, habitat corridors and permanent carbon storage options.
- **Behaviour-change and capacity-building activities** such as BMP education and support, PMP facilitation, extension to landholders and communities focused on climate change awareness, threat mitigation, sustainability education.

Potential collaborators Landholders; industry bodies; agri-service providers; carbon aggregators; councils; community groups; State and Australian Government; Private Forests Tasmania.

Opportunities for community participation Engagement with landholders including through the development of extension and education materials and website resources; field days and public events; opportunities for the community to get involved with revegetation projects; potential for citizen science in monitoring biodiversity and tree growth.

5.4 Soils and vegetation

5.4.1 State-wide Outcome

By 2050, actions have been implemented to improve soil health, vegetation cover and increased adoption of best management practices in productive agricultural landscapes.

5.4.2 Regional context

Cradle Coast is one of the most agriculturally productive regions in Tasmania. Fertile soils associated with the northern coastline of the region and on King Island benefit from a temperate moist climate to provide ideal conditions for high-value horticulture, dairying and beef production.

Innovation and investment in agriculture is well-established in the region. The Tasmanian and Australian Governments are investing in expanded irrigation capacity in key production areas, providing greater certainty for individual producers. There is also growth in the dairy industry, transition to large scale berry production under greenhouses, and the profitability of the grazing industry is strong.

Significant expansion of the dairy industry into the far north-west has led to land management issues due to heavy stocking rates, high use of artificial fertilisers, extensive subsoil drainage and land clearing. While the far north-west remains highly productive, practice change towards reduced inputs and soil health improvement is desirable. These farming systems are based on soils which include drained swampy coastal plains and sandy coastal dunes but with the combination of high rainfall and high inputs, they are highly productive. Careful management of these systems is necessary to manage nutrient inputs and off-site impacts.

Intensive horticulture is one of the highest value landuses in the region, and consequently, the most productive soils are used. This includes the cultivation and cropping of sloping land. Management of erosion, sediment and nutrient transfer is critical to reducing off-site impacts and maintain soil health and productivity.

The following Priorities were identified and described using a risk/threat-based approach:

- Soils at risk of biological and/or carbon decline
- Soils at risk of structural decline and/or erosion
- Soils at risk from nutrient imbalance and/or acidification
- Soils and vegetation at risk from weeds, pests and disease
- Native vegetation on farms

5.4.3 Priorities and Actions

PRIORITY LS1: Soils at risk from structural decline and erosion

Soil structural decline through compaction is a threat and ongoing management issue for intensively farmed land under irrigation across the region. Compaction is the result of tillage operations or excessive traffic (animal or vehicular) when soil moisture conditions are less than optimal. Compaction leads to increased bulk density by reducing the volume of air and water in the soil and gives rise to poorer plant growth and root penetration, reduces the ability of water to infiltrate into the soil profile and increases the risk of surface runoff. Structural decline from excessive traffic at elevated soil moisture levels usually occurs during winter and spring in the Cradle Coast region from wet harvesting of crops and on densely stocked intensive grazing enterprises. Structural decline and low levels of ground cover increase the likelihood and severity of soil erosion from rainfall events and irrigation. Poor soil structure reduces water infiltration into the soil profile, with the resultant increase in surface runoff eroding soil particles as water moves downhill. In the absence of ground cover, raindrop impact causes surface sealing of soil also reduces water infiltration leading to increased surface runoff and greater risk of erosion.

Outcome:

By 2030, 30% of land managers in the region have adopted management practices to manage soil structure and stability and are actively implementing soil loss prevention practices in priority areas for erosion by water (hillslope) and wind (coastal and hinterland), as a result of new CCA projects.

Local threats that can be addressed by NRM actions:

- Soil loss
- Loss of production
- Reduction in economically viable enterprises in the region
- Impacts on water quality, biodiversity and ecosystem function in freshwater and marine ecosystems

Actions:

LS1.a	Encourage the adoption of practices under cropping that maximise groundcover, reduce soil loss and improve soil structure to benefit soil health and productivity.
LS1.b	Encourage the adoption of practices under dryland grazing to manage soil compaction and erosion and improve pasture quality, persistence and productivity.
LS1.c	Increase awareness of BMP and encourage the adoption of practices under irrigation to manage waterlogging, soil compaction and erosion.

Implementation:

Investment opportunity	✓ Australian Government	✓ Tasmanian Government	✓ Regional or Local	✓ Private or philanthropic

Potential delivery methods

- **Information gathering activities** including a foundational spatial review of properties in erosion-prone areas.
- **On-ground works** including trials, demonstrations and one-to-one advice on BMP for different production systems.
- **Behaviour-change and capacity-building activities** such as BMP education and support, PMP facilitation, extension to landholders.

Potential collaborators	Landholders; industry bodies; agri-service providers; processors; State and Australian Government; research institutes.
Opportunities for community participation	Engagement with landholders including through the development of extension and education materials and website resources; field days and public events; on-farm customised support.

» Beans sprouting at Forthside

PRIORITY LS2: Soils at risk from biological and carbon decline

Tasmanian agricultural systems have relatively high organic carbon content (significantly greater than most of those on mainland Australia) due to climatic and soil influences (lower mean annual temperature and higher precipitation in Tasmania result in less oxidation of soil organic matter). Soil organic carbon relates directly to productivity in agricultural soils. The relationship is a function of the organic carbon content in soil improving water holding capacity and nutrient availability, in addition to improving conditions for soil biological activity. Declining soil carbon levels across farmland of the Cradle Coast region are an issue for numerous aspects of soil health and farm productivity. Well-structured soils provide habitat for necessary organisms within the soil profile, with natural senescence of such soil organisms contributing to soil carbon stocks. Soil carbon itself has beneficial properties for soil structure, chemistry and microbiology, and soil carbon levels will reach a state of effective equilibrium based on land use and rainfall or irrigation. Excessive use of inputs, inadequate rest periods between intensive cropping or removal of carbon stocks at rates higher than biological processes can replace them, can lead to declining biological activity and the carbon that this activity facilitates the accumulation of.

Outcome:

By 2030, 30% of land managers in the region have adopted management practices to improve levels of soil organic carbon and biological activity.

Local threats that can be addressed by NRM actions:

- Loss of natural capital
- Loss of production
- Reduction in economically viable enterprises in the region

Actions:

LS2.a	Encourage the adoption of practices under cropping that increase soil organic carbon and biological activity to benefit soil health and productivity.
LS2.b	Encourage the adoption of grazing and pasture management practices that increase soil organic carbon and biological activity to improve pasture quality, persistence and productivity.

Implementation:

Investment opportunity	✓ Australian Government ✓ Tasmanian Government ✓ Regional or Local ✓ Private or philanthropic
Potential delivery methods	• **Information gathering activities** including a foundational spatial review of properties in areas prone to carbon decline. • **On-ground works** including trials, demonstrations, and one-to-one advice on BMP for different production systems. • **Behaviour-change and capacity-building activities** such as BMP education and support, PMP facilitation, extension to landholders.
Potential collaborators	Landholders; industry bodies; agri-service providers; processors; State and Australian Government; research institutes.
Opportunities for community participation	Engagement with landholders including through the development of extension and education materials and website resources; field days and public events; on-farm customised support.

PRIORITY LS3: Soils at risk from nutrient imbalance and acidity

Nutrient imbalances and acidity are an ongoing concern for farm productivity and environmental outcomes across the region. Unmeasured and unmanaged soil pH will lead to suboptimal plant growth and potential animal health issues as nutrients and trace elements may be either unavailable for plant uptake or available in toxic quantities. Many soil types of the region are naturally acidic, which is further acidified over time through moderate to high levels of precipitation which leach basic cations from the soil profile. Inadequate nutrient levels lead to crops failing to achieve optimal yield quality attributes, while excessive levels (particularly nitrate and phosphate) may exacerbate existing soil acidity and lead to adverse off-site impacts.

Awareness and adoption of pasture management practices that maintain a stable pH, such as appropriate fertiliser and lime application, are essential to maintaining the productivity and health of northern Tasmanian soils.

Outcome:

By 2030, 30% of land managers in the region with permanent pasture systems have adopted management practices to manage soil acidity and fertility.

Local threats that can be addressed by NRM actions:

- Loss of natural capital
- Loss of production
- Reduction in economically viable enterprises in the region
- Off-farm impacts such as water quality reduction caused by poor nutrient management.

Actions:

LS3.a	Encourage the adoption of practices under grazing systems to address soil acidity and nutrient imbalance to improve pasture quality, persistence and productivity.
LS3.b	Encourage the adoption of practices under cropping systems to address soil acidity and nutrient imbalance to improve soil health and productivity.

Implementation:

Investment opportunity	✓ Australian Government ✓ Tasmanian Government ✓ Regional or Local ✓ Private or philanthropic
Potential delivery methods	• **Information gathering activities** including a foundational spatial review of properties in areas with permanent pasture systems. • **On-ground works** including trials, demonstrations, and one-to-one advice on BMP for different production systems. • **Behaviour-change and capacity-building activities** such as BMP education and support, PMP facilitation, extension to landholders.
Potential collaborators	Landholders; industry bodies; agri-service providers; processors; State and Australian Government; research institutes.
Opportunities for community participation	Engagement with landholders including through the development of extension and education materials and website resources; field days and public events; on-farm customised support.

PRIORITY LS4: Soils and vegetation at risk from weeds, pests and disease

Effective biosecurity is critically important to Tasmania's natural environment and production landscapes. Tasmania's apparent "clean and green" image is a product of the island's natural capital and the relative absence of pests and diseases that are present in other parts of Australia, permitting access to domestic and international markets unavailable to other states and territories. As biosecurity pressures and threats increase, due to increased movement of goods and people, so does the potential for weed, pest and disease incursion.

Partnerships and capacity building are vital to maintaining and improving biosecurity management, as the complexity of biosecurity systems increases and effectiveness of maintaining a biosecure environment increasingly relies on stakeholder capabilities, in particular land managers, and their approaches to biosecurity activities.

Outcome:

> By 2030, 40% of priority land managers in the region have increased their capacity to recognise and manage weed, pest and disease threats to agriculture.

Local threats that can be addressed by NRM actions:

- Loss of natural capital
- Loss of production
- Reduction in economically viable enterprises in the region
- Region-wide biosecurity threats

Actions:

LS4.a Increase awareness of weed, pest and disease threats to agriculture and build the capacity of farmers to prevent, detect and manage threats to farm businesses.

Implementation:

Investment opportunity	✓ Australian Government	✓ Tasmanian Government	✓ Regional or Local	✓ Private or philanthropic

Potential delivery methods

- **Information gathering activities** including a foundational spatial review of regional biosecurity threats.
- **On-ground works** including trials, demonstrations, and one-to-one advice on BMP for different production systems.
- **Behaviour-change and capacity-building activities** such as BMP education and support, PMP facilitation, extension to landholders.

Potential collaborators Landholders; industry bodies; agri-service providers; processors; State and Australian Government; research institutes.

Opportunities for community participation Field days and public events; engagement with landholders including through the development of extension and education materials and website resources.

PRIORITY LS5: Native vegetation on farms

Native vegetation on farms provides a range of benefits for farm production and the natural environment, in addition to improved amenity. Fragmented or absent riparian vegetation gives rise to increased evaporation and higher water temperatures, as well as increased sediment from surface runoff entering waterways, nutrient runoff and faecal coliform contamination. The risk of soil erosion is heightened in the absence of roots to bind soil in place and leaf litter and decomposing vegetation to slow runoff water and trap sediment. Shelterbelts reduce windspeeds and evaporation from flora and soil, also providing shade and shelter for livestock which may reduce animal energy requirements and improve livestock health outcomes.

Increasing the extent and condition of native vegetation in production landscapes with well-managed native shelterbelts, riparian areas and remnant vegetation is critical for biodiversity improvement. Restoring and rehabilitating native vegetation in these highly altered landscapes can reverse the effect of historical clearing and habitat fragmentation, providing core habitat for native species, many of which are threatened, and improving connectivity as linking habitat.

Outcome:

By 2030, 25 revegetation and habitat restoration projects have been completed across the region, protecting and expanding areas of native vegetation on farms to improve productivity, biodiversity habitat value and landscape connectivity in priority agricultural landscapes.

Local threats that can be addressed by NRM actions:

- Loss of natural capital
- Loss of production
- Reduction in economically viable enterprises in the region
- Region-wide biosecurity threats
- Biodiversity and habitat loss

Actions:

LS5.a	Encourage the protection and expansion of wetlands, remnant and riparian vegetation on farms to improve productivity, landscape connectivity and habitat value in priority agricultural landscapes.
LS5.b	Increase awareness of the productive benefits of the strategic establishment of native vegetation on farms.
LS5.c	Facilitate strategic biodiversity offsets for vegetation loss and biodiversity impacts from irrigation development and land-use change.

Implementation:

Investment opportunity	✓ Australian Government	✓ Tasmanian Government	✓ Regional or Local	✓ Private or philanthropic

Potential delivery methods	• **Information gathering activities** including a foundational spatial review of vegetation cover to determine priority areas, scoping biodiversity offset programs and potential. • **On-ground works** including trials, demonstrations, and one-to-one advice on BMP for different production systems. • **Behaviour-change and capacity-building activities** such as BMP education and support, PMP facilitation, extension to landholders.
Potential collaborators	Landholders; industry bodies agri-service providers; processors; State and Australian Government; research institutes; Private Forests Tasmania.
Opportunities for community participation	Engagement with landholders including through the development of extension and education materials and website resources.; field days and public events; on-farm customised support.

6

Water

» Coastal sunrise (Nick Green, We Are Explorers)

6 Water

The Water Theme encompasses Tasmania's key water assets, which include rivers and estuaries, wetlands and waterbodies, and coastal and marine systems. Tasmania's water assets support multiple primary industries including agriculture, fishing, and aquaculture. They also support community-dependent infrastructure systems for hydro-electric power generation, drinking water supply and wastewater treatment, ports, and marine traffic. The built environment is concentrated near the state's water assets. The combined influence of climate change, development and land use change, human movement and population change, and ageing infrastructure, is increasing pressure on water assets.

Further, emerging priorities may be associated with threats to Assets that are due to climate-driven events such as drought, bushfire and flood, and these are likely to be ongoing issues in managing water resources.

Protection and management of water resources is closely linked with land management, including some actions listed in the Land Theme (e.g. soil and erosion management and resilient landscapes) and Biodiversity Theme (e.g. aquatic threatened species and important vegetation communities, including riparian vegetation). The delivery of actions across all Themes will contribute to the health of Tasmania's water resources.

The movement of fresh surface and groundwaters through the landscape supports ecological, economic, and social values. Ecological values of catchments and estuaries, and current and emerging threats in receiving waters are used to identify Priorities and Actions for rivers, floodplains, and estuaries.

Wetlands and other waterbodies include internationally recognised wetlands of significance under the Ramsar Convention, which support high-value ecological communities. Nationally and regionally important wetlands and other water bodies are recognised for their conservation value.

Coastal and marine areas encompass a wide variety of landscapes and habitat types. Important coastal and marine areas can be identified by high value habitats or species. To enhance ecological, social, and economic values, identified Actions will build resilience to pressures and emerging threats across regional Priorities.

6.1 Water in Tasmania

TABLE 3: **A snapshot of Tasmania's water assets**

48	**WATER CATCHMENTS** Approximately 150,000 km of river systems	Longest rivers: • South Esk – 252 km (North) • Derwent – 239 km (South) • Arthur –172 km (Cradle Coast)
10	**RAMSAR WETLANDS** Internationally significant wetlands covering 26,000 ha	• 10 Ramsar wetlands ranging in size from 7 ha to 4,517 ha • 89 nationally important wetlands ranging in size from 1 ha to 16,070 ha
113	**ESTUARIES** Moderate to large in size	• 68 critical/high conservation value estuary systems
3,030	**KM OF COASTLINE** 2,237 km of mainland coastline	• 900 beaches • 9 Interim Marine and Coastal Regionalisation of Australia bioregions • Over 300 islands with 10 over 5,000 ha in size
10	**MARINE CONSERVATION AREAS** Covering 135,000 ha	• 7 Marine Nature Reserves • 3 Australian Marine Parks

6.2 Rivers, floodplains and estuaries

6.2.1 State-wide Outcome

By 2050, actions have been implemented to improve waterway health and the condition of riparian vegetation for improved health and function of rivers, floodplains and estuaries.

6.2.2 Regional context

River systems in the region are significant biodiversity assets, providing habitat for state and nationally listed species including Giant Freshwater Crayfish, Australian Grayling and freshwater snails.

There are 38 estuaries and harbours in the region. Several of these are associated with river systems in remote areas and despite impacts from climate change and natural processes, such estuaries are in good condition. Estuaries in the region provide important habitat for marine fauna and are of significant value for migratory and resident shorebirds.

Agriculture is a major land use in catchments on King Island and in 10 of the 12 catchments draining into Bass Strait. These catchments contribute significantly to the region's present and future economy as well as providing homes for the majority of our population. Maintaining or improving the health and sustainability of catchments impacted by agricultural and urban land uses has been identified as a high priority for NRM investment through this Strategy. Changes in catchment hydrology can also drive declines in condition of estuaries, riverine ecosystems and habitats as well as impact sustainability of farming systems.

6.2.3 Priorities and Actions

PRIORITY WR1: Priority rivers in agricultural landscapes

There are 21 major river catchments in the region. They are generally steep and while all have conservation value, those flowing westward are relatively less disturbed than the northward flowing catchments which have been developed for agriculture, industrial and urban uses. These rivers experience pressures associated with point-source and diffuse pollution, thereby impacting ecosystem health, including water quality.

Through Catchment Management Planning, an improved understanding of catchment condition and hydrology trends can be established and adoption of improved land management practices (such as nutrient management, riparian fencing and restoration, smart irrigation technologies, and crop rotations) can lead to improvement in catchment and river health, as well as providing economic savings.

Outcome:

> By 2030, all high priority rivers in agricultural landscapes in the Cradle Coast have Catchment Management Plans or Water Quality Improvement Plans (WQIPs), and a strategic program for improving river health (biological communities, instream and riparian habitats, water quality) has been implemented.

Local threats that can be addressed by NRM actions:

- Poor water quality and river health
- Biodiversity and habitat loss
- Flooding and impacts of extreme weather

Actions:

WR1.a	Implement WQIP actions to improve dairy effluent and riparian zone management on Circular Head farms (Duck, Montagu, Welcome catchments) to protect river system values and mitigate downstream impacts (Duck Estuary and Robbins Passage-Boullanger Bay).
WR1.b	Implement WQIP actions to improve agricultural best management practices and improve river health in the Mersey catchment and connected waterways (Mersey and Don Rivers and their tributaries).
WR1.c	Improve land and industry management practices in priority catchments – Rubicon, Forth-Wilmot, Blythe, Leven and Detention – to protect river system values and mitigate downstream impacts.
WR1.d	Improve agricultural best management practices in the Sea Elephant catchment to protect river system values and mitigate downstream impacts (Sea Elephant estuary, part of Lavinia Ramsar site).
WR1.e	Improve long-term river health outcomes in priority rivers in all agricultural landscapes through catchment management planning and river health monitoring and flow studies.

Implementation:

Investment opportunity	✓ Australian Government	✓ Tasmanian Government	✓ Regional or Local	✓ Private or philanthropic

Potential delivery methods	• **Information gathering activities** including a foundational spatial review to prioritise catchments. • **Policy and planning activities** such as participating in state-wide healthy waterways planning and collaborating with government authorities on river health improvement programs. Undertaking WQIPs and catchment management plans. • **On-ground works** including trials, demonstrations, and grants for fencing, nutrient management, and riparian restoration. • **Behaviour-change and capacity-building activities** such as BMP education and support, and river health extension to landholders.
Potential collaborators	Landholders; industry bodies; agri-service providers; processors; State and Australian Government; research institutions; not-for-profit organisations (e.g. OzFish).
Opportunities for community participation	Engagement with landholders including through the development of extension and education materials and website resources.; field days and public events; on-farm customised support.

» Green Point Beach, West Coast

PRIORITY WR2: Macquarie Harbour (including Gordon, Franklin and King Rivers)

Situated on the West Coast of Tasmania, Macquarie Harbour is approximately 315 km^2 in size and is fed by freshwater, largely from the Gordon and King Rivers. Having a relatively narrow entrance to the ocean, Macquarie Harbour is one of the largest salt-wedge estuaries in the world. It is a significant asset which is a focus for commercial aquaculture and local and international tourism. The harbour is impacted by historic and ongoing inflow of waste materials and litter from urban and commercial sources. Community and industry interest and action to reduce and remove waste streams from the harbour are ongoing and existing partnerships support prioritisation for action under this strategy.

Outcome:

> By 2030, community and industry engagement has resulted in increased understanding of the natural values and condition of Macquarie Harbour compared with 2020 levels.

Local threats that can be addressed by NRM actions:

- Poor water quality and river health
- Biodiversity and habitat loss
- Biosecurity, introduction and spread of pest species and disease to marine areas
- Threat of contamination of an important harbour for aquaculture and natural values

Actions:

WR2.a Lead community engagement activities and develop a partnership program with harbour-based industries that aims to identify and manage local threats, and promote Macquarie Harbour's natural values, condition, and improvement.

WR2.b Raise awareness of the ecology, habitat, threats to, and potential management actions for, the Maugean Skate.

Implementation:

Investment opportunity

- ✓ Australian Government
- ✓ Tasmanian Government
- ✓ Regional or Local
- ✓ Private or philanthropic

Potential delivery methods

- **Information gathering activities** including a review of Maugean Skate research and programs that relate to Macquarie Harbour
- **Policy and planning activities** such as supporting Macquarie Harbour industry and community representatives to maintain a stakeholder group and program of activities to improve the natural values of the harbour and surrounds.
- **Behaviour-change and capacity-building activities** such as citizen science supporting research, extension and education activities about the natural values of Macquarie Harbour and its catchment.

Potential collaborators Aquaculture industry, recreational fishers, not-for-profit organisations (e.g. OzFish), local government, State Government (Marine Farming Branch), education and research organisations (e.g. IMAS).

Opportunities for community participation Citizen science, educational activities, marine debris clean-ups and similar community-led activities.

6.3 Wetlands and other waterbodies

6.3.1 State-wide Outcome

By 2050, actions have been implemented to improve or maintain the ecological character and resilience of Tasmania's wetlands and waterbodies.

6.3.2 Regional context

Wetlands associated with urbanised and farming landscapes are impacted by sediment, nutrient and biological pollutants which in turn are influenced by riparian and adjacent land use, and vegetation clearance. Catchment planning approaches identified in this Strategy are proposed to address these issues and require effective engagement with multiple stakeholders and comprehensive technical review. Best practice approaches to community engagement are essential.

Lavinia State Reserve on King Island, listed under the Ramsar Convention, is globally significant for its wetland vegetation communities and as habitat for resident and migratory wildlife.

Robbins Passage-Boullanger Bay is an important environmental asset, while not formally listed as a Ramsar site, meets listing criteria due to its significant areas of undisturbed saltmarsh and habitat for globally migrating shorebirds. The area is recognised internationally as a Key Biodiversity Area (KBA) by BirdLife International and the extensive coastal saltmarsh areas are a listed Threatened Ecological Community under the EPBC Act.

Both these natural systems are of critical importance for terrestrial and marine biodiversity conservation at the global, national, state and regional scales.

6.3.3 Priorities and Actions

PRIORITY WW1: Lavinia State Reserve

Lavinia State Reserve was first listed as a Ramsar site in 1982. It is situated on the north-east coast of King Island and is contained wholly within a State Reserve under the management of Tasmania Parks and Wildlife Service (PWS).

The reserve contains a highly significant and diverse set of ecosystems, including a significant lagoon and wetland system, coastal and bush landscapes, and a rich Aboriginal cultural heritage. Major wetlands include a large estuary with saltmarsh, coastal lagoons, perched lakes, swamp forests, and numerous smaller, seasonally inundated, wetland areas. The site is one of the few unaltered areas of King Island and contains much of the remaining native vegetation on the island. The reserve also contains about 200 hectares of feeding habitat for the Orange-bellied Parrot and the largest tract of remaining habitat for the King Island Scrubtit, two of Australia's most critically endangered birds.

Outcome:

> By 2030, the ecological character of the Ramsar-listed Lavinia wetland has been re-assessed and improvement actions have been implemented.

Local threats that can be addressed by NRM actions:

- Poor water quality and river health
- Land management practices including drainage and land clearing
- Inappropriate recreational use
- Weeds and pests
- Uncontrolled bushfires

Actions:

WW1.a	Identify priority actions to mitigate threats to Lavinia Ramsar wetlands associated with land management practices, fire, weeds, pests and disease and recreational activity. Establish monitoring of ecological indicators.

Implementation:

Investment opportunity	✓ Australian Government ✓ Tasmanian Government ✓ Regional or Local ✓ Private or philanthropic
Potential delivery methods	• **Information gathering activities** including reviewing recent assessments of King Island vegetation. • **Policy and planning activities** such as selecting appropriate strategies and locations for investment. Supporting re-assessment of Lavinia Ecological Character Description. • **On-ground work** including threat mitigation actions on private land buffer zones. • **Behaviour-change and capacity-building activities** – education, awareness and skill-building focused on biodiversity values and best management practices.
Potential collaborators	King Island Council; Government agencies (e.g., DPIPWE, FPA and PWS); Landcare groups (e.g., KI Landcare and community groups); KI Threatened Birds Conservation Action Planning Group (Birdlife Australia).
Opportunities for community participation	Citizen science monitoring involving community volunteers; field days, workshops and educational activities; extension, capacity building and on-farm support opportunities for landholders.

PRIORITY WW2: Robbins Passage – Boullanger Bay

Robbins Passage – Boullanger Bay is listed in the Directory of Important Wetlands in Australia and is one of the most significant natural assets in Tasmania, containing intertidal flats, reef assemblages, seagrass beds, *Melaleuca* swamp forests and the EPBC-listed Subtropical and Temperate Coastal Saltmarsh Threatened Ecological Community. As the largest coastal wetland in Tasmania, covering some 28,000 hectares, it is globally important as part of the East Asian-Australasian Flyway and is a major focus for both resident and migratory shorebird conservation. The wetland complex provides habitat for the largest aggregation of migratory birds in the state including more than 20 species of trans-continental migratory waders. The Robbins Passage – Boullanger Bay wetland site meets six of the eight criteria for being listed as a Wetland of International Importance under the Ramsar Convention on Wetlands.

Outcome:

By 2030, 50% of identified stakeholders are engaged with management actions to protect and enhance the natural values of Robbins Passage – Boullanger Bay.

Local threats that can be addressed by NRM actions:

- Land use pressures including development and intensification of industries
- Land management practice in the catchment leading to chemical, nutrient and sediment runoff into the wetland
- Weeds and pests
- Aquaculture and fisheries management impacts

Actions:

WW2.a	Review and update management planning for Robbins Passage – Boullanger Bay wetland including stakeholder identification and engagement.
WW2.b	Lead targeted activities in marine, coastal foreshore and wetland areas to mitigate threats associated with agricultural land management including runoff from farms, aquaculture, fisheries, renewable energy projects, coastal development and recreation.
WW2.c	Build on current community and industry education to increase awareness of the area's natural and cultural values, the ecological character of Robbins Passage - Boullanger Bay and associated threats.

Implementation:

Investment opportunity	✓ Australian Government ✓ Tasmanian Government ✓ Regional or Local ✓ Private or philanthropic
Potential delivery methods	• **Information gathering activities** including stakeholder analysis. • **Policy and planning activities** such as selecting appropriate strategies and locations for investment. Participate in land use planning in the wetland's catchments. • **On-ground work** including supporting management practice change and threat mitigation actions on private land. • **Behaviour-change and capacity-building activities** – education, awareness and skill-building focused on biodiversity values and wetland ecological character for recreational fishers and farmers.
Potential collaborators	Circular Head Council; Government agencies (e.g., NRET, FPA and PWS); community groups (e.g., Circular Head Landcare, OzFish, volunteer migratory bird surveyors); industry groups (e.g. Dairy Tas, beef groups); Birdlife Tasmania and Birdlife Australia.
Opportunities for community participation	Citizen science monitoring involving community and Landcare volunteers; field days, workshops and educational activities; extension, capacity building and land management agreement opportunities for landholders; surveys and community consultation regarding wetland values and management options.

» Rocky coastline at King's Run, West Coast

6.4 Coastal and marine areas

6.4.1 State-wide Outcome

By 2050, actions have been implemented to improve management and human use of coastal and marine areas to build resilience to threatening processes.

6.4.2 Regional context

The Cradle Coast region has 2640 km of coastline and contains exposed rocky shorelines, extensive sand dunes and beaches and numerous estuaries and bays. It is a transition zone between marine and terrestrial habitats, so is of significant landscape and natural value and is a dynamic environment, continually being exposed to coastal processes. The shorelines vary greatly, with highly exposed, rocky shores in the south-west and west, and extensive sandy beaches and dunes north of Cape Sorell. The naturally moving dune systems on the west coast, rich in Aboriginal heritage sites, are of international significance, while the sheltered coastline of the far north-west includes broad intertidal flats and saltmarshes critical for resident and migratory birds and sea-life. Eastwards from Circular Head, intensive development along the shoreline has significantly modified the landforms.

The marine environment includes rocky reefs, wetlands, saltmarshes, harbours and open ocean. Natural values present on the sparsely inhabited islands of Bass Strait make them critical assets for the region as secure refuges for marine and avian wildlife. Many of the region's islands and coastlines also have significant Aboriginal heritage sites, including well-studied caves at Hunter Island and Rocky Cape, where archaeologists have recorded cultural heritage dating back to 23,000 years ago, when Tasmania was connected to the mainland.

In the Cradle Coast region, the coastline has also been the focal area for settlement and economic activity, particularly along the northerly, Bass Strait coast. Coastal land is highly valued for commercial, industrial, residential and tourism development. The vast majority of the region's population live and work within two kilometres of the coast and this is where population growth is greatest. The coast is also the place where future employment will be created in the region.

The topography of the region's northern coastline is conducive for commercial farming, transport corridors, housing and industrial development, and is an area of milder climate. This environment is also desirable for wind farm development as investment in renewable energy increases.

A sizeable part of gross regional product is derived from agricultural and industrial land uses within the coastal zone, while off-shore waters provide some 50 species for commercial wild fisheries (including crayfish, scallops, scalefish, giant crabs and abalone) and aquaculture (oysters, salmon and trout) is an established commercial industry in the region.

6.4.3 Priorities and Actions

PRIORITY WC1: Vulnerable coastlines

Cradle Coast's shoreline varies greatly, with highly exposed rocky shores in the south-west and west, and extensive sandy beaches and dunes north of Cape Sorell. The naturally moving dune systems on the west coast, rich in Aboriginal heritage sites, are of international significance, while the sheltered coastline of the far north-west includes broad intertidal flats and saltmarshes critical for resident and migratory birds and sea-life. Eastwards from Circular Head, intensive development along the shoreline has significantly modified the landforms.

The region's coastline, and its associated communities and industries, is vulnerable to significant hazard from storms, inundation, erosion and artificial alteration of habitat and landform – particularly in low lying and soft shorelines. This situation is likely to increase under all climate change scenarios. High-risk areas are sandy coastlines, wetlands, tidal sand and mud flats, saltmarshes and estuaries.

Future areas for urban, rural, marine and recreational development must be identified and located away from sites of natural and cultural significance and areas at high risk of coastal inundation. Activity in the coastal zone must allow for natural variability and migration of coastal processes. Future use may require retraction of existing settlement locations and relocation of key infrastructure as more detailed risk assessments on coastal erosion and inundation are conducted.

Outcome:

> By 2030, assess regional coastal assets and support member councils and other authorities to update land-use planning and to include climate change threats and human impacts in management plans.

Local threats that can be addressed by NRM actions:

- Land use pressures including development and intensification of industries
- Weeds and pests
- Inundation and damage resulting from rising sea level
- Recreational uses of coastlines
- Lack of knowledge about coastal vulnerability and predicted local climate change impacts

Actions:

WC1.a	Undertake and/or publicise climate change coastal vulnerability assessments and better-integrate coastal natural resource management into land-use planning by local government.
WC1.b	Support Henty Dunes land management activities, focusing on recreational vehicle impacts and weed management.

Implementation:

Investment opportunity		Australian Government	✓	Tasmanian Government	✓	Regional or Local	✓	Private or philanthropic

Potential delivery methods	• **Information gathering activities** including analysis of coastal management plans and council processes affecting coastal assets, and the integration of climate impact and climate mitigation data in land-use planning. • **On-ground work** such as weed management in Henty Dunes, temporary protection of vulnerable coastal assets, coastal dune revegetation. • **Behaviour-change and capacity-building activities** – capacity building initiatives with local council planners and education and awareness-raising in coastal communities.
Potential collaborators	Local government, State Government agencies, coastal community groups.
Opportunities for community participation	Volunteer land management activities and citizen science monitoring involving community and Landcare volunteers; field days, workshops and educational activities; capacity building for council staff.

PRIORITY WC2: Bass Strait islands

Natural values present on the sparsely inhabited islands of Bass Strait make them critical assets for the region as secure refuges for marine and avian wildlife. titima (Trefoil Island), Hunter, Three Hummock, Walker, Robbins, Kangaroo, Albatross, Christmas and New Year Islands have unique natural and cultural values requiring long term management planning to ensure values are protected.

Outcome:

> By 2030, key partnerships have been established and priority actions are being implemented on 50% of priority Bass Strait islands.

Local threats that can be addressed by NRM actions:

- Uncontrolled bushfires
- Weeds, pests, feral animals and disease
- Inundation and damage resulting from rising sea level
- Uncontrolled access
- Loss of cultural knowledge and access

Actions:

WC2.a	Identify Bass Strait islands priority actions based on biodiversity and cultural values to ensure long-term sustainability. Maintain ongoing partnerships and develop or contribute to management plans to guide implementation of priority actions.
WC2.b	Work with Aboriginal communities to identify priorities for assessing, learning about and protecting important Aboriginal Sea Country on the Bass Strait islands.

Implementation:

Investment opportunity	✓ Australian Government ✓ Tasmanian Government ✓ Regional or Local ✓ Private or philanthropic
Potential delivery methods	• **Information gathering activities** including analysis of island management plans, threats and Aboriginal aspirations for the islands. • **Policy and planning activities** such as updating management plans and selecting locations for investment; participate in government marine planning processes where appropriate. • **On-ground work** such as weed management, feral animal control, protection of culturally important sites.
Potential collaborators	Local government, State Government agencies such as Marine Branch, PWS; Aboriginal groups, research and environment groups; community groups (e.g. Landcare and Wildcare).
Opportunities for community participation	Volunteer land management activities and citizen science monitoring involving community and Landcare/Wildcare volunteers; support for capacity building for Aboriginal communities learning about and protecting important Aboriginal Sea Country on the Bass Strait Islands.

PRIORITY WC3: Rocky Cape National Park coastline

The coastline of Rocky Cape National Park is rugged with spectacular and ancient rock formations punctuating areas of coastal heath and sandy beaches. Evidence of Aboriginal occupation is found with numerous rock shelters, living places and artefacts.

The marine environment along this section of coast is significant with a diverse reef and substantial kelp habitat which attracts a range of marine species that are normally not found in other waters in the Cradle Coast region, including fish, coral, seaweed, invertebrates and shellfish species.

Outcome:

> By 2030, the natural and cultural values of the Rocky Cape National Park coastline and rocky reefs are maintained or enhanced by improved community engagement and awareness.

Local threats that can be addressed by NRM actions:

- Uncontrolled bushfires
- Weeds, pests, feral animals and disease
- Local declines in fish diversity and large individuals of some species
- Loss of cultural knowledge and access

Actions:

WC3.a	Work with Aboriginal communities to determine appropriate NRM actions and engagement about the cultural and natural values of the land and sea Country.
WC3.b	Improve engagement and education of recreational fishers and the broader community to build their capacity to recognise marine and coastal assets and understand threats.

Implementation:

Investment opportunity	☐ Australian Government	☑ Tasmanian Government	☑ Regional or Local	☑ Private or philanthropic
Potential delivery methods	• **Information gathering activities** including analysis threats and Aboriginal aspirations for the Rocky Cape area. • **Behaviour-change and capacity-building activities** such as supporting education and awareness-raising about the coastal and marine values of the Rocky Cape area.			
Potential collaborators	Aboriginal groups; recreational fishers and representing bodies; UTAS/IMAS; local community volunteers; PWS.			
Opportunities for community participation	Volunteer land management activities and citizen science monitoring involving community and Reef Life Survey; support for capacity building for Aboriginal communities learning about and protecting important Aboriginal Sea Country on the Rocky Cape coastline. Engagement with OzFish and recreational fishers.			

» Wombat at Ronny Creek, Cradle Valley

7

Biodiversity

7 Biodiversity

The Biodiversity Theme encompasses the full variety of life found in the state, including all species of plants, animals, fungi, microorganisms, and the ecosystems in which they live. While biodiversity refers to all living things, the NRM organisations focus on natural assets native to the state.

Ecologically-functioning systems are those that can maintain their biodiversity and ecological processes. A highly functioning ecosystem can support the full complement of its biodiversity and contribute to a range of ecosystem services. By contrast, poorly functioning ecosystems lose biodiversity and other resources such as soil, water, and nutrients, leading to the local extinction of species. A highly functioning ecosystem is more resilient and has a greater capacity to adapt to change while maintaining similar function, structure, and composition. By protecting and conserving areas that support biodiversity, the diversity of genes, species, communities, and ecosystems is also maintained.

It is the suite of species and ecosystems that provide the services for health and well-being, including clean water, air, shelter, and food.

Many agencies and individuals are working to protect and maintain Tasmania's high value habitat for threatened species, important biodiversity areas and ecological communities. Tasmania's NRM organisations work with partners to achieve shared strategic outcomes. Community and partner involvement in biodiversity programs range from monitoring, research, and on-ground restoration activities.

There is overlap between the Biodiversity, Land and Water Themes, including the maintenance of biodiversity on farms and resilient landscapes (Land Theme) and the prioritisation of Ramsar sites and aquatic and coastal habitats that support threatened species and ecological communities (Water Theme). The delivery of Actions across all Themes will contribute to the health of Tasmania's biodiversity resources.

Important biodiversity areas are significant because they are home to a diversity of biota and include formally recognised sites such as World Heritage Areas, important reserves, recognised biodiversity hotspots or Key Biodiversity Areas.

Threatened ecological communities include the communities listed under the EPBC Act and NC Act. Regionally or locally important and emerging priority ecological communities are also recognised.

Threatened species include species listed under the EPBC Act and TSP Act. Important species recognises that there are regionally or locally important species, as well as emerging threatened species.

7.1 Biodiversity in Tasmania

TABLE 4: **A snapshot of Tasmania's biodiversity assets**

42%	**PARKS AND RESERVES** Tasmania has 19 national parks and 823 natural reserves, covering 42% of the island. This includes the Tasmanian Wilderness World Heritage Area	The TWWHA is 15,800 km^2, which is almost 25% of the state. It meets seven of the 10 UNESCO World Heritage criteria.
7	**COMMONWEALTH–LISTED COMMUNITIES** Ecological communities listed as being under threat	These communities are diverse ranging from alpine to rainforest, buttongrass plains, wetlands and grasslands.
39	**STATE–LISTED COMMUNITIES** 23 state-listed threatened forest communities and 16 state-listed threatened non-forest communities	State-wide, there are 39 listed communities. These include 23 forest communities and 16 non-forest communities.
689	**LISTED PLANT AND ANIMAL SPECIES**	• 493 plant species • 19 fish species • 37 bird species • 117 insect species • 9 amphibian and reptile species • 14 mammal species • *Threatened Species Protection Act 1995* and *Environment Protection and Biodiversity Conservation Act 1999*

7.2 Important biodiversity areas

7.2.1 State-wide Outcome

By 2050, actions have been implemented that reduce threats to the natural values of Tasmania's important biodiversity areas.

7.2.2 Regional context

The prioritisation process utilised at the regional level for this Strategy has identified the Tasmanian Wilderness World Heritage Area (TWWHA) as the highest importance biodiversity area in the region.

The TWWHA is one of the largest protected areas in Australia, covering more than a million hectares. It constitutes one of the last expanses of intact temperate rainforest in the world. The property is inscribed on the World Heritage List for four natural and three cultural criteria. These criteria include outstanding values relating to records of the Earth's evolutionary history, outstanding geological processes, superlative natural phenomena, significant habitats and an outstanding example of traditional human settlement.

Key Biodiversity Areas (KBAs) have been mapped in north-west Tasmania, in partnership with Birdlife Australia, as part of an international standard in identifying globally important sites for conservation of biodiversity.

The region has 11 KBAs based upon avian biodiversity values and a further 20 identified from other taxa. These areas provide an opportunity to work with our partners and community to deliver conservation actions to protect some of the most important places for the region's wildlife, while also supporting global UN sustainable development goals. As well as large properties like the TWWHA and major national parks, the region's conservation estate also consists of many small reserves. If managed appropriately, these can provide a significant contribution to conservation outcomes by supporting important habitat, improving landscape connectivity and building resilience to emerging threats. Small reserves are also a valuable resource to engage local communities and encourage participation in natural resource management activities.

7.2.3 Priorities and Actions

PRIORITY BI1: Tasmanian Wilderness Word Heritage Area (TWWHA)

The TWWHA includes significant and extensive areas of intact vegetation and provides landscape-scale environments that enable interaction between native species without human intervention. A high proportion of flora and fauna are endemic to the TWWHA. Temperate rainforest, eucalypt forest, buttongrass moorland and alpine communities create a unique mosaic and provide refuge for a wide range of rare and threatened species including carnivorous marsupials. The TWWHA contains many sites of tangible cultural value for the Aboriginal community, including caves, artefact scatters, quarries and middens. The broader connection that Aboriginal people have to Country is also recognised and plants, animals, marine resources, minerals (ochre and rock sources), tracks, forests, interpretation and presentation, and fire management are all identified as broader Aboriginal values of the TWWHA. The ability then for Aboriginal people to be 'on-Country' is highly appropriate and important to maintain that connection.

Outcome:

By 2030, a partnership program is reducing the threat of invasive species affecting the natural values of the TWWHA.

Local threats that can be addressed by NRM actions:

- Land use pressures on surrounding land including development, intensification of industries and poor management practices
- Weeds, feral animals and disease
- Increasing fire risk due to climate change

Actions:

BI1.a Establish a partnership program with land managers, community groups and businesses in buffer areas around the TWWHA where invasive plants, animals, fungi and diseases, and fire risk are managed appropriately.

BI1.b Establish a partnership with PWS, Cradle Valley businesses and community groups to work on the issue of feral cats in the Cradle Valley area that borders the TWWHA.

BI1.c Support partnership opportunities between PWS and West Coast Aboriginal communities to access culturally important sites in the TWWHA and maintain Traditional Ecological Knowledge.

BI1.d Assess the weed, feral animal, fire and drought threat to patches of the EPBC-listed Threatened Ecological Community, Alpine Sphagnum Bogs and Associated Fens, and work with PWS to manage these threats if there is an opportunity to do so.

Implementation:

Investment opportunity

- ✓ Australian Government
- ✓ Tasmanian Government
- ✓ Regional or Local
- ✓ Private or philanthropic

Potential delivery methods

- **Information gathering activities** including assessment and mapping of weeds and feral animals.
- **On-ground work** including weed and feral animal management in strategic buffer zones. Land management agreements with neighbouring landholders. Fencing, stock control, bushfire risk mitigation.
- **Behaviour-change and capacity-building activities** – education, awareness and skill-building focused on natural and cultural values of the TWWHA.

Potential collaborators	Local councils; Government agencies including PWS; Aboriginal groups; Landcare, Wildcare and other community groups; land managers; volunteers; businesses and not-for-profits in Cradle Valley; researchers.
Opportunities for community participation	Field days, workshops and educational activities; extension, capacity building and land management agreement opportunities for landholders; consultation with PWS and neighbouring land managers about preferred management options; volunteer and citizen science opportunities.

» *Litoria raniformis*, Green and Gold Frog (Mark Wapstra)

PRIORITY BI2: Key Biodiversity Areas (KBAs) and small reserves

KBAs are part of an international conservation effort to recognise and conserve the most important places in the world for species and their habitats. Several of the KBAs in the Cradle Coast region are not part of the reserve estate, and face many threats. Additionally, the region has several small reserves, often managed by councils, which are important remnant habitats, often in peri-urban areas. As development pressures result in ongoing land clearance, these small reserves become even more important.

Outcome:

> By 2030, a partnership program is reducing threats affecting the natural values of KBAs and small reserves in the Cradle Coast and improving community educational outcomes.

Local threats that can be addressed by NRM actions:

- Land use pressures on surrounding land including development, intensification of industries and poor management practices
- Weeds, feral animals and disease
- Increasing fire risk due to climate change
- Habitat fragmentation
- Lack of knowledge and understanding in the community about natural values

Actions

BI2.a Establish a partnership program focused on and around high priority Cradle Coast KBAs and reserves, where invasive plants and animals, and fire risk, are managed appropriately.

BI2.b Establish partnership programs with land managers, local councils and community groups looking after important biodiversity areas and reserves to undertake activities to raise community awareness of natural values and threats, support participation in conservation action and enhance the tourism experience.

Implementation:

Investment opportunity	✓ Australian Government	✓ Tasmanian Government	✓ Regional or Local	✓ Private or philanthropic

Potential delivery methods

- **Information gathering activities** including assessment and mapping of weeds and feral animals.
- **On-ground work** including weed and feral animal management in strategic buffer zones. Land management agreements with neighbouring landholders. Fencing, stock control, bushfire risk mitigation.
- **Behaviour-change and capacity-building activities** – education, awareness and skill-building focused on the natural values of KBAs and small reserves.

Potential collaborators Local councils; Government agencies including PWS; Landcare, Wildcare and other community groups; land managers; volunteers.

Opportunities for community participation Field days, workshops and educational activities; extension, capacity building and land management agreement opportunities for landholders; consultation with neighbouring land managers about preferred management options; volunteer and citizen science opportunities.

7.3 Threatened and important ecological communities

7.3.1 State-wide Outcome

By 2050, actions have been implemented that reduce impacts to Tasmania's threatened and important ecological communities.

7.3.2 Regional context

The Cradle Coast region is home to a wide diversity of functional and resilient ecosystems ranging from alpine fens, peatlands, shrublands, sclerophyll and rainforests, coastal and estuarine systems and remote islands. An ecological community is often defined by the type of vegetation it contains (for ease of mapping), but it includes all of flora, fauna, fungi and microscopic organisms that make up the biodiversity.

While most of these ecosystems form part of the reserve estate protected by local, State and Australian governments, in rural and urban areas, threats from development, invasive species, land use change and climate variability have reduced the extents and functions of the original ecosystems.

Threat prioritisation as part of this Strategy has identified four ecological communities of regional importance for action and focus. Actions have been identified to assist these communities to remain viable and/or recover function.

» Saltmarsh plants, Circular Head (Vishnu Prahalad)

7.3.3 Priorities and Actions

PRIORITY BC1: Subtropical and Temperate Coastal Saltmarsh

An extensive and important listed ecological community in the region is Coastal Saltmarsh. The *Atlas of Coastal Saltmarsh Wetlands in the Cradle Coast Region* (Prahalad 2016) documents and maps twelve discrete wetland complexes in the region. The largest and most diverse of these saltmarsh communities, covering more than 1700 ha, occurs in coastal areas between East Inlet and Woolnorth Point in the far north-west of the region.

The Coastal Saltmarsh ecological community is highly productive as a food source for resident and migratory birds, but it is threatened by the invasive weed *Spartina anglica* (Rice Grass), by landholder use of tidal barriers or levees to reclaim saltmarsh for pasture, grazing and trampling, eutrophication from upstream land uses, and sea level rise.

Outcome:

By 2030, the invasive weed *Spartina anglica* (a key threat to the region's saltmarsh) is being treated across all saltmarsh communities, and other threats have been assessed and managed.

Local threats that can be addressed by NRM actions:

- Land use pressures on adjoining farmland including development, intensification of agriculture and other industries, and poor management practices
- Weeds, feral animals and disease
- Impacts of recreational uses
- Inundation and erosion of buffering vegetation due to sea level rise

Actions:

BC1.a Continue the saltmarsh ecosystem recovery activities in the region, focused on reducing threats such as *Spartina anglica* invasion, and cattle access.

Implementation:

Investment opportunity	✓ Australian Government	✓ Tasmanian Government	✓ Regional or Local	✓ Private or philanthropic

Potential delivery methods

- **Information gathering activities** including assessment, mapping and prioritisation of weeds and project areas.
- **Policy and planning activities** such as participating in land-use planning processes.
- **On-ground work** including weed and stock management. Land management agreements with landholders focused on saltmarsh protection and rehabilitation.
- **Behaviour-change and capacity-building activities** – education, awareness and skill-building focused on the natural values of coastal saltmarsh and buffering *Melaleuca ericifolia* Swamp Forest, and the importance of saltmarsh for native fish.

Potential collaborators Local Councils; Government agencies; Landcare, Wildcare and other community groups; Industry groups (e.g., Dairy Tas, TAPG, Greenhams).

Opportunities for community participation Field days, workshops and educational activities; extension, capacity building and land management agreement opportunities for landholders; volunteer and citizen science opportunities.

PRIORITY BC2: *Melaleuca ericifolia* Swamp Forest

This community typically occurs as almost pure stands of *Melaleuca ericifolia*, forming a dense canopy over a sedge-dominated understory. It is restricted to coastal areas and usually occurs on poorly-drained soils, often fringing saltmarshes. It is often impacted by agricultural practices.

Outcome:

> By 2030, *Melaleuca ericifolia* Swamp Forest communities in the Cradle Coast have been identified and assessed and have increased protection from agricultural threats including land clearing.

Local threats that can be addressed by NRM actions:

- Land use pressures including development, intensification of agriculture and industries
- Inappropriate land management practices including vegetation clearing
- Weeds and feral animals
- Increasing fire risk due to climate change
- Lack of knowledge and understanding in the community about remnant vegetation

Actions:

BC2.a Identify vulnerable remnant patches of *Melaleuca ericifolia* Swamp Forest threatened ecological community, then work with landholders and government on appropriate management actions.

Implementation:

Investment opportunity	☐ Australian Government	✓ Tasmanian Government	✓ Regional or Local	✓ Private or philanthropic

Potential delivery methods

- **Information gathering activities** including assessment and mapping of the threatened vegetation community.
- **Policy and planning activities** such as prioritisation of appropriate management actions and locations for investment, and engagement in council land-use planning processes.
- **On-ground work** including weed and feral animal management, and land management agreements focused on protection and rehabilitation of *M. ericifolia* Swamp Forests.
- **Behaviour-change and capacity-building activities** – education, awareness and skill-building focused on biodiversity values and best management practice.

Potential collaborators Local Councils; Government agencies (e.g. NRET, FPA and PWS); Landcare groups and community groups; Industry groups (e.g., Dairy Tas, beef groups); Farmers and land managers – land management agreements for on-ground works.

Opportunities for community participation Field days, workshops and educational activities; extension, capacity building and land management agreement opportunities for landholders; volunteer and citizen science opportunities.

PRIORITY BC3: Threatened Eucalypt Forests and Woodlands

The Black Gum (*Eucalyptus ovata*) – Brookers Gum (*E. brookeriana*) forest/woodland TEC is associated with lowland landscapes, often with poorly draining soils and sites that are wet or seasonally waterlogged such as the margins of swampy flats, but also in well-drained gullies. Most known remnants of the *E. ovata*-dominated component occur east of Burnie, with minor occurrences scattered along the north-west coast, west coast including the TWWHA and King Island. The *E. brookeriana* component is most prevalent in the far north-west and King Island.

The Tasmanian White Gum (*E. viminalis*) wet forest occurs mainly on fertile, well-drained sites in lowland areas in the central to eastern part of the region that receive high average annual rainfall (in excess of 1000 mm). Some of the largest stands occur on the flats and lower slopes of the major river valleys.

Both threatened eucalypt forest ecological communities have been heavily cleared historically and are now fragmented and many remnants are small, isolated, and in a modified condition.

Outcome:

> By 2030, all patches of Black Gum or Brookers Gum Forest and Woodland communities, and all patches of Tasmanian White Gum Wet Forest have been identified and assessed, and priority patches have increased protection from invasive species and agricultural threats including land clearing.

Local threats that can be addressed by NRM actions:

- Land use pressures including development, intensification of agriculture and industries
- Inappropriate land management practices including vegetation clearing
- Weeds and feral animals
- Increasing fire risk due to climate change
- Lack of knowledge and understanding in the community about remnant vegetation

Actions:

BC3.a Identify vulnerable remnant patches of Black or Brookers Gum Forests and Woodlands, and White Gum Wet Forest Threatened Ecological Communities, then work with landholders, community groups and government on designing and implementing appropriate management actions.

Implementation:

Investment opportunity	✓ Australian Government	✓ Tasmanian Government	✓ Regional or Local	✓ Private or philanthropic

Potential delivery methods

- **Information gathering activities** including assessment and mapping of the threatened vegetation community.
- **Policy and planning activities** such as prioritisation of appropriate management actions and locations for investment, and engagement in council land-use planning processes.
- **On-ground work** including weed and feral animal management, and land management agreements focused on protection and rehabilitation of threatened eucalypt communities.
- **Behaviour-change and capacity-building activities** – education, awareness and skill-building focused on biodiversity values and best management practice.

Potential collaborators: Local Councils; Government agencies (e.g., NRET, FPA and PWS); Landcare groups (e.g., Landcare Tas and community groups); Industry groups (e.g., Dairy Tas, beef groups); Farmers and land managers – land management agreements for on-ground works

Opportunities for community participation: Field days, workshops and educational activities; extension, capacity building and land management agreement opportunities for landholders; volunteer and citizen science opportunities.

PRIORITY BC4: King Island native vegetation

King Island has been heavily impacted by agriculture since European settlement. This has resulted in extensive clearing of native vegetation for conversion to pasture. Recent habitat mapping for threatened King Island birds has contributed to knowledge about the vegetation communities, but there is a general lack of understanding of their importance to native species, their key threats and the best practices for management. King Island vegetation communities include three unique communities, Scrub Complex on King Island (recently proposed for listing as a TEC), *Eucalyptus globulus* King Island Forest (a Tasmanian listed Threatened Vegetation Community), and King Island Eucalypt Woodland. There are also remnant patches of other priority vegetation communities listed in the CCA Strategy.

Outcome:

> By 2030, all significant native vegetation communities of King Island have been identified and mapped, with priority areas managed to control stock access, land clearing and fire frequency.

Local threats that can be addressed by NRM actions:

- Land use pressures including development, intensification of agriculture and other industries
- Inappropriate land management practices including vegetation clearing
- Weeds and feral animals
- Increasing fire risk due to climate change
- Lack of knowledge and understanding in the community about remnant vegetation

Actions:

BC4.a	Establish KI flora and fauna monitoring program to identify significant areas of threatened and vulnerable vegetation and habitat to determine critical species dependencies and priority threat mitigation actions.
BC4.b	Implement a community biodiversity education program.
BC4.c	Protect King Island native vegetation and the fauna that relies on it, through a program to support priority area landholders to undertake appropriate management actions.

Implementation:

Investment opportunity	✓ Australian Government ✓ Tasmanian Government ✓ Regional or Local ✓ Private or philanthropic
Potential delivery methods	• **Information gathering activities** including assessment and mapping of King Island vegetation communities. • **Policy and planning activities** such as prioritisation of appropriate management actions and locations for investment, and engagement in council land-use planning processes. • **On-ground work** including weed and feral animal management, and land management agreements focused on protection and rehabilitation of remnant vegetation communities. • **Behaviour-change and capacity-building activities** – education, awareness and skill-building focused on biodiversity values and best management practice.
Potential collaborators	King Island Council; Government agencies (e.g., NRET, FPA and PWS); Landcare groups (e.g., Landcare Tas and community groups); Industry groups (e.g., Dairy Tas, beef groups); Farmers and land managers – land management agreements for on-ground works.
Opportunities for community participation	Field days, workshops and educational activities; extension, capacity building and land management agreement opportunities for landholders; volunteer and citizen science opportunities.

Acacia mearnsii

7.4 Threatened and important species

7.3.1 State-wide Outcome

By 2050, actions have been implemented that reduce impacts to Tasmania's threatened and important species.

7.3.2 Regional context

There are 157 species of native flora and fauna in the region listed as rare, vulnerable or endangered under State or Commonwealth legislation. Of these, 49 are endemic to the Cradle Coast region, including the critically endangered King Island Thornbill and King Island Scrubtit. A further 58 of these species are endemic to Tasmania, including the Giant Freshwater Crayfish, and 19 species of orchid. There are another 21 listed marine species, such as Subantarctic Fur Seal (vulnerable) and Black-browed Albatross (endangered), which are regular or occasional visitors to the Cradle Coast region's marine areas.

Landscapes of the northern coastline are most impacted by human activity, with the greatest impacts within two kilometres of the coast. Land use intensification, industrialisation and population growth are key impacts while climate change and sea level rise increase risks in vulnerable areas.

Community engagement, along with interactive citizen science programs, have been shown to improve conservation outcomes for threatened species impacted by land use change and predation by domestic animals. NRM organisations are well-placed to foster greater community awareness of the impacts on, and importance of, threatened species in local and regional environments. In many cases encouraging behaviour change amongst the wider community can significantly reduce risks and threats to species such as shore-nesting birds, riverine and estuarine species, orchids and birdlife.

7.3.3 Priorities and Actions

PRIORITY BS1: Shearwaters and penguins

Short-tailed Shearwaters and Little Penguins both nest in burrows along the Cradle Coast region's coastlines. They attract strong community interest and engagement, but face threats due to human impacts on coastlines, as well as threats affecting the oceans where they feed, such as climate change causing warming waters and reduced feed sources like krill.

Short-tailed Shearwaters are migratory birds that spend winters in the northern hemisphere, and return to dig out burrows, mate and raise chicks in the Tasmanian summer.

They are a culturally-significant species to many Tasmanian Aboriginal people, who have traditionally harvested "muttonbirds" or *yula*, as a food source and for income.

Little Penguins, while not listed as threatened in Tasmania, are important to the Cradle Coast community. One Little Penguin viewing location, staffed by volunteers in Burnie, had more than 11,000 visitors in one summer season recently. Colonies face threats from human disturbance, feral and domestic cats, and domestic dogs.

Outcome:

By 2030, four threats to Short-tailed Shearwater and Little Penguin populations are being managed successfully and adaptively along priority sections of the coast.

Local threats that can be addressed by NRM actions:

- Land use pressures on coastlines including development, expansion of urban areas, intensification of industries and poor management practices
- Feral animals, pests and disease
- Pollution of waterways and oceans, including marine debris which can entangle birds and be ingested by them
- Human use of coastlines for recreation
- Domestic dogs

Actions:

BS1.a	Lead citizen science mapping and threat analysis using the Little Penguin Toolkit.
BS1.b	Support dog and cat management activities including regional domestic animal management and feral cat management at prioritised penguin and shearwater colonies.
BS1.c	Implement a marine debris reduction program – stop at source + clean-up at coast.
BS1.d	Develop partnerships with councils to address coastal management issues affecting seabirds and shorebirds.

Implementation:

Investment opportunity	✓	Australian Government	✓	Tasmanian Government	✓	Regional or Local	✓	Private or philanthropic

Potential delivery methods	• **Information gathering activities** including monitoring and threat assessments, and supporting muttonbird harvest sustainability assessments. • **Policy and planning activities** such as prioritisation of appropriate management actions and locations for investment, and engagement in council land-use, cat and dog management and waste management planning processes. • **On-ground work** including habitat protection and rehabilitation at priority sites, supporting domestic cat management initiatives, supporting targeted feral cat management initiatives, marine debris clean-up and monitoring activities, and supporting point source pollution management initiatives. • **Behaviour-change and capacity-building activities** – education, awareness and skill-building focused on coastal biodiversity values.
Potential collaborators	Local Councils; Government agencies; Aboriginal groups; Landcare, Wildcare and other community groups; Land managers; volunteers; researchers.
Opportunities for community participation	Field days, workshops and educational activities focused on coastal biodiversity values and domestic pet management; volunteer and citizen science opportunities; support for the Aboriginal community to carry out muttonbird sustainability assessments.

» Moulting Little Penguin at Burnie Penguin Observation Centre (Perviz Marker)

PRIORITY BS2: Resident and migratory shorebirds

There are four species of "resident" shorebirds in the Cradle Coast region, Hooded Plover, Red-capped Plover, Pied Oystercatcher, and Sooty Oystercatcher. All nest on the beaches or rocky shorelines of the Cradle Coast, and are subject to the same threats of human disturbance from recreational beach use, domestic dogs, feral and domestic cats, pollution including marine debris, and weeds.

Migratory shorebirds are usually summer residents who breed in the northern hemisphere. They include Eastern Curlew (CR), Great Knot (CR), Greater Sand Plover (VU), Lesser Sand Plover (EN), Red Knot (EN), and 16 other species that are not listed as threatened. When they are in the Cradle Coast region, they face threats from weed incursion onto the mudflats where they feed, human disturbance, coastal development and pollution including plastics. Migratory shorebirds are protected by international agreements along the East Asian-Australasian Flyway.

Outcome:

By 2030, long-term monitoring of resident and migratory shorebird populations is showing stable or increasing populations compared to 2019 estimates.

Local threats that can be addressed by NRM actions:

- Land use pressures on coastlines including development, expansion of urban areas, intensification of industries and poor management practices
- Weeds and feral animals
- Pollution of waterways and oceans, including marine debris which can entangle birds and be ingested by them
- Human use of coastlines for recreation
- Domestic dogs

Actions:

BS2.a	Develop partnerships with councils to address coastal management issues affecting seabirds and shorebirds.
BS2.b	Support the continuation of the resident shorebird community monitoring program and biannual Australian migratory shorebird monitoring
BS2.b	Implement Hooded Plover recovery actions at key sites in collaboration with the national recovery program and Birdlife organisations.

Implementation:

Investment opportunity	✓ Australian Government	✓ Tasmanian Government	✓ Regional or Local	✓ Private or philanthropic

Potential delivery methods

- **Information gathering activities** including supporting community monitoring programs.
- **Policy and planning activities** such as supporting conservation action planning, and engagement in council land-use, cat and dog management and waste management planning processes.
- **On-ground work** including habitat protection and rehabilitation at priority sites, supporting domestic cat management initiatives, supporting targeted feral cat management initiatives, marine debris clean-up and monitoring activities, and supporting point source pollution management initiatives.
- **Behaviour-change and capacity-building activities** – education, awareness and skill-building focused on coastal biodiversity values.

Potential collaborators	Local Councils; Government agencies; Birdlife Tasmania and Birdlife Australia; Landcare, Wildcare and other community groups; Land managers; volunteers; researchers.
Opportunities for community participation	Field days, workshops and educational activities focused on coastal biodiversity values and domestic pet management; volunteer and citizen science opportunities.

» Fairy Tern (Eric Woehler)

PRIORITY BS3: King Island woodland birds

The King Island Scrubtit and King Island Brown Thornbill are listed as Critically Endangered and Endangered (respectively) under the EPBC Act, primarily due to extensive habitat loss associated with agricultural land clearing, altered hydrology (primarily drainage for agriculture) and wildfire. The limited area of suitable habitat and extremely small population size of both birds places them amongst the top five Australian birds considered most likely, in the absence of intervention, to become extinct within 20 years. Management recommendations are hampered by a lack of detailed knowledge of the distribution and abundance of the birds, and currently no agreed habitat descriptions. As well as the KI Scrubtit and KI Brown Thornbill, King Island Black Currawong and King Island Green Rosella are both listed as "vulnerable" under the EPBC Act, and will also benefit from the Actions proposed for this Priority.

Outcome:

> By 2030, recovery actions for the King Island Brown Thornbill and the King Island Scrubtit have been implemented in critical habitat patches.

Local threats that can be addressed by NRM actions:

- Land use pressures including development, intensification of agriculture and other industries
- Inappropriate land management practices including vegetation clearing
- Weeds and feral animals
- Increasing fire risk due to climate change
- Lack of knowledge and understanding in the community about threatened species

Actions:

BS3.a	Undertake KI Brown Thornbill and KI Scrubtit habitat assessment and improvement activities in partnership with the members of the King Island Bird Conservation Action Plan.
BS3.b	Develop a King Island cat management program in partnership with King Island Council and King Island Landcare.
BS3.c	Support King Island Bird Conservation Action Plan activities such as landholder engagement, best management practice extension, ecosystem restoration activities.

Implementation:

Investment opportunity	✓ Australian Government	✓ Tasmanian Government	✓ Regional or Local	✓ Private or philanthropic

Potential delivery methods

- **Information gathering activities** including review of recent flora and fauna surveys.
- **Policy and planning activities** such as prioritisation of appropriate management actions and locations for investment, engagement in council land-use planning processes, support for cat management planning.
- **On-ground work** including weed and feral animal management, and land management agreements focused on protection and rehabilitation of remnant vegetation communities.
- **Behaviour-change and capacity-building activities** – education, awareness and skill-building focused on biodiversity values and best management practices.

Potential collaborators

King Island Council; Government agencies (e.g., NRET, FPA and PWS); Landcare and community groups; Industry groups (e.g., Dairy Tas, beef groups); Farmers and land managers – land management agreements for on-ground works; Conservation Action Planning group (Birdlife).

Opportunities for community participation

Field days, workshops and educational activities; extension, capacity building and land management agreement opportunities for landholders; volunteer and citizen science opportunities; domestic animal management education and support.

PRIORITY BS4: Aquatic species of concern

The Giant Freshwater Crayfish (GFC) is the largest freshwater invertebrate in the world, and an iconic species in the region. Well-established management actions that have been implemented to protect and enhance GFC habitat can also be applied in focus areas for other aquatic species of concern. The Central North Burrowing Crayfish and Burnie Burrowing Crayfish, the Tasmanian Azure Kingfisher, the Green and Gold Frog and Striped Marsh Frog, Dwarf Galaxias and Australian Grayling, and the Australasian Bittern, are all EPBC-listed species that rely to some extent on rivers and wetlands with good water quality, healthy riparian zones, and best practice land management where they occur on private land. Platypus are of importance to the community, and their population size is not well-known. NRM activities in the region will focus on Actions that improve the trajectory of these threatened and important aquatic species.

Outcome:

> By 2030, region-wide catchment management planning has been implemented, recovery actions for Giant Freshwater Crayfish have been completed in twelve priority areas, partnerships for burrowing crayfish protection have been established in two peri-urban areas, and the five listed actions that improve the trajectory of other priority species have been implemented.

Local threats that can be addressed by NRM actions:

- Land use pressures including development, intensification of agriculture and other industries leading to reduced areas of suitable habitat
- Inappropriate land management practices including vegetation clearing, lack of stock fencing, and poor quality riparian buffers leading to reduced water quality
- Draining of wetlands
- Weeds and feral animals
- Lack of knowledge and understanding in the community about threatened species and best practice riparian and wetland management

Actions:

BS4.a	Implement Giant Freshwater Crayfish recovery actions in priority catchments.
BS4.b	Establish burrowing crayfish species protection partnership programs in Devonport and Burnie municipalities to improve the trajectory of the Central North Burrowing Crayfish (*Engaeus granulatus*) and Burnie Burrowing Crayfish (*Engaeus yabbimunna*).
BS4.c	Implement regional catchment management planning that considers aquatic species habitat.
BS4.d	Develop and publish regional best practice riparian management guidelines.
BS4.e	Support the continuation of citizen science initiatives to map and quantify platypus populations and threats.
BS4.f	Raise awareness of Azure Kingfisher range, threats and preferred habitats, and target riparian management extension in priority kingfisher areas.

BS4.g	In partnership with Inland Fisheries Service, develop actions to support the recovery of Dwarf Galaxias and Australian Grayling, such as improved education and awareness of native fish species, and identifications of barriers to fish movement.
BS4.h	Raise awareness of the range, threats and habitats of threatened and important frog species such as *Litoria raniformis* and *Limnodynastes peronii*, and target wetland management extension in priority threatened frog areas including King Island.
BS4.i	Support citizen science initiatives to understand Australasian Bittern population and range. Raise awareness of best practice wetland management and support wetland restoration activities.

Implementation:

Investment opportunity	✓ Australian Government	✓ Tasmanian Government	✓ Regional or Local	✓ Private or philanthropic

Potential delivery methods

- **Information gathering activities** including review of recent GFC program outcomes, and citizen science frog, bittern, burrowing crayfish and platypus monitoring.
- **Policy and planning activities** such as prioritisation of appropriate management actions and locations for investment, engagement in council land-use planning processes, and regional catchment management planning that considers aquatic species habitat.
- **On-ground work** including weed management and land management agreements focused on protection and restoration of riparian and wetland areas on farms.
- **Behaviour-change and capacity-building activities** – education, awareness and skill-building focused on biodiversity values and best management practices that result in improved water quality and habitat protection of riparian and wetland areas.

Potential collaborators	Local Councils; Government agencies (e.g. IFS); Landcare, Wildcare, community groups and not-for-profits (e.g. NatureTrackers); Land managers; volunteers; researchers.
Opportunities for community participation	Field days, workshops and educational activities; extension, capacity building and land management agreement opportunities for landholders focused on riparian areas and wetlands; volunteer and citizen science opportunities.

» Giant Freshwater Crayfish, *Astacopsis gouldi*, in the Flowerdale River

PRIORITY BS5: Threatened mammals

The Cradle Coast region has some of the last healthy (facial tumor disease-free) populations of Tasmanian Devils in the state. There are also strong populations of Eastern Barred Bandicoots, Eastern Quolls and Spotted-tailed Quolls.

Unfortunately all of these species (and many other non-threatened mammals) are extremely vulnerable to roadkill, threats caused by humans (such as habitat clearing), weeds and domestic and feral animals.

Outcome:

> By 2030, management actions in five priority areas have been implemented that reduce three priority threats to threatened mammals – e.g. roadkill, feral cats, and land management practices.

Local threats that can be addressed by NRM actions:

- Land use pressures including development, intensification of agriculture and other industries
- Inappropriate land management practices including vegetation clearing
- Roadkill
- Weeds and feral animals
- Increasing fire risk due to climate change
- Lack of knowledge and understanding in the community about threatened species

Actions:

BS5.a	Support feral cat management activities to protect threatened mammals in conservation areas.
BS5.b	Implement activities to protect Eastern Barred Bandicoots on farms.
BS5.c	Support programs caring for injured and orphaned wildlife.
BS5.d	Implement roadkill mitigation measures at identified roadkill hot-spots including raising visitor awareness.

Implementation:

Investment opportunity	✓ Australian Government ✓ Tasmanian Government ✓ Regional or Local ✓ Private or philanthropic
Potential delivery methods	• **Information gathering activities** including supporting professional and citizen science fauna surveys. • **Policy and planning activities** such as prioritisation of appropriate management actions and locations for investment, engagement in council land-use planning processes, support for cat management planning. • **On-ground work** including weed and feral animal management, roadkill mitigation measures and land management agreements focused on protection and rehabilitation of remnant habitat. • **Behaviour-change and capacity-building activities** – education, awareness and skill-building focused on biodiversity values, roadkill reduction and best management practices.
Potential collaborators	Local Councils; Government agencies; Landcare and community groups; Industry groups (e.g., Dairy Tas, beef groups); Farmers and land managers – land management agreements for on-ground works and habitat protection;
Opportunities for community participation	Field days, workshops and educational activities; extension, capacity building and land management agreement opportunities for landholders; volunteer and citizen science opportunities; domestic animal management education and support.

PRIORITY BS6: Raptors and owls

Tasmanian Wedge-tailed Eagle, White-bellied Sea-Eagle, Grey Goshawk and Masked Owl are all species listed under Australian Government or Tasmanian threatened species legislation. In addition, other owls and raptors are important to the community, and their population sizes are not well understood. The Actions planned for the Priority will address the three main threats affecting raptors and owls – loss of habitat, infrastructure collisions, and the impact of rodenticides which kill the predators of rodents too.

Outcome:

> By 2030, three priority threats (infrastructure collisions, rodenticide impacts and habitat loss) to raptors and owls in the Cradle Coast region are being reduced by NRM activities.

Local threats that can be addressed by NRM actions:

- Land use pressures including development, intensification of agriculture and other industries
- Inappropriate land management practices including vegetation clearing
- Roadkill
- Weeds and feral animals
- Increasing fire risk due to climate change
- Rodenticide use
- Collisions with electricity infrastructure
- Lack of knowledge and understanding in the community about threatened species

Actions:

BS6.a Provide support and advice to managers of electricity infrastructure to implement best practice management that reduces raptor collisions.

BS6.b Lead a community education program to minimise raptor and owl deaths from rodenticide impacts.

BS6.c Facilitate citizen science mapping of owl and raptor habitat and support nest hollow and nest box management.

Implementation:

Investment opportunity

- ✓ Australian Government
- ✓ Tasmanian Government
- ✓ Regional or Local
- ✓ Private or philanthropic

Potential delivery methods

- **Information gathering activities** including supporting professional and citizen science fauna surveys.
- **Policy and planning activities** such as prioritisation of appropriate management actions and locations for investment, engagement in council land-use planning processes, support for council and state government-led roadkill mitigation planning.
- **On-ground work** including roadkill mitigation measures, support for Tas Networks (and others) undertaking raptor collision mitigation, and land management agreements focused on protection and rehabilitation of remnant habitat.
- **Behaviour-change and capacity-building activities** – education, awareness and skill-building focused on biodiversity values, roadkill reduction and best management practices.

Potential collaborators Local Councils; Government agencies; Landcare, Wildcare, community groups and not-for-profits (e.g. NatureTrackers); Industry groups (e.g., Dairy Tas, beef groups); TasNetworks; Farmers and land managers – land management agreements for on-ground works and habitat protection.

Opportunities for community participation Field days, workshops and educational activities; extension, capacity building and land management agreement opportunities for landholders; volunteer and citizen science opportunities; domestic animal management education and support.

PRIORITY BS7: Swift Parrots and other hollow-nesting birds

The Swift Parrot is listed as Critically Endangered under the EPBC Act and endangered under the TSP Act. It is also one of the priority species under the Australian Government's Threatened Species Strategy. It is a migratory species that over-winters in south-eastern mainland Australia, and flies to Tasmania to breed in spring and summer, foraging on nectar from a limited range of eucalypt species, predominantly Tasmanian Blue Gums and Black Gums. During the breeding season the Swift Parrot breeds in tree hollows of mature eucalypts near foraging resources. As not all suitable food species flower every year, the Swift Parrot's breeding areas vary annually and although predominately found in Tasmania's east coast, areas in the Cradle Coast Region, such as Kelcey Tier and the Dial Range, are known nesting sites. Tree hollows are also a significant ecological feature for other birds such as the Masked Owl, Green Rosella and Yellow-tailed Black-Cockatoo.

The main threats to the Swift Parrots are the loss of foraging and nesting habitat, and predation by Sugar Gliders. Other threats include competition from the introduced Rainbow Lorikeet (and other hollow-nesting species), and collision mortality (with structures such as windows and chain-link fences).

Outcome:

> By 2030, in potential nesting forests, regular Swift Parrot surveys are being conducted, an increased number of nesting sites are available, and Sugar Glider populations are being managed.

Local threats that can be addressed by NRM actions:

- Inappropriate land management practices including vegetation clearing and removal of old, hollow-bearing trees
- Fragmentation and loss of habitat due to development pressures
- Feral animals and disease
- Increasing fire risk due to climate change

Actions:

BS7.a	Support citizen science assessment of Swift Parrot habitat, tree hollows and populations.
BS7.b	Support habitat protection and improvement on council reserves and private land including bushfire management, remnant woodland protection and provision of nest boxes.
BS7.c	Establish a Sugar Glider threat mitigation program and assess other threats such as Rainbow Lorikeets.

Implementation:

Investment opportunity	✓ Australian Government ✓ Tasmanian Government ✓ Regional or Local ✓ Private or philanthropic
Potential delivery methods	• **Information gathering activities** including assessment and mapping of potential nesting and foraging forest communities. • **Policy and planning activities** such as prioritisation of locations for investment and engagement planning. • **On-ground work** including targeted engagement and establishment of nest boxes and conservation agreements for habitat restoration at known and potential nesting and forage sites. • **Behaviour-change and capacity-building activities** – education, awareness and skill-building focused on natural values.
Potential collaborators	Local Councils; Government agencies including PWS and FPA; Land managers including Sustainable Timbers Tasmania; volunteers; researchers.
Opportunities for community participation	Extension, capacity building and land management agreement opportunities for landholders and land managers; volunteer and citizen science monitoring opportunities.

PRIORITY BS8: Marrawah Skipper and Ptunarra Brown butterflies

The Marrawah Skipper is a subspecies which is endemic to the Cradle Coast Region and is listed under both Commonwealth and State legislation. It is exclusively associated with the tussock-sedge *Carex appressa* in coastal or near-coastal areas. Its habitat ranges from dense *Carex appressa* sedgeland (e.g. along drains and forest margins) and swamp forest to plantations and pasture. The main threats to the Marrawah Skipper are clearing of coastal and near-coastal habitat, further fragmentation of subpopulations, and inappropriate disturbance including cattle grazing, weed invasion and forestry.

The Ptunarra Brown Butterfly occurs in Poa tussock grassland and grassy shrubland and woodland above 400 m in the north-west plains. Large areas of this species' habitat have been lost through conversion to pasture or plantation. Over-grazing, over-burning and predation by the introduced European wasp can also lead to loss of this species from a site.

Outcome:

By 2030, there has been a reduction in loss of habitat through two partnerships established to manage threats associated with land and fire management across 50% of the known range of each species.

Local threats that can be addressed by NRM actions:

- Land use pressures including development, intensification of agriculture and other industries
- Inappropriate land management practices including vegetation clearing
- European wasps
- Increasing fire risk due to climate change

Actions:

BS8.a	Partnerships developed to establish or sustain monitoring regimes in the known range of the species.
BS8.b	Habitat protection and restoration through improved land management and implementation of appropriate fire regimes.
BS8.c	Education and awareness of key habitat requirements and disturbance threats.

Implementation:

Investment opportunity	✓ Australian Government ✓ Tasmanian Government ✓ Regional or Local ✓ Private or philanthropic
Potential delivery methods	• **Information gathering activities** including assessment and mapping of known populations and habitat. • **Policy and planning activities** such as prioritisation of appropriate management actions and locations for investment and engagement planning. • **On-ground work** including land management agreements for habitat protection and restoration and weed and pest management. • **Behaviour-change and capacity-building activities** – education, awareness and skill-building focused on natural values.
Potential collaborators	Government agencies including PWS and FPA; Aboriginal groups; Land managers including Forico; volunteers; researchers.
Opportunities for community participation	Extension, capacity building and land management agreement opportunities for landholders and land managers; volunteer and citizen science opportunities.

PRIORITY BS9: Threatened orchids and Preminghana Billybuttons

The Cradle Coast Region has a wide variety of orchids, many of which are threatened or found only in Tasmania, with small numbers of specimens known and in localised areas. They usually flower for short periods only. Orchids can be found in a variety of habitats including alpine herbfields, heathland, ancient rainforests, native grasslands and coastal vegetation and often rely on specific biological and ecological interaction for growth and survival. This makes them susceptible to disturbance and at risk to a variety of localised threats, which need to be better understood and managed.

The Preminghana Billybutton is known to occur only on basalt cliff edges at Preminghana, an Indigenous Protected Area in the far north-west of the region. It is a herb with 1-3 stems which grows to 36 cm high. Flowering occurs from October to January. It is estimated to number less than 200 individual plants, all of which occur within one population at Preminghana and is listed as endangered under both Commonwealth and State legislation.

Outcome:

By 2030, four priority populations of threatened flora species have been protected from known threats, and a citizen science program to increase community knowledge about threatened flora has been implemented.

Local threats that can be addressed by NRM actions:

- Land use pressures on surrounding land including development, intensification of industries and poor management practices
- Weeds and feral animals (e.g. deer)
- Increasing fire risk due to climate change
- Lack of knowledge in councils and amongst land managers about threatened flora

Actions:

BS9.a Implement a program to map and protect populations of threatened flora species such as Preminghana Billybuttons and endemic orchids.

Implementation:

Investment opportunity	✓ Australian Government	✓ Tasmanian Government	✓ Regional or Local	✓ Private or philanthropic

Potential delivery methods

- **Information gathering activities** including assessment and mapping of known habitat and threats.
- **Policy and planning activities** such as prioritisation of appropriate management actions and locations for investment and engagement planning.
- **Behaviour-change and capacity-building activities** – education, awareness and skill-building focused on natural values.

Potential collaborators Local Councils; Government agencies including PWS; Aboriginal groups; Landcare, Wildcare and other community groups; Land managers; volunteers; researchers.

Opportunities for community participation Extension, capacity building and land management agreement opportunities for landholders and land managers; capacity-building for council staff and contractors about threatened flora; volunteer and citizen science opportunities.

PRIORITY BS10: Other threatened flora and fauna

In undertaking prioritisation work to determine our regional Priorities for investment in the medium term, 237 species of flora and fauna were assessed due to their IUCN status, Commonwealth or State listing or Tasmanian or regional endemism. There are 18 EPBC-listed threatened species (including Riverbed Wintercress, Basalt Peppercress, Grassland Paperdaisy, Scrambling Groundfern and several heath species) and another 33 species that are listed as "marine" species (such as Great White Shark, Subantarctic Fur Seal and Pacific Gull) and State listed species, such as freshwater snails, which were all assessed using the same MCA but are not currently considered regional Priorities. It is acknowledged, however, that there are both emerging threats and unforeseen challenges in the future which will affect the viability and status of many species, many of which are not currently listed, and we have to remain vigilant and nimble enough to adapt to future uncertainty.

Outcome:

> By 2030, a regional threatened species prioritisation has been completed or updated, and an action plan established.

Local threats that can be addressed by NRM actions:

- Lack of knowledge and understanding of emerging threats
- Lack of threatened species data for many species – e.g. range, population size, habitat requirements
- Lack of knowledge and understanding in the community about threatened species

Actions:

BS10.a Review threatened species prioritisation and plan future actions. Adapt to emerging priorities.

Implementation:

Investment opportunity	✓ Australian Government	✓ Tasmanian Government	✓ Regional or Local	✓ Private or philanthropic

Potential delivery methods

- **Information gathering activities** including assessment and mapping of emerging threats, and supporting professional and citizen science flora and fauna surveys
- **Policy and planning activities** such as prioritisation of appropriate management actions and locations for investment and engagement planning.
- **Behaviour-change and capacity-building activities** – education, awareness and skill-building focused on natural values.

Potential collaborators

Dependent upon types of species and nature of threat but could include local Councils; Government agencies; Aboriginal groups; Landcare, Wildcare and other community groups; Land managers; volunteers; researchers.

Opportunities for community participation

Volunteer and citizen science monitoring opportunities.

» A calm day at Cradle Mountain

8 Implementation

8 Implementation

8.1 Project development

The Strategy identifies the priorities, actions, and outcomes for each prioritised asset class to guide the development of potential projects (identified in Sections 5, 6 and 7). Project designs/plans aligned with the Strategy may be further assessed, refined, and developed during the preparation of Regional Investment Plans and/or in response to investor requests, tender or funding application requirements, or emerging needs.

Each project design/plan will outline, as appropriate, specific, measurable, attainable, realistic and timebound outcomes, methods, baselines, deliverables, monitoring indicators, budgets, measures of success, adaptive management processes, and an evaluation and improvement framework.

All projects will be developed and designed with the funding body/bodies, project partners and in consultation with stakeholder groups to maximise opportunities at the regional level. Projects will effectively contribute to the Outcomes of the Strategy, and those of the funding body/bodies (e.g. the outcomes defined under the Regional Land Partnerships/National Landcare Program, Australian Government).

It is acknowledged that data is deficient for many Priorities identified in the Strategy. Expert technical knowledge was sought to develop appropriate Actions in the Strategy. As projects are developed, NRM organisations will continue to seek expert advice where required to complement available scientific data and address data deficiency. The collection of baseline data may be a component of some project designs/plans.

Regional Investment Plans, or similar documents will be dynamic and will be modified on an as needs basis, such as when new issues or opportunities arise (see Section 8.3).

As Priorities and Actions are developed into Projects, the NRM regions will apply principles and processes to select and rank activities and interventions which are cost effective and demonstrate value for investment (see Attachment 3 and 5). Regional Investment Plans will be developed to identify and describe the types of delivery mechanisms in projects to ensure delivery is cost-effective and outcome focused.

8.2 Partnerships: the way we work

Tasmania's regional NRM organisations work in collaboration with industries, communities, NGOs, specialist groups, research organisations and governments (including GBEs). This Strategy provides a framework that considers community values, expert knowledge and scientific evidence, with the aim to focus the efforts of the NRM organisations.

Critical to the effective and successful delivery of natural resource management projects in the region is the active involvement of individuals, communities, organisations and businesses. Partnerships provide opportunities to for broader involvement in natural resource management. Through the process of project development, the NRM organisations will continue to work with existing and new partners to:

- Understand diverse views and find commonality, where appropriate;
- Be informed and to inform decision-makers about regional natural resource management priorities;
- Target action in prioritised areas and achieve the best outcomes possible with the resources available;
- Identify opportunities to improve natural resource management practices;
- Facilitate collaboration across multiple partners, in priority areas; and
- Advocate for investment into identified regional natural resource management priorities.

8.3 Emerging priorities

New priorities are likely to emerge in and across the three Themes during the life of this strategy. Emerging issues may stem from new or changed threats, or shifts in drivers such as government priorities, regional, local or community concerns.

The regional NRM organisations will monitor emerging priorities from a local, state, and national perspective.

As an example, the list of nominated species, ecological communities and key threatening processes that have been approved for assessment by the Minister responsible for the EPBC Act are detailed annually in the Finalised Priority Assessment List (FPAL). Relevant Actions have been identified in the Strategy to support/reduce threats to species and communities currently listed under the EPBC Act – the regions will monitor the FPAL list annually to assess and prioritise new Actions for emerging species and communities that are scheduled to be assessed for the EPBC Act.

The process to monitor for emerging issues will involve the periodic review of:

- Relevant government policies, strategies, and positions;
- Changes in the listing of species or ecological communities under relevant legislation;
- Updates to recovery plans, listing statements or conservation advice;
- Key advances or updates on threatening processes, strategies or technological developments to address threatening processes;
- Regular communication and consultation with key stakeholders including local and regional organisations (e.g. Government, research institutions, GBEs and NGOs, etc); and
- Reports on the work of our partners and stakeholders.

The Multi-Criteria Decision Analysis process (see Appendix 3) will be used to determine if the emerging issue will change current priorities or actions. This assessment will also consider the resources required. For example, while a priority may emerge or change, it may not be feasible to alter current priorities or actions to address the emerging one.

Projects based on emerging priorities may be included in the Regional Investment Plan from time to time.

8.4 Reviewing the Strategy

The 2030 NRM Strategy provides the framework for natural resource management delivery in Tasmania to 2030. It is a statutory requirement (under Tasmanian legislation) that this Strategy is reviewed in 5 years. While the planning horizons of the strategy are to 2030, a review will be undertaken in 2027. This review will inform the development of any required updates to Outcomes, Priorities, Actions, or other elements of the strategies.

The review will assess the extent the Strategy has achieved its outcomes – including the extent to which Priorities have been addressed, or Actions have been completed.

As a part of the review of the strategy, the following Key Evaluation Questions will be considered:

1. Strategic alignment and appropriateness:

a) Are the Outcome statements for each Asset Class still appropriate, or should they be modified?
b) Are the Priorities or Actions in each Asset class still relevant and appropriate?

2. Progress and impact:

a) What was the level of investment secured to deliver the strategy?
b) What proportion of Priorities or Actions identified in the Regional Strategy plan have been addressed (in part or in full)?
c) Have the funded projects contributed to the achievement of the Outcome statements for each Theme?

3. Adaptability:

a) Have emerging priorities been identified since the strategy was developed? Were they addressed in any way?
b) Are there any new or changed focus areas that should be addressed by the strategy?
c) What were the key learnings from project implementation, including any constraints, and the implications for the strategy?

4. Engagement and sustainable outcomes:

a) Are the identified UN SDGs being addressed in the delivery of projects?
b) Has Aboriginal participation, culture and knowledge been included in relevant projects?
c) Were stakeholder aspirations reflected adequately in the strategy?
d) What was the percentage of projects delivered in partnership with stakeholders (with shared aspirations)?

8.5 Measuring project success

A MERI (Monitoring, Evaluation, Reporting and Improvement) framework will be used to assess progress on achieving outcomes of funded projects. This framework embeds adaptive management and establishes a measure of success for a project. The specific MERI framework used for each project will be developed on a case-by-case basis, but will broadly cover the approach described by the Australian Government (http://www.nrm.gov.au/publications/meri-strategy):

Monitoring: Collection of data and information.

Evaluation: Analysing monitoring data, assessing what it means and making informed judgements about the success of a project (or program) and potential improvements.

Reporting: Communicating what was found from monitoring and evaluation. It is about sharing information, including about achievements and lessons learnt.

Improvement: Using this information to improve the way things are done.

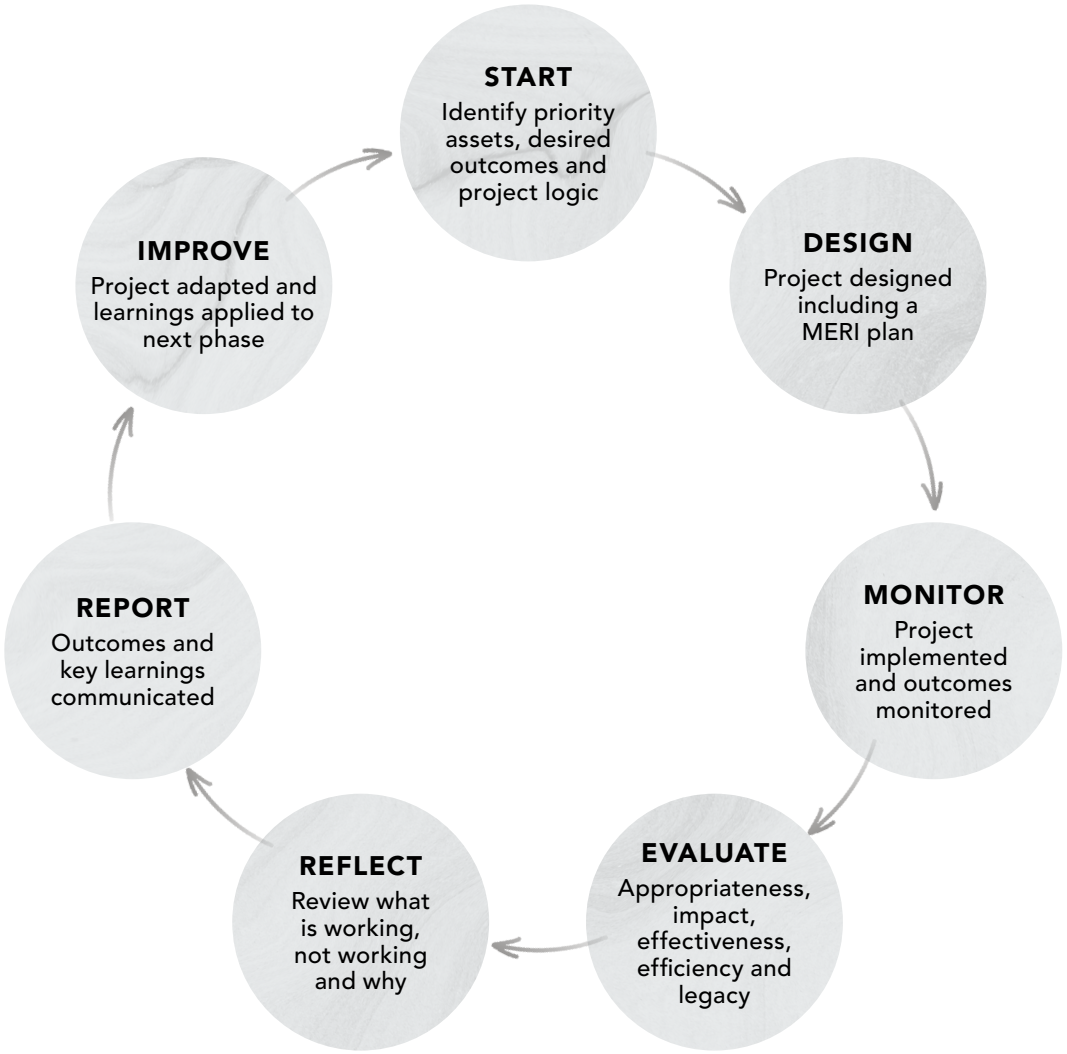


FIGURE 8: **Project level MERI processes that support adaptive management and continuous improvement**

» Potato crop at Penguin (Ernst Kemmerer)

9

Acronyms and glossary

9 Acronyms and glossary

9.1 Acronyms

ALCT	Aboriginal Land Council Tasmania	**km²**	square kilometres
ANU	Australian National University	**LIST**	Land Information System Tasmania
AWI	Australian Wool Innovation	**M**	Million
BMP	Best Management Practice	**MCA**	Multi-criteria Analysis
CCA	Cradle Coast Authority	**MERI**	Monitoring, Evaluation, Reporting and Improvement
cm	Centimetre	**ML**	Megalitre
COVID-19	2019 novel coronavirus disease	**MLA**	Meat and Livestock Australia
CR	Critically endangered (threatened species listing)	**NC Act**	*Nature Conservation Act 2002* (Tasmanian)
CSIRO	Commonwealth Scientific and Industrial Research Organisation	**NGO**	Non-government organisation
DAWE	Department of Agriculture, Water and the Environment	**NRET**	Department of Natural Resources and Environment Tasmania (formerly DPIPWE)
DPIPWE	Department of Primary Industries, Parks, Water and Environment	**NRM**	Natural Resource Management
EN	Endangered (threatened species listing)	**OBP**	Orange-bellied Parrot
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)*	**PFT**	Private Forests Tasmania
FPA	Forest Practices Authority	**PMP**	Property Management Planning
FPAL	Finalised priority assessment list	**PWS**	Tasmania Parks and Wildlife Service
GBE	Government Business Enterprise	**RLP**	Regional Land Partnerships
GFC	Giant Freshwater Crayfish	**STT**	Sustainable Timbers Tasmania
ha	hectares	**TAPG**	Tasmanian Agricultural Productivity Group
IFS	Inland Fisheries Service	**TEC**	Threatened Ecological Community
IMAS	Institute for Marine and Antarctic Studies	**TFGA**	Tasmanian Farmers and Graziers Association
IPA	Indigenous Protected Area	**TLC**	Tasmanian Land Conservancy
IPCC	Intergovernmental Panel on Climate Change	**TSP Act**	*Threatened Species Protection Act 1995* (Tasmanian)
IUCN	International Union for Conservation of Nature	**TWWHA**	Tasmanian Wilderness World Heritage Area
k	1000	**UN SDGs**	United Nations – Sustainable Development Goals
KBA	Key Biodiversity Area	**UTas**	University of Tasmania
kg	Kilogram	**VU**	Vulnerable (threatened species listing)
KI	King Island	**WQIP**	Water Quality Improvement Plan
km	kilometres		

9.2 Glossary

Actions	Actions are the identified tangible steps to address the threatening processes affecting the Priorities, and outline potential investment options that will guide specific project development and activities further refined in a Regional Investment Plan or similar document.
adaptive management	The principle of observing, recording and monitoring project delivery mechanisms and resulting responses in order to inform changes and different approaches for future work. This involves regularly evaluating and analysing progress to adapt management decisions as required, resulting in robust decision-making in the absence of certainty.
anthropogenic	Originating in or from human activity.
Asset Class	Within each of the identified Strategy Themes, specific Asset Classes are identified at the state and regional scale. Asset identification provides a structure that focuses action and investment in priority areas.
assets	Natural resource assets represent a specific form of natural value, and its interaction with economic and social values. This includes natural values such as a species, ecological community or character description, water body, geographical area, or a combination of soil type and land use. Asset Classes are used to classify assets within the Strategy Themes.
best management practice (BMP)	Methods that have been determined to be the most effective and practical means of achieving a positive outcome. These are methods that are supported by best available science, as well as government, industry, and/or certification programs, and have been practically applied and tested through adaptive management processes.
biodiversity	The variety of all life forms on earth - the different plants, animals and micro-organisms, their genes, and the terrestrial, marine and freshwater ecosystems of which they are a part.
biosecurity	The management of risks to the economy, the environment, and the community, of pests and diseases entering, emerging, establishing, or spreading.
blue carbon sequestration	Blue carbon refers to the contribution of coastal vegetated ecosystems to global carbon sequestration.
carbon storage	Retain carbon and keep it from entering Earth's atmosphere.
citizen science	The practice of public participation and collaboration in scientific research to increase scientific knowledge.
collaborator	NRM organisations rely on project collaborators, groups or organisations that help facilitate project outcomes through mechanisms such as: in-kind commitment, associated services and endorsement. This may include project participation through activities such as citizen science, or participating in project governance.
conservation covenant	A voluntary agreement made between a landholder and an authorised body (for conservation purposes in an NRM context).
ecological character	Referring to Ramsar-listed wetlands: the combination of the ecosystem components, processes, benefits and services that characterise the wetland at a given point in time.
ecological community	A naturally occurring group of native plants, animals and other organisms that are interacting in a unique habitat.
ecosystem function	The combined effects of all natural processes that sustain an ecosystem.
emerging priority	NRM priority based on new information or changing circumstance that arises during the life of the plan.
endemic	Native and restricted to a certain place.

fragmentation	Relating to habitat, a process during which a large expanse of habitat is transformed into a number of smaller patches.
hydrology	The distribution and movement of water.
indicators	Measuring success in delivery towards achieving outcomes.
intertidal	The zone where the ocean meets the land between high and low tides.
invasive species	A species occurring, as a result of human activities, beyond its accepted normal distribution and which threatens valued environmental, agricultural or other social resources by the damage it causes.
Key Biodiversity Areas	Key Biodiversity Areas are sites of global importance to the planet's overall health and the persistence of biodiversity. The Key Biodiversity Area Partnership is an international programme supporting nationally led efforts to identify areas that are critical for the survival of unique plant, animals and ecological communities.
land manager	Any person or group of people with responsibility for managing land, including but not limited to land owners and lease holders, farmers, government or privately owned entities.
lutruwita	The Tasmanian Aboriginal name for the land, sea and sky Country now called Tasmania, agreed under the Aboriginal and Dual Naming Policy. Some Tasmanian Aboriginal people prefer the name trowunna, and this is acknowledged, but has not been used throughout the Strategies.
management actions	Are developed as a part of the project implementation process, within specific projects, as project-related activities.
net primary productivity, or NPP	The gross primary productivity minus the rate of energy loss to metabolism and maintenance.
Outcomes	Long-term (aspirational) and near-term Outcomes for Tasmanian natural resources were identified by the regional NRM organisations. These Outcomes form benchmarks for measuring the success of Actions described in this Strategy.
partner	Partners are organisations who have a formal relationship with NRM organisations through an existing mechanism such as a grant deed, contract or other agreement.
peri-urban	Transition from rural to urban land uses located between the outer limits of urban or regional centres and the rural environment.
Priorities	Priorities are assets that have been identified under each Asset Class through a regional prioritisation process.
production landscape	Landscapes on which primary or other production occurs for economic outcome.
Ramsar Convention/ site	Ramsar Convention on Wetlands of International Importance is an international treaty for the conservation and sustainable use of wetlands
recognised biodiversity hotspots	Areas that are acknowledged in scientific literature, management plans or other technical references as having high biodiversity and important conservation values.
reforestation	The intentional replanting of forests and woodlands that have been depleted, usually through deforestation or land clearing.

Regional Land Partnerships	As the largest component of the Australian Government's National Landcare Program, the Regional Land Partnerships investment is being delivered through a reformed regional model that supports a range of projects contributing to four environment and two sustainable agriculture outcomes. The program logic provides an overview of Regional Land Partnerships outcomes and how these outcomes will be achieved through the implementation of services appropriate to priority actions identified in plans, strategies, reports and advice.
Regional Land Partnerships 5-Year Outcomes	Long term outcomes in the RLP Program Logic will be achieved through 5-year outcomes in each of the environment and agriculture outcomes.
rodenticide	Pesticides that specifically kill rodents, including mice and rats.
Tasmanian Aboriginal people and community	This is the name used for the First Tasmanians and their descendants throughout the Strategies. We acknowledge that some organisations and individuals prefer First Nations People, or Indigenous people.
Themes	Land, Water, and Biodiversity are the high-level categories, adopted as Themes, to provide the structure of the regional NRM Strategies at the state-wide scale.

» Tree planting materials

10 Attachments

The following documents provide further context or background relevant to the Strategy:

Ref.	Document	Description
A1	Tasmanian NRM policy context and drivers	A description of the current policy setting, risk and opportunities arriving from global and local drivers.
A2	Tasmanian NRM linkages with UN SDGs	A table summary of priorities and linkages with UN SDGs.
A3	Tasmanian NRM prioritisation process	A summary of the MCA prioritisation process undertaken for each theme.
A4	Stakeholder engagement	A summary of the ways in which the NRM organisations engaged with their stakeholders during the development of the Strategy.
A5	NRM planning linkages with Regional Land Partnerships Outcomes	Detail about how the regional priorities relate to the Australian Government Investment Priorities
A6	References	Documents and important links referred to in the Strategy.

More information about the three Tasmanian NRM organisations is available on their websites:

https://nrmsouth.org.au/

https://nrmnorth.org.au/

https://www.cradlecoast.com/

» Brown Thornbill (Ernst Kemmerer)

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